



QUALITY DEER MANAGEMENT ASSOCIATION

P.O. Box 160 • 170 Whitetail Way • Bogart, GA 30622
PHONE: 800.209.3337 • FAX: 706.353.0223 • www.QDMA.com

14 June 2018

Governor Scott Walker
Office of the Governor
PO Box 7863
Madison, WI 53707

Dear Governor Walker,

On behalf of the Quality Deer Management Association (QDMA) I am writing to support your three proposals listed below relating to chronic wasting disease (CWD) management. The QDMA is a national nonprofit wildlife conservation organization dedicated to ensuring the future of white-tailed deer, wildlife habitat and our hunting heritage. The QDMA has over 60,000 members nationwide, and our membership includes hunters, landowners and natural resource professionals.

Proposal 1 - harvested unprocessed wild deer cannot be moved from a CWD county to another county except to an adjacent CWD county unless they are being taken to a meat processor or taxidermist.

Currently, 26 states prohibit hunters from bringing harvested deer with intact high-risk parts (brain, eyes, spleen, spinal cord and lymph glands) into their state from states that have confirmed CWD. Fifteen states restrict high risk parts from entering their state from any other state – regardless if that other state has confirmed CWD or not. The proposed restriction will help slow the spread of CWD and thus we support it.

Proposal 2 - all cervid farms must have enhanced fencing including a second eight-foot high fence, a solid wall or an electric fence.

CWD can be spread via saliva and interactions between wild deer and captive deer should be eliminated. The enhanced fencing proposal would not allow any co-mingling between wild and captive deer and thus we support it.

Proposal 3 - deer farms in CWD affected counties would not be able to move deer from their facilities.

Unfortunately, there is not a practical and reliable live animal test so CWD-positive deer could unknowingly be moved among facilities. Moving live deer is the most likely way to spread this disease so we support this proposal.

Thank you for the opportunity to comment on these proposals and for your commitment to Wisconsin's natural resources.

Respectfully,

Kip Adams
Director of Conservation

Carlson, Michael M - DATCP

From: ANNETTE AEBERHARD <mikeandnet@tds.net>
Sent: Monday, June 11, 2018 7:00 PM
To: Carlson, Michael M - DATCP
Subject: Farm raised deer

Dear Michael,
I do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing.
These rules will put
most of these farmers out of business.

Thanks for listening,
Annette Aeberhard
720 E Coates Avenue
Monticello, WI 53570

Carlson, Michael M - DATCP

From: Cathy Ahrens <cahrens2016@gmail.com>
Sent: Monday, June 11, 2018 5:56 PM
To: Carlson, Michael M - DATCP

To Whom It May Concern,

My name is Cathy Ahrens and I am a concerned voting Wisconsin citizen. The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The three-step plan will prevent the genetic resistant research to continue what has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,
Cathy Ahrens

Carlson, Michael M - DATCP

From: Allen, Dee <dee.allen@ldftribe.com>
Sent: Monday, June 11, 2018 1:38 PM
To: Carlson, Michael M - DATCP; DNR Administrative Rules Comments
Cc: Wildcat Sr., Joseph
Subject: Lac du Flambeau Band of Lake Superior Chippewa Tribe comments/Scope Statement for Emergency Board Order WM-11-18(E) and Board Order WM-12-18, to revise chs.NR 10 & 16, relating to deer carcass Transportation, deer farm fencing, and chronic Wasting disease

Please accept these comments for the record:

First, the Lac du Flambeau Band of Lake Superior Chippewa Tribe has and continues to be very concerned with the increase in Chronic Wasting Disease in Wisconsin and within all ceded territories. Waawaashkeshi (deer) are a prominent traditional food that we highly depend on for sustenance.

We also go on record to support and concur with the Great Lakes Indian Fish and Wildlife Commission comments regarding these proposed rules as well.

However, as a Tribe we request formal consultation on how the proposed rules will apply within our reservation borders. Please follow up with our Tribal President Joseph Wildcat, Sr.

>These proposed and current rules are not protective enough and more stronger restrictions or prohibition of deer farms throughout the states need to be a priority.

> A targeted testing initiative should be conducted within every county to monitor the spread of CWD.

>More coordination between DATCP, DNR and Tribes must occur to successfully address the CWD issue and Tribal input must be considered in any effort.

>Increase public and community awareness on CWD and the handling of CWD infected meat and carcasses(in the interim before/during testing and disposal of).

>Conduct more training on CWD sampling for various species.

>Develop a coordinated plan with all concerned parties (Tribes, hunters, state agencies, federal agencies, GLIFWC, etc.).

Thank you for the opportunity to submit these comments.

Dee Ann Allen
Lac du Flambeau Tribal Natural Resource Department/Environmental Protection Program/ LDF Tribal member and Tribal Council Member
P.O. Box 67
Lac du Flambeau, Wisconsin 54538
Ph#715-588-4295 Cell#715-614-8454

Carlson, Michael M - DATCP

From: Kenneth C. Andries <kcanbr@aol.com>
Sent: Monday, June 4, 2018 5:56 PM
To: Carlson, Michael M - DATCP
Cc: kcanbr@aol.com
Subject: DATCP hearing on CWD 6-7-2018

To: Michael Carlson
Re. DATCP Hearing on CWD, June 7, 2018

Dear Mr Carlson,

I am contacting you in response to an article in Sunday's Milwaukee Journal/Sentinel regarding newly proposed, permanent rule changes affecting whitetail deer hunting in Wisconsin, as related to CWD management.

In this proposal, you seek to "PREVENT THE REMOVAL" of legally harvested deer carcasses from a CWD affected county, unless the meat is deboned from the carcass. If passed this rule would prevent me from deer hunting!

As a senior hunter approaching the age of 80 years, this regulation would present an extreme hardship for me. Although I can field dress a deer, I am not capable of nor do I have the expertise required for skinning, quartering and boning the animal.

I, like thousands of other hunters who live near the Milwaukee/Waukesha area, drive three to five hours each trip to central or northern Wisconsin to deer hunt. For over 40 years, I have been deer hunting on land I own in Marathon County, Wisconsin. As I reside in Waukesha County, after registering a harvested deer in Marathon County, I normally transport it home to the City of Waukesha where I take it to a local professional butcher for the proper processing, which includes butchering, packaging and freezing of the meat. This process often takes several weeks before my venison is ready to be picked up from the butcher.

If I were required to have the deer processed in the county in which it was harvested (Marathon County in my case), that would require me to make an additional trip back to Marathon County to pick up the venison after hunting season, likely in late winter if the deer was killed during the gun hunt or late bow season. That would mean at least an eight hour driving trip back and forth during winter weather conditions, which could be hazardous and which I am not comfortable doing. In addition, there is the hardship of the additional time and expense of a second round trip, which for some, may require a stay overnight. **THIS JUST DOES NOT MAKE SENSE** for senior citizens. I have some doubts that the Governor would be willing or able to do that if he hunted alone.

Although I can understand the rationale of the proposal, I feel the point which requires the meat be removed from the carcass before being transported from the CWD affected county would place a severe hardship on many hunters, and most specifically on senior citizens and those of any age who may have health problems or other physical issues.

I respectfully urge you to look carefully at this proposal and take whatever steps necessary to do away with the proposed rule which requires hunters to basically butcher a deer before removing the meat from the CWD

affected county in which it was harvested. Please use every effort to protect and maintain the ability of all hunters to participate in the great sport of Wisconsin deer hunting in our state, by not creating an additional hardship that may force many hunters, like myself, to give up the sport.

Thank you for your consideration and help in this regard.

Sincerely,

Kenneth Andries
115 East Sutton PL. Unit A
Waukesha, WI. 53188

Email: kcanbr@aol.com
Phone: 262-309-6966

Carlson, Michael M - DATCP

From: Autumn Armstrong <autumnrarmstrong@gmail.com>
Sent: Tuesday, June 12, 2018 3:58 PM
To: Carlson, Michael M - DATCP

To Whom It May Concern,

My name is Autumn Armstrong and I am a Wisconsin hunter/concerned voting citizen. The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The three-step plan will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely, Autumn Armstrong

Carlson, Michael M - DATCP

From: Barb <barb_armstrong@yahoo.com>
Sent: Monday, June 11, 2018 2:53 PM
To: Carlson, Michael M - DATCP
Subject: Emergency Ruling

To Whom It May Concern,

We are Jan and Barb Armstrong. We own and operate Wildlife Creations Whitetails in Taylor County.

We have put almost everything we had, retirement funds and inheritance to build our facility. We are almost 60 yrs old and were planning on the farm for some support for our retirement. Our farm is OUR LIVELIHOOD, OUR PASSION. We love what we do and care what happens to our deer. If this Emergency Ruling passes we will lose EVERYTHING we worked so hard for.

We are all concerned about CWD, but do not believe the Emergency Ruling would be the answer. The farms are not the problem but the solution.

On behalf of Jan and I, and all Deer Farms in Wisconsin we hope you will reconsider the Emergency Ruling.

Thank You
Jan And Barb Armstrong

6/14/18

To Whom it May Concern:

I'm writing today about the issue of CWD in Wisconsin and some of the ideas that have been proposed. I must say that CWD is a disease that should be monitored, but should be monitored in a way that is industry and wildlife friendly. I'm convinced that CWD is in every state if someone wants to test enough animals. That is not the point however. The point should be to discover ways to prevent or control the disease. Double fencing the domestic cervid ranches has not worked since producers have tested thousands of animals and then one shows up as a positive. Cervid producers have rules and regulations they must follow, and there are regulations concerning CWD they must follow. We all know that captive cervids are being tested at a much higher rate than those cervids in the wild. Why punish the captive producers when in fact they could help lead to discoveries of preventing or controlling CWD? Is this not the goal of the wildlife agencies or is this a political issue? There are labs and studies being conducted to see if there are specific genes that are resistant to CWD. This may come to fruition or may not, but at least they are trying to make discoveries. That is more than what most, if not all, of the opponents of the captive cervid industry. We need to allow the captive cervid industry to continue operating under the current rules and regulations as long as they meet those standards. They, as business owners can't control diseases outside of their facilities, but can within their facilities. We don't close state lines or halt everyday life because there is a flu epidemic, we look for vaccines or ways to cure it or prevent it. The same applies here. We all know CWD exists, so let's work together and come up with solutions instead of creating more issues. We need to make this great country we live in easier to do things, not make everything more difficult.

Sincerely,

Andy Azcarraga

Lindsay Balson
8067 State Highway 47 E
Woodruff, WI 54568

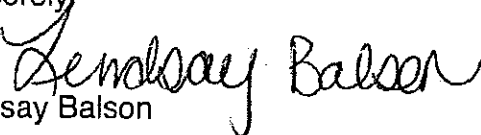
Wisconsin Department of Agriculture, Trade and Consumer Protection
ATTN: Alex Girard
Small Business Regulatory Coordinator
P.O. Box 8911
Madison, WI 53708-8911

June 14, 2018

Dear Mr. Girard:

I am opposed to the Emergency Scope Statement Proposal. I am the Head Curator at Wildwood Wildlife Park for the past ten years. I am a biology graduate from University of Wisconsin Green Bay and I believe that the zoo is extremely regulated for our deer herd already and we are on the CWD certified herd management program for the past 17 years with no evidence of CWD. I believe these proposed measures will cause hard ship to the zoo and even effect the attendance, which is our total revenue for the zoo operations. I know for a fact many guests come to Wildwood Wildlife Park to see and hand feed the deer it is an awesome experience not to mention very educational. I would hope you would reconsider what you have done when putting this Emergency Scope Proposal out there. We are not in any state of emergency we just need DATCP and the DNR to work together with the deer farmers to better understand what is going on with the wild deer. We certainly should not be blamed for the CWD in our counties there is no scientific evidence to point the blame on our businesses.

Sincerely,


Lindsay Balson

Carlson, Michael M - DATCP

From: Heather Begley <begleyheather@gmail.com>
Sent: Monday, June 11, 2018 8:38 PM
To: Carlson, Michael M - DATCP

Hi I do not support the emergency rule for farm raised deer movement and enhanced fencing.

Carlson, Michael M - DATCP

From: Steve and Marsha Bertram <windyridge@frontier.com>
Sent: Monday, June 11, 2018 8:52 AM
To: Carlson, Michael M - DATCP
Subject: Our Position with Proposed "Emergency Rules"

To Whom It May Concern:

We are lifetime hunters, life members of Seven Oaks Archery Club and former deer farmers in Iowa County. The recent proposals of Governor Walker have weighed on our minds VERY heavily. We are writing this letter to the board to state that we do NOT agree with said proposals. The proposals will prevent the genetic resistant research to continue that has the potential to sustain the farmed AND free range whitetail deer populations in Wisconsin long into the future.

As been known since 2002, Iowa County has "freely" shared CWD through the wild deer. Last fall our deer farm of 20 years was one of the few double-fenced deer farms that contracted CWD. For 12 years we were double fenced, 9 years we didn't bring any new animals into our herd and all deer over 1 year old that we tested prior to October proved negative for CWD. We are anxious to learn exactly how our non-clinical deer could "catch" CWD. We depopulated our herd and just received test results back on Friday. We can undeniably state that we cannot come to a conclusion as to how they contracted CWD. Two of the deer that we were told tested positive had no contact whatsoever with each other or the other 19 deer that tested positive on the stocker side of our farm which is split by a 20' runway.

There is so much more we need to learn about this disease – you cannot do it without deer farmers. You just can't. If the Deer Farms go down, the Wild Deer go down. Potential cures for CWD may be lost if these proposals are passed.

Steve and Marsha Bertram
Windy Ridge Whitetails
525 Old Highway Road
Mineral Point, WI 53565
608-341-9520
www.WindyRidgeWhitetails.com
<https://www.facebook.com/windyridgewhitetails/>



Virus-free. www.avg.com

Carlson, Michael M - DATCP

From: WOW Admin.Ass't. <wow@whitetailsofwisconsin.com>
Sent: Thursday, June 14, 2018 6:07 PM
To: Carlson, Michael M - DATCP
Subject: On Behalf of Whitetails of Wisconsin
Attachments: Jerry Campbells Appraisal of WI Deer.pdf; Jerry Campbells Whitetail Resume 2017.pdf

Dear Mr. Carlson:

On behalf of Whitetails of Wisconsin, I submit to the DATCP Board a copy of Jerry Campbell's Appraisal of Wisconsin Deer and his Resume in our effort to show this will be more than a \$10 million economic impact. Thank you.

Marsha Bertram, Adm. Asst.
Whitetails of Wisconsin
525 Old Highway Road
Mineral Point, WI 53565
608-341-9520
wow@whitetailsofwisconsin.com
www.whitetailsofwisconsin.com



Whitetail Certified Appraiser

JERRY CAMPBELL

jcdeerfarm@gmail.com

Phone: 847-778-8327

29024 Hwy C • Alexandria, MO 63430

Ryan Rodenkirch ordered appraisal 5/21/18

This is my opinion of the whitetail deer located on Wisc deer farms.

The price of the AVERAGE buck raised commercially in Wisc is \$5000.00 Wholesale

The price of an AVERAGE open doe is.....\$2500.00

The price of a AVERAGE buck fawn is\$2000.00

The price of an AVERAGE doe fawn is \$750.00

This is my opinion based on fair market value 5/21/18

Jerry Campbell

Certified Appraiser

Fee Paid by Ryan

June 7, 2018

Thank you for considering this input on behalf of the Wisconsin Conservation Congress (WCC) regarding these important CWD rules that Governor Walker has requested be promulgated. In 2016, the DNR initiated the first 5-year review of the DNR 15-year CWD response plan and CWD initiatives. The Wisconsin Conservation Congress (WCC), Department of Natural Resources (DNR) and the Department of Agriculture, Trade and Consumer Protection (DATCP) came together as sponsors of a broader CWD review process.

The sponsors established an ad hoc, multi-stakeholder review committee to further discuss and assess the CWD response plan, and to recommend modifications to it. Membership of the CWD Response Plan Review Committee consisted of Wisconsin agencies and non-governmental organizations all of whom had a significant stake in addressing CWD in Wisconsin. The groups and organizations involved included the Wisconsin DNR - Law Enforcement, Wisconsin DNR - Wildlife Management, Wisconsin Department of Agriculture, Trade and Consumer Protection, Wisconsin Veterinary Diagnostic Lab, Wisconsin Department of Health Services, Wisconsin Department of Tourism, Wisconsin Conservation Congress, Wisconsin Commercial Deer and Elk Farmers' Association, Whitetails of Wisconsin, Wildlife Rehabilitation Advisory Council, Whitetails Unlimited, Quality Deer Management Association, Wisconsin Wildlife Federation, Wisconsin Veterinary Medical Association, Wisconsin Bowhunters Association, Safari Club International, the Archery Trade Association, and the Sporting Heritage Council.

Members of the public provided comment during the designate public comment period at each meeting and the sponsors actively engaged the public and sought their input as we reviewed the current CWD management strategies with the stakeholders. The rules we are reviewing today were all part of that discussion.

Enhanced fencing is an important part of any biosecurity plan for livestock based agricultural facility. The mink industries have had to go to extremes to keep disease from destroying their businesses by constructing expensive barriers and fencing to make sure no animals from the wild will enter their facilities. Similarly, the cervid industry should also take these precautions for the protection of their businesses as well as that of the wild herd. Currently there are some cervid farms in Wisconsin who understand the value of double or enhanced fencing and have already applied this as an aspect of their biosecurity plan. With the lower cost of electric fencing, this requirement is a reasonable and affordable precaution to require of cervid farms.

In addition, restricting the movement of deer from deer farms that are in CWD affected counties would be an effective measure, however, it would likely put some deer farmers out of business. While the Conservation Congress does not promote deer farming, when making rules and laws, we also want to take every measure possible to avoid economic hardships for the citizens who stand to lose the businesses they are heavily invested in. The WCC would be supportive of a modification that would only allow movement of deer from deer farms in CWD affected counties to others CWD affected counties. This would still restrict movement of deer from deer farms in CWD affected counties to those counties that are not CWD affected. We feel this is a reasonable compromise that offers the non-affected portions of the state protection against movement of animals from CWD affected counties, but still allows those farms in CWD affected areas an option and place to sell their animals.

Again, thank you for the opportunity to provide comments on these proposed rules on behalf of the Wisconsin Conservation Congress. While we are advisory to the Natural Resources Board, in this instance we felt it was prudent to provide our input to this body given the importance of these rules to preventing the continued spread of CWD into the non-affected portions of the wild deer herd.

A handwritten signature in black ink that reads "Larry Bonde". The signature is written in a cursive, flowing style.

Larry Bonde, Chair
Wisconsin Conservation Congress

DELAFIELD

Chamber of Commerce

P.O. Box 180171
Delafield, WI 53018
Phone: 262.646.8100
Fax: 262.646.8237

www.visitdelafield.org  Info@visitdelafield.org

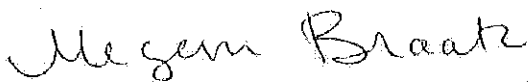
The Honorable Scott Walker
Governor of Wisconsin
115 East State Capitol
P.O. Box 7863
Madison, WI 53707

Dear Governor Walker,

My name is Megan Braatz, and I am the Executive Director for the Delafield Chamber of Commerce. The Delafield Chamber of Commerce has been working with Reindeer Games from Hartford, WI since 2002. Reindeer Games has played a large role in our holiday event, Breakfast with the Reindeer. We have over 2,000 community members who look forward to this event every year and travel from all over Wisconsin to see Reindeer Games. Reindeer Games is a positive influence on our community and provides joy and memories for thousands of children each holiday season.

We have been made aware that you are considering not letting their reindeer leave their property. This decision would hugely impact our chamber and community along with many other local communities. Reindeer Games is a great company with great morals and ethics and has provided and continues to provide excellent care to the reindeer for many years.

Please reconsider restricting movement of reindeer, and allowing them to continue community events.



Megan M. Braatz
Delafield Chamber of Commerce
415 Main St.
Delafield, WI 53072



Carlson, Michael M - DATCP

From: Todd Breitenfeldt <Todd.Breitenfeldt@kretzlumber.com>
Sent: Friday, May 18, 2018 9:46 AM
To: Stamm, Christine A - DATCP
Subject: DATCP Board Meeting

Hi Christine,

I am writing to inform you of how these New proposed rules dealing with CWD will affect my family deer farm. My wife Carrie and I along with our two children, Christopher and Nicole have been raising Whitetail deer since 1995. Needless to say, we have learned a great deal about raising whitetail and we have also shared our experiences and knowledge with local communities. When CWD hit Wisconsin back in 2002, that was really an eye opening experience we all had to endure and it was for the better until we all could learn more about CWD and how to prevent it from spreading. Unfortunately, deer farming will come to an end if these new regulations get set in place for a few different reasons; the cost of modifying our fences, the stress it will cause our animals, my family and I are also restricted by the property boundaries which would require us to put up all new fencing and we have no place to put our animals while this is being done and not being able to sell our animals due to being in an affected county.

Wisconsin already has:

- One of the strictest CWD programs in the country
- Deer farms test 100% of their animals over 12 months of age
- Deer farmers are contributing to research to help fight CWD
- WOW is funding research projects to study the effects of CWD on infected captive animals
- There is no evidence CWD is substantially increasing mortality rates during the duration of a study done from 2003 through 2007

My opinion is there has been substantial dollars invested into the CWD research only to find CWD has been around since the 1950's. The eradication zone in the southern part of the state did absolutely nothing to prevent the CWD Prions from remaining in the soil from dead carcasses. The only known solution is to breed deer with certain genes that are resistant to the CWD prions. Humans cannot contract the disease. I feel the state needs to pull back the dollars we are sticking into CWD as well as discontinue with having affected counties and let mother nature run its course. There has been 16 years of state research as well as the Deer Czar research and we are all still spending more tax dollars and enforcing more regulations for hunters as well as deer farmers.

We should vote to get rid of the feeding ban for hunters which would take away the pressure the hunters are putting on state officials to put more regulations on deer farms. Deer farms should have looser regulations for TB testing. We have been TB testing for 16 years and have not had a positive TB test but yet are required to test our animals every 3 years at a cost of approximately \$100 per animal.

We need to look at the Wisconsin Deer Farm industry being a \$200 Million dollar industry as well as the dollars we spend in our economy. The Wisconsin wild deer herd is as strong as it's ever been in the central region of the state and CWD will not change this. Having tighter regulations on feeding for hunters is going to do nothing but over populate the Wisconsin deer herd, push hunters away from purchasing a license and also cause conflict between hunters and deer farmers.

Deer Farms are the victims of CWD and not the problem.

Thank you for taking the time to relay these comments.

Best Regards,

Todd Breitenfeldt
N2405 Hillside Road
Antigo, WI 54409

C 715-216-3472

Carlson, Michael M - DATCP

From: Nate Chambers <chambers135@gmail.com>
Sent: Tuesday, June 12, 2018 8:20 PM
To: Carlson, Michael M - DATCP
Subject: CWD Proposals

To Whom It May Concern,

My name is Nate Chambers and I am a Wisconsin, hunter, taxpayer and voter . The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The three-step plan will prevent the genetic resistant research to continue what has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,
Nate Chambers

Sent from my iPad

Carlson, Michael M - DATCP

From: Jake Clark <jclark152003@gmail.com>
Sent: Monday, June 11, 2018 12:25 PM
To: Carlson, Michael M - DATCP; DNR Administrative Rules Comments
Subject: Emergency for CWD

I am opposed to (or) I do not support the emergency rule for farm raised deer movement and enhanced fencing.
Jacob Clark
320 west dell st. New Auburn, WI

Carlson, Michael M - DATCP

From: L Clark <lclark@dietaryprosinc.com>
Sent: Wednesday, June 13, 2018 5:38 PM
To: Carlson, Michael M - DATCP
Subject: Please submit my testimony as follows, and as attached.
Attachments: 2015 Prion research 79408.2-20150917081750-covered-253bed37ca4c1ab43d105aefdf7b5536.pdf; Research shows human prion proteins resist chronic wasting disease.pdf; Portfolio of DNR scopes response 2018 submitted via email on 06132018.pdf; Veterinary Statement 2018.pdf; Lisa Testimony Summary to DATCP Statement of Scope 061318.pdf; Stewart Document CWD ATT00089.pdf

I object to the Statement of Scope **as a whole**.

I reference the testimony of **all** speakers at the June 7th meeting in Madison, who provided multiple viewpoints on a plethora of concerns.

It is ill conceived, and will not, as currently written, have the desired outcome on mitigating CWD, as it purports its intention to be.

There are no statutory criteria being presented that meet the requirements for this to be allowed through the emergency rule making process.

The data being presented as factual in the scope statement, is flawed as well as inaccurate with regard to the financial impact that it would have on the small businesses of Wisconsin.

The true fiscal impact aspect alone, would preclude this scope from proceeding as an emergency rule, rather than being examined thoroughly under the normal legislative rule making process.

I vehemently request that this Board outright reject this Scope statement, or any further consideration in the emergency rule making process, as it is unwarranted, and unqualified for such consideration as an emergency rule, under current statutory requirements in Wisconsin.

As a registered female voter since 1988,

an outdoor enthusiast,
a small business employee,
a research advocate,
a staunch defender of the Constitution,
a committed member of my community,
a natural resources aficionado,
a mother of a licensed deer hunter,

and a private deer herd health provider,

on a registered deer premise for the past 25 years,

which is licensed in the state of Wisconsin,
is certified Brucellosis and Tuberculosis free,
while maintaining consistent Vet-Client-Patient relationships with board certified
Veterinary doctors,
and has ***NEVER*** had a positive CWD result, yet tests of 100% of mortalities.

I submit my testimony.

Lisa Clark



Lisa Clark
Sales Executive
Probiotics & Exports

direct: 715.409.6972
office: 715.849.3800
fax: 715.849.9030
email: lclark@dietaryprosinc.com

7111 Stewart Avenue | Wausau, WI 54401 USA | www.dietaryprosinc.com

[Dietary Pros Inc.com](http://DietaryProsInc.com) Flexatine.com Probium.com



Paul Dlugopolski, D.V.M.

Thomas Albrecht, D.V.M., DACVPM

Carla Prahj, D.V.M.

ATHENS VETERINARY SERVICE, INC.

DAIRY, EQUINE & SMALL ANIMAL SERVICES

625 West Limit Road • Athens, Wisconsin 54411

715-257-7003

athensvet@aol.com

www.athensvetservice.com

Small Animals Seen by Appointment



Todd Berry, D.V.M.

Taylor Marquardt, D.V.M.

Ben Tegen, D.V.M., CVSMT

Ashley Clarke, D.V.M.

I would like to enter into the record that I am the veterinarian for the deer farm owned and operated by Karl Schreiner and Lisa Clark, which is located at 2166 Bergmann Road, Athens, Wisconsin.

Premise ID# 0047ETY Herd # 35-CW-02-185 TB cert # 35ATB0319 Bruc cert # 35CBC0102

- ✓ This farm has been engaged in the business of deer farming since 1993.
- ✓ This farm has been participating in the CWD monitoring program since 2002.
- ✓ This deer farm has never had a CWD positive test.
- ✓ This deer farm been tuberculosis certified since 2002.
- ✓ This deer farm has been brucellosis certified since 2012.

Our veterinarian practice performs annual inspections of each animal on this farm for general health.

We also conduct site inspections to ensure the health of every animal prior to issuing a Certificate of Veterinary Inspection (CVI) for movement of any deer offsite.

Our practice includes testing for tuberculosis, brucellosis, and overall health for this farm. We also provide services for the testing of the mortalities that occur on this farm.

Our veterinary practice collects tissue samples from 100% of the cervid livestock deaths on this farm; then each of those samples are sent to the state testing lab to confirm CWD status.

As of this date, and since the beginning of farm activities at this location, this farm has been CWD negative, Tuberculosis and Brucellosis free, for all deer under the management of this owner.

Our veterinary practice also serves 10 other deer farms in the state of Wisconsin.

The economic impact if this rule is enacted, on our individual veterinary business would be detrimental to our clinic. Best calculations equate to an annual loss of \$10,000 in revenue for our practice if the deer farms under our care are forced out of business due to this rule.

Todd F. Berry, DVM

18May2018

Testimony Response to DATCP Statement of Scope

Rule No. Wisconsin Administrative Code chapter ATCP 10 (Existing) Relating to: Animal disease and Movement

Scope Statement Notes:

- A. Finding / nature of emergency
- B. Chronic wasting disease (CWD) is a serious issue facing Wisconsin.
- C. Since 2002, 53 counties impacted? either experiencing positive test for CWD / within ten miles positive testing event.

Concern: A.CWD though a concern in deer is considered a SECONDARY disease process afflicting deer and is not a serious human health issue

B.NO primary disease research has been conducted by the State for any Primary disease(s) afflicting deer that eventually leads to the onset of CWD in the 18+ year history of CWD

Finding: A. Elisa Testing is a PRIMARY tool in "wild" deer testing to "manage" detection for "exposure" to CWD, not a "diagnosis"

B. Captive industry uses "Gold Standard IHC" testing to "diagnose" CWD

Recommend: A. DATCP Board mandates ALL "wild" whitetail deer be tested for CWD by IHC as the Gold Standard for improved CWD detection that is recognized as an official test "diagnosing" CWD.

B. The Board has this tool in their tool box that is approved by the USDA and current Wisconsin State Statutes for reportable diseases to help "certify" CWD in the wild deer of Wisconsin.

Scope Statement Notes:

While the pathways for the transmission of CWD remain unclear,

Wisconsin has made efforts to slow the progression of the disease by restricting baiting and feeding

Concern: A.Efforts to date for "control" CWD disease in the "wild" deer population the DNR is only regulated by State statute to "manage" CWD not "control".

B.CWD prions have been scientifically found to contaminate agricultural crops such as hay, mineral licks and possibly other agricultural crops.

Findings: A. DATCP historically demonstrates "control" of CWD disease process by USDA approved methodologies under direction of veterinary care unlike "wild" deer with CWD.

Recommend: If this emergency rule is truly imminent and restrictions of farmed deer (Certified CWD Free Status) for live movement of their agricultural products in commerce this Board must mandate:

A. removal of "wild" deer from the landscape in areas of deer farms to protect farms from CWD exposure risks without costs to Farmers

B. restriction of any agricultural crop movement outside the endemic counties or any current designated 53 counties as "AFFECTED" by CWD.

SCOPE Statement Notes:

by requiring additional fencing that restricts contact between wild deer and captive populations.

Concern: There is no evidence that CWD is spread between single fenced enclosures.

Double fencing has recently demonstrated not to be an effective tool against the wild CWD disease infecting a deer farm.

Recommend;

A. DATCP's Scope notes little is known re: CWD transmission.

Current research, by the Deer Farm Industry who are your constituents, needs to be embraced by this Boards action for research collaboration before any rulemaking is designed / implemented re: CWD. This collaboration can be accomplished through the Secretary of Agriculture, acting through the Animal and Plant Health Inspection Service-Wildlife Services with Federal research funds.

- B. Any Board considerations with the current Scope directives must include working with deer industry stakeholders.
- C. Without inclusion of stakeholders concerns the Boards potential recommendations of emergency rule making will not begin to prevent the spread of CWD in the State of Wisconsin.
- D. Any rule / legislation to double barrier "ANY" deer farm in the State protecting DATCP's licensed agricultural farms from "wild deer" diseases must be paid for by the DNR.
- E. All Whitetail Deer farm fencing should be moved from DNR to DATCP oversight as to streamline fencing under one Department.

Other information has been provided to the Board for testimony via email submittal.

Lisa Clark 715-409-6972

Statement of Scope
Rule No. WM-12-18,
Relating to: Deer Carcass Transportation,
Farm Fencing, and
Disease (chs. NR 10 & 16),
Permanent and Emergency

Deer
Chronic Wasting
Rule type: Both

As a small business employee and Whitetail deer farmer, my concerns related to the Statement of Scope is to certain objections and suggestive refinements of the proposed SCOPE, for considerations of the Natural Resources Board, before adoption by the NRB as written for implementation into potential legislation as an emergency or permanent rule.

The following reasons for objections are indented and indicated by green font, for ease of distinguishing the objections from the Scope text:

Scope 1.

Finding/nature of emergency (Emergency Rule only):

The department finds that an emergency rule is necessary in order to prevent the further spread of Chronic Wasting Disease (CWD) so that the state can continue the proper management of the deer population in a way that preserves the public welfare. A healthy deer herd and quality deer hunting are a critical component of Wisconsin's culture, economy and identity.

Concern for review 1.

What constitutes a proper level of public welfare in the total Wisconsin population regarding CWD in the wild deer population? Please reference Charts 2 & 3, as it seems inconsistent with the intent of this.

This Scope does not demonstrate any public outcry by any majority or substantial population of Wisconsinites (est. 5.8 million).

The only group that has expressed a minority viewpoint of citizen concerns is that of a small group of hunting public (est. 800,000 / license sales 2017). Within this hunting public population less than 7,000 had expressed an interest in all game and fishing concerns this past year at the annual Conservation Congress spring hearings.

Of these approximately 7,000 interested parties only a portion of this group 3,400+ voted on an advisory question for the action of the DNR to pursue an increase of CWD surveillance in the State as a whole.

The CDAC Charter's mission is to:

- Gather public opinion on deer populations and goals, antlerless quotas and herd management strategies.
- Review and consider scientific metrics on deer herd trends, impacts to habitat and agriculture and human-deer interactions.
- Provide the department with recommendations on deer population objectives, antlerless quotas and herd management strategies.

These findings of a minority view point does not provide for the concern of preservation of welfare to the people of the State of Wisconsin.

Scope: 2. Detailed description of the objective of the proposed rule:

The first wild deer in Wisconsin to test positive for CWD was discovered in 2002. Since then, the department has promulgated rules to seek to prevent the further spread of the disease by regulating carcass transportation, but our rules are becoming outdated as CWD positive deer are identified in additional counties.

Over the recent months there have been instances where we have had CWD positive test results from wild white-tailed deer in counties that did not previously have CWD detected.

This proposal would create additional restrictions on the movement of deer carcasses and certain carcass parts from deer harvested in a CWD-affected county.

The department may also investigate enhanced fencing of deer farms.

Request 1:

Consider the suggestion about transferring the fencing to DATCP since the term "may" seems to connote a disinterest of expending precious man hours and resources in order to do so. This would alleviate the Natural Resources Department of the burden of inspections, allowing them to truly focus on the stated goal of managing the public trust wildlife resources. This makes perfect sense when DATCP oversees ALL other aspects of farmed livestock; deer, cows, sheep, chickens, goats, hogs, etc. By not being divided on time/focus with livestock concerns, the DNR can more properly devote these resources to wildlife management.

These restrictions will seek to help prevent the further spread of CWD.

Additional rule changes may be pursued which are reasonably related to those discussed here.

These rules may make additional updates such as correcting cross-reference citations, updating road names on maps, changes needed in order to update application forms, or revisions which are necessary for consistency with recently enacted legislation

Concern for review 2.

The detailed description of the proposed rule #2 demonstrates that more deer farms have become infected from the spread of CWD from wild deer detected populations. Though the admittance of just recent months of new CWD detections in areas of the state shows that outdated management techniques managed by the DNR as outlined in Scope statement #1.

In this proposed rule can the restriction of deer carcasses movement across the landscape be achieved as a qualified goal or is this action just a "manage" only action?

Recent publication of how Wisconsin deer move across the landscape from hunter harvested Whitetail deer each year demonstrates that there are more hunters per zip code address which hunt in the 4 highest CWD endemic areas of the state.

This is due to the fact that the deer in these areas are living longer and growing bigger racks much sought after by hunters.

This increased interest and the proposal of the department to allow "more whole" carcass' to move across the landscape to taxidermists will increase the rest of the carcass as well increasing the opportunity to have an opposite effect of restricting carcass movement as proposed.

As described in this portion of the scope statement the department only "seeks to help" in the spread of the CWD disease process.

With this carcass movement, will there be any mandated penalties/fines along with enforcement activities, if the department is serious about containing or mitigating CWD in Wisconsin?

Home Zip Codes of hunters harvesting deer in Dane, Iowa, Richland and Sauk Counties, Wisconsin, 2016-2017

Data: Wisconsin Department of Natural Resources

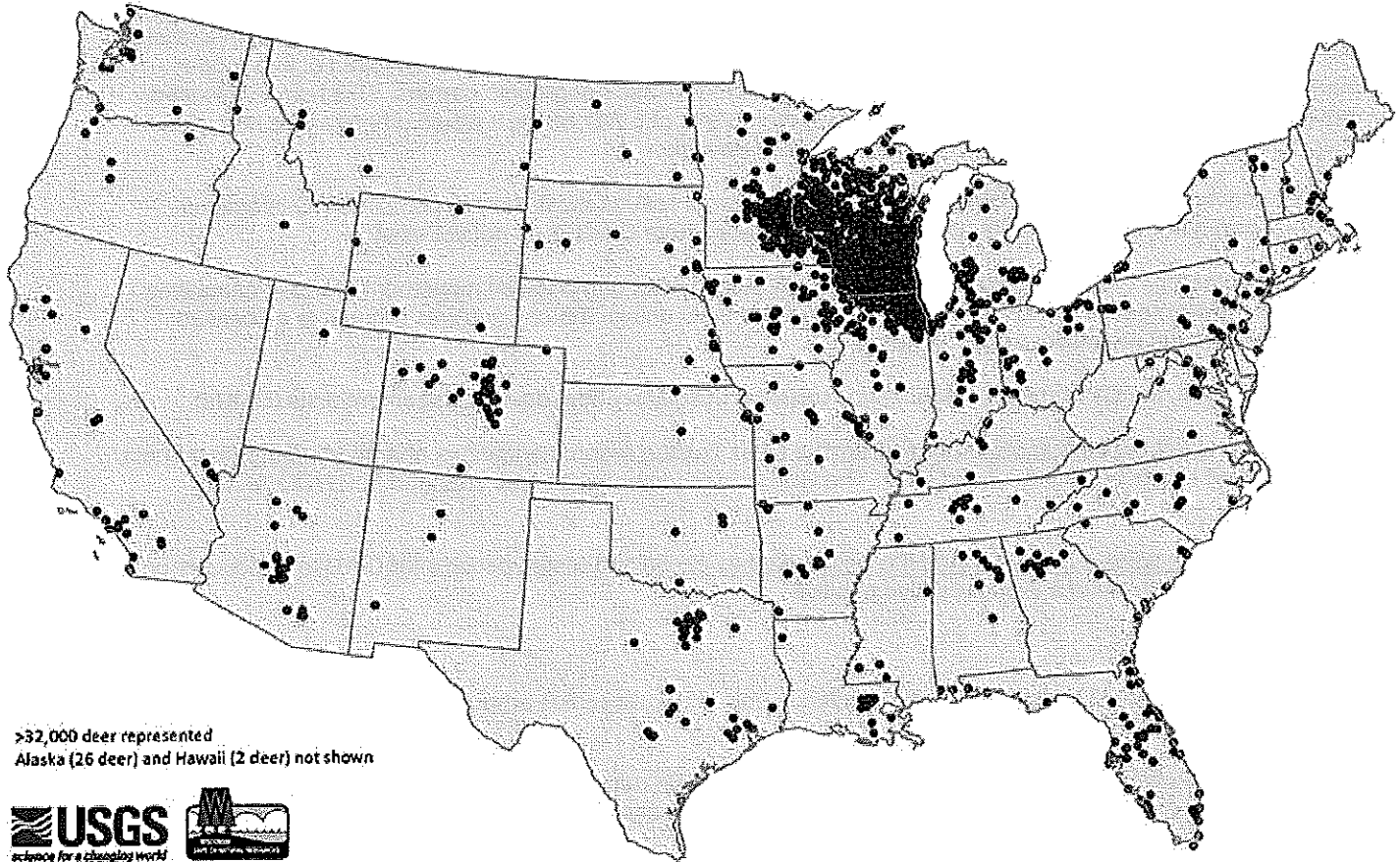


Chart 1

Scope 3. Description of the existing policies relevant to the rule, new policies proposed to be included in the rule, and an analysis of policy alternatives:

Carcass Transportation Movement (natural or human-assisted) of infected animals is a key pathway in the spread of CWD. The infectious nature of the CWD prion contributes to an increased risk of transmission not only where live animals are concentrated, but also where dead animals are transported to if not disposed of in a proper manner. Hunter harvested deer carcasses are often moved across geographic barriers. This human assisted movement of carcasses has the potential to cause the spread of CWD where it would otherwise be much less likely through the natural movements of deer in a wild population.

Carcass movement restrictions were put into place to prevent tissues most likely to contain CWD infectious agents (prions) from being introduced to areas of the state where CWD does not yet exist.

Starting September 1, 2009, regulations were put into place which only allowed movement of whole carcasses within the management zone and adjacent management units unless the carcass was brought to a licensed taxidermist or meat processor within 72 hours.

From 2002-2013, the CWD management zone consisted of south-central deer management units (DMUs).

In 2014, upon implementation of new rules from the Deer Trustee recommendations, the deer management units were changed to mostly county-based units. The CWD management zone was changed to CWD-affected counties.

A county was considered CWD-affected if a wild or captive cervid had tested positive for CWD in the county or is a county within 10 miles of a wild or captive positive.

Concern for review 3:

Past epidemiological testing was only provided in only a 10 mile radius around a new or existing location of a new CWD detection in the wild.

With a Scope proposal of this practice extending the 10 mile rule of CWD detection circle to the whole county for epidemiological surveillance for control of, is disease surveillance effective?

There are no Scope provisions of how this will be achieved in neither ALL counties of the State in either a programmatic practice nor a financial review of relevance to the practice of just "managing" CWD.

Concern for review 4:

Chronic wasting disease is fatal to deer and elk and is caused by an abnormal prion, or protein. Since elk were brought to Wisconsin in 1995 the department as of today HAS NOT developed any CWD surveillance program for elk as they did for whitetail deer in Wisconsin.

This lack of CWD surveillance program development regarding a susceptible species such as elk demonstrates the lack of consideration from the department. to provide due diligence for concern elk in Wisconsin and upload on their web page for public information.

Concern for review 5:

Will this current Scope include the suspension of any wild Elk transfers from Kentucky or elsewhere into Wisconsin as a compliance inclusion factor to the current emergency Rule being proposed?

The new CWD-affected counties structure encompassed a much larger area than the previous CWD management zone, including areas outside the southern endemic CWD area.

Concern for review 6:

This practice was for hunting zone management only for deer population estimates for the purpose of hunting and not to be used for new CWD surveillance principles as current 10 mile current practice.

This change inadvertently allowed hunters to move a whole carcass to more areas of the state than previously allowed and from areas with a relatively high prevalence rate to areas where perhaps there are no positive wild or captive deer have been found, and Thereby no longer aligned with the original intent of the regulations.

Concern for review 7:

As above hunting map demonstrates that hunting numbers in the endemic area and subsequent changes to regulations have created an unwelcome outcome. Therefore, the current Scope proposal by the department continues to ignore basic principles of taking care of a disease in elimination vs. current practice of just "managing"

Concern for review 8:

What assurances in this new emergency / permanent Scope Rule request does the DNR expect or produce a positive gain on the CWD concern given the past history of other failed regulatory changes that became outdated or ineffective? The department has not reviewed the timeline for this Scopes proposed effectiveness.

An advisory question which proposed further restricting the movement of whole deer carcass and certain carcass parts was placed on the 2018 annual spring fish and wildlife public hearing agenda. The question passed in fifty counties with fifty four percent of those voters approving.

Concern for review 9:

Referring back to question #1 and above only 54% of approx. 1,000 - 2,750 people voting for the advisory question. The respondents represent 3.66% of the population of Wisconsin.

Or is not that other way. Out of 20,000 citizens, only 13 are in favor according to the percentage.

The small number of people are to represent the scope of the 5.8 million people, Wisconsin?

The Scope of this proposal being pushed from only a small percentage of Wisconsin's population have a concern for an emergency regarding CWD in the wild deer population?

With the lack of concern from a majority of the State's population does this Scopes emergency rule proposal culminated via this advisory question results from the CDAC have a misguided and unwarranted determination of Scope?

Since this is not in the interest of the majority of the people of Wisconsin and creates a false perception of a need to preserves the public welfare as outlined in #1 Scope expression of a concern.

There exists an underlying agenda being forwarded by persons, for which this scope is being utilized as a tool to further that agenda. Evidence of such has been provided to a member of this board related to a working meeting that took place on July 21, 2016. Since that time, additional witnesses have corroborated, with similar events occurring through various channels on various dates.

Request:

Theses findings of bias, if investigated, should provide justification to refuse the scope for this emergency rule.

Currently, department rules only require white-tailed deer farms to have a single eight-foot-high fence measured from the ground to the top horizontal wire. However, fences that were constructed and approved prior to January 1, 2003 only need to be 7'10" in height. All fences must extend all the way to the ground.

Request 2:

DNR should turn over whitetail deer fencing to DATCP for more efficient veterinary management of agricultural animals.

Request 3:

As outlined in the above I respectively request the retraction of this Emergency / Permanent Rule Scope as described herein as not being an effective management tool by the department as demonstrated from past regulatory or implementation failed attempts and the lack of Scopes input to suppress vs. "manage" this disease in the 72 counties of Wisconsin.

4. Detailed explanation of statutory authority for the rule (including the statutory citation and language):

The chapter on wild animals and plants, in s. 29.014, "rule making for this chapter", establishes that the department shall maintain open and closed seasons for fish and game and any limits, rest days, and conditions for taking fish and game. Additionally, s. 29.063 grants the department broad authority to manage CWD in deer with subsections (3) and (4) allowing the department the ability to regulate the transportation, possession, control, storage or disposal of the carcass of a cervid in the state.

Concern for review 10:

The department has a demonstrated history of culminating rules and legislation pertaining to the "managing" of CWD. Though the past models have failed to achieve the goal of suppression to eradication process of the disease s.29.063 grants the department to only "manage" the disease. This legislated intent has led the department to only "manage" in a way that has led to a process of a perceived financial model. This provides the narrative for financial incentive of the department to gain financially where as not a focus of "managing" the disease processes through scientific epidemiological methods of disease process' in the wild deer herd.

Concern for review 11:

Will the "Scope" provide reduction of the spread of CWD on the landscape by this Scopes rule / legislation current intent as to the past demonstrated history of the department with past legislative failures for controlling a disease in whitetail deer?

Finally, s. 90.21 (6) allows the department to promulgate rules for the fencing of deer farms that raise white-tailed deer.

Concern for review 12:

As noted in the above s.29.063 grant to "manage" a disease in the environment to a narrative of profiting from a disease in the environment narrative the department recently failed legislation to put forth a legislative measure regarding fence inspection / gates on whitetail deer farms.

This measure in the financial accounting section would have left the department with a \$40,000 profit margin from deer farms had this legislation passed with an implied attempt to put the deer farms out of business.

Concern for review 13:

DNR needs to place all whitetail deer fencing under the control of Agriculture with DATCP where as other health measures with the animals are managed with veterinary interfaces vs. wildlife biologists or others.

5. Estimate of amount of time that state employees will spend developing the rule and of other resources necessary to develop the rule: Employees will likely spend more than 160 hours developing these rules.

Concern14:

This original abridged Scope shows little input of thought, materials, or process' to the over arching goals of the Scopes intent.

There is no review, suggestion nor alternatives for any unwarranted impact on unknown consequences in the control of a disease or any potential negative effect on the farmed whitetail deer industry here in Wisconsin.

This lack of predictive input of the little time spent in the developing of the Scope demonstrates the continued effort of the Department seeking legislation without input from all stakeholders. In the Scopes development will in no doubt lead to yet another failure of proposed rule / legislative intent as provided in this document by the department with another possible negative outcome.

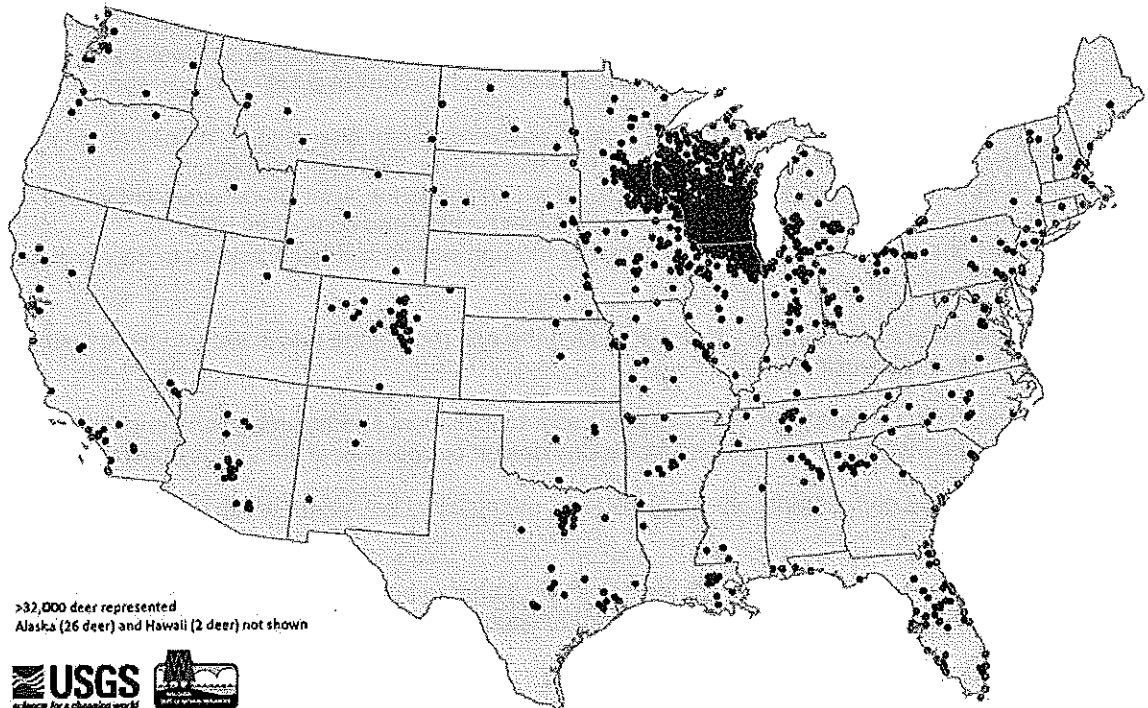
Scope 6. List with description of all entities that may be affected by the proposed rule:

- a. Deer hunters will be the group most likely impacted by the deer carcass transportation rules. More specifically, deer hunters who hunt in a CWD-affected county who need to transport their deer outside of the county of harvest will be directly affected (e.g. they will be required to quarter their deer in a way that no part of the spinal column is attached).

SEE # 2 answer Above, and I again refer to the chart 1 shown on page 4 and below

Home Zip Codes of hunters harvesting deer in Dane, Iowa, Richland and Sauk Counties, Wisconsin, 2016-2017

Data: Wisconsin Department of Natural Resources



Farmers who raised white-tailed deer will be the group impacted by rules that enhance deer farm fencing.

Concern for review 15:

There are more than 400 deer farms which raise cervids in Wisconsin. These farms have over 31,000 acres of fencing. If the Scope mandates double fencing, the cost to the farmer will be approximately \$28,000,000.00 and a financial burden on their small business here in the State of Wisconsin. Other costs associated with this fencing concern would be gates, hardware and unknown property acquisitions of land to comply in certain unknown situations where property lines overlap in ownership.

This demonstrates that 160 hrs spent on the Scope development did not take into consideration this economic impact as a total burden on the deer farmer.

Request 4:

All fencing is turned over to DATCP for proper control of whitetail deer farms so the DNR can focus on wildlife and not agricultural species for disease control and maintenance behind a fence.

Scope 7. Summary and preliminary comparison with any existing or proposed federal regulation that is intended to address the activities to be regulated by the proposed rule:

States possess inherent authority to manage the wildlife resources located within their boundaries, except insofar as preempted by federal treaties and laws, including regulations established in the Federal Register. None of these rule changes violate or conflict with the provisions established in the Federal Code of Regulations.

The State department (DNR) through this Scope document notes its legislative creation, implementation and failure of implementation of rule/legislative action to control to mitigate a disease process. Its own legislative findings of "manage" the disease has shown this current effort does not work.

The department in this Scope does not include any verbiage for changing of "managing" to more proactive approach to mitigate the disease processes in the wild deer population. This is why the department needs to relinquish all fencing to the Agricultural oversight where as disease control is through the use of veterinary oversight for health conditions of the deer. The DNR only "manages" the disease process through wildlife biology practices to only include "managing" of a disease.

Scope 8. Anticipated economic impact of implementing the rule (note if the rule is likely to have a significant economic impact on small businesses):

The proposed carcass transportation rules are applicable to individual sportspersons and impose no compliance or reporting requirements for small business, nor is any design or operational standards contained in the rule.

This is because department only spent 160 hrs. on the initial document which did not include any financial impact.

While these rules may make it more difficult for individuals to home butcher their deer, the process will not be outright prohibited since statute allows the movement of specific parts of the deer to any area of the state.

Concern for review 16:

Without any penalties in the Scope document there will be no incentive of hunters to comply with these new rules being proposed for carcass movement. Case in point, a hunter has 72 hours to take to a taxidermist.

- Q. Will the hunter cut off the head and cape at home and deliver the head / cape to taxidermist?
- Deer farms are required to have the tissues harvested from a Veterinarian. Are taxidermists qualified to properly harvest those tissues? How is this determined?
- Q. Will taking to taxidermist first for head and cape removal allow hunter to still home butcher? Nothing has changed in the opportunity without penalty for the hunter to comply as to transporting carcass across the landscape.
- Q. Will these new rules increase this carcass movement activity as outlined in map provided? Many of the state's deer hunters already take their deer to a licensed meat processor and current rules exempt the movement of deer out of a CWD affected county to any licensed meat processor.

We anticipate any additional cost to sportsmen will be related to those who currently home butcher carcass and do not take advantage of moving carcass in parts as currently permitted.

Concern for review 17:

"Many" state deer hunters already take their deer to a meat processor statement, to state this without an analysis by the department is just a guess. If more deer go to processors more deer carcasses will move across the landscape as with taxidermists.

The average cost of meat processing is estimated to be about \$150.

Concern for review 18:

How were these estimates presumed? The lack of accuracy in the other figures cited by this Scope make me wonder if this presumption is accurate, higher or lower, than real dollars across the state.

We do not know how many sportsmen will opt to process their carcass at a licensed meat processor.

Based on our preliminary analysis, we do not anticipate a significant economic impact to individuals or groups.

If there were to be any economic cost resulting from this rule, we anticipate that it would be very minimal to moderate (between \$50,000 to \$370,000).

Concern for review 19:

Using the best guess numbers by the department since they "do not know" the maximum dollar amount of \$370,000 $-: - \$150 = 2466$ is used for deer taken to a processor?

With a 2017 deer harvest est. of over 387,000+ deer, the estimate in the Scope determination demonstrates how off base the departments forecasting of "managing" a disease process is even after the deer is dead.

This would mean the department anticipates in this proposed Scope that approximately 380,000+ deer will continue to travel intact across the landscape unknown of the carcass proper / improper disposal.

The additional cost that will be attributable to additional sportsmen opting for a licensed meat processor will be a benefit transferred to meat processors within the economy.

Concern for review 20:

According to the departments estimate on highest cost in Scope of maximum cost to hunter will not provide processors a financial benefit within the economy as outlined or anticipated.

The proposed deer farm fence enhancement rules

- I. could have a fiscal impact.
- II. We do not know the exact economic impact at this time.
- III. This will become clear as the rule is developed.
- IV. We anticipate that implementation and compliance costs that would be passed along to white-tailed deer farms
- V. will be far less than \$10 million over any two-year period.
- VI. The economic impact of this rule is estimated to be a moderate impact (less than \$20 million).

- In these proposed Scope the department "Doesn't know" what the financial impact would be of the deer farms:
 - Though not knowing, the department does know all costs will be passed onto the deer farmer. How convenient.
 - The Department also knows that these costs are underestimated, seeking to increase fiscal accounting on the State books of the financial burden to small businesses. This is evident in the lack of mention of the impact on secondary business which serves the deer farm industry, such as Veterinary practices, Agronomy & Feed Cooperatives, Mineral Suppliers, etc. Referential page 13 for one example.
- Had the department lasted more than 100 years in developing these Scope permits of legislation rule meant they would see that even a \$20 million cost to the farmers would qualify as redemptive, the emergency order being presented.
- If the department is allowed to cost structure out, over a period of 2 years time, it is essentially transferring the cost burden to thousands of small businesses, that begs the question of: "What is the emergency?" as this mandated legislative effort for just "managing" a disease.

NOTE:

Last year the State Legislators lowered the accounting to \$10 million dollars as a ceiling of costs to a small business for other legislative review for costs but the DNR tries to imply that two years will not bring a financial accounting to the departments own permit fence paying constituent.

Request 5:

DNR transfer all fencing administration, regulation, or inspection duties relating to farmed livestock, i.e. captive whitetail deer to DATCP for the proper management of farmed deer. This properly places the onus on the DATCP to secure the proper health assessment for CWD controlled by fence and CWD assessment and status by veterinary oversight vs. overburdened wildlife biologists, allowing the DNR to concentrate on the public trust management duties for the wild herds under its jurisdiction.

Scope 9. Anticipated number, month and locations of public hearings:

The Department anticipates holding four public hearings on the permanent rule in the month of December 2018. Hearing cities will be: Madison, Milwaukee, Eau Claire and Appleton.

One public hearing on the emergency rule will be held in Madison in July of 2018.

These locations will grant the greatest opportunity for citizens to comment on these proposed rules.

Concern for review 21:

Do these locations provide the greatest opportunity for impacted citizens to comment on the rules? It is highly suspect that the vast majority of affected small businesses are in close proximity to Milwaukee. Madison is within a short drive of Milwaukee, yet Eau Claire and Appleton are on opposite ends of the state. Where is the convenient location for those who reside in the upper and larger geographic hunting area of Wisconsin?

The anticipated timeline of this Scope demonstrates that the department can / will only by legislative direction "manage" a disease such as CWD.

Past proposed legislative intent has been met with the departments own admission the failure of past legislative intent to implementing the proper tools to suppress the spread of or to mitigate wildlife disease status of the wild deer herd.

In a continuing legislative intent of this Scope continues to only seek current methodologies to just "manage" the CWD disease giving the impression the department seeks to make this effort a financial cash cow at the expense of the deer farmer.

If the department seeks to truly understand a disease process it would seek a different legislative intent as not to repeat the past failures by just "managing" the disease.

The department needs to embrace technology of science of mitigating diseases using epidemiological processes in working with DATCP in a proper MOU and to work with other scientific entities including private business and farm industry stakeholders.

- I am personally aware of opportunities to collaborate on research which have been resoundingly ignored or rejected by the DNR. Private businesses and volunteer organizations are funding scientific research, with current studies focused on multiple aspects of disease mitigation with regard to CWD. This private research is happening in Wisconsin, and the DNR is not interested.

The department in creation of this Scope, lacks the proper direction and content of disease focused mitigation, without due process, or sound science. This will lead to an improper legislative request that will yet again lead to an unanticipated outcome, one that will only economically hurt all Wisconsin deer farm enterprises; in addition to having a negative revenue result to many other small businesses that rely on those farm activities for a portion of their sales and services.

Request 6:

I formally request of the Natural Resources Board, that they **not approve** the advancement of this proposed Scope by the DNR.

s. 94.73 (2) should be deeply considered prior to any advancement of this scope, as it could add substantially to the complexity of this situation, reference charts 1, 2, & 3 and Chapter NR 726

Until there is a properly focused and developed Scope, with the intent to control CWD in the wild deer population, it is pointless to attempt misguided action which in poor legislation, sadly, as indicated historically, this promulgates a worsening of the situation.

I remain adamantly opposed to regulations based on such vague responses, as listed in the current Scope.

- All affected parties should have a seat at the table to discuss options.
 - When that occurs, we can move forward with best practices implemented as a united citizenry, to one day eliminate this disease's impact, in the wildlife, for the benefit of generations of Wisconsinites.

Final request:

Please provide responses to my concerns via the email address provided. If you would like additional testimony, or clarification of any item referenced, don't hesitate to contact me.

Response to Department of Natural Resources

Statement of Scope: Rule No. WM-12-18,
Relating to: Deer Carcass Transportation,
Deer Farm Fencing, and Chronic Wasting Disease (chs. NR 10 & 16),
Rule type: Both Permanent and Emergency

To: Department Natural Resources Board:

As a small business owner of a Whitetail deer farm in Wisconsin I am providing in this response to the Statement of Scope being proposed by the department. I have certain concerns and some suggestion requests regarding the proposed SCOPE for consideration of the Natural Resources Board before any action is taken by the department as written before approval / implementation into potential legislation as an emergency or permanent rule.

The Scope as written is requested **NOT to be approved or forwarded** to further department or legislative review without taking into consideration the concerns or requests in a proactive manner to address the current false concern of CWD perpetrated by the department as just a “management” of department resources issues, rather than an implied CWD disease “emergency”.

The following reasons for concerns / suggestions are:

Finding/nature of emergency (Emergency Rule only):

The department finds that an emergency rule is necessary in order to prevent the further spread of Chronic Wasting Disease (CWD) so that the state can continue the proper “management” of the deer population in a way that preserves the public welfare. A healthy deer herd and quality deer hunting are a critical component of Wisconsin’s culture, economy and identity.

What constitutes a proper level of public welfare in the total Wisconsin population regarding CWD in the wild deer population?

This Scope does not demonstrate any public outcry by any majority or substantial population of Wisconsinites (est. 5.3 million).

The only group that has expressed a minority viewpoint of citizen concerns is that of a small group of hunting public (est. 800,000 / license sales 2017). Within this hunting public population less than 7,000 had expressed an interest in all game and fishing concerns this past year at the annual Conservation Congress spring hearings.

Of these approximately 7,000 interested parties only a portion of this group 3,400+ voted on an advisory question for the action of the DNR to pursue an increase of CWD surveillance in the State as a whole.

The CDAC Charter's mission is to:

- Gather public opinion on deer populations and goals, antlerless quotas and herd management strategies.
- Review and consider scientific metrics on deer herd trends, impacts to habitat and agriculture and human-deer interactions.
- Provide the department with recommendations on deer population objectives, antlerless quotas and herd management strategies.

These view point's are of a minority group of Wisconsin's population that does not provide for the concern of preservation of welfare to the people of the State of Wisconsin. In fact this minority population has been shrinking in size and scope due to this group's age structure leading to continued lack of participation for these Scopes directives. This minority concern does not speak for a potential cause relating to CWD as a welfare issue for the people of Wisconsin by population. The Natural Resources board needs to review its due respect to the people of the population of the state of Wisconsin when making a determination.

Concern

CWD though a concern in wild deer is considered a "SECONDARY" disease process epidemiologically afflicting deer and is not a serious human health issue.

NO primary disease research has been conducted by the DNR for any Primary disease(s) afflicting deer that eventually alters immune function that leads to the onset of CWD in the 18+ year history of CWD

Elisa Testing is only a PRIMARY tool in "wild" deer testing to "manage" potential detection for "exposure" to CWD, not a "diagnosis" as defined by state statute.

DATCP / Captive industry uses "Gold Standard IHC" testing to "diagnose" CWD

Recommend:

DNR Board members mandate ALL "wild" whitetail deer be tested for CWD surveillance by IHC as the Gold Standard for improved CWD detection as an official test "diagnosing" CWD.

The DNR Board has this tool (MOU) in their tool box that is approved by the USDA and current Wisconsin State Statutes for reportable diseases to help "certify" CWD in the wild deer of Wisconsin. Without the use of the Gold Standard used in testing efficacy the department stands to allow false negatives to spread upon the landscape undetected in an incomplete surveillance program to detect CWD appropriately.

Scope: 2. Detailed description of the objective of the proposed rule:

The first wild deer in Wisconsin to test positive for CWD was discovered in 2002. Since then, the department has promulgated rules to seek to prevent the further spread of the disease by regulating carcass transportation, but our rules are becoming outdated as CWD positive deer are identified in additional counties.

Over the recent months there have been instances where we have had CWD positive test results from wild white-tailed deer in counties that did not previously have CWD detected. This proposal

would create additional restrictions on the movement of deer carcasses and certain carcass parts from deer harvested in a CWD-affected county.

The department may also investigate enhanced fencing of deer farms.

These restrictions will seek to help prevent the further spread of CWD.

Additional rule changes may be pursued which are reasonably related to those discussed here.

These rules may make additional updates such as correcting cross-reference citations, updating road names on maps, changes needed in order to update application forms, or revisions which are necessary for consistency with recently enacted legislation

Concern

The detailed description of the proposed rule #2 demonstrated that more deer farms have become infected from the spread of CWD from wild deer detected populations. This is probably due to the lack of proper testing by the department utilizing the Elisa testing method for detection for which can allow non-detects of the CWD issue upon the landscape.

Though the advances of just recent months of new CWD detections in areas of the state shows that outdated management techniques managed by the DNR as outlined in Scope statement #1.

There is no evidence that CWD is spread between single fenced enclosures from farms to the wild deer population. There are other vectors at work that the department does not conduct primary study or recognize as disease carrying species of wildlife that are chaperoning disease processes to farmed species..

Double fencing has recently demonstrated not to be an effective tool against the wild CWD disease infecting a deer farm operation that subsequently was condemned and depopulated.

The DNR only collects the majority of any surveillance samplings of deer carcasses for CWD surveillance during the fall hunting seasons. This unbalanced "surveillance" activity has left the herd at risk by the wait and see what we get this fall for "detection" method or the how many do we have this year approach method. After many years of this practice with the reduction and inequity of surveillance numbers of samples per counties across the state builds upon the "NEW" narrative that 1 more county becomes a big deal and we now have an "EMERGENCY"?

There are more deer killed by cars across the state that seriously injure and kill people every year. Where is the emergency? CWD has never made a person sick by consuming their venison but I bet that ecoli infected venison does.

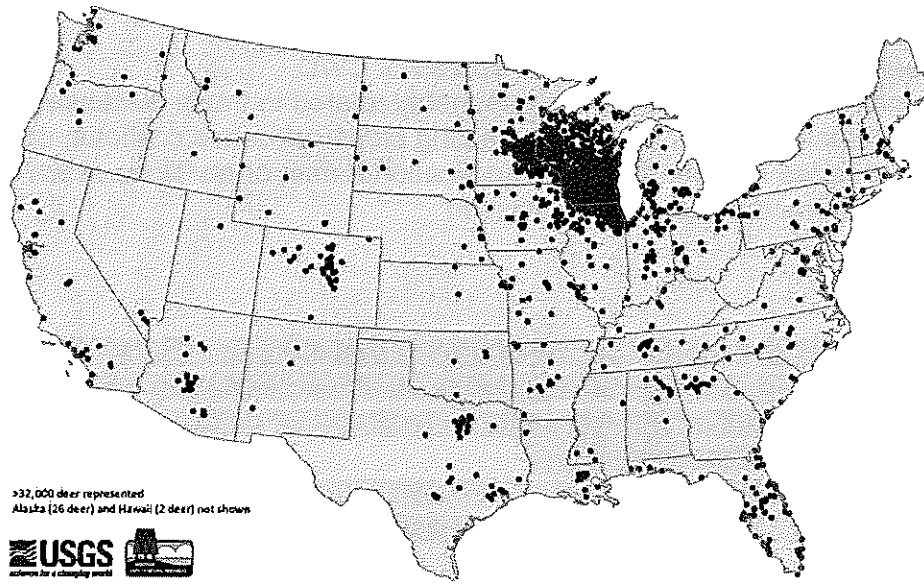
DATCP historically demonstrates "control" of CWD disease process by USDA approved methodologies under direction of veterinary care unlike "wild" deer with CWD in a controlled manner behind a fence.

Current research by the Deer Farm industry YOUR Fence CONSTITUENTS needs to be embraced by this DNR Board in action for research collaboration before any rulemaking is designed / implemented re: CWD. This collaboration can be accomplished through the of Agriculture, acting through the Animal and Plant Health Inspection Service-Wildlife Services Federal research dollars.

Any DNR Board considerations with the current Scope directives must include working with whitetail deer industry stakeholders.

Home Zip Codes of hunters harvesting deer in Dane, Iowa, Richland and Sauk Counties, Wisconsin, 2016-2017

Data: Wisconsin Department of Natural Resources



Scope 3. Description of the existing policies relevant to the rule, new policies proposed to be included in the rule, and an analysis of policy alternatives:

Carcass Transportation Movement (natural or human-assisted) of infected animals is a key pathway in the spread of CWD. The infectious nature of the CWD prion contributes to an increased risk of transmission not only where live animals are concentrated, but also where dead animals are transported to if not disposed of in a proper manner. Hunter harvested deer carcasses are often moved across geographic barriers. This human assisted movement of carcasses has the potential to cause the spread of CWD where it would otherwise be much less likely through the natural movements of deer in a wild population. Carcass movement restrictions were put into place to prevent tissues most likely to contain CWD infectious agents (prions) from being introduced to areas of the state where CWD does not yet exist.

Starting September 1, 2009, regulations were put into place which only allowed movement of whole carcasses within the management zone and adjacent management units unless the carcass was brought to a licensed taxidermist or meat processor within 72 hours.

From 2002-2013, the CWD management zone consisted of south-central deer management units (DMUs). In 2014, upon implementation of new rules from the Deer Trustee recommendations, the deer management units were changed to mostly county-based units. The CWD management zone was changed to CWD-affected counties.

A county was considered CWD-affected if a wild or captive cervid had tested positive for CWD in the county or is a county within 10 miles of a wild or captive positive.

Concern:

Past epidemiological testing was only provided in a 10 mile radius around a new or existing location of a new CWD detection in the wild.

With a Scope proposal of this practice extending the 10 mile surveillance rule for CWD detection to a proposed whole county surveillance for epidemiological results an effective process by dilution by land mass size of surveillance?

Is this achievable with the past low surveillance numbers in past practices by the department in certain counties (45,000+ to only 27 in a 17 year history)?

There are no Scope provisions of how this will be achieved, neither in ALL counties of the State in a programmatic practice, nor a financial review of relevance to the practice of just "managing" CWD in under performing epidemiological surveillance methods or areas of the state.

Concern:

Chronic wasting disease is fatal to deer and elk and is caused by an abnormal prion, or protein. Since elk were brought to Wisconsin in 1995 the department as of today HAS NOT developed any CWD surveillance program for elk as they did for whitetail deer in Wisconsin that is transparently located on the departments web pages. WHY?

This lack of CWD surveillance program development regarding a susceptible species for CWD such as elk demonstrates the lack of consideration from the department to provide due diligence for elk in Wisconsin to be uploaded onto their web page for public information.

Concern:

Will this current Scope include the suspension of any wild Elk transfers from Kentucky or elsewhere into Wisconsin as a compliance inclusion factor to the current Scope of the Emergency Rule / Permanent Rule being proposed? Part of the "Kentucky" elk agreement was to exchange grouse from Wisconsin to Kentucky to establish a grouse population in Kentucky. Grouse are now under scrutiny of "west Nile" virus contamination. Will the DNR suspend the transfer and notify Kentucky of the potential spread to Kentucky of west Nile?

The new CWD-affected counties structure encompassed a much larger area than the previous CWD management zone, including areas outside the southern endemic CWD area.

Concern:

This practice was developed for hunting zone management only for deer population estimates determined by the CDAGs for the purpose of hunting and not intended to be used for new diluted CWD surveillance principles as a "whole county" method to the current 10 mile surveillance practice. There are no proposed methods of surveillance for a "Whole County" by the DNR after designating the "Whole County" as "affected".

This change without a clear understanding of disease principles inadvertently has allowed hunters to move a whole carcass to more areas of the state than previously allowed and from areas with a relatively high prevalence rate to areas where perhaps there are no positive wild or captive deer have been found, and thereby it is no longer aligned with the original intent of the regulations.

Concern:

As above hunting map demonstrates that hunting numbers in the endemic area and subsequent changes to regulations have created an un-welcomed outcome for “managing” deer carcass movement. Therefore, the current Scope proposal by the department continues to ignore basic principles of taking care of a disease in elimination vs. current practice of just “managing” of a disease.

Where is the increase of the spread of CWD to an “emergency” level located in the State? This has yet to be determined and expressed by the department.

Concern:

What assurances in this new emergency / permanent Scope Rule request does the DNR expect or produce a positive gain in any CWD concern? Given the past history of other failed regulatory changes that became outdated or ineffective will be history repeating itself? The department has not reviewed or submitted a timeline for this Scopes proposed effectiveness by any accountable measures.

An advisory question which proposed further restricting the movement of whole deer carcass and certain carcass parts was placed on the 2018 annual spring fish and wildlife public hearing agenda. The question passed in fifty counties with fifty four percent of total voters approving.

Concern:

Referring back to question in #1 and above only 54% of approx. 7,000 = 3,780 people voting for this advisory question. This is even a smaller number that seeks to represent the voice of 5.3 million people of the State, unelected.

The Scope of this proposal being pursued finds only a small percentage of Wisconsin's population have a concern for CWD in the wild deer population.

With the lack of concern from a majority of the State's population, does this Scopes emergency rule proposal culminated via this advisory question results from the CDAC have a misguided and unwarranted determination of Scope?

Since this is not in the interest of the majority of the people of Wisconsin and creates a false perception of a need to preserves the public welfare as outlined in #1 Scope expression of a concern in unjustified / warranted and must be rescinded.

What is of concern is not with CWD in the deer. In a Conservation Congress meeting held on 12-09-2017 it was noted in minutes (sec III Discussion) of the Wolf Advisory Committee that there was a disease from wolf scat that is harmful to humans and pets.

This concern was met only by the chair of this committees meeting as: “as a veterinarian for years, that if people knew of all of the diseases in wild and domestic animals, people would not go outside”. This chairman is now the Vice-chair of the CDAC committee an arm of the department. No rational here on transparencies!

In an action of CDAC transparency, has the Natural Resource Board ever addressed this Public Health issue as outlined by a concern of the wildlife Biologist?

What other disease is present in the whitetail deer that the Public is not made aware by CDACs or DNR research group concerning public health?

I know of a hunter, who harvested a deer in northern Wisconsin in the 2017 season which had an ecoli (shigella) contamination of the lungs and liver (35% / 80%). Unless other hunters test their deer they are harvesting how are they to know if the meat is safe to eat?

In the proposed Scope there is a movement for the Public to bone out their harvest in the field. How many might cut themselves and get sick from something the deer have? Precautions could be made if pertinent information like this is not published on the DNR / CDAC web pages for Public safety.

Request: The findings of the Scope are ill conceived and is justification to withdraw this request from emergency rule as no emergency is recognized by the people of the State for CWD. The Scope should include other disease risks associated with epidemiological disease findings that would be a true Public health concern for the hunter or hiker or the people of the state of Wisconsin.

Current research findings titled “Research shows human prion proteins resist chronic wasting disease”

<https://www.isonews.com/research-shows-human-prion-proteins-resist-chronic-wasting-disease/>

Shows the human resistance of contracting CWD from potentially infected venison. This supports the 20+ years of DNR telling the public not to consume CWD infected venison. The continuance of this negative narrative upon the people who hunt in this state will most certainly hurt tourism here in Wisconsin in the long run.

Currently, department rules only require white-tailed deer farms to have a single eight-foot-high fence measured from the ground to the top horizontal wire. However, fences that were constructed and approved prior to January 1, 2003 only need to be 7’10” in height. All fences must extend all the way to the ground.

Request:

DNR should turn over whitetail deer fencing to DATCP for more efficient veterinary management of agricultural animals. This would allow the DNR to put more emphasis on the wild deer population health issues with wildlife biologists.

Request:

As outlined in the above I respectfully request the retraction of this Emergency / Permanent Rule Scope as described herein as not being an effective management tool by the department as demonstrated from past regulatory or implementation failed attempts and the lack of Scopes input to suppress vs. “manage” this disease in the 72 counties of Wisconsin.

4. Detailed explanation of statutory authority for the rule (including the statutory citation and language):

The chapter on wild animals and plants, in s. 29.014, “rule making for this chapter”, establishes that the department shall maintain open and closed seasons for fish and game and any limits, rest days, and conditions for taking fish and game. Additionally, s. 29.063 grants the department broad authority to manage CWD in deer with subsections (3) and (4) allowing the department the ability to regulate the transportation, possession, control, storage or disposal of the carcass of a cervid in the state.

Concern:

The department has a demonstrated history of culminating rules and legislation pertaining to the “managing” of CWD. Though the past models have failed to achieve the goal of suppression to eradication process of the disease s.29.063 grants the department to only “manage” the disease. **This intent has led the department to only “manage” in a way that has led to a process of a focusing on financial revenue increases to the department by passing on costs to deer farms, regardless of the crippling results to those legitimate small business owners.** This provides the narrative for financial incentive of the department to gain financially where as not a focus of “managing” the disease processes through scientific epidemiological methods of disease process’ in the wild deer herd. **There are no forward measurable endpoints to the proposed emergency rules as an effective legislative measure as why the emergency rule must not be forwarded for acceptance by the state legislature.**

Concern:

Will the “Scope” provide reduction of the spread of CWD on the landscape by this Scopes rule / legislation current intent? As to the past demonstrated history of the department with past legislative failures for controlling a disease in whitetail deer will the Scope include other disease testing in providing the people of Wisconsin transparency of findings?

Finally, s. 90.21 (6) allows the department to promulgate rules for the fencing of deer farms that raise white-tailed deer.

Concern:

As noted in the above s.29.063 grant to “manage” a disease in the environment to a narrative of profiting from a disease in the environment narrative the department recently failed legislation to put forth a legislative measure regarding fence inspection / gates on whitetail deer farms.

This measure in the financial accounting section would have left the department with a \$40,000 profit margin from deer farms had this legislation passed with an implied attempt to put the deer farms out of business.

Concern:

DNR needs to place all whitetail deer fencing under the control of Agriculture with DATCP where as other health measures with the animals are managed with veterinary interfaces vs. wildlife biologists or others for disease control.

5. Estimate of amount of time that state employees will spend developing the rule and of other resources necessary to develop the rule: Employees will likely spend more than 160 hours developing these rules.

Concern:

This original abridged Scope shows little input of thought, materials, or process’ to the over the over arching goals of the Scopes intent.

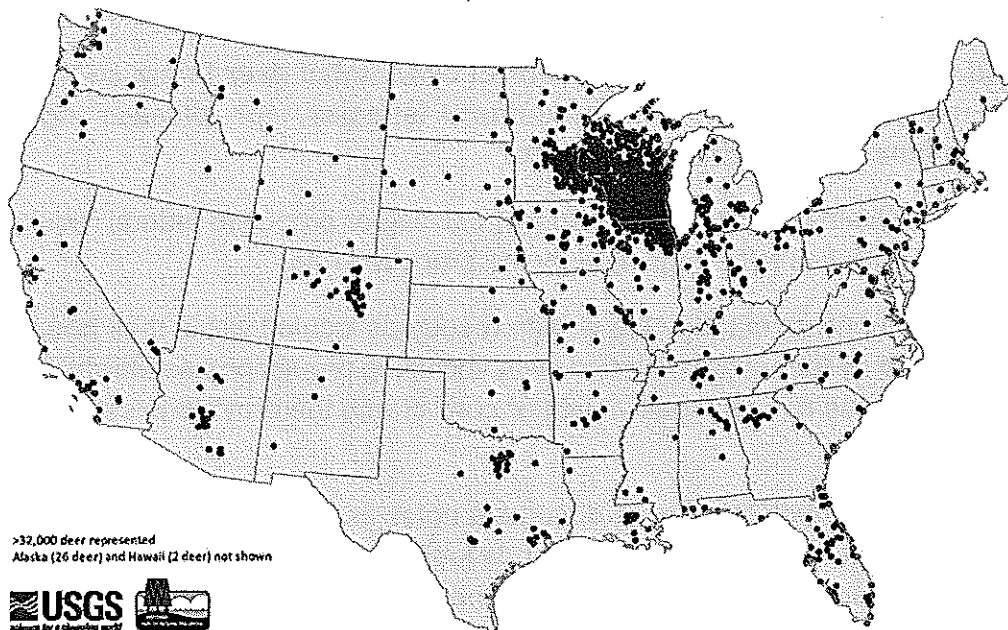
There is no review, suggestion nor alternatives for any unwarranted impact of unknown consequences in the control of a disease in the wild or any potential negative effect on the farmed whitetail deer industry here in Wisconsin.

This lack of predictive input of what little time was spent in the developing of this Scope demonstrates the continued effort of the Department seeking legislation intent without input from all stakeholders or a majority of the people of Wisconsin. If this Scope proceeds, it will without doubt lead to yet another failure of proposed rule / legislative intent as provided in this document by the department with another possible negative outcome and unwarranted consequences.

Scope 6. List with description of all entities that may be affected by the proposed rule:

- a. Deer hunters will be the group most likely impacted by the deer carcass transportation rules. More specifically, deer hunters who hunt in a CWD-affected county who need to transport their deer outside of the county of harvest will be directly affected (e.g. they will be required to quarter their deer in a way that no part of the spinal column is attached). SEE #2 answer Above

Home Zip Codes of hunters harvesting deer in Dane, Iowa, Richland and Sauk Counties, Wisconsin, 2016-2017
Data: Wisconsin Department of Natural Resources



Farmers who raised white-tailed deer will be the group impacted by rules that enhance deer farm fencing.

Concern:

There are approximately 240 deer farms that raise whitetail deer in Wisconsin. These farms have about 22,000 acres of fencing. If the Scope mandates double fencing the cost to the farmer will be approximately \$20+ million and a financial burden on their small business here in the State of Wisconsin. Other costs associated with this fencing concern would be gates, hardware and unknown property acquisitions of land to comply in certain unknown situations where property lines overlap in ownership.

This demonstrates that 160 hrs spent on the Scope development did not take into consideration this economic impact as a total the burden on the deer farmer when writing the Scope.

Concern:

If this is not a "manufactured" Scope for a "manufactured" disease and CWD is being mandated upon the industry along with other state agencies then the department will have another "manufactured" public relations issues to deal with as yet another unintended consequence of pursuing legislation. With over 18,000 cervids in Wisconsin (horns are already hitting the ground) without new born in this count. It will in no doubt bring a class action CROP DAMAGE suits to the forefront. Farm raised deer are by Wisconsin statute are considered livestock and are protected under state livestock law specifically for crop damage for which includes specifically wild deer. Since the department has determined through the generation of this Scope that a disease will cascade to the quarantine of ALL captive cervids, All farms to be double fenced will bring the estimated cost of lose of farm animal in commerce, cost of ALL farms being double fenced, once depopulated department buying All fenced acres like the "HALL" farm (31,000+ acres) to a minimum estimate of over \$120 million dollars.

Request:

All fencing is turned over to DATCP for proper control of whitetail deer farms so the DNR can focus on wildlife management and not agricultural species, for disease control and maintenance behind a fence by veterinary practices.

Scope 7. Summary and preliminary comparison with any existing or proposed federal regulation that is intended to address the activities to be regulated by the proposed rule:

States possess inherent authority to manage the wildlife resources located within their boundaries, except insofar as preempted by federal treaties and laws, including regulations established in the Federal Register. None of these rule changes violate or conflict with the provisions established in the Federal Code of Regulations.

The State department (DNR) through this Scope document notes its legislative creation, implementation and failures of past implementation of rule/legislative action to control to mitigate any disease process. Its own legislative findings of "manage" the wildlife diseases has shown this current legislative action as written does not work.

The department in this Scope does not include any verbiage intent for changing of "managing" in a more proactive approach to mitigate the disease processes in the wild deer population. This is why the department needs to relinquish all fencing to the Agricultural oversight where as disease control is through the use of veterinary oversight for health conditions of the deer in a farmed setting. The DNR only "manages" the disease process through managing a fence permit system for whitetail deer in a farm practice while "managing" wildlife diseases through wildlife biologist's practices that only include "managing" of a disease. Changing to a veterinarian practice of total farmed deer control of fencing permit will provide the DNR to be more focused on their task at hand if one exists.

Scope 8. Anticipated economic impact of implementing the rule (note if the rule is likely to have a significant economic impact on small businesses):

The proposed carcass transportation rules are applicable to individual sports-persons and impose no compliance or reporting requirements for small business, nor is any design or operational standards contained in the rule.

This is because department only spent 160 hrs. On the initial document which did not include any financial impact.

While these rules may make it more difficult for individuals to home butcher their deer, the process will not be outright prohibited since statute allows the movement of specific parts of the deer to any area of the state.

Concern:

Without any penalties in the Scope document, there will be no incentive of hunters to comply with these new rules being proposed for carcass movement. Case in point, a hunter has 72 hours to take to a taxidermist.

Q. Will the hunter cut off the head and cape at home and deliver the head / cape to taxidermist butchering the carcass at home like in the past?

Q. Will taking it to taxidermist first, for head and cape removal allow hunter to still home butcher? Nothing has changed in the opportunity, without penalty for the hunter to comply, as to carcass transport across the landscape.

Q. What is the proper disposal of the carcass by taxidermists? Has this been mandated to eliminate additional dispersal of the prion to new areas?

Q. Will these new rules increase this carcass movement activity as outlined in map provided above?

Many of the state's deer hunters already take their deer to a licensed meat processor and current rules exempt the movement of deer out of a CWD affected county to any licensed meat processor.

We anticipate any additional cost to sportsmen will be related to those who currently home butcher carcass and do not take advantage of moving carcass in parts as currently permitted.

Concern:

"Many" state deer hunters already take their deer to a meat processor statement without an analysis by the department is just a guess. If more deer go to processors, more deer carcasses will move across the landscape, the same as with taxidermists.

The average cost of meat processing is estimated to be about \$150 by the department Scope.

We do not know how many sportsmen will opt to process their carcass at a licensed meat processor.

Based on our preliminary analysis, we do not anticipate a significant economic impact to individuals or groups. If there were to be any economic cost resulting from this rule, we anticipate that it would be very minimal to moderate (between \$50,000 to \$370,000).

Concern:

Using the best guess numbers by the department since they "do not know" the maximum dollar amount of \$370,000 \div \$150 = **2466 deer taken to a processor / yr.?**

The departments estimate in this case of hunters taking deer to be processed is almost the same amount of CDAC members minority voters) pushing this agenda of a "manufactured emergency".

With a 2017 deer harvest est. of over 387,000+ deer, the estimate in the Scope determination demonstrates how off base the departments forecasting of managing "disease process is even after the deer is dead for where carcass will travel and end up

This harvest number @ \$150 processing fee per deer would equate to a \$58 million dollar cost to hunters across the state being forced to take their harvest to a meat locker instead of traditionally do it themselves. Are there enough accredited meat lockers to take on this amount of carcass under compliance standards not even considered yet?

Without the above realization this would mean the department anticipates in this proposed Scope that approximately 380,000+ deer will continue to travel intact across the landscape unknown of the carcass proper / improper disposal.

Scope statement: The additional cost that will be attributable to additional sportsmen opting for a licensed meat processor will be a benefit transferred to meat processors within the economy.

Concern:

This would be a burden on the meat processing industry that would not provide enough proposed slaughter services for hunters in compliance at the current harvest goals of 300,000+ deer / year.

If the department did simple math 387,000 deer harvested in the past 17 years = 6,579,000 deer harvested. In 17 years there were 209,918 wild deer tested for CWD with only 4,190 deer testing positive for carrying CWD. In the farmed community contracting this wildlife disease has only resulted in 250 deer testing positive for CWD in the same 17 year history timeline. There is no emergency with farmed raised deer for CWD.

Concern:

According to the departments estimate in the Scope of maximum cost to hunter will not provide processors a financial benefit within the economy as outlined or anticipated. This Scope is lacking the knowledge of current number of processors to butcher so many more of the proposed carcass' during harvest. There are some butchers still going through the 2017 deer carcass' as of today and cannot expand to take on any more carcass' in the future. With the eccl disease concern, will meat testing from processors be required?

The proposed deer farm fence enhancement rules could have a fiscal impact. We do not know the exact economic impact at this time. This will become clear as the rule is developed. We anticipate that implementation and compliance costs that would be passed along to white-tailed deer farms will be far less than \$10 million over any two-year period. The economic impact of this rule is estimated to be a moderate impact (less than \$20 million).

In these proposed Scope rules the department "doesn't know" what a financial impact would be on the deer farmer. Though not knowing this, the department *does know* all costs will be passed onto the deer farmer, how convenient.

Had the department used more than 160 hrs. In developing these Scope principles of legislative / rule intent they would see that a \$20 million cost to the farmers would be extensive in the emergency order being presented.

If the department cost structures out over 2 years time to minimize the cost burden to the farmer brings the question of where is the "emergency" in this mandated legislative intent for just "managing" a disease.

Last year the State Legislators lowered the accounting to \$10 million dollars as a ceiling of costs to a small business for other legislative review for costs but the department tries to imply that two years will not bring a financial accounting to the departments own permit fence paying constituent.

Request:

DNR turn over all fencing for farmed whitetail deer to DATCP for the proper management of farmed deer as to the proper health assessment for CWD detected and controlled by fence with CWD health assessment and status by veterinary oversight vs. wildlife biologists.

9. Anticipated number, month and locations of public hearings:

The Department anticipates holding four public hearings on the permanent rule in the month of December 2018. Hearing cities will be: Madison, Milwaukee, Eau Claire and Appleton. One public hearing on the emergency rule will be held in Madison in July of 2018. These locations will grant the greatest opportunity for citizens to comment on these proposed rules.

Concern:

The anticipated timeline of this Scope demonstrates that the department can / will only by legislative direction "manage" a disease such as CWD.

Past proposed legislative intent has been met with the departments own admission the failure of past legislative intent to implementing the proper tools to suppress the spread of or to mitigate wildlife disease status of the wild deer herd.

In a continuing legislative intent of this Scope continues to only seek current methodologies to just "manage" the CWD disease giving the impression the department seeks to make this effort a financial cash cow at the expense of the deer farmer.

If the department seeks to truly understand a disease process it would seek a different legislative intent as not to repeat the past failures by just "managing" the disease.

The department needs to embrace technology of science of mitigating diseases using epidemiological processes in working with DATCP in a proper MOU and to work with other scientific entities including private business and farm industry stakeholders.

The department in creation of this Scope lacks the proper direction and content of disease focused mitigation without due process of sound science. This will lead to an improper legislative request that will again lead to an unexpected outcome that will only economically hurt a deer farm enterprise as a small business.

Request:

Department Natural Resources Board not approve the advancement of this proposed Scope by the Board or DNR until there is a development of a proper focus on the intent of the Scope to control CWD in the wild deer population.

There seems to be the premise of a manufactured "emergency" using CWD as a method of control of the narrative that seems to be unwarranted based on how many deer have been harvested in the past 17 years vs. how many positives were documented in the both the wild and captive industry.

With inclusion of all stakeholders having a seat at the table instead of a minority group representation driving an "Emergency" narrative there is a need to move forward with the use of best practices as we all face an effort to control and hopefully some day to eliminate this disease for the benefit of ALL the people of the State of Wisconsin.

Respectfully submitted on behalf of my family, our business, and the hunters who enjoy the benefit of the wild herd in my community. None of us want CWD in our herds, lets do something real about it, rather than implement ineffective policies that promulgate, rather than restrict the spread of this secondary disease process.



WISCONSIN LEGISLATURE

P.O. Box 7882 • Madison, WI 53707-7882

Testimony on Chronic Wasting Disease

Secretary Harsdorf, Department of Agriculture, Trade and Consumer Protection staff, and distinguished members of the board, thank you in advance for considering the following testimony.

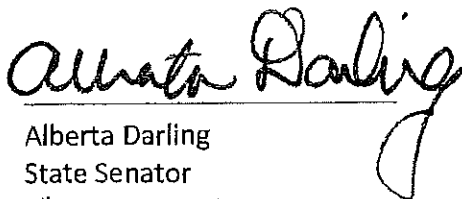
We all recognize the seriousness of chronic wasting disease (CWD). We also realize that steps to stem this horrible disease are necessary to help prevent the disease from spreading further into Wisconsin's deer population.

With that being said, we are concerned with the livelihood of the reindeer farms in our district should the new rules include provisions affecting reindeer. We ask that the proposed rule exempt reindeer farms for the following reasons:

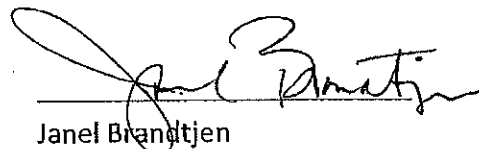
1. Farm-raised reindeer in many instances are treated much like domestic livestock. These animals are well cared for and inspected continuously by veterinarians including every 30 days during the traveling season.
2. Over the past decade, each deceased reindeer has been tested for CWD without one positive case of the disease. Reindeer Games, a farm in our district, has even been testing for 16 years with the same results.
3. Reindeer have an immense impact on tourism in our state, especially in November and December. For instance, Reindeer Games alone serves 29 communities in Wisconsin, drawing thousands of shoppers into historic downtown areas for winter festivities.
4. The reindeer at locations like Reindeer Games are already protected by a double fence. There is no evidence to prove that more restrictions on these reindeer farms will yield results in hindering the spread of CWD.

The reasons above clearly demonstrate the futility in including reindeer farms into new CWD regulations. These farms are already regulated and have successfully diverted CWD for their reindeer population. Thank you again for the time and consideration.

Sincerely,



Alberta Darling
State Senator
8th Senate District



Janel Brandtjen
State Representative
22nd Assembly District

Carlson, Michael M - DATCP

From: RICK DEHRING <rdehring@wi.rr.com>
Sent: Thursday, June 14, 2018 4:35 PM
To: Carlson, Michael M - DATCP
Subject: RE: Form letter

From: RICK DEHRING <rdehring@wi.rr.com>
Sent: Thursday, June 14, 2018 8:48 AM
To: 'Michael.Carlson@wisconsin.gov.' <Michael.Carlson@wisconsin.gov.>
Subject: FW: Form letter

To Whom It May Concern,

My name is Rick Dehring and I am a supporter of Wisconsin hunters and farmers. The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The three-step plan will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely, Rick J. Dehring
124 Carpenter Court Mukwonago WI 53149

Carlson, Michael M - DATCP

From: Jacques deMoss <jacques.demoss@gmail.com>
Sent: Thursday, June 14, 2018 9:16 AM
To: Carlson, Michael M - DATCP
Subject: DATCP Rule Comment Period

Mr. Carlson,

My name is Jacques E. deMoss. I am the President of the Missouri Deer Association and First Executive Vice President of the North American Deer Farmers Association.

Please accept these comments in regards to the DATCP Proposed Rule that will negatively impact deer farmers in the State of Wisconsin.

- **Concern #1:**
 - Eliminating deer farming in Wisconsin is not going to stop the spread of CWD. The disease is in the wild and removing deer farmers will do nothing to change that fact. No one would ever consider shutting down 75% the cattle industry in a state due to a disease.

- **Concern #2:**
 - Even though the deer industry has been vilified in the past. This industry could end up being the solution to CWD by driving research into live testing, vaccine development, genetic mapping to breed CWD resistant deer (like what was done with Scrapie in sheep species).

- **Concern #3:**
 - Many Wisconsin deer farms are already double fenced and with the Governor's proposal, those farms will also not be able to move within the state. Why would anyone spend money to double fence if movement is going to be prohibited anyway? Further, science does not support transmission through fences.

Thank you for your consideration.

Regards,

Jacques E. deMoss

Carlson, Michael M - DATCP

From: Michael Deveny <devenym@gmail.com>
Sent: Thursday, June 14, 2018 10:14 AM
To: Carlson, Michael M - DATCP
Subject: CWD Comment

- Shutting down deer farms in Wisconsin is not going to stop the spread of CWD
- Deer farmers could end up being the solution to CWD by breeding for and producing resistant animals much like the sheep industry did with Scrapies
- Emotional politically driven ideas that are not founded by science may be appealing to the uninformed public but it won't stop CWD
- The cervid industry has spent over a decade working to prevent CWD, but unfortunately the wildlife agencies have not done their part and now the free ranging herd is jeopardizing our herds and our livelihoods.
- The 4 most highly infected CWD counties in Wisconsin have populations that have doubled or nearly doubled since 2002 when CWD was first discovered. How could this possibly be considered an emergency that warrants destroying an entire industry?
- No one would ever consider shutting down 75% the cattle industry in a state due to a disease.
- Many Wisconsin deer farms are already double fenced and with the Governor's proposal, those farms will also not be able to move within the state. Why would anyone spend money to double fence if movement is going to be prohibited anyway?
- Science does not support transmission through fences.
- CWD in Wisconsin does not warrant an emergency rule!

Michael Deveny

Carlson, Michael M - DATCP

From: Courtney Devine Devine <courtneyrdevine@hotmail.com>
Sent: Wednesday, June 13, 2018 12:03 PM
To: Carlson, Michael M - DATCP
Subject: Cwd proposal

My name is Courtney Devine and I live in Portage county in Wisconsin. I'm writing today to share that I strongly oppose governor Walkers cwd proposal. There is absolutely no scientific evidence, studies or any proof, to justify this proposal; it is a blatant attack on the deer farming industry. The proposal stands on an assumption, not founded in science, and I ask that you support the deer farmers as they are the victims of this unfortunate situation. It is not right that they are being discriminated against with this proposal. There is no evidence that preventing the movement of private animals will have any impact on cwd in the wild. Walker needs to come up with a scientifically backed solution instead of destroying families and businesses in Wisconsin. Please share this with the governor so that he doesn't make this huge mistake. Thank you

Sent from my iPhone

Carlson, Michael M - DATCP

From: mdevine1181@gmail.com
Sent: Tuesday, June 12, 2018 9:05 AM
To: Carlson, Michael M - DATCP
Subject: Deer farm proposal

Dear Mr. Carlson,

I am writing to voice my strong opposition to Governor Walker's proposals to restrict the deer farmers in Wisconsin. The spread of CWD is not the fault of the deer farmers. By adding the restrictions in the Governor's proposal, it will severely cripple the deer farmers in Wisconsin, and put many of them out of business. I would suggest as a compromise that the deer farmers have the ability to move deer from cwd areas to other cwd areas.

Sincerely,
Michael P. Devine
1011 Victorian Lane
Plover, WI

Sent from my iPad

Carlson, Michael M - DATCP

From: Taylor Devine <devinetl21@gmail.com>
Sent: Tuesday, June 12, 2018 12:54 PM
To: Carlson, Michael M - DATCP
Subject: Please don't pass the Bill

I am very concerned about the bill that could possibly put deer farmers out of business. My name is Taylor and I was born and raised in WI. I currently live in Dunn Co Wisconsin. The biggest reason I am against this bill is because it will be harming local businesses. WI has a large amount of deer farms and people from around the US come here for the experience. If the bill passes and the farms go out of business, those people won't be traveling here to boost our local economy. Are the deer farmers really the reason CWD is not under control or is it the fact that the government can't pay enough money to a government department to contain it? Don't blame others for the government's fault. Try other options before ruining WI families. Thank you for your consideration.

Sent from my iPhone

Carlson, Michael M - DATCP

From: Derrick Domask <derrickdomask@gmail.com>
Sent: Sunday, June 3, 2018 8:27 PM
To: Carlson, Michael M - DATCP
Subject: CWD Proposed Rules

Mr. Carlson,

I am strongly opposed to the Governor's proposed rules that would required double fencing for deer farmers and ban the movement of live deer in CWD affected counties. These actions would not effectively manage CWD and would instantly put deer farmers out of business across the state.

These proposed measures are deeply flawed for many reasons.

First, deer farms are closed, fenced environments that already test their animals to ensure they are free of CWD. In the off chance CWD is detected on a farm, the disease is contained and can be eliminate, unlike with free-ranging deer that have spread CWD across Wisconsin and other states.

Next, Wisconsin deer farmers are contributing to research to help fight CWD. Whitetails of Wisconsin is funding research projects to study the effects of CWD on infected captive animals. These studies are helping us better understand many things about CWD that can and will never be identified through studies of the wild deer herd in Wisconsin. The deer industry is also funding genetic resistant research which could prove to be a solution to CWD. Wisconsin deer farmers, along with CWD positive hunting ranches, are spending tens of thousands of dollars working with researchers to find deer with greater resistance to CWD than were previously known to exist.

Furthermore, no farm or hunting ranch wants CWD, but redundant fencing would cost hundreds of thousands of dollars or more to install, while bans on transporting deer between controlled environments would choke farms and hunting ranches. Double fencing every deer farm in the state is not going to stop free-ranging deer from continuing to spread CWD. Even if every deer farm in the state is put out of business, free-ranging deer are still going to continue to spread CWD.

The biggest risk of CWD transmission is not deer farms, but carcass movement by hunters, according to an official with the US Geological Survey. Carcasses are moved around the state to non-infected areas and then birds of prey feast on these infected carcasses, further spreading the disease.

In addition, there is no evidence of a need for "emergency" regulations. CWD was first found in Wisconsin in 2002, and research released from the University of Wisconsin-Madison found "no evidence that CWD was substantially increasing mortality rates during the duration of our study from 2003-2007."

Wisconsin has already wasted millions on bad strategies to fight CWD and these latest proposals will cost taxpayers when the state has to defend them in court.

Lastly, the rules suggested would put deer farms and hunting ranches—a \$100 million a year Wisconsin industry—out of business, even though these businesses are already doing whatever they can to stop CWD. Wisconsin farmers are already fighting the spread of CWD as participants in a federal CWD program.

Regards,

Derrick
Franksville, Wisconsin (Racine County)

Carlson, Michael M - DATCP

From: Derrick Domask <derrickdomask@gmail.com>
Sent: Tuesday, June 12, 2018 9:00 PM
To: Carlson, Michael M - DATCP
Subject: Re: public comment

Thank you.

Please feel free to call me at 414-551-9519 if you would like to discuss further.

I feel very strongly that the proposed rules will not be effective in managing CWD. It is important that we allow the genetic resistant research by the cervid industry to continue as it has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if the proposal rules by the governor are passed.

Sincerely,
Derrick

On Tue, Jun 12, 2018 at 5:01 PM, Carlson, Michael M - DATCP <Michael.Carlson@wisconsin.gov> wrote:

Dear Mr. Domask,

Thank you for contacting DATCP to provide feedback about the statement of scope for proposed emergency rule ATCP Chapter 10.

Your comments have been incorporated into the record for this proposed rule and will be relayed to the DATCP Board.

Michael Carlson

Administrative Rules Coordinator

Department of Agriculture, Trade and Consumer Protection

2811 Agriculture Drive

Madison, WI 53708

(608) 224-5029

michael.carlson@wisconsin.gov



Wildwood Wildlife Park
10094 Hwy 70 West
Minocqua, WI 54548

Judy and Duane Domaszek
Park Owner/Director

Phone (715) 356-5588
E-Mail nature@wildwoodwildlifepark.com

May 7, 2018
Judy and Duane Domaszek
10094 Hwy 70 West
Minocqua, WI 54548

The Honorable Scott Walker
Governor of Wisconsin
Madison, WI

Dear Governor Walker,

I would like you to be aware that the CWD laws that are being imposed by the Department of Natural Resources will possess a threat to our Deer herd existence at Wildwood Wildlife Park. We are licensed and regulated to have our deer in captivity. So to put into law to stop movement of deer among licensed facilities is unlawful. Also the double fencing law will not work in the zoo setting to put another fence up 10 feet from the first fence would take up prime real estate land that we have other exhibits on. The DNR is imposing these laws and they have nothing to do with the deer they washed their hands of it years ago and the Wisconsin Department of Ag took it over. CWD has been around for years, but now they have an escape goat the deer farmers to blame it on.

The Wisconsin Department of Ag Trade and Consumer Protection regulate Wildwood Wildlife Park's facility. The only part the DNR has is Deer Farm Fence Certificate license fee.

So in order to have the deer at the zoo we have a Farm-Raised Deer Fee License, which is now \$325.00 per year, a Qualified and Accredited Tuberculosis Herd certificate, which is \$150.00, and a CBW census, herd certificate. Boy does this sound like government over regulation? Roger Sabota a Conservation Congress Committee member told all the people at the Public Hearing on Monday April 9, 2018 that the deer organizations are in favor of these new laws and that every person attending should vote in favor of this law change. I am not in favor of the changes and I oppose the Department of Natural Resources law changes. Thank you for your time.

Sincerely;

Judy and Duane Domaszek

**Wildwood Wildlife Park
10094 Hwy 70 West
Minocqua, WI 54548**

**Judy and Duane Domaszek
Park Owner/Director**



Phone (715) 356-5588

E-Mail nature@wildwoodwildlifepark.com

Wisconsin Department of Agriculture, Trade and Consumer Protection
ATTN: Alex Girard
Small Business Regulatory Coordinator
P.O. Box 8911
Madison, WI 53708-8911

June 14, 2018

Dear Mr. Girard:

Duane and Judy Domaszek owner of Wildwood Wildlife Park are opposed to the Emergency Scope Statement Proposal. Our zoo has held a deer farm license for over 60 years and now this will be in jeopardy and we have done nothing wrong by the law. All our guests love coming to the zoo with the deer walking among them. The guests also love hand feeding the deer and simply just enjoying them. Our zoo educates the public everyday about conservation. Our patronage guests/zoo members are very concerned and upset about how this will affect Wildwood Wildlife Park and Nature Center. Not being able to have the deer at the zoo would impact the visitation of our zoo guests. With over 160,000 attendees and over 4,000 zoo members which, come to the zoo with endless visits seeing the baby fawns being born, the fawns nursing from their mom, and simply seeing them grow into the magnificent animals they are. Then to see the bucks growing their antlers and then see them shed their velvet creating a beautiful antler is an awesome experience that our zoo guests witness. Wildwood Wildlife Park has 20,000 students that attend the zoo on educational fieldtrips we are advocates for conservation, education and preservation of all wildlife.

The Emergency Scope Statement Proposal states the anticipated economic impact is moderate to significant. Today that would be a \$68 million dollar industry that is more than significant. Many deer farmers bought land that is marginal for most kinds of agriculture and made it into a profitable business, bringing tax revenues for Wisconsin. Not to mention many are family run businesses that have families to support off of their livelihood.

At present Wildwood Wildlife Park is on the CWD Herd Certification Program, which requires our herd to be tested for Chronic Wasting Disease of all animals over 12 months that die for any reason. Our deer herd has been on the CWD Herd Certified Program for over 17 years contributing to research aimed at fighting CWD. To date we have not had any deer test positive for CWD. The DATCP has rigorous protocol already in place that we must follow for moving animals intrastate and interstate. So we are highly regulated already and do not feel this emergency rule is of merit nor is it necessary.

The DATCP and the DNR have no scientific research about this disease, which they were suppose to gather and nothing was done on this matter and all of a sudden it is a state of emergency for a situation that the DATCP and DNR should of been working on for the past 20 plus years. Wisconsin already wasted millions of dollars on bad strategies to fight CWD, and the latest proposals will cost taxpayers even more money.

We attended the DATCP hearing on June 7, 2018 in Madison. The deer farmers were overwhelmingly against this emergency proposal. There were two gentlemen in favor of this Emergency Scope Proposal. Mr. George Myers from the Wildlife Federation and one gentlemen from

the conservation committee which both have no understanding of what licenses we hold to have our deer or how we are regulated by the DNR and DATCP. They just think it sounds good to protect the wild deer for Wisconsin's Heritage Hunting. There is absolutely no evidence in the past 20 plus years where CWD came from. The U.S. Geological Survey states the high risk of CWD transmission is not deer farms. Moreover, CWD has been discovered in several states (AR, MS, MT) without cervid ranches so there is no private industry to blame. Clearly, there are other factors at work spreading this disease. As the representative from the Whitetails of Wisconsin stated in his testimony we the deer farms have become the scapegoats for the DATCAP and the DNR. Scape-goat definition is an animal which is ritually burdened with sins of others then driven away that sounds exactly what they want to do is drive the deer farmers away and put them out of business. That means over 375 deer farmers/families that will be put out of business.

I can only hope that Dr. McGraw would contact Dr. Bret Marsh the State Veterinarian and head of the Indiana Board of Animal Health to discuss what they did with the over 700 deer farmers in Indiana. He can be a valuable asset moving this process forward. Why reinvent the wheel if Dr. Marsh has already been through this process.

One more point to consider if this truly is a health and safety emergency then no trade organization should be exempt from this emergency. As stated in the definition Chapter ATCP 10.01 Definitions (42) "Farm-raised deer" has the meaning given in s.95001 (1) (ag), Stats. but does not include a cervid kept by an institution accredited by the association of zoos and aquariums (AZA). This is a political exemption not an animal health and safety exemption. Wildwood Wildlife Park is accredited with the Zoological Association of American with no exempt status.

I am appalled at Governor Walker's actions after visiting our Zoo and participating in our new safari ribbon cutting ceremony in May of 2017 that you would even think of trying to damage our family run business in Minocqua, WI. Not to mention the negative tourism economic impact it would have across the state of Wisconsin.

We strongly oppose both rulings stated in the Emergency Scope Statement Proposal. The ban on movement of farm-raised deer in any county that is affected by CWD and The enhanced fencing consisting of at least one of the following barriers around the entire perimeter of any deer farm or hunting preserve: a double fence: a solid barrier; or three strands of electrified wire on the inside or the outside of the entire length of the perimeter fence. Our facility also holds and exhibitors license with the United States Department of Agriculture, Trade, and Consumer Protection and we already meet their barrier/fencing requirements set forth by this licensing agency.

Sincerely,

Jody and Duane Domaszek

Shawn & Kim Domaszek
10315 County Lane
Woodruff, WI 54568

Department of Agriculture, Trade and Consumer Protection
Office of the Secretary
2811 Agriculture Drive
PO Box 8911
Madison, WI 53708

June 14, 2018

Dear Mr. Carlson:

We oppose the Emergency Scope Statement Proposal. My mom and dad own the Wildwood Wildlife Park for the past 22 years of which those years I grew up and worked at the zoo. I am now married and have a family to support and am still work with our family owned business. I cannot believe that any of these measures will do anything for the CWD problem. Our deer herd is very heavily regulated already and we as business owners have no ability to stop free-ranging deer from bringing Chronic Wasting Disease into our counties.

My mom has been going to all the hearing fighting for our livelihood and I pledge that you look at what you did when you decided to have the State of Emergency.

I am also an advent bow-hunter and the proposal for the deer carcass transportation is not right I own land in Marathon County and if I harvest a deer in Marathon County I would not be able to bring my deer back to Oneida County to feed my family. Many times I will drive to our land after work sit in the stand hoping for the big one and if I shot one I can not wait until the next day to process it in that area. The proposal just does not make sense. If we are so worried about the spinal colon then why in the hell are we not worried about all the deer that are killed on the roads and are just lying bloated and nothing is done to them. That used to be the DNR's responsibility but they gave it to the counties again washing their hands from work that must be done. And what about the animals (crow, eagle, raccoon) eating on the dead deer if that deer is infected, which know one would know. The animal that ate the infected deer will then go defecate in the woods or on an agriculture field where the CWD prions are shed now exposed and sitting on the ground waiting to possibly infect another wild deer. Thus creating a snowball effect.

The Emergency Scope Proposal will not do anything to protect the wild deer nor will it help the deer farmers other than run them out of business.

Sincerely


Shawn and Kim Domaszek

Carlson, Michael M - DATCP

From: Jerome Donohoe <ag_o3@earthlink.net>
Sent: Wednesday, June 6, 2018 1:49 PM
To: Carlson, Michael M - DATCP; Jerome
Subject: Submittal Testimony Re: Emergency Rule Regarding Farm - Raised Deer Movement and Fencing
Attachments: ATCP 10 DEER FARMER Response Letter 6 7 18 final.pdf

Hi Michael, attached is my submittal of testimony / public comment on the Emergency Rule Regarding Farm - Raised Deer Movement and Fencing to be held on 6-7-18. Please let me know your receipt of the attached.
Thank you, Jerome

Jerome Donohoe CEO
Agricultural Omega Solutions LLC
2020 N. 53rd st
Milwaukee, Wisconsin 53208
414-699-9332
ag_o3@earthlink.net

To: Department of Agriculture, Trade and Consumer Protection (DATCP)

From: Jerome Donohoe

Date: 6 - 7 - 18

Re: Statement of Scope

Rule No. wis. Admin. Code ch. ATCP 10 (Existing)

Relating to: Animal disease and Movement

Rule Type: Emergency

1. Finding / nature of emergency:

Chronic wasting disease (CWD) is a serious issue facing Wisconsin. Since its discovery in Wisconsin in 2002, 53 counties either have experienced a positive test for CWD or are within ten miles of a positive testing event. While the pathways for the transmission of CWD remain unclear, Wisconsin has made efforts to slow the progression of the disease by restricting baiting and feeding and by requiring additional fencing that restricts contact between wild deer and captive populations. These efforts have not prevented the spread of CWD.

Concern: 1. The CWD disease has been left uncontrolled in wild deer population of the state while only “managed” by the Department of Natural Resources (DNR) utilizing wildlife biologists or scientists or CDAC input for biased harvest goals as the only key “management” tool in an effort to “control” this disease process. By States current harvest management practices of wild deer during regulated harvest seasons by fee oriented / land acre oriented practices limits the ability to properly “manage” the disease process vs. “controlling the disease process that the department has at it’s disposal through the USDA MOU with the State departments of Agriculture and Natural Resources alike. DATCP has the ability to mandate DNR to execute all tools of CWD control as proven in current satisfactory deer farm practices. By mandating that the DNR utilize IHC testing methods for “ALL” surveyed deer tested in the wild population is the only “epidemiological” method of proof by State statute to diagnose an animal with CWD. The current Elisa testing method used by the DNR can only legally be used to describe a cervid as “exposed” to and does not offer proof of a diagnosis of the CWD disease.

If this lack of USDA approved proper diagnostic testing method (IHC) is not mandated by DATCP for the DNR to utilize for “ALL” CWD tested deer will only misinform the hunters of the states deer an illegal diagnosis by method (Elisa test) of their harvested deer by State Statutes for consumption. This misinformation will also be confusing to the people of the State of Wisconsin that potentially diseased deer as exposed vs. properly diagnosed has kept potential deer to be taken by hunters off of the landscape that have continually practiced as in-effective since 1999 - 2018.

Farms raised cervids are considered livestock under definition of state statues as are other livestock species. Farmed cervid management for animal health, illness or potential clinical diseases are currently managed by DATCP through herd veterinary oversight for each farm license. Disease control for the clinical onset of CWD is controlled by utilizing the USDA CWD program and approved mitigation process’ including required State statute (ATCP10.03 Disease reporting) epidemiological detection methods for diagnostic evidence to be able to provide a diagnosis of the CWD disease in any cervid raised agriculturally behind a fence if suspected. To date, the current USDA embraced CWD Herd Status Program has worked in all cases of CWD detection and control in the current agricultural program.

Since the DNR has statutory authority of "DEER FARM" fencing for whitetail deer they are also by signature enrolled into the USDA MOU CWD Herd Status Program. Since DATCP has departmental authority for the movement of "WILD" cervids in approval of interstate cervids (current elk) for quarantine purposes to be satisfactory for "release" into the WILDS of Wisconsin. The quarantine period prescribed by DATCP TO DNR only encompasses testing for and negative results for tuberculosis and brucellosis and not "ANY testing for CWD". Currently there are a majority of deer farms in Wisconsin that have 18 years of history of CWD negative status by IHC testing proving that DNR utilizing Elisa testing methods is not as effective as controlling CWD detection in the wild deer population.

Efforts by the DNR to minimize the spread of disease in the wild deer population also by restriction of feeding and baiting has been met with failure due to their statutory authority to only "maintain" the disease.

The DNR also acknowledges they cannot control this disease in the wild deer population. This is a DNR department position where as this is noted by DNR department personnel that they "DO NOT" have the hunting public support for controlling CWD because there is "NO" science being the disease process. This is probably due to the fact that the DNR only uses a testing method (Elisa) that can only be considered that a deer has been exposed to CWD not is "diagnosed with CWD".

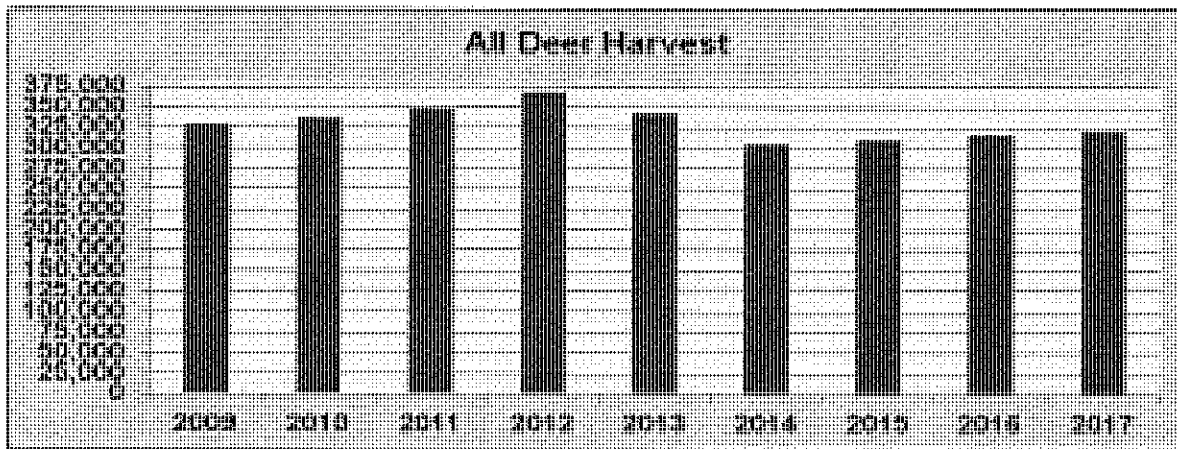
The Department (DATCP) is enrolled in an approved USDA CWD Herd Status Program for the State of Wisconsin for which is an enhanced program following approved effective strict policies and procedures that are also by state statues enhanced for "control" of the CWD disease process behind fence. State of Wisconsin participation in this program for which is designed to allow intrastate and out of state shipment of certified farmed cervids with a history of CWD negative status employ these strict measures to maintain their small agricultural business and farming heritage. There are currently only 6 CWD positive whitetail deer farms in 6 independent counties of the 72 counties of the state. This is far fewer counties with CWD detection by epidemiological detection as compare to the department's notation of the DNR's 53 counties.

The progression of CWD threatens the welfare of Wisconsin's unique hunting culture as well as the multi-billion dollar hunting industry within the state. CWD also threatens captive deer herds maintained by Wisconsin's deer farms. The situation warrants emergency rule-making because findings of CWD infection are likely to increase prior to the completion of the multi-year process of permanent rule-making.

Concern 2. The progression of the CWD disease does not and has not threatened the "welfare" of the "people of the state" or the minority population hunting culture nor the hunting industry or economic impact.

Hunting in today's culture is considered a "sport" where as a heritage of a minority hunting population vs. the number of population engaged in agricultural livestock production and other non- hunting populations of the State view this heritage as to provide for subsistence living off the landscape for food and clothing.

Since 1999 when CWD was first detected in Dane county the hunting industry has thrived in Wisconsin even with the events of the minimal spread of CWD upon the landscape.



Deer populations above can take 4 plus years to recover (2009-2012) whereas after a hard winter (2014) the numbers had an obvious impact on the deer herd as a whole. The same pattern with an increase of the herd over a longer time from a hard winter along with an increase of deer harvest by archers with expanded use of crossbows (2014 - 2017) can take longer but shows increase of hunter harvest.

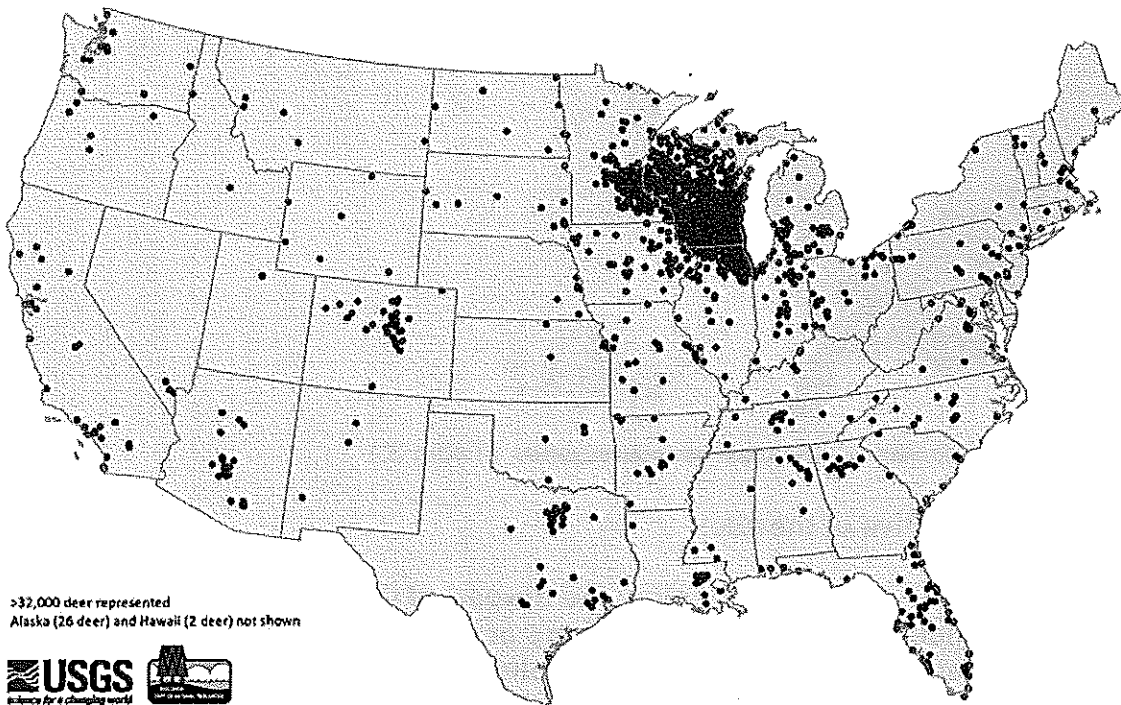
Another lack of public outcry for the “WELFARE” of the people of the State is that there is “NO” moratorium / Quarantine Order by the Department for the DNR identified “Endemic County Zones” or other counties in the State determined by DNR as “Affected”. The lack of quarantine order on the movement of other “agricultural crops” such as all types of hay, corn, beans, fruits and vegetables that have been “exposed” to farm areas populated by deer with CWD. This concern has not materialized though research has demonstrated that the CWD prion can infect plant based agricultural crops and can be spreading the CWD prion upon other areas of the State and country to agricultural livestock and humans alike.

The following map (table 1) provided by the DNR’s own supported research provides hunting opportunities where as more hunters actually hunt in the higher CWD endemic areas of the state from around the country because the deer in these endemic areas are living longer and growing the more massive racks the deer hunter desires.

Since 1999 when CWD was detected in the wild deer population in Dane county there has only been 18 captive cervid farms of over (500+ farms) with an epidemiological detection for CWD in 16 of 72 counties of the state. These detections and control of the CWD disease process have been properly managed by the department (DATCP) through the aforementioned Certified USDA CWD Herd Status program and enhanced program controls by the department. If there are any improvements to the current statutes maintaining farm fencing against contraction of CWD from the wild cervids or potential CWD disease transfer to the wild deer from farmed deer it would be the allowance of electric fencing as an alternative double fence currently mandated by the department as determined for higher risk farms or counties at risk only after statute authorized epidemiologically testing to make a qualified diagnosis of the presence of the clinical detection of the CWD disease.

Home Zip Codes of hunters harvesting deer in Dane, Iowa, Richland and Sauk Counties, Wisconsin, 2016-2017

Data: Wisconsin Department of Natural Resources

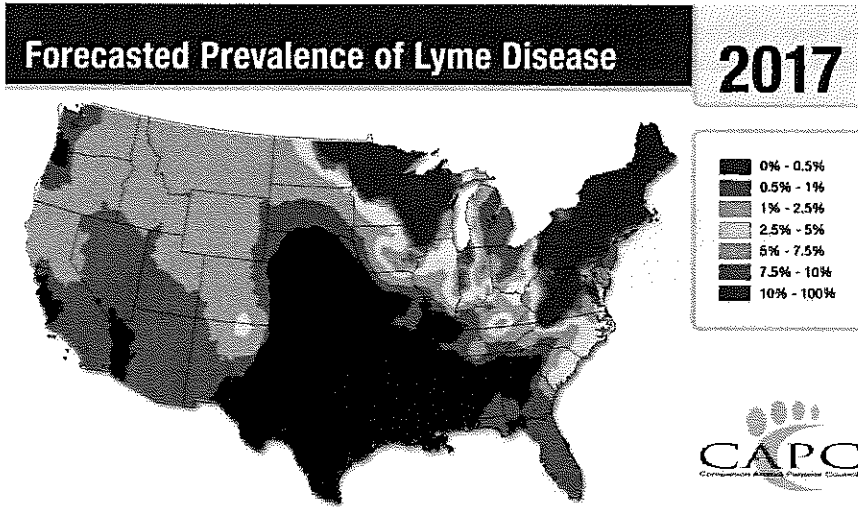


(Table 1.) Hunters from across the country flock to Wisconsin's Endemic area to hunt big racked deer.

There is also evidence that demonstrates that Limes disease (Table 2.) is considered by publication of disease at the wildlife – livestock interface is ranked by importance more than CWD in relation to a human / livestock “emergency (Table 3.) Concerning health or a “welfare” concern or issue in the State of Wisconsin.



(Table 2.)



(Table 3.)

1. Description of the objective of the rule:

This proposed rule is intended to prevent or slow the spread of CWD by requiring the installation of enhanced fencing around all populations of captive deer. Enhanced fencing is conceptualized as consisting of at least one of the following barriers around the entire perimeter of any deer farm or hunting preserve: a double fence; a solid barrier that is at least 8 feet high; or three strands of electrified wire on the inside or the outside of the entire length of the perimeter fence.

Secondly, the rule would institute a ban on movement of farm-raised deer in any county that is affected by CWD.

Concern 3. The current rule proposal requirement for enhanced fencing to slow the spread of CWD by the captive deer population is flawed by the simplicity of lack of evidence of an “emergency” having an effect on the “welfare” of the people of the state of Wisconsin.

In review of the confirmed past 17 year history of farmed cervids and wild cervid detection of clinical vs. an exposed status of CWD by epidemiological statutory approved methods utilizing IHC testing demonstrates a veterinarian approach under the DATCP current practiced methodologies work. By DATCP aligning to the USDA approved and State of Wisconsin statutorily approved process in providing a “diagnosis” of CWD in any farmed cervid can be validated. With the DNR utilizing an Elisa test method provides for errors (4,217 wild CWD “exposed” deer) in a 17-year history vs. only 250 farmed CWD “diagnosed” deer IHC tested positives in 17 years of testing).

Without proper “diagnosis” of the wild deer population by the DNR can only provide a confusing / misleading narrative by the DNR to DATCP and to the people of the state. This misleading narrative demonstrates that there is no emergency by rule because all of the facts from the DNR have been to misinform the State by it’s’ use of testing methods for CWD that are not recognized as the “gold standard” by other states or agencies.

There has never been a confirmed case of a CWD transfer from a farmed cervid to a wild cervid that has lead to the increased CWD detection in the wild population. This has been under current farm fencing requirements by both the DNR and DATCP for the health and safety of both wild

and captive cervids in Wisconsin. Since there is no epidemiological evidence of an emergency, additional concerning CWD enhanced fencing is unwarranted to control the disease process by non – veterinary medical interventions.

Though there has been detection of CWD in the captive cervid population in the state, there has never been proof that its origin was from the wild deer population having a negative effect on the farmed cervid industry to move live cervids in commerce. Protection of the wild population from the farm deer population concerning CWD detection in farmed cervids is through the USDA and states CWD Herd Certification Program as stated earlier in this document for detection and mitigation process up to depopulation of a farm if condemned by statute. There has never been an exposure to wild deer population in relation to an exposure of any live farmed cervid by the epidemiological statutory requirements that would preclude any farmed cervid to be restricted to movement of any live cervid by Certificate of Veterinary Inspection (CVI) as currently used by the department.

2. Description of existing policies relevant to the rule and of new policies proposed to be included in the rule and an analysis of policy alternatives; the history, background and justification for the proposed rule:

The status quo

Currently, a herd in which CWD is detected must be quarantined for 5 years. DATCP may order the destruction of the herd, may require the disinfection of the premises, and may require the herd owner to enter into an agreement including a covenant to maintain fencing at the premises. DATCP maintains a chronic wasting disease herd status program that requires participants to engage in a variety of testing regimens, keep records, and install safe guards including the installation of enhanced fencing in cases where wild deer test positive for CWD in the vicinity of the captive herd. The program includes requirements concerning the movement of deer and additions to the herd.

Justification for proposed rule.

The reasons for the proposed rule are (a) the severity of CWD and (b) existent policy has not arrested the spread of CWD.

Concern 4. The justification of the proposed rule is flawed in the aspects that the department has controlled the spread of CWD in captive farms. The department does have legislative jurisdiction under the USDA MOU on the wild deer population of the State for disease reporting and movement. This oversight applies to bringing livestock or cervid wildlife species into the state in particular for release into the wilds of Wisconsin.

One particular concerning part of this CWD disease is the DATCP allowance of wild elk being imported from Kentucky under quarantine procedures that do not include any CWD detection methods that are used by the USDA or the States DNR for wildlife disease detection methods of suspect exposed cervids from other states in the wild cervid populations.

I propose that DATCP modify its current permit that allows the DNR to bring elk into Wisconsin for release to require rectal biopsies (statute 95.20) by IHC testing methods from any wild cervids applied for in the past or future and reviewed before they are verified to be brought

through transportation means into Wisconsin for release into the wild as has happened in the past.

If this cannot be accomplished then any elk destined for transfer to Wisconsin under past department agreements must be suspended until it can be determined by epidemiological review that these cervids are free of suspect or diagnostic CWD disease.

Policy Alternatives.

The alternatives are to remain with the status quo or to promulgate measures that are more restrictive than the status quo but less restrictive than the proposed rule.

Concern 5. With the current promulgated measures in place it demonstrates that the department efforts over the years to control CWD in farmed cervids are working in the containment and mitigation efforts of control and elimination of the CWD disease when found by statutory authority of disease diagnosis.

With only 250 deer found to be "clinically" confirmed with CWD in the captive population of over 42,000 tests performed on 18 farms in 16 counties over a 17 year history this does not constitute a change in status or constitutes an "emergency" to the "welfare" of the people of the state of Wisconsin.

An improvement to any farmed cervid farming practices could be to review with farm cervid stakeholders to work on implementations of agreed upon best management practices that could enhance the opportunity to keep farmed cervids safe from the disease in the wild deer population.

Some of these measures could include option items such as electric fence vs. current mandated double fence State requirements when wild diseased deer are found in the vicinity of or within 5 miles of a cervid farm. If there is a mandating of this scope to enact measures to include a mandatory of double barrier, (fence, electric wire, physical barrier or live cervid movement in commerce) then reparations of crop damage must be paid to ALL cervid farmers affected by the DNR for wildlife disease by statutes to livestock. There should also be a mandated quarantine effort by DATCP to restrict any agricultural crops from moving outside of any "affected" county to another county or state until this "emergency order" is dismissed in whole for provisions of the Scope that would negatively have a negative detrimental effect on the cervid farmer in Wisconsin.

3. Statutory authority for the rule (including the statutory citation and language):

DATCP has specific rulemaking authority over the farm-raised deer industry under s. 95.55 (6), Stats. including the authority to promulgate "standards to be followed by persons keeping farm-raised deer to prevent the spread of disease." DATCP also has authority under s. 95.20, Stats., to prohibit or regulate the movement of animals if there are reasonable grounds to believe it is necessary to prevent the introduction or spread of disease. Additionally, under s. 93.07, Stats. DATCP is obligated to make regulations that are necessary and proper to the enforcement of statutes including chap. 93, and to establish and enforce animal quarantines.

Concern 6. The department has the statutory authority to rulemaking in section 3 but in concert with other statutes for relief to the cervid farmers under paid licensures with the department for an agricultural enterprise. Under ATCP 10.03 Disease reporting # 1 thru #5 , statute 93.07 10 Animal health and Quarantine, ATCP 10.89 Quarantine, ATCP 10.90 Temporary Hold order, ATCP 10.58 Farm raised deer separation from diseased wild deer, Statute 990.01 (5g) Communicable Diseases.

DATCP also has the authority to mandate the testing methodology used by the DNR to upgrade to using the "gold standard testing method" (IHC) for diagnosing by state statute the CWD disease vs. the current DNR practice for using the Elisa testing method for only "exposed" deer to CWD.

4. Estimate of the amount of time that state employees will spend to develop the rule and of other resources necessary to develop the rule:

DATCP estimates that it will use approximately 0.10 FTE staff to develop this rule, which includes time required for the investigation and analysis, financial assistance criteria, rule drafting, preparing related documents, and communicating with affected persons and groups. DATCP will use existing staff to develop this rule.

Concern 7. Current double fence mandate estimated at \$28 million. Loss of allowing cervids in commerce would bring this total to a conservative \$110 million.

5. Description of all entities that may be impacted by the rule:

The rule will have an impact on keepers of farm-raised deer and on hunting preserves maintaining herds of captive deer.

Concern 8. The Department of Natural Resources would be impacted as DATCP must "mandate" the use of IHC testing by the department for all wild deer tested. This has been demonstrated by DATCP in testing farm raised deer by IHC to be the only statutory approved method of diagnosing deer with CWD in the state of Wisconsin.

Other entities other than those described would be animal exhibits owned by local townships, petting zoos that would have a tourism cascading impact on the state's economy.

Summary and preliminary comparison of any existing or proposed federal regulation that is intended to address the activities to be regulated by the rule:

No federal regulations govern the interstate movement of captive deer. The USDA Animal and Plant Health Inspection Services (APHIS) is in the process of promulgating a set of Chronic Wasting Disease Herd Certification Program Standards. Federal legislation has been introduced to provide additional funding for CWD research and control efforts, upgrade diagnostic laboratories and create a National Chronic Wasting Disease Clearinghouse.

Concern 9.

I recommend that the Scope maintain the status quo for deer farmers as to current practices as "best management practices" There are USDA enhanced program recommendations forthcoming for

potential inclusion of cervid farming community stakeholders for best management practices. The current USDA MOU with the State of Wisconsin DATCP /DNR must include the mandating of "ALL" deer in the wild deer population be tested by IHC for statutory compliance vs. testing methods for exposure only.

6. Anticipated economic impact

The proposed rule will have a moderate to significant economic impact on keepers of farm-raised deer and on hunting preserves. Few of these locations currently have enhanced fencing. The cost of additional fencing consists of the cost of the materials plus the cost of labor. Both of these will vary based on the size and dimensions of the farm or preserve. The proposed rule is anticipated to include the option of electrified fencing, which is cheaper than existent options for enhanced fencing. It is anticipated that many keepers of smaller premises would perform the labor themselves. Most deer farms are small, less than 10 acres. The proposed limitation on the movement of captive deer will have a potentially moderate to significant impact on keepers of farm-raised deer.

Concern 10. Current double fence mandate estimated at \$28 million. Loss of allowing cervids in commerce would bring this total to a conservative \$110 million. If the Scopes of the DATCP and DNR are fulfilled as written to mandate legislative rules or laws that would in fact label Wisconsin with the stigma as a "DISEASED STATE" that would put all deer farmers out of business creating an economic burden on the farmer and society, tourism alike will also have a cascading effect while not being able to mitigate the wild deer population for CWD. While hunting still thrives in a minority population of hunters as per the population of the State of Wisconsin (8.3 million) the only diminishing impact on any reduced hunting opportunities is recruitment of hunters because of an aging hunting participating group unable to recruit more younger hunters for which has already had a cause for declining revenue from the DNR from license sales, not the CWD "manufactured" to revenue venue.

By DATCP board requesting the DATCP veterinary unit include the enhance testing method of IHC vs. Elisa testing methods used by the DNR it would put the State of Wisconsin on equal statutory authority encumbered under the USDA/DATCP MOU agreement regarding disease reporting and quarantine / surveillance procedures.

I request that the DATCP board in consideration of the above concerns not approve this scope as is and to have the department review with all stakeholders prior to submittal of any new Scope of potential legislative intent on rule or legislative action that would have a negative impact on the cervid farming communities here in Wisconsin.

If the board would need any more information regarding these concerns I can be reached at ag_o3@earthlink.net.

Thank you, Jerome Donohoe

Rule No. Wisconsin Administrative Code chapter ATCP 10 (Existing)

Relating to: Animal disease and Movement

— Scope Statement Notes:

A. Finding / nature of emergency

B. Chronic wasting disease (CWD) is a serious issue facing Wisconsin.

C. Since 2002, 53 counties impacted? either experiencing positive test for CWD / within ten miles positive testing event.

Concern:

A. CWD though a concern in deer is considered a **SECONDARY** disease process afflicting deer and is not a serious issue

B. **NO** primary disease research has been conducted by the State for any Primary disease(s) afflicting deer that eventually leads to the onset of CWD in the 18+ year history of CWD

Finding:

A. Elisa Testing is a **PRIMARY** tool in “wild” deer testing to “manage” detection for “exposure” to CWD, not a “diagnosis”

B. Captive industry uses “Gold Standard IHC” testing to “diagnose” CWD

Recommend:

A. DATCP Board mandates **ALL** “wild” whitetail deer be tested for CWD by IHC as the Gold Standard for improved CWD detection that is recognized as an official test “diagnosing” CWD.

B. The Board has this tool in their tool box that is approved by the USDA and current Wisconsin State Statutes for reportable diseases to help “certify” CWD in the wild deer of Wisconsin.

Scope Statement Notes:

While the pathways for the transmission of CWD remain unclear, Wisconsin has made efforts to slow the progression of the disease by restricting baiting and feeding

Concern:

A. Efforts to date for “control” CWD disease in the “wild” deer population the DNR is only regulated by State statute to “manage” CWD not “control”.

B. CWD prions have been scientifically found to contaminate agricultural crops such as hay, mineral licks and possibly other agricultural crops.

Findings:

A. DATCP historically demonstrates “control” of CWD disease process by USDA approved methodologies under direction of veterinary care unlike “wild” deer with CWD.

Recommend:

If this emergency rule is truly imminent and restrictions of farmed deer (Certified CWD Free Status) for live movement of their agricultural products in commerce this Board must mandate:

A. removal of “wild” deer from the landscape in areas of deer farms to protect farms from CWD exposure risks without costs to Farmers

B. restriction of any agricultural crop movement outside the endemic counties or any current designated 53 counties as “AFFECTED” by CWD.

SCOPE Statement Notes:

by requiring additional fencing that restricts contact between wild deer and captive populations.

Concern: There is no evidence that CWD is spread between single fenced enclosures.

Double fencing has recently demonstrated not to be an effective tool against the wild CWD disease infecting a deer farm.

Recommend;

A. DATCP's Scope notes little is known re: CWD transmission.

Current research by the Deer Farm industry YOUR CONSTITUENTS needs to be embraced by this Boards action for research collaboration before any rulemaking is designed / implemented re: CWD. This collaboration can be accomplished through the Secretary of Agriculture, acting through the Animal and Plant Health Inspection Service-Wildlife Services with Federal research dollars.

B. Any Board considerations with the current Scope directives must include working with deer industry stakeholders.

C. Without inclusion of stakeholders concerns the Boards potential recommendations of emergency rule making will not begin to prevent the spread of CWD in the State of Wisconsin.

D. Any rule / legislation to double barrier "ANY" deer farm in the State protecting DATCP's licensed agricultural farms from "wild deer" diseases must be paid for by the DNR. *re: Crop damage*

E. All Whitetail Deer farm fencing should be moved from DNR to DATCP oversight as to streamline fencing under one Department. *For improved disease "control"*

Other expanded information is provided to the Board for testimony via email submittal. 6-7-18

Jerome Donohoe, 414-699-9332



Dear Governor Walker,

I am Sherry Douglas, the Owner of Douglas' Big Dog Saloon a Bar and Grill in downtown Portage Wisconsin, I'm also the past president and a current volunteer with Downtown Portage Inc. I have personally organized our event with Reindeer Games for the past 5 years, and Downtown Portage Inc. has been working with Reindeer Games from Hartford, WI for approximately 9 years in total. We have been made aware that you are considering not letting their reindeer leave their property. We have over 600 people in attendance each year at the Christmas season event in our Business Improvement District. This event is always on Small Business Saturday and it brings families to our downtown district. Reindeer Games is a positive influence on our community, and helps bring consumers into our shops and restaurants. Please reconsider restricting movement of reindeer, and allowing them to continue community events.

A handwritten signature in black ink, appearing to read "Sherry Douglas".

Sherry Douglas
Owner, Douglas' Big Dog Saloon
218 W. Cook Street
Portage, WI 53901

Volunteer
Downtown Portage Inc.
Portage, WI

Carlson, Michael M - DATCP

From: Corinne Dunwiddie <corinnedunwiddie@yahoo.com>
Sent: Tuesday, June 12, 2018 8:05 AM
To: Carlson, Michael M - DATCP

I do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing.

Corinne Dunwiddie Juda, WI.

Sent from Yahoo Mail for iPhone

Carlson, Michael M - DATCP

From: Steve Dvorak <SteveD@dvoinc.com>
Sent: Monday, June 4, 2018 1:16 PM
To: Carlson, Michael M - DATCP
Subject: FW: Emergency rule regarding farm-raised deer movement and fencing

From: Steve Dvorak
Sent: Monday, June 04, 2018 12:15 PM
To: 'michael.carlson@wisconsin.gov' <michael.carlson@wisconsin.gov>
Subject: Emergency rule regarding farm-raised deer movement and fencing

Dear Mr. Carlson;

I wish to use this email to voice my opposition to the change in elk fencing regulations. As a farmer, a 40 year principal owner of a farm equipment business, and an owner of an engineering company all located in WI, I find this rule change to be very unusual and of a knee-jerk reaction for the State of WI.

I have been raising elk on our farm for 25 years. Our elk herd is in the DATCP TB and CWD program for over 20 years and we have continuously used artificial insemination on our herd cows to limited the animals brought into our herd from the outside. Our concern for our herd has been the exposure to CWD that we would get from outside wild whitetail deer who are not subjected to any controls like we institute on our captive herd. However, in the 25 years of raising elk, we have never seen a nose-to-nose contact from native whitetails to our captive elk through the fence nor have we seen winter deer tracks that would indicate that this is happening. I see no benefit to double fencing for these reasons.

It is obvious that the State's attempts to irradiate CWD in the wild whitetail is not working and this needs to be addressed. The breeding program that sheep raisers arrived at through selective testing and breeding for sheep that are genetically resistant to scrapie's is an example that I believe should be considered for whitetails and for our wild, introduced elk herd. I would be willing to work on this program with our captive herd, if you are interested.

If that State does pass these restrictive fencing requirements, I will be forced to give up raising elk after 25 years of following DATCP regulations and testing. I feel that this is unjust and unfair.

Sincerely

Steve Dvorak, P.E.
President



920 . 849 . 9797
820 West Main St.
P.O. Box 69
Chilton, WI 53014
dvoinc.com

Carlson, Michael M - DATCP

From: Tina Edwards <tinafish328@gmail.com>
Sent: Sunday, June 10, 2018 9:50 PM
To: Carlson, Michael M - DATCP
Subject: Walker's CWD Proposal

Hi, my name is Tina Edwards. I live in Dane county, and I strongly oppose Walker's CWD proposal because of the negative impact it will have on the entire industry. After looking into how it will impact deer farmers, and finding that there's no scientific proof that cwd is perpetuated by deer farms, I feel very strongly that the potential benefits are far less than the guaranteed consequences. It will decimate deer farms, putting them all out of business. Prioritizing cwd over family lives in wi is a poor choice in my opinion. Thank you for your time.

Tina Edwards

Carlson, Michael M - DATCP

From: Deb Elmer <koobs90@yahoo.com>
Sent: Monday, June 11, 2018 10:09 PM
To: Carlson, Michael M - DATCP
Subject: Deer farm proposal

To whom it may concern,

I do not support the emergency rules for farm raised deer movement and enhanced fencing.

Sincerely,

Deborah Elmer
Monticello, Wi

To: Department of Agriculture, Trade and Consumer Protection (DATCP)

From Joel Espe W4840 Pierce Road, Monticello, WI 53570 Date 5-22-2018 _____

Re: Statement of ScopeThere

Rule No wis Admin. Code ch. ATCP 10 (Existing)

Relating to: Animal disease and Movement

Rule Type: Emergency

1. Finding/nature of emergency

Chronic wasting disease (CWD) is a serious issue facing Wisconsin. Since its discovery in Wisconsin in 2002, 53 counties either have experienced a positive test for CWD or are within 10 miles of a positive testing event. While the pathways for the transmission of CWD remain unclear, Wisconsin has made efforts to slow the progression of the disease by restricting baiting and feeding and by requiring additional fencing that restricts contact between wild deer and captive populations. These efforts have not prevented the spread of CWD

The first CWD positive deer was found 2 years earlier in 1999 in Dane County

Since the first deer tested positive in Wisconsin, there has been no effective measures to eradicate, or control the spread of CWD in the wild by the DNR. They have now resigned themselves to "managing" the wild herd by documenting the spread of the disease while doing nothing about it. This may be an EMERGENCY on their part, while the captive herd has been able to control CWD and eradicate if necessary. This disease should have been handled by trained veterinarians from the start, not wildlife biologists. Unlike the failures of the DNR in disease control, the USDA CWD program has been successful in testing, detecting and eliminating CWD positive livestock.

The DNR has attempted to minimize the spread of CWD by eliminating baiting and feeding in infected areas. They have also been guilty of violating their own rules starting with DNR sharpshooters with night vision scopes shooting deer over bait piles of corn in the endemic zone and most recently by using more corn piles to lure deer in for capture and release in their current predator research project.

The progression of CWD threatens the welfare of Wisconsin's unique hunting culture as well as the multi-billion dollar hunting industry within the state. CWD also threatens captive deer maintained by Wisconsin deer farms. The situation warrants emergency rule-making because finding of CWD infection of permanent rule-making.

The DNR records clearly show that the hunting culture has not suffered due to CWD. The endemic areas are sought out by hunters from Wisconsin and other states due to the abundance of trophy racks in the endemic zones. This also indicates that the bucks regardless of CWD are living longer.

The farmed cervid population is threatened into extinction not by the disease but by this proposed rule. 416 farm families will lose their investments in this agricultural small business and their livelihoods.

1. Description of the objective of the rule:

This proposed rule is intended to prevent or slow the spread of CWD by requiring the installation of enhanced fencing around all populations of captive deer. Enhanced fencing is conceptualized as consisting of at least one of the following barriers around the entire perimeter of any deer farm or hunting preserve: a double fence; a solid barrier that is at least 8 feet high; or three strands of electrified wire on the inside or the outside of the entire length of the perimeter fence.

Secondly, the rule would institute a ban on movement of farm-raised deer in any county that is affected by CWD

This scope has failed to show any emergency that will affect the welfare of the people of Wisconsin which is a necessary component to have a valid emergency. In the review of the confirmed past 17 year history of farmed cervids and wild cervid detection of clinical or exposed CWD by epidemiological methods demonstrates a veterinarian approach to a statutorily approved process before a diagnosis of CWD in any cervid can be validated (4,217 wild CWD vs. 250 farmed CWD positives). The farmed cervids have tested a much higher percentage of their livestock for CWD than is done by the DNR for the wild deer and elk. There has never been a confirmed case of a CWD transfer from a farmed cervid to a wild cervid that has led to the increased CWD detection in the wild herd. This has been under current farm fencing requirements by both the DNR and DATCP for the health and safety of both wild and captive cervids in Wisconsin. Since there is no epidemiological evidence of an emergency, additional concerning enhanced fencing is unwarranted to control the disease process by non-veterinary medical interventions.

The ban on moving farm raised cervids to any other location including slaughter will be a financial holocaust for the industry. There is no science to show that moving these livestock from one fenced location to another or to a packing plant would jeopardize the wild herd. This would be a restraint of trade and commerce which should be protected by DATCP not endangered. CWD detection in farmed livestock is conducted by USDA and our states CWD Herd Certification Program.

Description of existing policies relevant to the rule and of new policies to be included and of new policies proposed to be included in the rule and an analysis of policy alternatives: the history, background and justification for the proposed rule:

The Status Quo

Currently, a herd in which CWD is detected must be quarantined for 5 years. DATCP may order the destruction of the herd, may require the disinfection of the premises, and may require the herd owner to enter into an agreement including a covenant to maintain fencing at the premises. DATCP maintains a chronic wasting disease herd status program that requires participants to engage in a variety of testing regimens, keep records, and install safe guards including the installation of

enhanced fencing in cases where wild deer test positive for CWD in the vicinity of the captive herd. The program includes requirements concerning the movement of deer and additions to the herd.

Justification for proposed rule:

The reasons for the proposed rule are (a) the severity of CWD and (b) existent policy has not arrested the spread of CWD.

The justification of the proposed rule is flawed in the aspects that the department has controlled the spread of CWD in captive farms. DATCP has allowed wild elk from Kentucky to be released in agricultural areas of Wisconsin without any testing of any kind for CWD. DNR is currently conducting rectal biopsies for CWD on WI deer as USDA in other states.

DATCP has the authority and the power to require the same testing on the KY elk as they are under quarantine prior to release and wearing USDA ear tags which makes them farmed livestock. Past department agreements of these animals must be suspended until it can be determined by epidemiological review that these cervids are free of suspect or diagnostic CWD disease.

Policy Alternatives,

The alternatives are to remain with the status quo or to promulgate measures that are more restrictive than the status quo but less restrictive than the proposed rule.

With the current promulgated measures in place demonstrates that the department's efforts over the years to control CWD in farmed cervids are working in the containment and mitigation effort of the control and elimination of the CWD disease when found by statutory authority of disease diagnosis.

With only 250 deer found to be clinically confirmed with CWD in the captive population of over 42,000 tests performed on 18 farms in 16 counties over a 17 year history does not constitute a change of status or constitutes an "emergency" to the "welfare" of the people of the state of Wisconsin. If double fencing is mandated to protect the healthy livestock with the fence, then the DNR should be mandated to pay for such fencing as it is their failure to control or eradicate this disease in wildlife and would fall under the statutes protecting livestock along with crop damage.

2. Statutory authority for the rule (including the statutory citation and language):

DATCP has specific rulemaking authority over the farm-raised deer industry under s.95.55 (6), Stats. Including the authority to promulgate "standards to be followed by persons keeping farm-raised deer to prevent the spread of disease." DATCP also has authority under s.95.20, Stats., to prohibit or regulate the movement of animals if there are reasonable grounds to believe it is necessary to prevent the introduction or spread of disease. Additionally, under s. 93.07, Stats. DATCP is obligated to make regulations that are necessary and proper to the enforcement of statutes including chap. 93, and to establish and enforce animal quarantines.

The department has the statutory authority to rulemaking in section 3 but in concert with other statutes for relief to the cervid farmer under paid licensures with the department for an agricultural enterprise. Under ATCP 10.03 Disease reporting #1 thru #5, statute 93.07 10 Animal health and quarantine, ATCP

10.89 Quarantine, ATCP 10.90 Temporary Hold order, ATCP 10.58 Farm raised deer separation from diseased deer, Statute 990.01 (5g) Communicable Diseases.

3. Estimate the amount of time that state employees will spend to develop this rule, and of other resources necessary to develop the rule:

DATCP estimates that it will use approximately 0.10 FTE staff to develop this rule, which includes time required for the investigation and analysis, financial assistance criteria, rule drafting, preparing related documents, and communicating with affected persons and groups. DATCP will use existing staff to develop this rule.

4. Description of all entities that may be impacted by this rule:

The rule will have an impact on keepers of farm-raised deer and on hunting preserves maintaining herds of captive deer.

Current double fence mandate estimated at \$28 million. Loss of allowing livestock in commerce would raise that total to a conservative \$110 million, which would not include the loss of pasture land in the double fenced corridor and its mandated upkeep. Other economic impacts would include loss of income from veterinarians, feed mills, hired help, and tourism.

Summary and preliminary comparison of any existing or proposed federal regulation that is intended to address the activities to be regulated by the rule:

No federal regulations govern the interstate movement of captive deer. The USDA Animal and Plant Health Inspection Services (APHIS) is in the process of promulgating a set of Clu-onic Wasting Disease Herd Certification.

I recommend that the Scope maintain the status quo as to current practices with enhancement coming from input of sated NEW USDA recommendations and the leaders selected by the cervid industry stakeholders for best management practices

5. Anticipated economic impact

The proposed rule will have a moderate to significant economic impact on keepers of farm-raised deer and on hunting preserves. Few of these locations currently have enhanced fencing. The cost of additional fencing consists of the cost of the materials plus the cost of labor. Both of these will vary based on the size and dimensions of the farm or preserve. The proposed rule is anticipated to include the option of electrified fencing, which is cheaper than existent options for enhanced fencing. It is anticipated that many keepers of smaller premises would perform the labor themselves. Most deer farms are small, less than 10 acres. The proposed limitation on the movement of captive deer will have a potentially moderate to significant impact on keepers of farm-raised deer.

I hardly consider over \$100 million to be a moderate to significant impact on keepers of farm raised deer. This rule would put 416 farm families out of business without compensation all because the DNR has failed to succeed with its various rules, regulations etc. to control their disease. Electric fencing is cheaper than 8 foot high tensile but it is still not free. How will the Amish farmers

accomplish this continually without electricity? As stated earlier, cost of double fence is estimated at \$28 million with a total loss of a conservative \$110 Million. If the Scopes of the DATCP and DNR are fulfilled as written to mandate legislative rules or laws that would in fact label Wisconsin as a "DISEASED STATE" that would put all deer farmers out of business creating an economic burden on the farmer and society, tourism alike will also have a cascading effect while not being able to mitigate the wild population for CWD. While hunting still thrives in a minority population of hunters as per the population of the State of Wisconsin (8.3) million. The only diminishing impact on any reduced hunting opportunities is recruitment of hunters because of an aging hunting participating group unable to recruit younger hunters which has already created a declining revenue to the DNR in license sales.

Because I truly believe that even if you wiped out every cervid farm in the state, CWD will continue to spread at the expense of 416 family farms being wiped out. There is no science behind this approach or even common sense: I request that the DATCP not approve this scope as is and to have the department review with all the stakeholders prior to submittal of any new Scope of potential legislative intent on rule or legislative action that would have a negative impact on the cervid farming communities here in Wisconsin. FORWARD!

Sincerely,

The Espe family

PS How would you vote if your farm was one of the 416 on Death Row?

I sent scope statement in advance

Rec'd from:
Joel Espe
5-24-18

Welfare of people + spread of CWD

5 24 2018

Questions for Ag Board and DATCP

1. Did the DNR report the outbreak of West Nile Disease in Ruffed Grouse in Wisconsin to DATCP as a human communicable disease?
2. Did the DNR report the outbreak of CWD in Wisconsin as a human communicable disease?
3. With the concern of possible suicides among Dairy Farmers during economic hard times, is DATCP looking at the direct correlation of 416 farm families being put out of business as a high risk of suicide in that group as well as the scope also looks at the welfare of the people of Wisconsin?
4. Knowing that Beef, Dairy, Sheep and Goat livestock has access to mineral blocks on farms and that wild whitetail deer have no problem jumping farm fences and will also access those mineral blocks, it opens the concern that a CWD positive deer can leave prion loaded saliva on that block which other wild deer or domestic livestock (beef, dairy, sheep and goats can then digest. Whereas the domestic livestock will not be affected by the disease as the wild deer would, they will still transmit it in their feces, which is then spread on fields and the prions can survive in alfalfa, corn, soybeans or other agricultural crops that can carry CWD prions according to UW Madison Research. Will these dairy, beef, sheep and goat farms be required to construct an 8 foot high fence around these farms and pastures to prevent the spread of CWD and protect their livestock as the cervid farms are required to do? *Raises question if can these crops be shipped*
5. I was required to double fence last year due to the five mile rule of a deer that may or may not have existed, now everyone will be required to double fence, where is the emergency?

Joel Espe
W4840 Pierce Road
Monticello WI 53570
608 558 8445

To: Department of Agriculture, Trade and Consumer Protection (DATCP)

From Joel and Cheri Espe and Family

Re: Statement of Scope

Rule No. Wis. Admin Code Ch Atcp 10 (existing)

Relating to Animal disease and Movement

Rule type: Emergency

I have previously sent my written statement regarding this "Emergency" rule. I believe the Ag Board recognized that there is no emergency that would warrant such a rule. One of the presenters at that initial meeting was retired Secretary of the DNR George Meyer. Last year at a press conference with Senator Wachs and Representative Milroy, who were advocating for their Save the Whitetails Bill, Mr. Meyer was asked by a reporter if there were too many game farms in the state. He responded that it would be nice if there were no game farms in the state. That bill which failed overwhelmingly, was aimed at eliminating farm raised cervids. Our legislators were intelligent enough to not allow the bill to progress. The DNR publication, Outdoor News, erroneously published that the bill passed and was sitting on the Governor's desk waiting for his signature to be put into law. (Fake News at its best). Between 1999 and 2001, 3 whitetail deer were confirmed positive for CWD in Dane County. The DNR did not release any information until 2002, was DATCP notified of this initial disease outbreak?

The Emergency rule you have been asked to examine and vote on will not accomplish its proposed goal of controlling the spread of CWD and there is no scientific evidence to show otherwise. It will financially ruin farm families and accomplish the goal of George Meyer as acknowledged at the aforementioned press conference. It is time to realize this all stems from a biased continual attack on a part of the state's farming community. Eliminating game farms accomplishes only two things: removal of what the DNR sees as competition and creating a smoke and mirror deception to move the focus away from the DNR's failure to eradicate, control or manage CWD and unfairly blame the game farms who have been successful in working with the disease.

CWD testing on game farms uses the most accurate and approved testing (IHC) to confirm the accuracy of the diagnosis. The DNR chooses to use less accurate and unapproved testing method (Elisa) which only indicates exposure to the disease, not that it is diagnosed with CWD. This misinformation to the people of Wisconsin creates an illusion of an emergency that doesn't exist. DNR should be held responsible to use the IHC tests as the farmers already do.

Our DATCP already meets or exceeds the USDA CWD herd status Program. The current rules governing cervid farmers has been successful and should remain as the Status Quo. The WIDNR should be required to follow all of the Federal rules in interstate movement of livestock to prevent disease spreading. Cervid farming is a legitimate business that should not be hampered by rules denying them the ability to ship their livestock to slaughter or to buyers intrastate and interstate as usual. Much of the land they raise their livestock on is not suitable for crop production but does work as pasture land. In addition to providing income for tax paying farmers and their employees, other benefits include tourism, quality meat, income for veterinarians, feed, seed and fertilizer companies.

Our livelihood as farmers is threatened because some people see us as an interruption to their hobby as a hunter. Most of us are hunters also, if hunting has declined in Wisconsin, it is not because of cervid farmers or CWD. Young people today have many more distractions or activities than ever before to compete with hunting. Double fencing around TVs or video games may help the DNR replace the now older generation of retiring hunters.

Enhanced fencing has proven not to prevent CWD so why pursue it. There are much more important diseases on the landscape that get no attention and can transmit and be fatal to humans. West Nile Disease killed 19 people in neighboring Illinois a few years ago. It has been detected in Ruffed Grouse in Minnesota and the UP. Did the DNR take blood samples of the grouse they trapped and sent to KY as part of the \$600,000 Elk deal? Have they sent a deadly disease interstate? There is a long list of other diseases they don't seem to care about. All the Kentucky elk, past and present should have rectal biopsies using the IHC test, treated to kill the ticks carrying babesiosis and checked for meningeal worm, both of which have been found in KY elk in Wisconsin.

Only 250 farm raised deer have been clinically confirmed with CWD with over 42,000 tests performed on 18 farms in 16 counties since CWD was discovered in Wisconsin. Importantly, does that constitute a danger to the welfare of the people of Wisconsin or an Emergency? Why have the stakeholders who have the most to lose, (cervid farmers) not been involved at the table with these agencies before an emergency rule or scopes were initiated?

The 0.10 FTE that the DATCP staff used to develop the rule is minor compared to the time it took me to read, understand, research and reply. The typing took much longer as I am not proficient in that profession. I hope I haven't wasted my time.

According to the USDS MOU with our WIDATCP/DNR, it is mandated that all deer be tested for CWD using the IHC test or they would not be in statutory compliance. ELISA testing does not meet the MOU Standards

To double fence all game farms using 8 foot high tensile fencing on 12 foot poles would cost in excess of \$28 million dollars that does not include the cost of gates and miscellaneous hardware. To eliminate all captive cervids since they could not be sold or slaughtered would cost a conservative \$110 million. I am still trying to figure out how that would be a minimal economic impact on the farmers according to the DNR. They must make a lot more than I thought.

In my county, we are one of top 3 tourist attractions along with the two major breweries. We have had visitors from all 50 States and a large number from foreign countries. We have retirement homes, boys and girl scouts, University of Wisconsin Animal Science field trips, FFA, and researchers from the US and foreign countries. We have sold semen internationally and Aled the first elk herds in Alaska with our semen. All of that would vanish with this rule.

I think it is embarrassing to spend so much time on something so obviously ill-conceived and opposed to what DATCP hopes to accomplish with marketing agricultural products and shipping them either intrastate, interstate, or international. AGRICULTURE TRADE AND CONSUMER PROTECTION, I hope politics doesn't throw those three things under the bus. Call me if I can clarify any of this information for you.

Sincerely,

Joel K. Espe Hawks Hill Elk Ranch

Monticello WI

608 558 8445

Rick Ewert
Hemlock Hills Trophy Ranch, LLC
W4155 Center Ave
Medford, WI 54451

To: DATCP

RE: Emergency rule regarding farm raised deer and movement

I am an elk farmer in north central WI who is deeply concerned about the proposed new rules regarding my industry. I think the point about transportation of carcass' has some validity and is probably the largest single contributor to the spread of CWD. However, the other 2 points, if imposed, would put me out of business and would, in my estimation, lose approximately \$100,000. That figure does not include all the blood, sweat, and tears I've invested over the years but just anticipated loss of value and ability to sell my animals.

- We are already a VERY regulated industry and fully comply with all existing regulations. I test 100% and our industry has a much lower rate of incidence than that of the wild population.
- Our industry is a significant source for solving the problem and if put out of business the problem may not ever be resolved. On my own farm I was going to begin to introduce CWD resistant genetics into my program. However, with this potential devastation of my business I can not afford to make that investment.
- As an elk farmer I am very knowledgeable on the behavior of elk. They are very social, family (herd) animals. They are extremely protective of their family units and do not accept new introductions readily. And they would NEVER show interest in a wild, whitetail deer. They would sooner kill it than cozy up to one. So my contention is that a double or additional fence would have no bearing on (CWD transmission at) an elk facility.
- Even though this rule is disguised as an emergency the problem it has existed for a long time. If it truly is an emergency, why wasn't the banning of baiting and feeding statewide included (or implemented years ago) if nose-to-nose contact is a concern?
- People are not really 'scared' of the disease. If they were why do they continue to hunt in the endemic areas? The bottom line is the haters do not like high fence hunting. This is evident on social media where people literally say they want us out of business and shut down because of that. However, hunting is a VERY minor part of our industry. As an elk farmer, my main product is meat with velvet antler coming in a close second. Then hard horn dog chews would be next. Finally, I do sell a few bulls each year to hunt farms but that is not a major part of the business. The new rules would completely put me out of business because I could not even slaughter my animals. What are we supposed to do with all the young stock?
- Personally my farm spends a significant amount of money in the local community. My feed and hay that I purchase run over \$30,000 annually. I also hire local farmers to cut, bale, and wrap hay and cost me almost \$5000/year. I regularly have to purchase new feeders, fence, tools and most years spend several thousand on that. I use about \$1000 in diesel fuel purchased at our local coop. Finally, all my equipment (tractors, skid steers, farm truck, ATV, etc.) are maintained by local shops and run several thousand dollars per year. So even though I only have 55 animals (another 22 calves due any day), I do contribute to our economy just like any other farmer.

Thank you for considering my comments and hope you realize that I am a victim of this disease too and can help be a solution to the problem if you don't put me out of business.

Carlson, Michael M - DATCP

From: Fields Fam <sajgf5@gmail.com>
Sent: Monday, June 11, 2018 9:40 PM
To: DNR Administrative Rules Comments; Carlson, Michael M - DATCP
Subject: I do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing

I am writing to simply state that I do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing.
Please reconsider.
Thank you,

Angie Fields
Brodhead, WI

Carlson, Michael M - DATCP

From: Rich <antler333@gmail.com>
Sent: Thursday, June 14, 2018 8:43 AM
To: Carlson, Michael M - DATCP
Cc: Jeremiah Cummons; Travis Lowe; Laurie Seale
Subject: CWD emergency rule

Governor Walker:

As a supporter of your presidential bid and as a regular and consistent purchaser and wholesaler of USDA Cervid (deer) meats derived from Crescent Meats of Cadott in Northern Wisconsin, I work with Wisconsin deer farmers year round to source animals and products. Further, I am a post-graduate geochemist-geologist, who is a very knowledgeable as a private foundation alternative CWD researcher (see www.stopcwd.org).

I am quite displeased with the current hysteria being displayed over CWD in WI and the likely reasons for its continued spread. I smell a DNR budgetary play, and/or a political motivation to this new found "hysteria".

I have two major declarations in regards to CWD:

1) CWD in Wisconsin does not warrant an emergency rule. As described herein below, the problem has been festering for well over several decades and will continue to fester unless and until the major reasons for disease spread are recognized and acted upon, and

2) Deer farmers are the victims of CWD not the cause of it.

First, one must recognize that most logically, the major source of strong CWD contamination in Wisconsin emanates from the sloppy and unknowing research work conducted by the University of Wisconsin at Madison at their Charmony Agricultural station in the late 1970's thru mid 1980's. and, secondarily perhaps at the Madison USFW services research unit partly affiliated with the U of WI. A further, smaller "point source" type of contamination is the transport of infected hunter kill carcasses from heavily infected CO and WY in the 70's, 80', and 90's still through until today.

In the early 1980's, the U of WI Madison (& USFW) research community utilized CWD tissues and perhaps even live CWD positive or exposed animals from the CO State University and the CO DOW pens outside of FT Collins, CO the virtual epicenter of CWD for the World . Despite poor University disclaimers, CWD positive research animals likely escaped, or their carcasses were disposed of at county landfill operations not all that far from Blue Mound, the CWD hotspot for Wisconsin. A permanent CWD epicenter can be found near Blue Mound. Probably a pervasive disease reservoir which can never be fully eliminated.

The continued spread of CWD in WI has not been substantially affected by the location of game farms. Most CWD is found in the 4 heavily contaminated counties of SW WI. This area is the most polluted and longest polluted area of the state due to its proximity to research facilities and animals.

Please recognize, Governor, that most farms are CWD monitored via an official USDA program and have been for a decade or more. When a game farm has a deceased animal, it then tests for CWD, and if found positive, the disease stops there. Quarantine followed usually by depopulation. Game farms are but the canary in the coal mine and are almost always the first to be found. This is BECAUSE THEY TEST ALL DEATHS. Not so for wild animals.

The real problem comes from the movement of diseased wild animals through infected live animal migration, or the transport of diseased carcass materials via 1) human or 2) other forms of natural transport, such as depredation kills, predator migratory habits, feces transport and other lesser mechanisms. Human transport of infected tissue, first by research mistakes and now via hunter kills IS the major factor in disease dissemination.

If you wish to stop the insidious movement of CWD around WI, you must stop the movement of untested carcasses derived from hunter kills from contaminated areas, in state and out of state. Natural predator transport or natural animal migration can not easily be mitigated. The DNR wholesale killing debacle of prior years is the proof positive.

Severely restricting or shutting down deer farms in Wisconsin is not going to stop the spread of CWD. Such activities will however trigger Constitutional "taking" issues, wasting endless hours of attorney, governmental and laymen's time to sort out and adjudicate. This is money better spent in finding a live animal test or perhaps to assist those in the mitigation of CWD damage.

Currently, good science does not support the transmission of CWD through fences. While a 2nd fencing barrier can inhibit wild to domestic contact, the costs are prohibitive and the results are cosmetic. Transient contact does not provide sufficient contamination to transmit the disease. Carcass transport does.

Lastly, I suggest that if the WI DNR is wanting an emergency declaration, it is to cover the fatal flaw of DNR actions: a failure to restrict carcass transport.

R.A. Forrest, MSc Montana Tech

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Rich Forrest
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Carlson, Michael M - DATCP

From: Rich <antler333@gmail.com>
Sent: Thursday, June 14, 2018 11:34 AM
To: Carlson, Michael M - DATCP
Subject: CWD emergency rule
Attachments: CWD - Bartz J C et al (1998) CWD a gift from BW.pdf; Research-Vosdingh, R.A., Trainer, D.O. and Easterday, B.C. (1968) Experiments with White-tails and sheep, EHD Charmany farms.pdf

Michael:

As a follow up in regards to my comments against the emergency rule offered earlier this morning. Here are a couple of documents supporting the concept of CWD research and whitetail deer research at the U of WI. This is the ORIGINAL source of most of the CWD in WI.

I believe much of the old University and other governmental records have been surreptitiously scrubbed leaving only published items, of which there are many more.

thank you for your attention.

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Transmitted by email: June 14, 2018

Division of Animal Health
Wisconsin DATCP
Attn: Michael Carlson
PO Box 8911
Madison WI 53708-8911

Wisconsin DNR
Attn: Mr. Scott Karel
PO Box 7921
Madison, WI 53707-7921

Re: Ch. ATCP 10, relating to animal (farm-raised deer) diseases and movement

Re: WM-11-18(E) and WM-12-18, relating to deer carcass transportation, deer farm fencing, and chronic wasting disease (chs. NR10 & 16)

Dear Mr. Carlson and Mr. Karel,

I am very concerned about the observed increase in prevalence and geographic spread of chronic wasting disease (CWD) in Wisconsin. Consequently, I am writing in general support of the respective Statement of Scope documents for the administrative rule modifications referenced above, and recommend board approval to proceed to drafting.

While the proposed rule modifications may be expected to help slow the spread of CWD due to certain anthropogenic factors (human-assisted movement of diseased live deer and infected deer carcasses, direct lateral disease transmission through inadequate deer farm fences, farm escapes etc.), it is not clear how they will reduce overall disease prevalence and distribution, or slow disease spread from existing locations via natural dispersal of infected deer or other mechanisms.

It is understood that rules are not required or necessarily expected to address all aspects of a need or problem. But it may be clear from the preliminary public hearings on the scope documents that the perception exists that CWD will continue to increase and spread regardless of the proposed rule modifications. This may reduce cooperation with the final rules and inhibit their enforcement—if not discourage rule adoption entirely.

If any of the above happens (disease spread through increasing prevalence followed by natural dispersal, or because of insufficient cooperation with the proposed rules), it seems unlikely that the rules will accomplish their objectives. Consequently, I would strongly encourage the rules to include additional aggressive and focused measures to reduce CWD prevalence in the wild deer wherever disease is found throughout the state.

It is my opinion as a retired wildlife biologist that this is the only way that the terrible threat of chronic wasting disease to our extremely valuable deer herd can be minimized to nuisance levels—and hopefully eliminated some day when an effective, practicable and affordable vaccine is developed. I would be happy to present some thoughts on how CWD prevalence may be reduced in our wild deer herd upon request.

Carlson and Karel, p. 2

While I have longstanding concerns about the captive deer farm industry, I support Governor Walker's statement that the state may consider assisting deer farms with the expense of complying with the proposed rules. As long as the state and federal government continues to indemnify deer farms for the high costs associated with the discovery of CWD-positive deer within their fences, it only makes sense that the state seriously consider sharing the costs of enhanced fencing and other regulations designed to prevent new infections in the first place.

In order to protect the public interest, I would qualify any state assistance, including indemnification, on agreement to willingly cooperate in CWD herd status, prevention and mitigation measures as proscribed by law, backed by a performance bond, including the depopulation and clean-up of all deer farms found to harbor CWD-positive animals, including hunting ranches, subject to due process arbitration acceptable to the industry.

Finally, I congratulate both DATCP and DNR for recognizing that a healthy wild deer herd and quality wild deer hunting is critical to Wisconsin's culture, economy and identity, which along with the captive deer farm industry is threatened by the growth and spread of chronic wasting disease in the state. The Wisconsin Supreme Court has recognized that wildlife is included in the Public Trust Doctrine enshrined in our state constitution, placing a duty upon all entities of state government to protect our deer herd. Working together, citizens and government, public and private, I am confident we can protect our Wisconsin deer resource from this terrible disease.

Respectfully,

Michael Foy
4317 Travis Terrace
Madison, WI 53711
mikekfoy@gmail.com
<https://www.facebook.com/CWD.Payment4Positives/>

Wisconsin Wildlife Federation

Testimony Supporting Governor's Proposed CWD Rules

Good morning, my name is Ralph Fritsch from Townsend Wisconsin in Oconto County and I am here representing the Wisconsin Wildlife Federation and its 206 hunting, fishing and trapping organizations.

The Federation endorses the Findings of Emergency contained in the DATCP Scope Statement and their conclusion that "(t)he situation warrants emergency rule-making because findings of CWD infection are likely to increase prior to the completion of the multi-year process of permanent rulemaking".

Facts supporting this are that in the last three years CWD has been found on five deer farms in northern and central Wisconsin well over a hundred miles from the CWD endemic zone in southern Wisconsin, (Eau Claire, Oneida, Marathon, Oconto and Shawano counties). In addition, in the last week it has been reported that CWD has been found in two additional deer farms in southern Wisconsin. It is obvious that the current CWD deer farm regulations have failed to stop the spread of CWD in captive cervid farms in the state.

The Governor has directed DATCP to require all cervid farms to have enhanced fencing which includes the options of a second 8' foot high fence, a wall or electric fencing. DNR has reported 25 escapes from deer farms in 2015, 16 in 2016 and 18 in 2017. The Federation supports the enhanced fencing requirement with the choice of which method at the option of the farm owner. Several cervid farms in the state already have enhanced fencing. While the Federation understands that double fencing or a wall may be expensive alternatives for a cervid farmer, tens of thousands of Wisconsin dairy and cattle operations have successfully used electric fences to contain their domestic livestock for decades.

The Governor has also Opposed the movement of cervids between cervid farms to prevent the further spread of CWD in the state. While understanding the Governor's proposal, the Federation recognizes the financial hardship this would bring to cervid farmers. The Federation would support a prohibition of the movement of cervids from cervid farms in CWD impacted counties to non-impacted counties.

These proposed regulatory changes are critical to protect Wisconsin's invaluable white-tail deer herd. Hunting white-tail deer brings a billion dollars a year into Wisconsin's economy. Deer hunting is a critically important part of Wisconsin's heritage and is an important legacy for our children and grandchildren

Thank you for the opportunity to testify today.

Carlson, Michael M - DATCP

From: April Fuhr <aprilfuhr@gmail.com>
Sent: Monday, June 11, 2018 7:11 PM
To: Carlson, Michael M - DATCP
Subject: Deer Farms

Hello Mr. Carlson,

I am taking the time to email to let you know that I do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing and include your name, city and state.

These rules will put most of deer farms out of business at a time when we need to be encouraging and supporting economic growth and non traditional farms. It is time to encourage cooperation and growth that is good for all involved.

April Fuhr
Monticello, WI

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April Fuhr
(608)558-0367

Carlson, Michael M - DATCP

From: allen gierhart <ajgierhart@yahoo.com>
Sent: Wednesday, June 13, 2018 10:29 AM
To: Carlson, Michael M - DATCP
Subject: Please say that you do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing

Hello,

I'm Allen Gierhart from Stoughton, WI and want the The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing rule to NOT pass

If the above rules take effect the following will happen to many great farms, not just one are but across the state. Deer farmers are not going to be able sell their deer if the herd can't be moved. If the farmer has no income, they will not be able to feed his deer. What will happen to thousands of healthy deer? They will be euthanized.

The deer farmer is not the problem, the deer farmer is but the victim in this case! The State should be doing more testing, cleaning up the wild deer carcasses that sit for weeks along the road (birds of prey feed on them and then spread their droppings on the landscape, which spreads CWD) and they should be funding research!

There are 382 deer farms in the State, 285 of them are located in CWD affected Counties that 76%. That means thousands of healthy deer are going to be killed over these rulings.

Thank you for your time.

Allen

July 7, 2018

Regarding: DATCP Rule ATCP 10.58 Enhanced Fencing

In reviewing this proposed rule, I am opposed to enhanced fencing for FRD herds that do not move deer or have not had a positive CWD animal on their preserve.

Our deer are on a 520+ acre hunting preserve licensed by DATCP. We have 4.3 miles of 8ft high tensile wire, which exceeds DNR fencing rule NR 16 standards. We have been CWD testing our animals since the program started in 2003 never having a positive deer.

The enhanced fencing rule offers no protection from my deer getting CWD from the deer/elk and environment outside our fence. If a person is going to invest the capital and time into our farm you have to look at some kind of payback or justification. Other than staying in business for another year or two until another political rule moves through there can be no other reason to double fence. The economic return in doing the additional fencing does not justify expense. Even though the 3-wire electric fence is much less expensive than the 8ft tensile, there would still be a significant expense incurred.

High Tensile 8ft materials and labor would cost us over \$118,000.00 alone, not including the land preparation cost. It would take two winters to accomplish the project, so we are in violation before we even begin without even putting the cost of the enhanced fenced.

Electric fencing would require 14 miles of wire, insulators, and additional posts. Power would have to be brought in, and significant labor cost incurred.

Materials: 14 miles - 14ga wire - \$128.00/mile = \$1,792.00
Additional Posts \$1,230.00
Insulators 3 per post @ \$3.50 (4600) (15ft post spacing) = \$16,100.00
Electrical = Trenching and electrical service hook up and electric fencers \$9,800.00
Labor @ \$22.75 per hr. Est. 160hrs per employee = \$7,300.00
Total Est. Cost \$33,522.00

The 90-day period to complete could not be met. Fall is our crop harvest time, pheasant hunting preserve and deer hunting. We do not have the staff available to accomplish what would be asked of us. Plus, the electric fence according to DNR and USDA damage people will have minimal effect on whitetails and no effect in the winter. I have personal experience with this through the damage abatement program in dealing with the Jackson County Elk herd and our farms. So why would a person want to invest capital into a fence that has proven not to be effective? The only reason to force a rule like this one on non- movement hunting preserves with acreage would be to prevent nose to nose contact correct? I do not see any sign of deer in, or outside our fence having this type of contact, very easily observed during winter with snow, and doesn't occur.

I will not be doing the enhanced fencing for reasons stated above. Please have an exit plan for the farms that don't comply. This is the questions I have for these new rules on healthy deer herds.

- 1) How long after the 90 days before we are declared non-compliant?

- 2) Once non-compliant how long before action is taken to de-populate my healthy deer, we cannot be asked to kill healthy does with fawns in spring or summer, the love for my deer won't allow to do that fines or not?
- 3) What is the process for the deer to be depopulated since this administrative rule is causing the killing of my herd not a disease?
- 4) Is there a fining process after you are declared non-compliant?
- 5) Who determines my farm is depopulated under this new rule?
- 6) Since my deer have tested clean, what can I do with my farm and fencing after the depopulation and I am out of the deer hunting preserve business?

This is a major loss to our farm's income. We live a farm that has been in my family since the 1890's. Our family has learned to diversify and think outside of the box to stay on our farm. We do 200+ acres of row crops, Pheasant Hunting, Deer hunting and Sporting Clays. It's this diversity that will help us weather this political rule, just like it has with weather, low commodity prices and markets. But please consider the families, our rural farms and how this rule impacts them vs. if this rule helps stop the spread of CDW in our state considering the areas it has popped up in wild herds with no FRD herds around.

Thank you for your consideration,

Scott Goetzka
Woods and Meadows Hunting Preserve
N4335 Potter Rd
Warrens WI 54666
608-343-4603
woodsmeadow@centurytel.net

Carlson, Michael M - DATCP

From: Joey . <joe@cpbait.com>
Sent: Monday, June 11, 2018 8:24 AM
To: Carlson, Michael M - DATCP
Cc: Ryan Rodenkirch
Subject: Deer farm Meetings

To whom it may concern,

As i am out of the country i will not be able to attend the July 24th meeting, therefore i have been notified of the situation on deer farming in the state of Wisconsin. As a "high fence" hunter and investor from Canada trying to help out a friend from WI and wanting a return on my capital it will be impossible to grow this business with no movement of animals!

Please take in consideration that alot of these farmers can't operate within the state of Wisconsin and rely on this to provide for their families.

Thank you



Joey Goguen
President
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Fax: +1 506-577-6662
Email: joe@cpbait.com

Rec'd from: Nicholas Haley 5-24-18
DATCP BOARD MEETING

Nicholas Haley, DVM PhD
Department of Basic Sciences
Midwestern University
Glendale, AZ

Dear Governor Walker and members of the Wisconsin legislature,

I am a veterinary researcher who has been working on solutions for chronic wasting disease (CWD) for the past 15 years. After completing my Doctor of Veterinary Medicine at Cornell University in New York State, I moved to Colorado and started working on a PhD, focusing on CWD at Colorado State University. Since then, my research has focused on how the disease is transmitted, the development of more sensitive live animal and postmortem tests for the disease, and most recently the identification of animals which may be resistant to CWD infection. You can find a bibliography of my past research publications here:

<https://www.ncbi.nlm.nih.gov/myncbi/browse/collection/49902408>.

I am currently an assistant professor at Midwestern University in Phoenix, Arizona, where I continue working on solutions for CWD and teaching the next generation of veterinarians.

I understand the state's position on farmed deer and their role, however big or small, in spreading CWD. From a disease transmission standpoint, I understand the perceived need to limit movement of both wild and farmed deer from areas with CWD to areas without CWD. I am not certain that preventing the movement of animals from areas with CWD to other areas with CWD will be very beneficial, however. For the deer farmers of Wisconsin, this would represent an end to their industry. From a farm biosecurity standpoint, I understand the desire to place double fencing around deer farms to decrease the risk of CWD transmission between wild deer and farmed deer. While double fencing may prove helpful in some instances, it is neither practical nor beneficial to farmed or wild deer in all cases. Ultimately, these are all ideas that you should be exploring to help prevent the spread of the disease and support the health of both wild and farmed deer and elk.

While I may understand these directives, I am writing to bring your attention to the efforts of Wisconsin deer farmers to help develop solutions for the CWD problem in your state, and how it's important that some of these directives be relaxed in cases for the sake of commerce and, more importantly, research. I recently spoke at the Whitetails of Wisconsin spring banquet on my work to identify CWD resistant deer and how that may soon help both the farmed deer industry and eventually the wild deer populations in North America. While I was there, I met with Greg Flees,

owner and operator of Wilderness Whitetails in Rosholt, Wisconsin. I first met Greg briefly a few years ago at a national deer farming conference, not long after he first found CWD in two deer in his herd. Greg contacted me in October of last year because he had learned of my research goals and wanted to find out what he could do to help come up with a solution. Mr. Flees' business is affected not only by CWD itself, but also the political pressures the disease was placing on him, his family, and his business, and he would very much like to be involved.

It was fortuitous that he contacted me when he did, as I was actively looking for a farmed deer herd we could work with to explore the possibilities of CWD resistance in whitetail deer, and his herd was exactly what we were looking for – a farm with active CWD on two of four properties and a significant number of animals on both affected and unaffected properties to work with to develop resistant lines of animals.

We began last October by identifying animals among his herd who we believe have the potential to be very resistant to CWD based on several genetic markers. Greg developed breeding strategies to have fawns on the ground this spring who promise to be extremely resistant. After thoroughly examining the health of these animals, we will eventually release them on the CWD affected properties and assess their disease resistance directly.

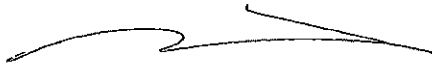
Greg has been invaluable in these efforts – he not only worked on the breeding program independently, but he regularly calls me with new ideas for the project. Greg is a constant source of new ways of approaching problems we hadn't thought about before. I am putting together a grant proposal this spring to submit to the United States Department of Agriculture to continue the work we're doing together. This grant will focus not only on disease resistance, but improving testing methods, identifying ways we can better screen for CWD in the environment, and developing a better understanding of disease transmission in the wild.

Importantly, this project cannot proceed without the ability to move animals from his unaffected herds to properties where CWD is present. At some point in the future, CWD may spill over from the wild deer to his unaffected properties – we will still need to have the ability to move animals from CWD-positive properties to other CWD-positive properties. It is my belief that if we can address the genetics on his properties, the impact of CWD on these animals will be reduced significantly. It is my hope that our work with Mr. Flees will serve as a model for managing CWD in farmed deer and elk, and eventually benefit wildlife managers faced with CWD in wild deer and elk. There has been some talk about the development of a vaccine for this disease. While I'm optimistic that a vaccine may someday be developed for prion diseases, I think that idea is

incredibly impractical for wild deer and elk and almost impossible to implement effectively. Disease resistance will be the only practical way out for the deer and elk farmers in North America, and perhaps we can convince wildlife managers that it is the most practical way for the disease to be managed in wild populations as well – someday relying on deer farmers to help by releasing resistant deer bred on their farms.

Time will tell, but we cannot do this without the help of Wisconsin deer farmers like Greg Flees.

Thank you very much for your time and consideration, and please contact me with any questions you might have.



Nicholas Haley, DVM PhD
Midwestern University
Glendale, AZ
nhaley@midwestern.edu

June 14, 2018

My name is Wayne and Shirley Hamann, we represent Balsam Hollow Ranch, Medford, WI. 54451 715-748-5706 wwhamann@hotmail.com.

You want us to double fence for what? Dane County just had a positive whitetail. No deer in or out since 2009. He is double fence. DNR has been against capture deer farmers since I started in 1969. DNR has no proven reason to put that cost on deer farmers that it will save our wild deer herd. We are a victim not a solution

Is 400 captive farmers, 100 % CWD monitored a risk to our wild herd with 10,000 tested, 600 positive, this is 6 % positive , 320,000 killed in 2017.

My figures tell me that is 19,200 deer of 320,000 were positive. I think you have bigger problems than captive farmer raising deer. You come up with ideas from where? \$32 million spent to depopulate deer herd in S.W. Wisconsin. Take OUR money to research, so we all can defeat CWD.

I also think fencing should go to DATCP not DNR as DATCP already has authority over double fencing. I believe with the research captive farmers have presently they will have this figured out in near future.

We have had CWD found in Wisconsin since 2002. What is the big rush to eliminate the captive farmers now. Could it have anything to do with politics. If it is our heritage of deer hunting will be over.

Mother nature will take its course if you don't figure out how to treat CWD, not put more cost on the deer farmers. This won't cure nothing. You will wipe us out for the cost of double fence. If this does happen, pay us 100% value of our deer and loss of our business appraised value.

As a deer farmer we will be glad to work with DATCP and DNR to help resolve this , not throw rules that no one knows will do anything. Think about it, My deer in captivity are mine, and the deer in the wild are a portion of mine.

Lets get together and try an defeat this problem.

A deer farmer, out doors man,
hunter and wild life lover.

Thank You,
Wayne and Shirley Hamann

Rec'd from: Roxanne Lotts 5-24-18



Dr. Helene Keily, Dr. Brooke Wehr
Carlsen, Dr. Lisa Hansen

1686 13½ Avenue, Barron, WI 54812
Phone: (715) 537-3197 Fax: (715) 637-3801
www.barronvet.com

May 21, 2018

Dear Governor Walker:

This letter is in response to the proposed rulings dealing with CWD.

I am a large animal veterinarian in northwestern Wisconsin. I provide direct services to twelve cervid farms and provide consultation services to an additional six farms throughout Wisconsin. These farms comprise a total of approximately 3000 animals. All of the farms I work with are on a routine herd health program consisting of annual herd visits, vaccination programs, CWD, TB and Brucellosis testing.

The proposed CWD rule changes would be devastating to the farms I work with. Increasing regulation on these farms will only cause financial hardship, it will not help protect the health of the deer. In 2017 my clinic tested 203 deer for CWD, all of which were negative. I understand that not all farmed herds are completely devoid of CWD, but I highly doubt there are any that reach the prevalence found in the wild population. In a recent article in The Country Today, the WI DNR stated that 30% of the male deer population in Iowa county is infected with CWD. I would like to know of any farmed herd that comes close to this prevalence. If Wisconsin is concerned with the health of the captive deer population and wish to protect the farmed deer, the state should be responsible for paying for the required fencing.

If the proposed CWD ruling is enforced, it is possible that half of the farms I work with will no longer be in business. Working in an area that is already in a large animal vet shortage area, losing additional farm revenue makes difficult to hire new veterinarians and be able to pay them a livable wage. The harder that we make it for any farmer to be in business, the more spread out our farms become and the more difficult it becomes to provide timely veterinary service. If we continue down the path of over-regulation, veterinary services will become even more scarce and animal health will suffer.

I hope you strongly consider the implications that the proposed CWD ruling has on the healthy farmed deer herd and look for ways to more effectively manage the infected wild deer population.

Sincerely,

Lisa Hansen, DVM

Carlson, Michael M - DATCP

From: ray hanson <rmhanson_65@hotmail.com>
Sent: Wednesday, June 13, 2018 6:05 PM
To: Carlson, Michael M - DATCP
Subject: deer farm rules

Michael Carlson: Comments regarding new proposed emergency rules.

I am sure that the AG dept. can not be behind this new rule making process, but my comment is why are you not using the rules already in place , such as ATCP 10.89 if the department is so concerned with movement of diseased animals? Why creat a whole new rule?

The double fencing issue does not make scenes seeing as the last 4 or 5 farms that have tested positive for cwd have all been double fenced, and most have been closed herds.

Using the DNR's own web sites I can not see where the emergency is. The ag department has always been on the side of the deer farming industry. Following the rules that are in place. How can the department now change course 180 degrees and put all deer farmed out of business.

Sometimes it is just. RIGHT to take a stand and tell your boss that he is wrong. It may cost someone their job. But it is also going to put hundreds of people out of making a living , along with generations of family members to follow. Thank You for your attention. Ray Hanson. Chetek. WI

Carlson, Michael M - DATCP

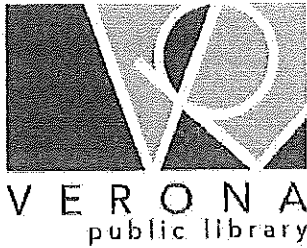
From: rosie@chorus.net
Sent: Monday, June 11, 2018 9:35 PM
To: Carlson, Michael M - DATCP
Subject: CWD

To whom it may concern,

My name is Skip Hanson and I am a concerned citizen living in Waunakee. The recent proposals of Governor Walker that will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin is something I can't agree with. Potential cures for CWD may be lost if these proposals are passed.

Thanks,

Skip Hanson
6156 Winding Heights road
Waunakee WI



May 31, 2018

The Honorable Scott Walker
Governor of Wisconsin
115 East State Capitol
P.O. Box 7863
Madison, WI 53707

Dear Governor Walker:

The Verona Public Library has been working with Reindeer Games from Hartford, Wisconsin, for the past four years. We've recently learned that you are considering a requirement that their reindeer stay on their property. Over 1200 people attend our annual reindeer event at the Verona Public Library. We offer live music, crafts and hot apple cider inside with the reindeer outside. The Phillips family and their staff are kind and generous, care greatly for their animals, and educate the public on their unique features. It is our most popular program of the year, and a festive, happy time for everyone who attends. Please reconsider including reindeer in this proposal, and allow them to continue attending community events.

Sincerely,

A handwritten signature in cursive script that reads 'Julie L. Harrison'.

Julie L. Harrison
Head of Youth Services

June 14, 2018

To: Division of Animal Health
c/o Michael Carlson
Department of Agriculture, Trade and Consumer Protection
P.O. Box 8911
Madison, WI 53708-8911

Re: Emergency Scope Statement – Farm raised deer

Thank you for the opportunity to comment on the scope statement for proposed rules on farm-raised deer and movement of farm-raised deer. Sauk County is being negatively impacted by the continued increase in disease prevalence and spread within our county. We support State actions that will slow or prevent the spread of CWD to other parts of the state.

The proposed regulatory actions are well founded by CWD disease research and actual experience in our state. The movement of farm-raised deer to hunting ranches from areas with known CWD infection creates an unnecessary risk of disease spread. The recent case of movement of deer from a Iowa County breeding facility to a Waupaca County hunting ranch is a clear demonstration of the potential negative impact, both to the involved facilities, but also the surrounding wild deer herds. We have a great deal at stake. The Wisconsin deer hunting season has an annual \$1.3 billion impact on our economy. We risk losing this important economic impact as well as our cherished deer hunting heritage.

As you begin promulgation of the proposed rules, we ask that you consider addressing the following issues that are directly related to your proposal:

Depopulation of CWD+ facilities – ATCP policy has allowed hunting ranches to continue operations under the rationale that only dead deer would leave the property. However, as your scope statement indicates, current policies are not preventing the spread of the disease within captive herds. Furthermore, a CWD+ positive facility that continues to operate allows for continued bio-accumulation of prions on the premises and a continued increase in prevalence in the herd remaining on the affected facility. Finally, the facility even if adequately fenced remains a source for disease fomites to infect the wild deer herd surrounding the captive herd. The Marathon County hunting ranch that

has had 47 CWD+ animals detected within its herd is a very serious situation that needs to be addressed immediately.

Publication of CWD detection and sampling data – CWD is of great concern to the captive cervid industry and persons interested in the health of Wisconsin's wild deer populations. Your counterpart agency, Wisconsin DNR, does a very complete job of publishing up-to-date and historical testing data for CWD at both the county and statewide level. This information allows for more informed discussions and better policy decisions. We encourage you to develop a web-based reporting of CWD testing within the captive cervid farms in Wisconsin. This disease is having great impacts on both the farmed and wild deer herds. We need to have equal transparency of the testing data.

Deer farm fencing – Nose-to-nose contact between captive deer and wild deer through deer farm fences has been well documented. This is an effective disease transfer route that can be addressed by creation of a more effective barrier. We understand that erection of a 2nd 8-foot high woven wire fence is a major cost for any deer farmer to undertake. However, we do believe that such a fence should be required if the deer farm chooses not to install alternative, lower cost fencing. Electric fencing has been documented to provide an effective barrier to deer. We encourage the department to engage USDA-Wildlife Services on electric fence configurations that could be incorporated into Wisconsin's deer fencing standards to reduce the risk of wild and captive deer contact.

We also urge the department to strengthen the standards for deer fence gates to reduce the occurrence of captive deer escapes when gates are inadvertently left open. We believe that any upgrade of deer fencing standards should address this aspect as it has been historically the greatest method of deer escapes from captive deer facilities. Perhaps, incorporating cattle crossing barriers would also be effective in preventing deer from exiting through open gates.

Finally, we suggest the department consider the establishment of performance bonds as part of the deer farm licensing requirements. Use of performance bonds is an effective mechanism to deal with situations where a facility is not meeting important environmental standards. Such bonds would provide a financial source for the costs associated with escapes from deer farms. Currently, the DNR is using hunter license fees to remove escaped animals from the landscape. This should be an industry borne expense

The Sauk County Sportman's Alliance appreciates the opportunity to submit our thoughts on this important matter. We look forward to your future action.

Tom Hauge, President
Sauk County Sportsman's Alliance
1225 Sunset Circle
Prairie du Sac, WI 53578
608-477-0537

Alex Girard

Unfortunately, I cannot make it to the hearing

I would like to express my concern over the 3-step plan of Governor Walker's CWD plan. The Emergency Rules.

We have been raising deer for over 20 years and we are constantly having to defend our right to raise livestock -in this case Whitetail Deer. Unlike most livestock farmers, the regulations are literally putting us out of business.

- We are in the business of producing deer. To sell our deer they must be moved to another location. A rule that restricts movement would turn our working deer farm into a bunch of expensive pets that we cannot afford to keep.
- We already must pay \$85.00 to test each dead deer for CWD. It costs \$24.00 to get a deer license and shoot a wild deer. This means we can't afford to eat our own animals that get tested 100%.
- We are already double fenced, so this is not an issue for us, but it is very expensive, and some people will go out of business because of the cost of building supplies needed to build these extra fences.

Please take into consideration:

Our deer can be traced and should be allowed to move throughout the state, like all other livestock.

The county barrier will include all county's, if they continue looking for and test in new areas.

The percent of CWD positive, out of the number tested in deer farms is extremely small.

CWD has not been proven to cause any harm to the human population.

Deer farming allows us to work our land for hay and raise animals that help support our family. This business allows us to keep our family farm.

Most rule are put in place to protect someone or something. These proposed rules will hurt deer farmers and we have caused no harm to the public or the public's hunting. There is no proof that limiting or stopping the movement of farm raised deer will stop or slow CWD in the wild. The wild deer can travel through any county they wish too. Thank you for allowing us to make comments.

Becky Heath

Owner of 245 deer and 7 fawns so far.

Orion Whitetails

W13055 Akron Ave.

Plainfield, WI 54966

715-335-6080

Everyone in this room shares a common goal. (To preserve whitetails.) Whether you are passionate about hunting them, raising them, or both. Instead of spending the time and resources to make more rules and regulations for deer farms, we should all be working together to prevent/stop cwd. Deer farmers are crucial in the hunt to find out more about CWD, because who knows more about whitetails than the people who dedicate their lives to caring for them?

One thing that people seem to forget is that the CWD positives deer are found only after the deer dies from something else.

Another of my concerns is The Emergency rules do not consider the number of years in the monitoring programs. Only the location of the farm on a map. This means our farm who has followed every rule set forth by DATCap has no value. The movement restrictions effects 53 counties which would leave us with over 300 deer with no place to move/sell them and no money to feed them. Please help us hold onto our livestock selling business.

Thank you

Becky Heath
W13055 Akron Ave.
Plainfield, WI 54966
1-715-347-2870

Carlson, Michael M - DATCP

From: Brad Heath <geppert@uniontel.net>
Sent: Friday, May 18, 2018 10:24 AM
To: Girard, Alexander C - DATCP
Subject: comments on emergency cwd rule

I have been raising whitetail deer since 1996. For the last 15 years that has been our families main source of income. These proposed rules, if adopted would put us out of business. We have been in the cwd program for 17 years and double fenced for 13 years. We are TB and brucellosis free. We have done everything that we could to protect our deer from the wild infected deer. If we can no longer move deer we will go under. My farm expenses are 10,000 dollars per month and most of that is feed.

I believe the deer farmers CWD monitoring program is working like it should. Stopping movement from breeding facility to hunting ranch will do nothing to control the spread of CWD.

Sincerely,

Brad Heath
Orion Whitetails
W13055 Akron Ave.
Plainfield, WI 54966

Carlson, Michael M - DATCP

From: Art Helin <arthelin@mhtc.net>
Sent: Monday, June 11, 2018 12:21 PM
To: Carlson, Michael M - DATCP
Subject: cwd

To Whom It May Concern,

My name is Art Helin and I am owner of Art Helin Outdoors, a Wisconsin, resident, landowner, wildlife photographer, hunter and voter. The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The three-step plan will prevent the genetic resistant research to continue what has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely, Arthur J. Helin

Carlson, Michael M - DATCP

From: Kevin Hinkebein <hinkebeinelk@gmail.com>
Sent: Wednesday, June 13, 2018 9:46 PM
To: Carlson, Michael M - DATCP
Subject: DATCP proposed rule (double fencing and no movement of live animals to from affected counties to unaffected counties):

I have been raising elk in Missouri for 28 years and started a voluntary CWD monitoring program on my elk in 2002 when CWD first became an issue. Since cervid producers are testing 100 percent of farm deaths and animals processed for meat, an occasional animal is found with CWD. CWD has probably been around for 100's of years and wildlife agencies have never tested for it until the past several years. CWD may be spread by many factors such as wild deer movement, eagles, possibly by hay, and the most serious avenue for entry into states is by hunter harvested deer being brought back to the hunters area and improperly disposed of in ditches and woodlots after they process the meat from the animal. Many family farms raise deer and elk the same as cattle and sheep farmers. These farm raised cervids are very well cared for and properly tested before any movement takes place. The cervid industry is working diligently to find a live animal test and also breeding for CWD resistant animals. Please have your Governor reconsider his decision to mandate double fencing and restricting animal movement of deer and elk in Wisconsin. These two rules would have detrimental effect to many family farmers and will have little to no effect on CWD.

Your consideration in this matter is greatly appreciated,
Kevin Hinkebein

Carlson, Michael M - DATCP

From: McKenzie Homan <spudmckenzie@hotmail.com>
Sent: Wednesday, June 13, 2018 9:05 AM
To: DNR Administrative Rules Comments; Carlson, Michael M - DATCP
Subject: Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing

Hello,

I'm writing to inform you that I do NOT support the Governor's proposed emergency rules to combat CWD. Banning live animal movement for farm-raised deer and requiring deer farms to double fence will only put small businesses out of business, not reduce CWD. The government should be investing money into research, and if these farms can longer continue to be in business it will also stop research that is currently being conducted by farms on genetic resistance to CWD. Deer farmers are a victim of CWD, not the cause and we need to all work together to reduce the spread.

Thank you for your consideration,

McKenzie Homan
Brodhead, WI

Carlson, Michael M - DATCP

From: Alan Horvath <alanh0311@gmail.com>
Sent: Thursday, June 7, 2018 10:37 AM
To: DNR Administrative Rules Comments; Girard, Alexander C - DATCP
Subject: DNR and DATCP Rules Changes Regarding CWD
Attachments: 2018 CWD TWO Resolution ResultsM.xlsx; AlHorvathResolution2018Signed.docx; DaveClausenResolution2018Signed.docx

To DNR and DATCP Personnel:

I am sending information in support of the state DNR and DATCP increasing regulations, procedures, and any restrictions that will help stop the spread of CWD in Wisconsin.

I am also sending the results of two resolutions which went through the Wisconsin Conservation Congress Spring Hearings.

Full documentation is attached along with the resolutions. I will recap them here to simplify matters.

Citizens of the State are concerned, alarmed, and potentially threatened by the spread of this disease. Our wild deer population, environment, and hunting traditions are also in jeopardy due to CWD.

A. Both resolutions have been endorsed by the following organizations:

1. Wisconsin Conservation Congress
2. Wisconsin Wildlife Federation
3. Wisconsin Bow Hunters Association
4. Wisconsin Traditional Archers Association

B. Dave Clausens "CWD Action Recommendations" resolution ran in 42 Counties. 2,850 Yes votes (92%) against 245 No votes (7.9%). Was one vote shy of a unanimous approval by all Delegates at the May WCC 2018 Convention on a floor vote for endorsement.

1. It called for Double fencing on all cervid farms in endemic counties
2. Prohibition of movements of all captive cervids from CWD endemic counties and from all positive facilities
3. Depopulation with indemnification, of any CWD infected facilities immediately upon diagnosis of CWD

C. Al Horvath "Improve Safeguards to Prevent the Spread of CWD" resolution ran in 40 Counties. 2,554 Yes votes (90%) against 281 No Votes (9.9%) Was unanimously approved by all Delegates at the May WCC 2018 Convention on a floor vote for endorsement. This resolution was a call to action for the DNR and DATCP.

1. It calls for strengthening the fencing requirements, transportation safeguards, and depopulation of positive facilities.
2. It seeks mandatory participation in the CWD herd status program where possible. 46% participation is too low a rate.
3. It asks that the State develop stronger safeguards to prevent the spread of CWD and allow the DNR and DATCP to work together by combining strategies to achieve that end.

I ask that you consider the following when making or considering your recommendations:

The strength of the citizen support for these resolutions.

The endorsement by the above groups.

The undeniable concerns of the citizenry of the State.

It is past time to make strengthening the rules governing captive cervid operations and putting additional controls in place to prevent the spread of cwd a top priority.

Sincerely,
Al Horvath
Private Citizen
6 Belknap Shores
Superior, WI. 54880
715-394-5694

	DC: CWD ACTION RECOMMENDATIONS	CWD	Ran in 42 Counties	COUNTIES THAT RAN SEPARATE CWD RESOLUTIONS	AH: IMPROVE SAFEGUARDS TO PREVENT the Spread of CWD	Imp.	Ran in 40 Counties
	Red = 's CWD Positive Blue = 's CWD Affected Black = 's CWD Free	Yes Votes	No Votes		Red = 's CWD Positive Blue = 's CWD Affected Black = 's CWD Free	Yes Votes	No
1	Adams				Adams		
2	Ashland	41	1		Ashland	42	0
3	Barron	29	7		Barron	33	10
4	Bayfield	42	0		Bayfield	40	0
5	Brown	103	5		Brown		
6	Buffalo	43	7		Buffalo	41	8
7	Burnette	25	0		Burnette	24	0
8	Calumet	67	4		Calumet	63	8
9	Chippewa	98	10		Chippewa	93	13
10	Clark	39	2	YES	Clark	37	2
11	Columbia	56	3		Columbia		
12	Crawford				Crawford		
13	Dane	268	31		Dane	256	36
14	Dodge	109	3		Dodge	107	3
15	Door			YES	Door		
16	Douglas	46	0		Douglas	46	0
17	Dunn	55	3		Dunn	51	7
18	Eau Claire	58	1		Eau Claire	51	6
19	Florence	29	2		Florence	25	10
20	Fon du Lac	85	15		Fon du Lac	85	16
21	Forest	17	0		Forest	17	0
22	Grant				Grant		
23	Green				Green		
24	Green Lake	70	4		Green Lake	67	5
25	Iowa			YES	Iowa		
26	Iron				Iron	24	0
27	Jackson			YES	Jackson		
28	Jefferson				Jefferson	70	25
29	Juneau	40	3		Juneau	40	2
30	Kenosha				Kenosha		
31	Kewaunee				Kewaunee		
32	La Crosse	60	4	YES	La Crosse		
33	Lafayette			YES	Lafayette		
34	Langlade				Langlade		
35	Lincoln	47	1		Lincoln		
36	Manitowoc	81	12		Manitowoc	79	13
37	Marathon				Marathon		
38	Marinette				Marinette		
39	Marquette	35	7		Marquette	39	3
40	Menominee	10	0		Menominee	10	0
41	Milwaukee	118	7		Milwaukee		
42	Monroe			YES	Monroe		
43	Oconto	37	0		Oconto	37	0

44	Oneida	89	14		Oneida	91 10
45	Outagamie	103	9		Outagamie	117 5
46	Ozaukee	58	3		Ozaukee	59 2
47	Pepin				Pepin	
48	Pierce			YES	Pierce	36 1
49	Polk	53	20		Polk	
50	Portage	86	9		Portage	82 11
51	Price				Price	
52	Racine				Racine	
53	Richland				Richland	
54	Rock	74	10		Rock	76 11
55	Rusk			YES	Rusk	
56	Saint Croix	59	3		St. Croix	59 3
57	Sauk	106	7		Sauk	104 9
58	Sawyer	58	6	YES	Sawyer	59 5
59	Shawano	91	5	YES	Shawano	84 5
60	Sheboygan				Sheboygan	
61	Taylor				Taylor	
62	Trempealeau				Trempealeau	
63	Vernon				Vernon	
64	Vilas			YES	Vilas	56 12
65	Walworth				Walworth	
66	Washburn	46	3		Washburn	47 2
67	Washington	69	8		Washington	72 7
68	Waukesha				Waukesha	
69	Waupaca	67	3		Waupaca	67 10
70	Waushara				Waushara	
71	Winnebago	82	7		Winnebago	73 10
72	Wood	101	7		Wood	95 11
	Ran in 42 Counties	Yes votes	No votes	Total	Ran in 40 Counties	Yes votes No votes
	Totals:	2850	245	3095		2554 281
		92%	7.9%			90.0% 9.9%
	Combined Totals	5404	526	5930		
	Of Both Resolutions	91.1%	8.9%			
	CWD Positive Count.					
	CWD Affected Count.					
	Non CWD Counties					
	WI. CWD STATUS AS OF May 14, 2018 REFLECTED ABOVE					
	12 other Resolutions	521	161	682		
	ran besides ours	76.4%	23.6%			

Improve Safeguards to Prevent the Spread of CWD

The presence of Chronic Wasting Disease continues to increase throughout Wisconsin. Currently 31 counties have CWD positive deer within them. Of the last nine **New County** positives, five have been found on game farms which are controlled by Department of Agriculture Trade and Consumer Protection. These are substantial increases from two years ago.

All research indicates that it is vital to control the spread of this disease. It is obvious that our current preventative measures need to be strengthened. Fencing requirements, transportation to and from, and depopulation of CWD positive facilities are some of the areas that should be addressed. Mandatory participation in the CWD herd status program should be required. Currently, of 376 captive cervid operations, only 46% participate in that program.

This resolution is intended to garner support for Legislation to establish more effective controls to prevent the spread of CWD. The health of our wild deer herd, citizens, and deer hunting tradition are at risk

Therefore, be it resolved that the Conservation Congress at its annual meeting held in Douglas County on April 9th, 2018 recommends that the Conservation Congress work with the state legislature to **develop stronger safeguards to prevent the spread of CWD and allow the DNR and DATCP to work together by combining strategies to achieve that end.**

Al Horvath

6 Belknap Shores
Superior, WI 54880
715-394-5694
Douglas County

Carlson, Michael M - DATCP

From: Suzanne Perry <suzymack@citizens-tel.net>
Sent: Wednesday, June 13, 2018 11:59 AM
To: Carlson, Michael M - DATCP; DNR Administrative Rules Comments
Subject: Emergency Rule for CWD

>

> I am opposed to the Emergency Rule for Farm Raised Deer Mivement and enhanced fencing.

Walter and Rosemary Huse
W13444 Mud Lake Road
> New Auburn, WI. 54757

GREAT LAKES INDIAN FISH & WILDLIFE COMMISSION

P. O. Box 9 • Odanah, WI 54861 • 715/682-6619 • FAX 715/682-9294



• MEMBER TRIBES •

MICHIGAN

Bay Mills Community
Keweenaw Bay Community
Lac Vieux Desert Band

WISCONSIN

Bad River Band
Lac Courte Oreilles Band
Lac du Flambeau Band
Red Cliff Band
St. Croix Chippewa
Sokaogon Chippewa

MINNESOTA

Fond du Lac Band
Mille Lacs Band

June 4, 2018

Governor Scott Walker
115 East Capitol
Madison, WI 53702

Terry Hilgenberg, Chair
Wisconsin Natural Resources Board
PO Box 555
Shawano, WI 54166

Dan Meyer, Secretary
Wisconsin Department of Natural Resources
P. O. Box 7921
Madison, WI

Sheila Harsdorf, Secretary
Department of Agriculture, Trade, and
Consumer Protection
2811 Agriculture Dr.
P.O. Box 8911
Madison, WI 53708-8911

Greetings,

I am writing you on behalf of the Voigt Intertribal Task Force (VITF) of the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) regarding the ongoing threat to wild waawaashkeshi (deer) and omashkooz (elk) populations posed by chronic wasting disease (CWD) in Wisconsin. GLIFWC's mission is to assist our member tribes in the implementation of their treaty-reserved rights throughout the Ceded Territories in a biologically sound and culturally appropriate manner. The tribes retained their rights to hunt, fish, and gather to ensure future generations would be able to sustain their traditional lifeways. Because the tribes consider CWD a risk to human health (the Centers for Disease Control advise that no one consume CWD infected deer), CWD poses a direct threat to the tribes' ability to exercise their treaty rights with respect to deer and elk, and consequently, their ability to sustain their traditional lifeways.

The continued spread of CWD in the State of Wisconsin demonstrates the ineffectiveness of the Wisconsin Department of Natural Resources (WDNR) and the Wisconsin Department of Agriculture, Trade, and Consumer Protection's (DATCP) rules and regulations, as well as the lack of effective coordination and cooperation between the WDNR and DATCP.

The news of two additional wild CWD-positive deer within the Ceded Territories is especially troubling to the VITF. The location of the CWD-positive deer in Lincoln and Oneida counties is within 25 miles of the reservation of the Sokaogon Chippewa Community and within 30 miles of the reservation of the Lac du Flambeau Band of Lake Superior Chippewa. Tribal deer hunters regularly hunt deer near where the CWD positive deer were harvested.

Current regulations governing captive cervid facilities (including, but not limited to, facilities referred to as deer farms, breeding facilities, hunting preserves, petting zoos, animal displays, etc. that contain animals from the Cervidae family) are inadequate and recently proposed

initiatives are not adequate to address the crisis. CWD continues to spread through captive cervid and wild deer populations in Wisconsin due to shortcomings in the existing regulations and lack of effective coordination among state agencies. More specifically, the VITF offers the following recommendations to strengthen current regulations:

✓ “Affected Counties”

The “affected counties” designation has likely increased the spread of CWD in Wisconsin by relaxing carcass transport rules in areas free of CWD. Affected counties are currently designated as counties where a CWD positive deer has been detected and any county within 10 miles of the detection. This designation triggers carcass transport rules in the affected counties *and* all counties which adjoin the affected counties. However, this area is so large that it has the effect of allowing the transport of CWD infected carcasses throughout the state with the exception of only Ashland and Door counties. Another problem with designating counties as “affected” after CWD has been detected in a captive cervid facility is that it then allows the transport of wild harvested deer from other CWD-affected counties within that county, despite there being no detection of CWD in the wild herd. This policy does not effectively prevent the spread of the disease. In fact, allowing the transport of CWD-infected carcasses within counties that have been designated as “affected” solely due to the detection of CWD in captive cervid facilities or adjacent counties has likely increased the spread of the disease in Wisconsin by relaxing carcass transport rules.

✓ Transport of Live Cervids

It is not enough to prohibit the import of live cervids from facilities located in counties where CWD has been detected. Without an effective CWD test for live deer, any import of live cervids into the Ceded Territories that is carried out using standards less rigorous than the standards employed to augment the wild elk herds (i.e. allowing animals only from areas not known to support CWD, mandatory quarantine and observation periods, veterinarian examinations, etc.) is reckless from a wildlife health perspective. The State of Wisconsin should impose a moratorium on the transport of live cervids, *regardless* of their origin. DATCP confirmed that the CWD-infected deer harvested at a Waupaca County hunting preserve originated from a farm in Pennsylvania. Likewise, deer from a Washington County facility, which had been considered a county free of CWD infections, were transported to a hunting preserve in Bayfield County. Only after the deer were transported was it determined that the Washington County facility was a CWD-infected herd. Both of these instances illustrate the need to end the importation of live cervids to areas which are free of the disease, or experiencing it at low levels until a live test can verify the animals are CWD-free or effective quarantine facilities and protocols are in place. It is not enough to ban the transportation of live cervids to or from affected counties.

✓ Carcass Transport/Disposal

A lack of effective deer carcass transport and disposal rules and regulations increases the risk of spreading CWD within Wisconsin. Deer carcass movement restrictions appear to be nothing more than recommendations according to the information provided on the WDNR’s website. In addition, there are exceptions to some of the restrictions, for example allowing the transport of carcasses to counties adjacent to CWD-affected counties, and allowing 72 hours to bring the carcass to a taxidermist or meat processor. Both of these exceptions allow CWD to continue to spread throughout the state. The former example only excludes Ashland and Door counties, while the latter allows carcass transport throughout the state.

As the number of these instances continues to increase, the risk to the wild deer herd in the Ceded Territory also increases. A recent study within the CWD-endemic area of southern Wisconsin determined that CWD-infected deer are dying at three times the rate of uninfected deer. Multiple long-term studies have observed declines in white-tailed deer and mule deer populations within CWD-endemic areas in western states where the disease has been prevalent on the landscape much longer than in Wisconsin. The perception that CWD could affect human health is also likely to lead to a drop in hunter recruitment within CWD endemic areas. As waawaashkeshi continues to be a significant source of lean, healthy protein within Anishinaabe communities, the failure of the State's approach to effectively address CWD also perpetuates harm to the sustainable economies of Anishinaabe communities and to their health.

In summary, until effective rules and regulations can be adopted and enforced, WDNR-DATCP coordination can be implemented, and adequate testing levels have documented that CWD is no longer spreading within the state, the VITF strongly recommends the following measures be taken to protect ceded territory deer and elk populations:

- A moratorium on the intrastate and interstate transport of live cervids.
- A moratorium on the intrastate and interstate transport of commercial products that contain captive cervid bodily fluids (e.g., urine, semen, scent glands, etc.).
- A moratorium on new captive cervid facilities.

In addition to the moratoriums, the VITF recommends the following requirements be put in place at all captive cervid facilities currently in operation within the State of Wisconsin:

Regarding fencing:

- Double fencing should be mandatory for all captive cervid facilities at the expense of the deer farm owner(s).
- Fences should be inspected annually, and after any severe weather events. The tribes have expressed an interest and willingness to assist with conducting fence inspections at captive cervid facilities in the past.
- All trees that could potentially fall on a captive cervid facility fence line should be removed to prevent a significant source of fence damage.
- All fences should have electronic alarms to indicate whether the fence has been breached or gates have been left open.
- Penalties for escaped captive cervids should be increased.
- Fencing at captive cervid facilities should be required to be maintained if CWD is detected on the property until appropriate remediation of the prior-contaminated environment has occurred.

Regarding enrollment in the CWD herd status program:

- All captive cervid facilities in Wisconsin should be required to be enrolled in a CWD herd status program using USDA APHIS standards at a minimum.

- This will ensure that all captive cervid facilities are subject to the same set of standards, which is critical in taking a serious approach to dealing with CWD.

Regarding testing of captive cervids:

- Mandatory CWD testing should be required of every captive cervid that dies on a captive cervid facility, regardless of age, whether they are being shipped to slaughter, or whether they are enrolled in the CWD herd status program.
 - Currently, there are testing exemptions for the following in Wisconsin:
 - 100% of cervids <12 months of age are not tested (fawns as young as 5 months have become infected in Wisconsin).
 - 75% of cervids >12 mo. of age sent to slaughter from a facility that has been enrolled in CWD herd status program for more than 5 years are not tested.
 - 100% of cervids <16 months of age in a facility not enrolled in the CWD herd status program are not tested.
 - 50% of cervids >16 months killed by a hunt on a shooting preserve in a facility not enrolled in the CWD herd status program are not tested.
 - 50% of cervids >16 months killed intentionally in a facility not enrolled in the CWD herd status program are not tested.
 - 75% of cervids >16 months shipped directly to slaughtering establishment in facility not enrolled in herd status program are not tested.
- All herds associated with captive cervid facilities that have animals that test positive for CWD should be depopulated within 30 days.

Establishing preventive controls to bar CWD contaminated meat from human/animal food:

- Following slaughter, cervid carcasses from captive facilities should be maintained separately and not processed for human consumption or animal food until the CWD test results for each carcass have been received. Carcasses that test positive for CWD should be considered “adulterated” and unfit for human consumption or animal feed.

Regarding indemnification of CWD-infected deer farms:

- All captive cervid facilities should be required to maintain insurance to cover the costs associated with depopulating, testing, and disposing of a herd that tests positive for CWD.

Regarding marking and identification of individual animals:

- All captive cervids should be required to have two forms of identification, regardless of whether they are born on a hunting ranch or are in a non-enrolled facility.

Regarding the transportation of captive cervids and bodily fluids and disposal of carcasses from CWD-positive cervids:

- A moratorium on the transport and import of live cervids and bodily fluids used as commercial products or for breeding purposes from captive cervids (e.g., urine, semen, etc.) within the state and across state boundaries should be implemented until an effective test can be developed and approved to determine whether the live cervids or bodily fluids used as commercial products or for breeding purposes are infected with CWD.
- Carcasses from captive cervid facilities that test positive for CWD should be disposed by the following two methods only: within a clay-lined landfill or biodigestion.
- Care should be taken in the transportation of CWD-contaminated carcasses from captive cervid facilities to ensure that the carcass, implements and surfaces which came into contact with the animal are responsibly disposed and/or segregated.

The VITF does not take these issues lightly. There is genuine concern that the future of wild deer and elk populations are at risk because of CWD. The fact that the disease has continued to spread across the state, and across the country, both in the wild and between captive cervid facilities demonstrates the inadequacy of existing law and regulation. Unless significant steps are taken to curtail the spread of the disease, CWD will severely compromise treaty resources that the tribes rely upon for sustenance, cultural identity, and ceremonial purposes. The threat of CWD poses a direct threat to the tribes' abilities to exercise their reserved treaty rights and sustain their traditional lifeways.

I have asked Travis Bartnick of GLIFWC's staff to assist in facilitating further discussions of these issues. He can be reached at 715-682-6619, extension 2166 or tbartnick@glifwc.org. Please do not hesitate to contact me directly as well.

Sincerely,



Michael J. Isham Jr.
Executive Administrator

cc: Voigt Intertribal Task Force
Dr. Susan Mayne, Ph.D., Director, Food Safety and Applied Nutrition, Food and Drug Administration
Dr. Steven M. Solomon, D.V.M., M.P.H., Director, Center for Veterinary Medicine, Food and Drug Administration
Greg Ibach, Under Secretary, Marketing and Regulatory Programs, United States Department of Agriculture
Kevin Shea, Administrator, Animal and Plant Health Inspection Service, United States Department of Agriculture
Dr. Jack Shere, Deputy Administrator, Veterinary Services, Chief Veterinary Officer, United States Department of Agriculture
Rima Khabbaz, MD, Director, Center for Disease Control and Prevention, National Center for Emerging and Zoonotic Diseases



ROBA



Reindeer Owners and Breeders Association
website: www.reindeer.ws

Governor Walker,

As President of the Reindeer Owners and Breeders Association and representing our membership, we have always been as concerned about the spread of CWD as you are. We are also concerned about many other diseases that reindeer can get from the wild whitetail and elk herds (Brain Worm, Babesiosis) which are usually fatal to reindeer.

We have always tried to go beyond state and federal regulations and we did this to protect our reindeer. Your proposal to shut down any movement of deer in your state will put our members out of business. This would be devastating to our industry which has always exceeded regulations and also to our customers who use the reindeer for state tourism and attractions for events across the country.

I feel this is a knee jerk reaction due to pressure from the wildlife people for the hunting licenses (MONEY). This proposal will not stop the spread of CWD.

I feel Wisconsin should take the lead on this issue and get the Certified Deer program working so that farms that do what is required, can move and so that farms that go above and beyond what is required are not always afraid that they will be locked down because someone finds CWD in that county or state.

I feel if these herds are following your programs they should be able to move and the state and Feds should guarantee that. I also feel that farms that are trying to get around the rules should be given one warning and if they don't do what is required they should be shut down. I don't feel that farmers that are in good standing in the program should be put under the same umbrella as the ones that don't. If a farm follows what is required by the state then they should have certain guarantees from the state that they will be able to move and do business.

This is the time for Wisconsin to show by example and fix the program. Good farms are protected and farms that do not follow the program are closed.

If you do not do this and go with a knee jerk reaction to pressure, you will be putting a lot of good farms out of business. This will in turn affect tourism for your state and will suffer along with local business which will lose revenue. If your proposal is put into law, good farmers doing the right thing are going to lose their farms. Your state will lose tax revenue and your tourism will suffer greatly. The state will in effect have taken reindeer out of Christmas

Michael Jablonski, President

Reindeer Owners and Breeders Association

Carlson, Michael M - DATCP

From: Laura Johnson <laura@matteroftime.com>
Sent: Monday, June 11, 2018 7:17 PM
To: Carlson, Michael M - DATCP
Subject: CWD Proposals

My name is Laura Johnson and I'm a voting citizen of WI. The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state I do not agree with the said proposals.

The three- step plan will prevent the genetic resistant research to continue what has the potential to sustain the farmed and free range whitetail deer populations in WI long into the future.
Potential cures for CWD may be lost if these proposals are passed.

Laura I. B Johnson
4747 Diamond Ln
Auburndale, WI. 54412

Carlson, Michael M - DATCP

From: Laura Johnson <laura@matteroftime.com>
Sent: Tuesday, June 12, 2018 9:57 PM
To: Carlson, Michael M - DATCP
Subject: Governor Walker's CWD proposals

My name is Tom Johnson. I'm a passionate bow hunter in the state of WI and a former deer farm owner. I'm also a WI voting citizen.

The recent proposals for combating CWD of Governor Walker have been brought to our attention thus I am writing this letter to state I DO NOT agree with the said proposals.

The three step plan will stop the genetic research. This research has the potential to sustain the farmed and free range deer populations in Wisconsin long into the future.

Potential cures may be totally lost if these proposals are passed.

Sincerely,
Tom Johnson

Governor's Proposed Rulings Dealing with CWD and Bullet Points for Written Comments for DATCP – DNR Scope Hearing

Comments From:

**Tom Justmann, Owner
Tomorrow River Ranch LLC
6765 County Road D
Amherst, WI 54406**

- **The Tomorrow River Ranch is a 200 acres white-tailed deer and elk hunting preserve.**
- **Tom Justmann**
 - o **Owns approximately 2,000 acres of land in Wisconsin primarily irrigated vegetable ground**
 - o **Owns and operates a fertilizer company based in Utah**
 - o **Owns and operates an International Trading Company**
 - o **Employed as the International Business Director for the US subsidiary of a Belgium company with commercial responsibility for Europe, Africa, Asia and the Middle East.**
- **On average, an estimated 10-15% of the hunters annually at Tomorrow River Ranch are coming from Europe.**

Scope of the Governor's Plan:

Governor Walker's three-step plan creates a balanced approach to combat chronic wasting disease:

General Comments To The Three-Step approach:

- a. The root cause of CWD has not been identified and legislating a fix before understanding the genesis of the problem puts "the cart before the horse". Science with factual objective evidence needs to guide Wisconsin in a planned path forward.
- b. Emotional politically driven ideas that are not founded by science may be appealing to an uneducated populace but are short sighted.
- c. Long term corrective actions must be guided by science to ensure that deer farmers, ranchers and the state's "farm raised deer economy" (estimated at M\$100 annually) are not permanently damaged by unsubstantiated rhetoric.
- d. If the Governor wishes to take a pro-active scientific approach, I recommend funding to identify CWD sources and CWD transmission causes, be appropriated and directed at root cause analysis and delving further into recent genetic test findings (contact Laurie Seale from Whitetails Of Wisconsin at Cell# 830-928-3143 for more information on recent findings).
- e. What does the risk analysis suggest? Will this change in legislation have a positive impact? What objective evidence does the DATCP – DNR – Governor have to support this emergency legislation?
- f. The deer farmers of Wisconsin test a high percentage of the deer at their ranches for CWD, while the state of Wisconsin tests a very low percentage of the deer population outside the farm raised deer ranch fences. Does the state have a realistic understanding of the scope of the CWD infection in the deer outside of deer farms?

- g. There is no evidence of a need for “emergency” regulations. Science, science, science.... Redirect resources.... Get answers and focus on solutions, not regulations!
- h. **Deer Farms are an easy convenient target of CWD but there is no evidence that they are the problem! Social media and governmental agencies have not accurately portrayed the problem and have further exacerbated the churn by proposing unfounded, emotional band aids which do not solve the problem for our great state of Wisconsin and its long tradition of deer hunting.**

1. Requiring enhanced deer farm fencing through a new DATCP and DNR rule. Currently, farms are required to have an eight-foot fence. Enhanced fencing would require either: a second eight-foot-high fence, an electric fence, or an impermeable physical barrier to meet the emergency rule’s requirements.

- a. This is a classic example of “Big Brother” trying to generate regulations to a problem they do not understand, nor know the answer. So instead of seeking the root cause of the problem, the “convenient” solution is to pass regulations to show the public “we took action”.
- b. Science needs to prevail, where is the funding to seek out a scientific solution?
- c. The deer farmers in the state of Wisconsin installed fences according to the rules and regulations of the WI DNR. To promulgate new laws, rules and regulations without compensation or recourse will invite litigation. (Eliminating a M\$100 farm raised deer industry could be expensive)
- d. Due to the post glacial moraine topography in my hunting preserve, I have installed 10’ fences to protect against any animal escapes, and the potential for any deer outside the fence to enter my preserve.
- e. The estimated cost for a double fence at my hunting preserve is in the range of \$150,000.
- f. In addition, I am installing an apron at the base of the fence as further protection against predators having access to the preserve at an added cost of \$23,000.
- g. Wisconsin deer farmers are contributing to research to help fight CWD. Whitetails of Wisconsin is funding research projects to study the effects of CWD on infected captive animals. These studies are helping us better understand many things about CWD that can and will never be identified through studies of the wild deer herd in Wisconsin. The deer industry is also funding genetic resistant research which could prove to be a solution to CWD. Wisconsin deer farmers, along with CWD positive hunting ranches, are spending tens of thousands of dollars working with researchers to find deer with greater resistance to CWD than were previously known to exist.

2. Controlling the movement of potentially infected deer through the creation of a new DATCP rule banning the movement of live deer from deer farms in CWD-affected counties.

- a. I’m not sure this has been thought through. Passing legislation in this direction will result in the public video deaths, offered to TV stations, of the killing of thousands of deer since they cannot be moved.
- b. Deer farmers have invested in the deer herds they own based on the law in effect at the time they made the investment decision. Should the state of Wisconsin wish to undermine the value of the herds, I can only expect litigation that may not be difficult to obtain public support based on the videos taken in Article 2. (a) above.

3. Preventing contamination from hunted deer carrying CWD by tasking the DNR to create emergency and permanent rules banning the movement of deer carcasses from CWD-affected counties. Under the proposed rule, Hunters can still quarter the deer within the county it was harvested and then take the meat anywhere in the state, but no portion of the spinal cord may be attached or moved. A hunter who harvests a deer in a CWD-affected county may only move a whole carcass outside of the county if the carcass is delivered to a licensed taxidermist or meat processor.

- a. Persons who live on county lines, should have a minimum radius to move the carcass as well (e.g. 5 miles, 10 miles)
- b. In any case, I don't believe the state of Wisconsin has the budget to hire enough game wardens to enforce this law.

Carlson, Michael M - DATCP

From: belinda@southernyankees.net
Sent: Wednesday, June 13, 2018 2:45 PM
To: Carlson, Michael M - DATCP
Subject: CWD in Wisconsin

Dear Mr. Carlson:

My husband and I own and operate a deer breeding operation in Alabama. I know you immediately ask, "What does that have to do with us in Wisconsin?" Please allow me a few minutes to tell you.

We are hunters and we have traveled to Wisconsin and hunted with some of the very people that will be affected by shutting down deer farming in your state. Do you think we will stop hunting? Absolutely not! We will simply move the money we spend to fly into your state, the lodging and food we purchase will in your state and the fees we pay for licenses and hunting expenses to Illinois or some other state.

Furthermore, we buy semen from the Fleas family of Wilderness Whitetails. They have some of the best genetics in the United States. We have been using their semen to artificially inseminate our doe herd. Do you think that if you have put the Fleas family out of business we will close our deer farm? Of course not! We will simply look for the next best farm in another state and continue doing what we do but sending our farm dollars to Michigan or some other state.

Anyone who has studied the problem of CWD knows that shutting down deer operations will not stop CWD. Laurie Seale is a deer farmer in Wisconsin. She has always been a highly-informed source of information to everyone in the deer farming business. If we have a sick fawn, an injured buck or a doe that looks like she has pneumonia, I call Laurie. She, like all deer farmers in Wisconsin and, frankly, all over the United States, understands the disease better than anyone. We all know it has become, primarily a political disease and politicians are using bad information and fake science to frighten the public. Meanwhile, Wisconsin, like many states are not been proactive in protecting the free-ranging herds and that is where the risk of CWD lies. Heck, we make our living and support our families with healthy herds. Who has more to lose with a CWD outbreak? A politician or wildlife official or a man or woman who pays his/her mortgage payments by selling semen, hunts or animals? The answer is very clear! It is the deer farmer! I urge you to consider facts not hyperbole.

Belinda Kennedy
Southern Yankees Whitetail Farm
29874 McKee Road
Toney, AL. 35773
256.990.3840

Carlson, Michael M - DATCP

From: Westover Ridge <westoverridge@outlook.com>
Sent: Wednesday, June 13, 2018 3:59 PM
To: Carlson, Michael M - DATCP
Subject: Re: DATCP proposed CWD rule

Dear Mr. Carlson,

As accredited veterinarians, we are writing to oppose prohibiting movement of live deer from farms in CWD affected counties. Effectively quarantining privately owned deer from CWD certified herds with 100% post-mortem surveillance will only serve to destroy an economically important agricultural industry in your state and will do nothing to prevent the spread of CWD in the wild.

Every time an adult deer in a certified herd dies, the obex and lymph nodes are submitted for surveillance, demonstrating once again that the herd is not infected. Requiring owners of uninfected animals to enhance their separation from infected animals as a means of keeping the uninfected animals from transmitting the disease to the infected animals does not make epidemiological sense.

Since CWD in WI is primarily a wild deer problem, any management plan should focus on the affected population under the direction of such seasoned experts as Dr. James Kroll.

Thank you for considering our opinion.

Sincerely,

Jeffrey R. Knibb, DVM
Roxanne I. Knibb, DVM
St. Louis, MO

To Whom It May Concern,

My name is Alyssah, and I am an avid hunter and a very concerned citizen here. The recent proposals of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The proposals will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free-range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,

Alyssah Kubly

W2763 Lumber Yard RD

Juda, WI 53550

Comments for WIDATCP Hearing to be Held on June 7, 2018

I first like to thank the Chair and the Board for taking the time to read and consider my comments. I disagree with the Governor's proposed emergency rulings to combat the spread of chronic wasting disease and I completely support all of the positions of Whitetails of Wisconsin.

When CWD is found in a captive environment, it is easily contained and the herd is depopulated. The same cannot be said for the wild. In fact, the State does very little testing. If the State is serious about CWD, the State would require all harvested deer to be tested. What the State might discover is CWD is everywhere in our State and it is not captive deer that are spreading it. If the State is serious about CWD, the State will clean up promptly the dead deer carcasses from the highways and roads that many times sit for up to weeks. We know birds of prey feed on these carcasses leaving their dropping filled with prions on the landscape. If the State is serious about CWD, the State will fund meaningful research that will stop CWD from spreading.

I take CWD seriously, I take every precaution available to me not to have it within my fences. We chose to double fence to protect our herd from the wild, but now find because of recent CWD positives within the State that it does not necessarily protect one from the wild. We utilize in our everyday operation the Industry's Best Management Practices. We are members of Whitetails of Wisconsin, NADeFA and other Industry organizations so that we know and keep up with regulations and best practices.

Our Industry is funding research that shows promise of a positive impact on the CWD. When the emergency rule was announced, it caused us to suspend our plans to do genetic testing of our herd for CWD resistant markers and breeding for resistance.

We participate in and fully comply with the highly regulated CWD Monitoring Program, which requires that each of our whitetails have two forms of identification from cradle to grave. We are required annually to submit two herd reports, one of which is a complete census of our herd from cradle to grave tracking all movements in and out of our herd. Our veterinary must annually submit a letter to WIDATCP certifying a business relationship with our farm and that our entire herd has been inspected. No live movement off our farm to another farm or preserve is allowed without a veterinary inspection and health certificate. No movement to slaughter is allowed without a permit. All deaths of deer, twelve months or older, on our farm require a CWD test. We have not missed any CWD tests. We have never had a CWD positive. Last year alone, because of deaths and does butchered on our farm, 9% of our herd that is older than twelve months of age were tested for CWD.

In addition, our veterinary is required every three years to submit a herd inventory and our herd is tested for TB and Brucellosis. There is a misconception in the public that the captive deer

industry is not regulated. It is simply not true. Deer Farming is highly regulated! I do not know of another agricultural industry that is as regulated.

If the proposed ban on live animal movement in CWD affected counties is implemented, it will force us to kill nearly 99 healthy whitetails on our farm. Without movement we cannot sell our animals to hunting preserves, which means no income to feed our deer or operate.

K & M Whitetail Ridge, LLC located in Green County is a small family run business. My daughter, her husband and six-year old daughter are partners with my husband and me. We entered deer farming in 2012. We have all invested our time, sweat, energy, money and resources into this endeavor. This is a truly a family-run farm, each (including my granddaughter) with our own area of expertise and responsibility. Kylie helps her mom take care of all of our fawns and with her dad feed peanuts to our deer. We love our deer, it is the only life my granddaughter has known. Killing our deer will devastate Kylie and all of us!

Green County is a county with known CWD in the wild herd. That is why chose to double fence before we accepted our first whitetail to protect our captive herd from the wild herd. We know that if one of our deer tests positive for CWD, we are done. We understand this risk and we accept this risk. But, now our State is proposing this emergency rule that changes the rules in the middle of the game. Rules that will cause the destruction of our healthy herd and put us out of business, this we do not accept.

Banning movement of live deer in CWD affected counties will not stop or reduce the spread of CWD. Even though we are already doing whatever we can to stop CWD; what it will do...is put down 99 healthy deer. We will not be the only deer or elk farm affected this way. In the State of Wisconsin that will be thousands of healthy deer and elk destroyed for no reason. If we are forced to destroy our deer because we cannot afford to feed them, we will not do it quietly. We will invite all the local news stations and press to witness. I am sure my fellow deer and elk farmers will do the same.

I am imploring you today not to support the proposed emergency rules. There is no justification for an emergency rule, CWD has been here for a long time. This emergency rule may make momentarily good headlines but it will do little to stop the spread of CWD. This emergency rule is not well thought out or based on science. This emergency rule will not protect "the welfare" of the State's hunting heritage nor its hunters. Wisconsin's hunting heritage and its hunters are better served by the State of Wisconsin working with the captive whitetail industry to affectively reduce the spread of CWD.

**Deer Farms are the victims of CWD, we are not the problem.
Though, we may be the solution!**

Signed:

Carol Casey Kubly, June 5, 2018
W3796 County Road EE

K&M Whitetail Ridge, LLC
Monticello, WI 53570

Carlson, Michael M - DATCP

From: brenda lawson <blaw69@hotmail.com>
Sent: Wednesday, June 13, 2018 5:17 PM
To: Carlson, Michael M - DATCP
Subject: CWD proposed emergency rules

Hello,

I'm writing to inform you that I do NOT support the Governor's proposed emergency rules to combat CWD. Banning live animal movement for farm-raised deer and requiring deer farms to double fence will only put small businesses out of business, not reduce CWD. The government should be investing money into research, and if these farms can longer continue to be in business it will also stop research that is currently being conducted by farms on genetic resistance to CWD. Deer farmers are a victim of CWD, not the cause and we need to all work together to reduce the spread.

Thank you for your consideration,

Brenda Lawson
Freeport Illinois

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To Whom It May Concern,

My name is Elmer Lemon and I am avid hunter and concerned citizen. The recent proposals of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The proposals will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free-range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,

Elmer Lemon

309 Cheyenne Tr

Madison WI 53705

Carlson, Michael M - DATCP

From: Cody Lewandowski <codylewandowski@yahoo.com>
Sent: Tuesday, June 12, 2018 9:08 PM
To: Carlson, Michael M - DATCP
Subject: Whitetails of Wisconsin
Attachments: To Whom It May Concern.docx

To Whom It May Concern,

My name is (Your Name) and I am (a member of Association or club name or avid hunter or concerned citizen here). The recent proposals of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The proposals will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free-range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,

(Your name)

(Your address)

Carlson, Michael M - DATCP

From: Amy Barlow Liberatore <sharplittlepencil@gmail.com>
Sent: Friday, June 1, 2018 11:41 AM
To: Carlson, Michael M - DATCP
Subject: Deer Farm regulations

Mr. Carlson,

Please add these comments to the public record regarding Gov. Walker's proposed legislation, which will place undue financial burden on deer farmers in Wisconsin.

As I understand it, these are the numbers:

Number of registered deer farms in Wisconsin 376
Number of hunting ranches 64 of the 376
Number of farms enrolled in the CWD herd status program 173
Number of farms with a CWD positive test since 2001 - 19
Number of herds depopulated as a result of a CWD positive - 11
NOTE: These last two stats are the most important.

From the Wisconsin Journal Sentinel: "Walker acknowledged taking ideas from the bill. But he stressed the rule goes further, requiring farms statewide to upgrade fencing rather than just farms with CWD-positives."

I object vehemently to this plan. We have known that CWD is a huge problem for years, but the Walker plan is too much regulation that comes too late... and does nothing to address the wild deer populations.

I support the farmers. Please stop this nonsense, now.

Thanks for listening.

Sincerely,
Amy Barlow Liberatore
4201 Hegg Ave., Madison WI 53716

--
Amy Barlow Liberatore
Member of the

Christian Left

Black Lives Matter

Resist Hatred, Fascism, and Phobias

Wage PEACE...Sow LOVE

Carlson, Michael M - DATCP

From: Eric Lotts <elotts9883@gmail.com>
Sent: Monday, June 11, 2018 12:25 PM
To: Carlson, Michael M - DATCP; DNR Administrative Rules Comments
Subject: Emergency rule for cwd

I am opposed to the emergency rule for deer movement and fencing.

Eric lotts

Carlson, Michael M - DATCP

From: Samantha Lehrer <samanderic2004@yahoo.com>
Sent: Tuesday, June 12, 2018 10:58 AM
To: DNR Administrative Rules Comments; Carlson, Michael M - DATCP
Subject: EMERGENCY RULE and ENHANCED FENCING

To Whom It May Concern-

Our family does not support the emergency rule for enhanced fencing. These rules will put many families out of business.

Eric and Samantha Lotts
Chippewa County Wisconsin

Carlson, Michael M - DATCP

From: roxanne lotts <indianheadwt@gmail.com>
Sent: Sunday, June 10, 2018 2:37 PM
To: Carlson, Michael M - DATCP
Subject: DATCP Emergency Rule Regarding Farm-Raised Deer Movement and Fencing
Attachments: DATCP Emergency Rule second Meeting.docx

Michael,

I would like to go on record as being against the implementation of this rule. Attached are some of my concerns.

James Lotts,
Indianhead Whitetails Deer Scent Company
2644 10th ave
Chetek WI 54728
715-642-0465

According to DATCP's web page:

Humans, cattle and other domestic livestock are resistant to the natural transmission of CWD according to research. To date there has been no documented transmission of CWD to humans.

So why is this a state of emergency?

Captive deer farms are not spreading this disease to other domestic livestock and there is no evidence that deer farmed animals have ever transmitted the disease to a wild deer.

When Governor Walker announced new aggressive initiatives for combating CWD affecting Wisconsin deer populations. He spoke of working together....

He stated: "We need to protect Wisconsin's hunting traditions and long-standing heritage by **working together to contain the spread of chronic wasting disease in deer**".

We would like to be a part of that process of **working together**. The captive industry can contain the disease when it shows up, where DNR is unable to contain or control the spread of this disease as it freely moves across the landscape in the wild herds.

Governor Walker's plan to:

- Control the movement of **potentially infected deer** through the creation of a new DATCP rule banning the movement of live deer from deer farms in CWD-affected counties will impact and likely decimate the entire industry in WI and possibly in the nation if other states adopt this type of Emergency Ruling.

Are all of our deer now considered **Potentially Infected Deer** and if that's the case, then **all Deer** in the State of WI must be considered **Potentially Infected**. Isn't the Animal Health Division, of the Wisconsin's Department of Agriculture, Trade and Consumer Protection - **responsible** for monitoring for animal diseases in the state of WI.

If so, what are you going to do about the free roaming Deer and Elk that are Potentially Infected and are potentially affecting the captive deer herds that may still be in business?

You have heard hunting organizations say that they represent so many hundreds of thousands of hunters who want the Emergency Rule passed, but what they don't tell you is that of those hundreds of thousands of individuals the clear majority of them use Deer Scent and you can only get it from a captive herd. There for: I can say that I represent those same individuals because they support our farm by purchasing our products. If deer farming is shut down, that product will no longer be available and hunters will not be happy.... I could also claim that I represent the millions of individuals that love animals as we have those types of people on our farms for tours every year.

But I encourage you to listen to what each person here and in a personal letter has to say. That should stand for much more than a **generated letter** sent out by an organization.

Thank you, James Lotts of Indianhead Whitetails and Indianhead Elk

DNR's web page shows the thousands of wild deer that are infected with CWD. If a hunter harvests an animal and leaves it where it lays and it is potentially infected it may be consumed and moved by scavengers across the landscape, so this rule is not controlling the spread of CWD. Unless each animal is properly disposed of hunters will inadvertently continue to spread CWD. Butcher shops, Slaughter facilities, Taxidermists and Deer farms must bury or incinerate all dead deer they are working to stop the spread of CWD. Hunters need to do the same. If this emergency rule is to control the spread of CWD this rule needs to go one step further: we need disposal sites for all carcasses that are then buried in an approved landfill. If you truly want to control the spread of this disease we must landfill all carcasses even after incineration as prions do not die unless heated to extreme temperature for a prolonged period of time. Almost every county in WI is a CWD affected county or will be in time, so this needs to be done state wide. When I ask hunters, what do you do with your deer carcass after you cut up the meat, most say I throw it in the woods or it goes in my trash, no one tells me they bury it.....

Roxanne Lotts,

Barron Co. WI

My name is Roxanne Lotts –

My husband and I own and operate Indianhead Whitetails in Barron Co.

I would like to go on record as being opposed to the Emergency Rules.

We own 500 Whitetail deer and 20 Elk on two separate farms; these animals provide product for our Urine Collection company.

We purchase 130 thousand dollars in feed and hay annually to feed our animals.

WI Deer Keepers are feeding approximately 12,800 captive whitetails at an annual cost of approximately \$5,000,000.

The Emergency Rule states: NO MOVEMENT OF ANIMALS, if we cannot move them to market for sale, then we no longer can afford to feed them. If we have no end market for our animals we will be FORCED to KILL HEALTHY ANIMALS and unable under this rule to send them to slaughter. No farming industry could sustain itself if it could not move or sell its product?

The federal regulations governing captive cervid is working to find CWD in our herds when present, if detected our herds are confined and depopulated.... That demonstrates the current system is working... as it is intended.

My farms have tested over 500 animals for CWD, that is 1 animal tested for every animal we currently own. Our record of testing shows that we currently have a CWD free farm, and if CWD ever comes into our farms “from the outside” it will be confined and detected because we test over 8% of our herd annually.

Instead of restricting movement of healthy animals, have you considered requiring a percentage of animals in every captive herd be tested annually? This would allow farms to stay in business and increase the effort to contain animals with CWD.

Double fencing has not stopped CWD from infecting farms that have been closed and CWD free for years. One of our farms is double fenced but now we worry that double fencing will not keep our herds safe from wild deer carrying the disease. The wild deer are moving CWD across the landscape (not the farmed deer) and because of this “the full cost of double fencing should be paid by the state”.

Indianhead Whitetails Wholesale Scent Manufacturing Business for the hunting industry impacts the national retail economy, with over \$30,000,000 in retail sales annually. If we are unable to move animals or restock our herds our company alone will impact millions of dollars in and out of the state of Wisconsin. If WI is the first state to adopt this Emergency Ruling and then other states follows “the total Economic impact is not moderate to significant”, it is enormous when all factors are considered.

If we are put out of business it will impact the retirement of my father and his wife who worked over 30 years as deer farmers, it will impact the second-generation farmer (myself and my husband) as we will be forced to file bankruptcy, and it will impact the third-generation farmer (my son and his family) as he will be out of a job and a future in the farming industry.

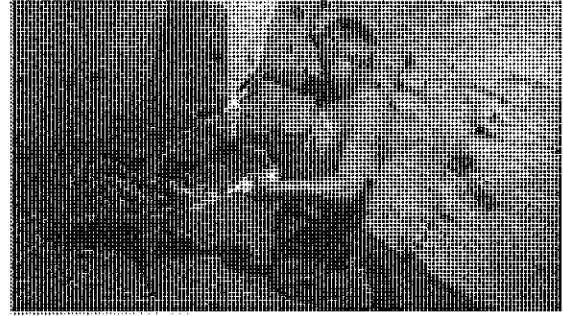
I urge you to reconsider this ruling and I encourage DATCP, DNR and the Governor to review the impact this Emergency Rule will place not only on our farms but on the economic impact it will have on all the businesses we patronage. If this Emergency Rule is enacted we will be forced out of business and CWD will continue to spread in the wild.

I also have a letter from our vet at the Barron Veterinary Clinic stating the impact the Emergency Rule will have on their business that I will leave as a written response unless you would like me to read it...

Indianhead Whitetails Deer Farm has been in business for over 30 years.

Ray & Marjorie Hanson owned and operated it until 2013 when they retired and Jim and Roxanne Lotts(Rays daughter) purchased the farm. This is a family business and Jim & Roxanne along with Eric Lotts(our son) and Jacob Clark(our nephew) work on the farm.

Many of you have seen or been on our farm, located off "CTY M" just past "Caddy Shack" in Chetek Wisconsin.



Gov. Scott Walker is calling on the state to be more aggressive in its response to the spread of chronic wasting disease with a list of "emergency rules" that deal with fencing requirements and transportation of live and dead deer.

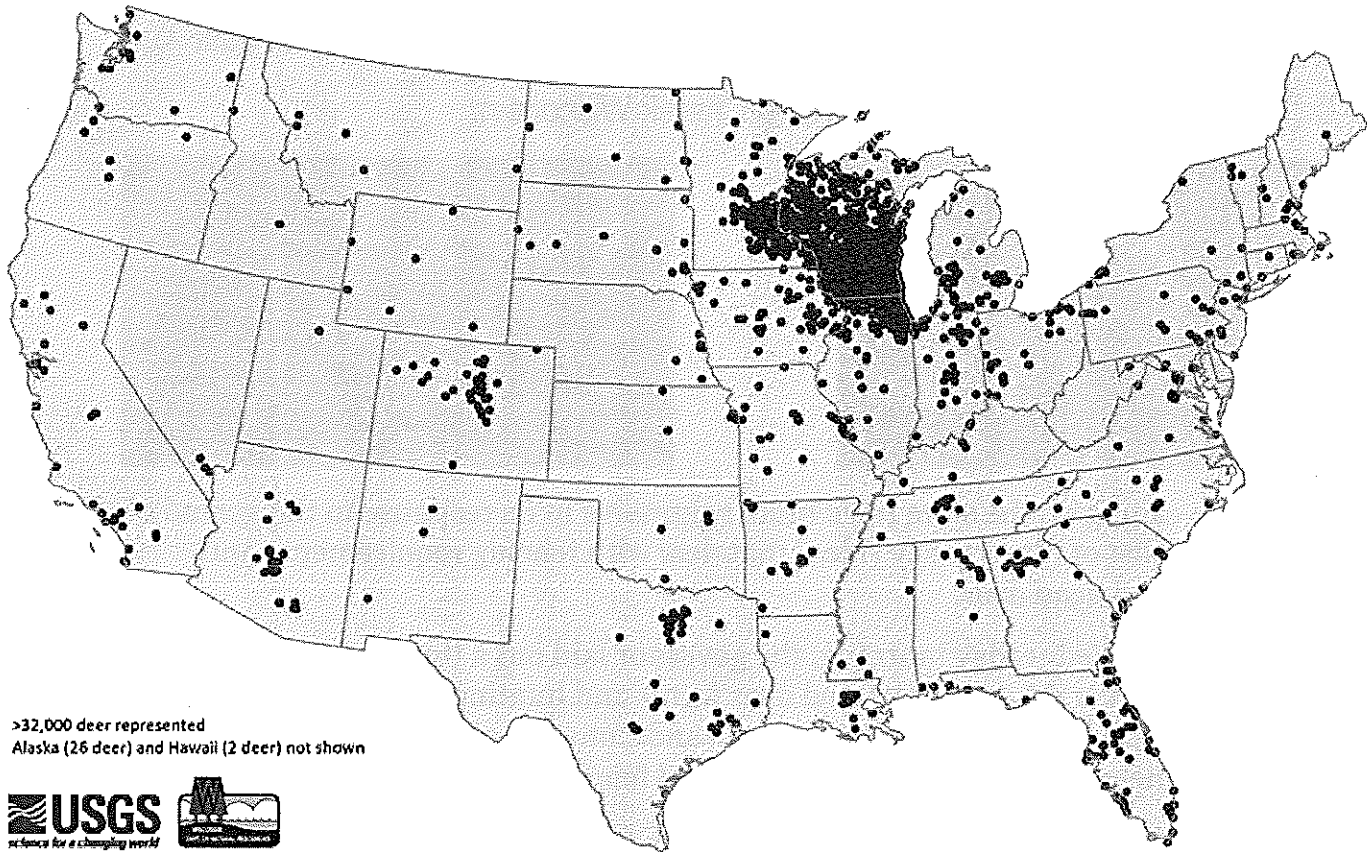
In a press release issued Wednesday morning, the governor laid out a three-part plan that includes the creation of new rules for the 376 registered deer farms and hunting ranches in the state. Walker "ordered" the state Department of Agriculture, Trade and Consumer Protection, which regulates deer farms, to create an "emergency rule" requiring enhanced fencing.

- Requiring enhanced deer farm fencing through a new DATCP rule. Currently, farms are required to have an eight-foot fence. Enhanced fencing would require either: a second eight-foot-high fence, an electric fence, or an impermeable physical barrier to meet the emergency rule's requirements. The last farms to come down with CWD were double fenced, so a double fence is no guarantee that our farms will not get CWD from the wild deer. A double fence will not keep out predators and birds of prey who move infected carcasses. We test every deer for CWD over the age of 12 months when it dies (at a cost of \$105 per animal) how many wild deer get tested for CWD?
- Controlling the movement of potentially infected deer through the creation of a new DATCP rule banning the movement of live deer from deer farms in CWD-affected counties. Almost all counties in the state are CWD affected counties, by enacting this rule Deer Farms will no longer be able to sell or move deer. This will put the majority of farms out of business, if you can't sell your animals, how do you pay for feed?
- Preventing contamination from hunted deer carrying CWD by tasking the DNR to create emergency and permanent rules banning the movement of deer carcasses from CWD-affected counties. Under the rule, Hunters can still quarter the deer within the county it was harvested and then take the meat anywhere in the state, but no portion of the spinal cord may be attached or moved. A hunter who harvests a deer in a CWD-affected county may only move a whole carcass outside of the county if the carcass is delivered to a licensed taxidermist or meat processor. This should have been done in 2002 when CWD was first detected in Wisconsin. This can and will help stop the spread of CWD to our wild deer.

This map shows that hunters may be inadvertently transport CWD to all counties in Wisconsin as well as almost every state in the nation according to Wisconsin DNR. Information obtained from Hunters licenses in 2016-2017.

Home Zip Codes of hunters harvesting deer in Dane, Iowa, Richland and Sauk Counties, Wisconsin, 2016-2017

Data: Wisconsin Department of Natural Resources



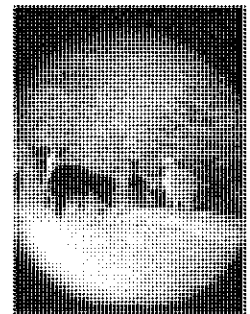
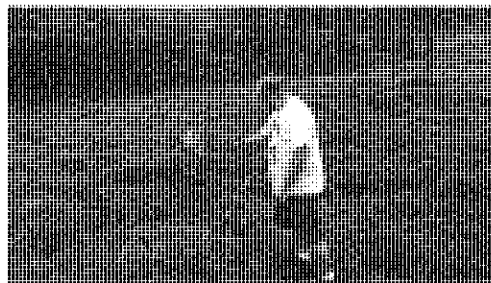
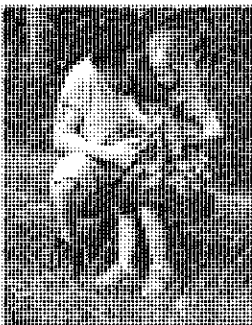
>32,000 deer represented
Alaska (26 deer) and Hawaii (2 deer) not shown



Please Call Governor Walkers office at 608-266-1212 and tell them that you do not support the Emergency Rules to double fence deer farms or restrict movement of captive deer. We are over regulated by state and federal laws and "Doing this will not stop the spread of CWD in the state of Wisconsin".

What this Emergency Rule will do is put many farms out of business. It will affect the money each farm contributes to our counties and state when we buy feed, hay, grains, medical supplies, fencing supplies, operational equipment, when we pay for trucking and hauling fees, veterinarian's expense's, employee's salaries, insurance expenses, land taxes, and the list goes on.....

It will also stop the good that our industry does by providing jobs, farm tours and hunts. We give back by donating hunts to Make-A-Wish Foundation and for the USSA organization for disabled children and wounded Veterans.



Thank you for your support

Carlson, Michael M - DATCP

From: roxanne lotts <indianheadwt@gmail.com>
Sent: Sunday, June 10, 2018 2:49 PM
To: Girard, Alexander C - DATCP
Subject: Emergency Rule Regarding Farm-Raised Deer Movement and Fencing
Attachments: DATCP response to Emergency Ruls.docx

Good Afternoon Alex,

Our farm would like to go on record as being opposed to this Emergency Rule. If it is enacted the ramifications will be devastating to the Captive Deer Industry in the state of WI. As most deer farms are small businesses they will not be able to afford the enhanced fencing requirements and if they can not move animals to market they will be forced out of business.

We need all the farms and small businesses to thrive as big industry keeps taking them over.

Attached is a letter I presented on May 24th to the DATCP board that states the economical impact that this rules will have if enacted.

Thank you for taking the time to listen.

Roxanne Lotts,
Indianhead Whitetails and Indianhead Elk

DNR's SCOPE states this emergency rule is necessary in order to prevent the further spread of CWD. Over the recent months there have been instances where we have had CWD positive test results from wild white-tailed deer in counties that did not previously have CWD detected and our rules are becoming outdated as CWD positive deer are identified in additional counties. What you failed to mention was that in these counties that have new CWD cases showing up the deer farms in those counties do not have CWD, nor did they bring it into those counties.

DNR statute 90.21 (6) allows the department to promulgate rules for the fencing of deer farms that raise white-tailed deer.

These rules pertain to the outside fence, strength, height, distance between posts all guidelines under our deer farm fence certificate issued by DNR. DATCP regulates all double fencing including distance between fences and inspections of the new fencing. We should only have one authority over our fences and that should be the agency that we are regulated by - DATCP. Fencing should not even be a part of this DNR scope.

The scope states:

The proposed deer farm fence enhancement rules could have a fiscal impact. **It should say "Will Have A Fiscal Impact".....**

It goes on to say: We do not know the economic impact at this time. **Well we do know the economic impact to double fence all farms and it will be over \$28,000,000. This is not a moderate impact, it is a significant impact and to many farmers it will be a devastating impact that puts them out of business.**

It goes on to say: DNR anticipates that implementation and compliance costs **would be passed along** to white-tailed deer farms and will be far less than \$10 million over any two-year period. The economic impact of this rule is estimated to be a moderate impact (less than \$20 million). **As I just stated this is a much bigger impact than written.**

Deer Farms should not have this cost "PASSED ALONG TO US" if the state wants it than they should pay for it because:

The facts show that double fencing does not stop CWD. Many farms that are double fenced are still getting the disease and many of those same farms are closed herds, so another deer did not move it into the farm, it came in from the outside of the fence. We double fenced our Whitetail herd over 20 years ago thinking that we were protecting our herd from the wild deer who move freely across the landscape carrying diseases. Now we know that a double fence does not guarantee our herd will not become infected. Nose to nose contact is not the only way this disease is spread as you know or you would not be requiring hunters to leave the carcasses in the field and not transport them around the country further spreading the disease. Roxanne Lotts, Indianhead Whitetails

According to DATCP's web page:

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So why is this a state of emergency?

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Thank you, James Lotts of Indianhead Whitetails and Indianhead Elk

Carlson, Michael M - DATCP

From: Jerry <maerz@chorus.net>
Sent: Tuesday, June 12, 2018 1:00 PM
To: Carlson, Michael M - DATCP
Subject: CDW Research Whitetail

To Whom It May Concern,

My name is Jerry Maerz and I have been an avid hunter for the last 40 years. The recent proposals of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The proposals will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free-range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely

Jerry Maerz
220 Sunset Dr
Dane, WI 53529

Sent from [Mail](#) for Windows 10

Carlson, Michael M - DATCP

From: Katie Marti <kkmarti86@gmail.com>
Sent: Tuesday, June 12, 2018 9:11 PM
To: Carlson, Michael M - DATCP
Subject: Emergency Rules Regarding CWD

Hello,

I first would like to say thank you for the opportunity to share my opinion on Governor Walker's proposed rules to combat CWD.

I disagree with the Governor's proposed emergency ruling which would ban live animal movement in CWD affected counties and the rule proposing all farms be double-fenced. The ban on live animal movement will affect my small 3-generation deer farm. These rulings will only destroy my farm and at minimum 76% of other deer farms in the state, not reduce CWD. In addition, I would also like to state that I fully support the positions of Whitetails of Wisconsin.

I am co-owner of a family-run whitetail breeding farm located in Green County. My husband and I began our farm 6 years ago with my parents. Knowing that Green County was a CWD affected area, we chose to double fence to protect our healthy deer from the wild deer. And we choose to participate in the CWD monitoring program, follow all regulations, and test 100% of our deer that have died which equals approximately 8-9% of our herd annually. We have never had a positive deer, yet the proposed rule banning movement would require us to eliminate all of our healthy deer (approximately 90 deer), as we would not be able to afford to continue if we cannot move our deer to hunting preserves and slaughter.

When we began 6 years ago, it was the same year my daughter, Kylie was born- therefore deer farming is literally what she has known since birth. We are proud to say we are a three generation farm. We each have our role which ensures every aspect of the farm is well-cared for. My husband and I both work full-time and tend to our deer after work each day and on the weekend, maintaining their health, feedings, managing our breeding program, and more. My dad maintains our equipment, mowing of pens and more and my mom does all of the record keeping, licensing, financial records and marketing. This is truly a family-run small business that would cease to exist if these rules passed as written. My daughter helps me with fawn care every year and loves going out with her dad to feed or give them peanuts, their treat. We bottle-fed our first doe fawn last year which my daughter absolutely loved! She helped raise this fawn and now goes on the farm each night to see her, pet her, and give her peanuts. She is overjoyed at the new fawns being born every day. Because of deer farming and the love for animals that my daughter has developed, she tells everyone she wants to be a Veterinarian. She has said this for the past couple of years now. She loves our deer, as do my parents, husband, and I. This has been our life for the past 6 years. We have put so much time, money, blood, sweat, and tears into this business. We are finally at our first year where it was going to pay for itself- however, the

Governor's proposed emergency ruling, banning movement would require us to go out of business, and euthanize all of our deer. Banning movement would not allow us to sell any deer, therefore eliminating any income, and we simply could not afford to pay \$20,000+ each year to feed them, in addition to our other expenses of \$18,000+. This would FORCE us to be put out of business and FORCE us to euthanize all of our deer which would be devastating to us all.

When the Governor announced his proposed rules, our hearts broke. My daughter could tell there was something wrong but I could not bring myself to explain any of what was happening nor what could happen to our deer farm, a love she has known her whole life. She would be devastated, as would we, as would our friends, family, and community that enjoy our deer farm so much.

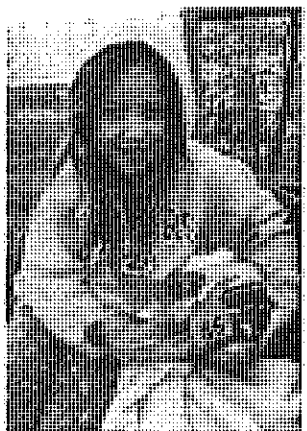
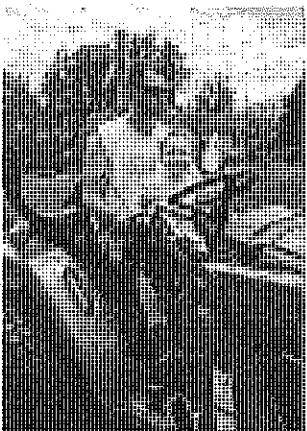
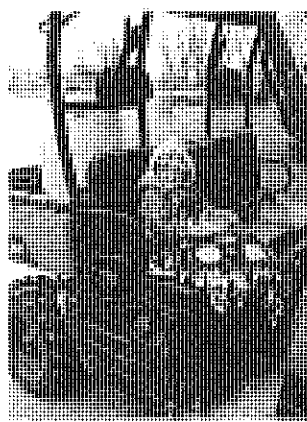
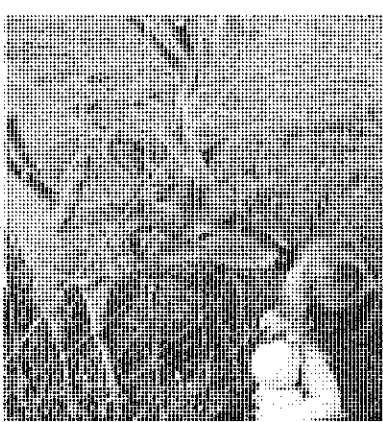
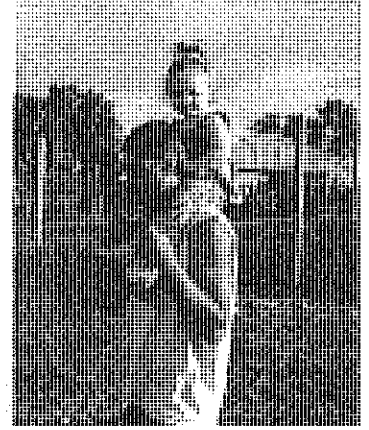
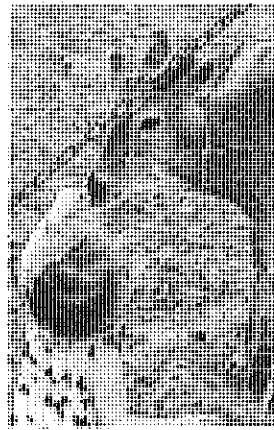
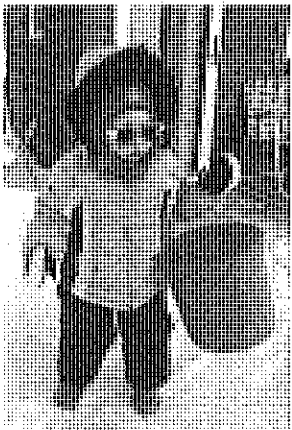
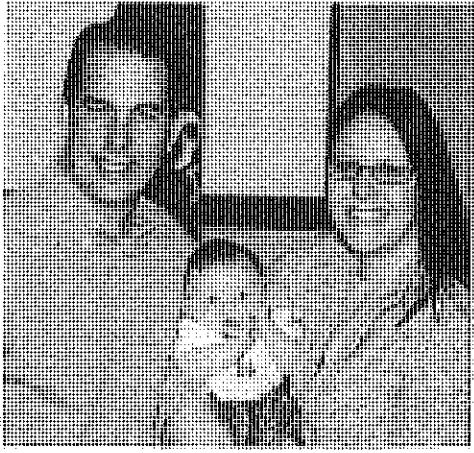
Deer Farms are the victims of CWD, we are not the problem! These proposed rules would eliminate the ability for deer farms to continue the CWD genetic resistance research that has been ongoing, potentially eliminating a possible solution to our state and country's CWD issue. Requiring double fencing will also not stop the spread of CWD. We need to focus our efforts on research to better understand this disease and how it is spreading. I see so many disgusting deer carcuses along side the road daily with eagles, vultures, and other birds eating this potentially positive-CWD animal and spreading the disease- why is this not being addressed? Why does the government think eliminating deer farms will reduce CWD when they are not even certain how this disease is spreading? Furthermore, what exactly is the emergency? I am not aware of any emergency risk to the public that would require such devastating rules to be proposed.

I am asking you to not support the proposed emergency rulings that will put deer farmers out of business. I am asking that you, the State, and our Industry work together to affectively reduce the spread of CWD.

Sincerely,

Katie Marti

Recd from: Katie Marty 5-24-18



KATIE MARTY

Carlson, Michael M - DATCP

From: Bill Mayes <bmayes@cvalley.net>
Sent: Thursday, June 14, 2018 11:58 AM
To: Carlson, Michael M - DATCP
Subject: CWD Issue

Please consider the following:

1. Double fencing of deer farms will have ZERO impact on the spread of CWD in Wisconsin or any other state. There is absolutely ZERO scientific evidence to support double fencing. This is just a platform that could be used to destroy private industry. Nothing more.
2. The private cervid industry is working diligently and farmers across the nation are spending their own money breeding animals with CWD resistant genetics to combat the disease. If ever there is a solution to CWD it will come from private enterprise not government agencies.
3. CWD is really about politics, money, and the funding of government agencies. The DNR screams that the world is coming to an end over CWD and they are the only ones that save the day – and by the way make sure our funding allocation is increased for the project.

Please don't fall for this.

Thanks.....Bill

Carlson, Michael M - DATCP

From: Malisa McLoud <mmcloud30@gmail.com>
Sent: Tuesday, June 12, 2018 9:45 AM
To: DNR Administrative Rules Comments; Carlson, Michael M - DATCP
Subject: Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing

I do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing.

Malisa McLoud
Monticello, WI

Wisconsin Wildlife Federation

WWF Comments to the DATCP on CWD Scope Statement

June 14, 2018

On behalf of the Wisconsin Wildlife Federation and our 206 member hunting, fishing and trapping clubs, thank you for providing this opportunity to support Governor Walker's three part proposal to slow the spread of CWD in Wisconsin.

The DATCP staff prepared Statement of Scope very accurately describes the state of emergency justifying the use of DATCP's Emergency Rulemaking authority to implement the Governor's directive. The DATCP Scope Statement, after indicating that current "...efforts have not prevented the spread of CWD" states: "The progression of CWD threatens the welfare of Wisconsin's unique hunting culture as well as the multi-billion dollar industry within the state. CWD also threatens captive wild herds maintained by Wisconsin's deer farms. **The situation warrants emergency rule-making because findings of CWD infection are likely to increase prior to the completion of the multi-year process of permanent rule-making.**"

Facts supporting this statement are contained throughout DATCP's website and press releases. CWD has been found in deer farms in six northern and central Wisconsin counties well over a hundred miles from the CWD endemic zone in southern Wisconsin, (Eau Claire, Oneida, Marathon, Oconto Waupaca and Shawano counties). In addition it has been recently reported that CWD has been found in two additional deer farms in southern Wisconsin. It is very obvious that Wisconsin's current CWD deer farm regulations have been a **failure** in preventing the spread of CWD in captive cervid farms in the state.

The Governor has directed DATCP to require all cervid farms to have enhanced perimeter fencing. Enhanced fencing includes the option of a second 8' high fence, a solid wall or electric fencing. The historic experience with deer farm fencing in Wisconsin justifies the Governor's directive. DNR has reported 25 incidents of escapes from deer farms in 2015, 16 in 2016 and 18 in 2017. The Federation supports the enhanced fencing requirement with the choice of which method to be at the option of the farm owner. Several cervid farms in the state already have enhanced fencing. While the Federation understands that building a second 8' high fence or a wall may be expensive alternatives for a cervid farmer, tens of thousands of Wisconsin dairy and cattle operations have successfully used electric fences to contain their domestic livestock for decades.

DNR records indicate that historically 30% of deer farms escapes occurred because of unattended, open gates in deer farm perimeter fences. Therefore DATCP, in this rulemaking, should include a requirement that perimeter fences on cervid farms have electronic monitoring systems on all of their exterior gates that provide warning to the farm owners that gates are open.

The Governor has also proposed a ban on the movement of any cervids between cervid farms in the state in order to prevent the further spread of CWD in Wisconsin. While understanding the Governor's concern behind this proposal, the Federation recognizes the financial hardship this would bring to cervid farmers. The Federation does support a modified version of the Governor's proposal. We support a prohibition of the movement of cervids from cervid farms in CWD impacted counties to counties that have not been impacted by CWD. A perfect example of this occurring was the discovery of CWD in a Waupaca County shooting preserve deer herd that had received deer from a Iowa County deer farm that was found to have a 20% prevalence of CWD in their deer herd.

The time for the DATCP Board to act is NOW. The Board should handle the continued spread of CWD in cervid farms in this state the same way that they would handle the spread of Bovine Tuberculosis or Brucellosis in the cattle of this state.

Submitted by the Wisconsin Wildlife Federation
By George Meyer, Executive Director

Nancy and Peter Minx
2240 Lingering Pines Ct
Saint Germain, WI 54558

Wisconsin Department of Agriculture, Trade and Consumer Protection
ATTN: Alex Girard
Small Business Regulatory Coordinator
P.O. Box 8911
Madison, WI 53708-8911

June 14, 2018

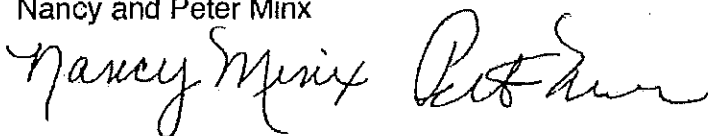
Dear Mr. Girard:

Both my husband and I volunteer at Wildwood Wildlife Park. We started our volunteering journey with the zoo one year ago after we retired. We really love this zoo and all it has to offer the guests. The hands-on experiences are awesome. Being able to walk among the deer and hand feed them is amazing. There are so many aspects of nature that the zoo is teaching each and every day. Wildwood Wildlife Park has a tremendous amount of schools that come to the zoo to learn about nature first hand. We do not favor these proposals stated in the Emergency Scope Proposal. As volunteers at the zoo we are just now understanding all the regulations these folks have and it is overwhelming. I cannot imagine imposing more regulations on their facility. I understand Wildwood Wildlife Park has been on the CWD monitoring for over 17 years and have not had any deer test positive for CWD. These rules will not fix the CWD problems that have been around for 25 years or more. Since the park owners Judy and Duane Domaszek told us about the Emergency Ruling I have done some research on this matter and there is no scientific evidence that CWD came from deer farms. It sounds like the DATCP needs to blame someone and the deer farmers got the wrap.

The Emergency Scope Proposal will not do anything to protect the wild deer nor will it help the deer farmers other than run them out of business.

Sincerely

Nancy and Peter Minx



Carlson, Michael M - DATCP

From: misty.mont14@yahoo.com
Sent: Tuesday, June 12, 2018 10:28 PM
To: Carlson, Michael M - DATCP
Subject: Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing

I do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing.

Misty Montgomery
Brodhead WI

Carlson, Michael M - DATCP

From: greg listle <ecrwhitetails@hotmail.com>
Sent: Thursday, June 14, 2018 10:13 AM
To: Carlson, Michael M - DATCP
Subject: Fwd: Emergency CWD rule concerns

[Get Outlook for iOS](#)

From: Phish Man <phishmann@gmail.com>
Sent: Thursday, June 14, 2018 10:07 AM
To: ecrwhitetails@hotmail.com
Subject: Fwd: Emergency CWD rule concerns

----- Forwarded message -----

From: Phish Man <phishmann@gmail.com>
Date: Thu, Jun 14, 2018, 9:43 AM
Subject: Emergency CWD rule concerns
To: Greg Listle <cauclairriverwhitetails@hotmail.com>

Hello Michael, My name is Michael Morrell. I'm a resident of Marinette County, and an avid hunter. Although I hunt in Shawano and Marathon county.

My concerns are with this emergency rule, or rules that are being discussed. Has the criteria for implementing an emergency rule even been met? Is there a human health hazard with CWD? The department of AG is making new rules to combat CWD when they still have no idea what causes the disease or even if the deer actually die from CWD. The rules that are in place right now seem to have no effect on the spread of CWD. They just found a doe (southwestern part of the state) on a double fenced fully contained deer farm that was 15 years old. That proves two points right, double fencing, and no deer brought in or left they're farm. Also, this deer was 15 years old. If the dept of AG had hard evidence of what causes CWD, or how it is spread, I'd be OK with emergency rules. But to make knee jerk reactions to a problem is not the way to solve a problem.

The rule that bothers me the most is hunters transporting their deer from one county to another. The idea is to keep the spine and the head of the deer in the county it's shot in? I'm a little confused with this rule. The whitetail deer does travel from county to county. The Coyotes that eat the carcasses will also travel from county to county. The scavenger birds that will eat on the carcass will fly from county to county. Are they worried about the CWD prion getting into the ground? Into the plants that deer might eat? What exactly are they trying to achieve with this rule? Do they expect hunters to quarter their deer out in the fields or in the swamps where they are shot? I hunt in Marathon county and my cabin is in Shawano County. Am I to bring the deer back to Shawano to quarter it up then bring the spine and head back to Marathon county? What about the people from down south that hunt up north? Has the baiting ban helped combat the spread at all? Does anyone even know if it helps combat the disease? This new transportation rule is being brought forth with no facts, and no evidence that it will have any effect. Hunter numbers are falling every year. This will push the numbers even lower.

If CWD was such an emergency, our deer population would be decimated by now. The deer population is just the opposite.

Has anyone looked at the deer numbers in the eradication zones? They are huge.

Carlson, Michael M - DATCP

From: Deb Myers <dmyers.1957@yahoo.com>
Sent: Monday, June 11, 2018 12:17 PM
To: Carlson, Michael M - DATCP
Subject: Recent Proposals

To Whom It May Concern,

My name is Debra Myers Ellinger and I am a concerned voting citizen. The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The three-step plan will prevent the genetic resistant research to continue what has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely
Debra Myers Ellinger
Lyndon Station, WI

Carlson, Michael M - DATCP

From: toates51@gmail.com
Sent: Wednesday, June 13, 2018 2:16 PM
To: DNRAadministrativerulescomments@wisconsin.gov; Carlson, Michael M - DATCP
Subject: Proposed Emergency Rule Change for Deer Farmers in Wisconsin

I am Thomas Oates, Commissioner on the Texas Animal Health Commission appointed by the Governor of Texas, Chair of the TAHC Cervid Working Group and also serve on the Texas Parks and Wildlife CWD Working Group. Here are my comments on the proposed rule for deer farmers in Wisconsin.

Deer farmers provide an unlimited supply of CWD samples for research. Many of these samples come from the same cervid, year after year as opposed to free range deer which is sampled post mortem.

Deer farmers are the key to creating a historical record of CWD in the lifespan of an individual deer. This information will be invaluable to the continued research of CWD. I make these comments because excess regulations in the private sector will eventually force these deer farmers out of business. This will eventually have an extreme impact on the Agriculture commerce of Wisconsin.

I appreciate your consideration of these comments when adopting regulations that have such a devastating effect on private ownership of deer.

As a Commissioner on the TAHC I cannot foresee placing this type of undue regulations on any of agriculture.

Sent from my iPhone



Clint Odekirk
920.477.5805 | sodekirk1961@gmail.com

Josh Odekirk
920.979.1788 | jodek393@yahoo.com

June 7, 2018

Wisconsin Department of Agriculture, Trade & Consumer Protection,

We operate a small multi-generational red deer farm in Fond du Lac county. We have been in the CWD herd status program since it's inception. We are concerned about the effect that CWD has on the deer farming industry in Wisconsin. We are also sportsmen and are concerned about the effect CWD has on the wild deer population of the state.

We understand the need for regulation to control the spread of CWD but we disagree with some aspects of the proposed emergency rules.

We believe that it is the ethical responsibility of deer farmers to ensure that they are not contributing to the spread of CWD in Wisconsin. Double or solid fencing is the most effective way of ensuring that CWD is not spread from captive herds to the wild population and vice versa. Though cost effective, we do not believe that three strand electric fence is effective at controlling movement of most deer species. If the animals aren't successfully separated there will be the opportunity for nose to nose contact between wild and farmed deer. Furthermore, electric fences in these settings will be prone to shorting out unless they are properly managed to control vegetation rendering them even less effective. It is highly unlikely that these fences will be properly mowed in many cases.

We recommend removing three strand electric fence as an acceptable double fence strategy to ensure that farm raised and wild deer are properly separated.

Controlling farmed deer movement in CWD effected areas is also an important part of controlling the spread of CWD. However, controlling the movement of deer from farms that are double fenced and that are actively participating in the CWD herd status program is excessive. Once the double fence is installed CWD won't be spread to or from the farmed animals and the monitoring shows that there is low likelihood of infected animals being present in the herd. Movement of these animals has an extremely low risk of contributing to the spread of CWD.

On our farm we have double fenced pastures on two farms less than one mile apart. According to this rule, as we understand it, once CWD is identified in Fond du Lac county we would not be able to move animals from one pasture to the other. These animals are part of the same herd under the same operation. This movement restriction will have huge impacts on our operation.

We recommend changing the rule to allow movement of animals on operations that are both double fenced and enrolled in the CWD herd status program. This will further incentivize farmers to be in the program.

We sincerely hope a common-sense approach can be added to this emergency rule so that our farm may be available to be passed down to the next generation when that time comes. If it is implemented as it is currently worded our farm will be out of business and the farming legacy will be lost.

Thank you for this opportunity to submit our comments on this rule. We welcome you to contact us to discuss these suggestions if you have any questions or concerns.

Sincerely,

Clint Odekirk
Odekirk Deer Farm

Josh Odekirk
Odekirk Deer Farm

Odekirk Deer Farm | W2681 Middle Road | Campbellsport, WI 53010 | www.facebook.com/odekirkdeerfarm

Carlson, Michael M - DATCP

From: R.C. Ottwell <jrottwell@plumbersgroup.com>
Sent: Thursday, June 14, 2018 10:10 AM
To: Carlson, Michael M - DATCP
Subject: Please know that

- Shutting down deer farms in Wisconsin is not going to stop the spread of CWD
- Deer farmers could end up being the solution to CWD by breeding for and producing resistant animals much like the sheep industry did with Scrapies
- Emotional politically driven ideas that are not founded by science may be appealing to the uninformed public but it won't stop CWD
- The cervid industry has spent over a decade working to prevent CWD, but unfortunately the wildlife agencies have not done their part and now the free ranging herd is jeopardizing our herds and our livelihoods.
- The 4 most highly infected CWD counties in Wisconsin have populations that have doubled or nearly doubled since 2002 when CWD was first discovered. How could this possibly be considered an emergency that warrants destroying an entire industry?
- No one would ever consider shutting down 75% the cattle industry in a state due to a disease.
- Many Wisconsin deer farms are already double fenced and with the Governor's proposal, those farms will also not be able to move within the state. Why would anyone spend money to double fence if movement is going to be prohibited anyway?
- Science does not support transmission through fences.

CWD in Wisconsin does not warrant an emergency rule!

Sincerely,
Jr Ottwell Tx 1654
Texas Deer Manager since 1983
Texas Deer Farmer since 1997

Carlson, Michael M - DATCP

From: Girard, Alexander C - DATCP
Sent: Friday, May 18, 2018 1:49 PM
To: Girard, Alexander C - DATCP; Carlson, Michael M - DATCP
Subject: Public Comment from Mr. Dennis Pagel - ATCP 10 Emergency Rule

Record of Interaction: ACTP 10 Emergency Rule (SS 049-18)

Dennis Pagel called Alex Girard during the afternoon of May, 18th 2018.

I spoke to Mr. Dennis Pagel regarding his concerns over ATCP 10 emergency rule at approximately 1:30pm on May, 18th 2018.

Mr. Pagel was concerned with the fast pace of the regulatory proposals and the impact it would have on his breeding farm, Grandview Whitetails in Portage County. He was not concerned with the proposal of CWD affected inter-county movement as this what he currently does as part of his business model. His farm was double fenced as part of its construction in 2007, and he estimated that he has invested \$200,000 in his current herd. I informed Mr. Pagel of the administrative rule process and opportunity to appear at public Board meeting on 5/24/2018, the tentative date for the preliminary public hearing, and through comment periods.

I strongly suggested that he write a formal letter or email stating his concerns and comments with the proposed rule and submit them to me to be passed to either the Board or appropriate personnel for review and consideration.

I spoke to his wife and gathered his email address to be of assistance in the future and where to send his public comments to. I emailed him at approximately 2pm on May, 18th 2018.

Alexander Girard
Legislative Advisor
Department of Agriculture, Trade, and Consumer Protection
(608) 224-5114



To Whom It May Concern,

My name is Andrew Peart and I am a concerned citizen. The recent proposals of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The proposals will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free-range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,

Andrew Peart

14135 W Northridge Dr

Evansville, WI 53536

Carlson, Michael M - DATCP

From: Suzanne Perry <suzymack@citizens-tel.net>
Sent: Wednesday, June 13, 2018 11:56 AM
To: Carlson, Michael M - DATCP; DNRAAdministrativeRulesComments@wisconsin.gov
Subject: Emergency Rule for CWD

I am opposed to the Emergency Rule for Farm Raised Deer Mivement and enhanced fencing.

Jack and Suzanne Perry
411 29th St
New Auburn, WI. 54757

Carlson, Michael M - DATCP

From: Taylor Pfeuti <taylor@kgtruck.com>
Sent: Monday, June 11, 2018 8:16 PM
To: DNR Administrative Rules Comments; Carlson, Michael M - DATCP
Subject: Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing

To Whom It May Concern,

I would like to express my great disagreement with the proposed Emergency Rules for Farm Raised Deer Movement and Fencing. To be clear, I DO NOT SUPPORT THIS IMPOSED RULE/LAW.

If you choose to proceed, I hope you go to each one of the farms and help the families euthanize each and every deer and fawn and look each of them (human and animal) in the eye and explain why this is a good idea, what it will do to help, etc. because I strongly disagree that these rules will help control CWD in the WILD deer population.

Deer farmers are helping to research CWD and forcing them out of business is going to disrupt this research process and drag out the process of hopefully finding a cure.

Again, I DO NOT SUPPORT THIS IMPOSED RULE/LAW.

Taylor Pfeuti
F&I Manager

Office: (414) 431-2575
Mobile: (414) 750-8534
Fax: (414) 231-9947
614 N Broadway Ave, Milwaukee, WI 53202
krietegroup.com

Carlson, Michael M - DATCP

From: Jeff Phillips <Jeff@ultrafiberglass.com>
Sent: Sunday, June 10, 2018 6:57 PM
To: Girard, Alexander C - DATCP
Attachments: Reindeergames Customer letters.pdf

Alex,

It was a pleasure meeting you on Thursday. I really got the feeling that you felt how personal and important this is to all of us farmers.

Attached you will find copies of my talk as well as a few letters from customers and one from the president of Reindeer Owners and Breeders Association. Below is a link to the video that I was telling you about (its on you tube, Reindeergames 2017) Thank you for any consideration. We have just become aware that a reindeer in Northern Il. was found to have CWD, as well as an elk in WI. The timing seems a little odd. I hope that our being double fenced will allow us to continue taking the reindeer out during the holidays.

Thank you for your consideration.

https://secure-web.cisco.com/1dLTzE6BbXoupFuxZqkZQvRDLmzGVdbWgz_rMZJibEQpixxtSkRI2HU6SiXqb1ibR_KpNokoiW7GuPTEYbG3d3hvrOkQiPgCjkyscf9IRStpn6Ra9ktyL7YBYb1J2WJi_d_OLbWaZVsiEmAe1ztLQXO2b0kgnkbMICpvP9jhmXuIFF-MMRn96cGSvdb7FS1Hfw4PPj6iuwHZARddAliXpb_vCtX_EFtnP7WT5Aw9EG3IHf1VM5zRCqe-DBD1gsAGZcE6suaHDWBKkZtukVSdNzqau3YA3ikytsAzpd9ISK8/https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DxUoWvQ2U91l%26feature%3Dyoutu.be

Jeff Phillips
Reindeergames
262.224.1199

Carlson, Michael M - DATCP

From: Jeff Phillips <Jeff@ultrafiberglass.com>
Sent: Sunday, June 10, 2018 7:05 PM
To: Carlson, Michael M - DATCP
Attachments: Reindeergames Customer letters.pdf

Michael,

It was a pleasure meeting you on Thursday.

Attached you will find copies of my talk as well as a few letters from customers and one from the president of Reindeer Owners and Breeders Association. Below is a link to the video that I was telling you about (its on you tube, Reindeergames 2017) Thank you for any consideration. We have just become aware that a reindeer in Northern Il. was found to have CWD, as well as an elk in WI. The timing seems a little odd. I hope that our being double fenced will allow us to continue taking the reindeer out during the holidays.

Thank you for your consideration.

https://secure-web.cisco.com/1KA1CmGWOwegejPjCi2tVN81Lojm5OsA1ngEO1GB1HRJQ1NxZpFnKktH_RjDPg_ZO8XKDncTJ1Xd6P9PBsnnrWoVV9I2omFSH9f9kTXGbqQMvEw7nyW2-4Pu6GAMzQW2ZqtX7KgrGb7Xf3YEZdOoCl4sMme200NAQOox9qbtesG8-G02Q_6RQtiDNOWOf7sjJ4jZTEC0zJYPoMiYB2ZEKGMwhigm1Pyjqd-bXpiJdM1amrur8m2OQwyx95InI82AR4pfDltfvz2m5cgBvaWQSBK1Q_sxKO90ghh0J_mgc0SQ/https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DxUoWvQ2U91I%26feature%3Dyoutu.be

Jeff Phillips
Reindeergames
262.224.1199

Carlson, Michael M - DATCP

From: Dedinsky, Paul - DATCP
Sent: Monday, June 11, 2018 8:53 AM
To: Carlson, Michael M - DATCP; Girard, Alexander C - DATCP
Subject: FW:
Attachments: Reindeergames Customer letters.pdf

Please add these comments to the list!

Paul C. Dedinsky, J.D., Ph.D.
Chief Legal Counsel
Department of Agriculture, Trade and Consumer Protection
2811 Agriculture Drive
Madison, WI 53708
office: (608)224-5022
cell: (262)271-1188
paul.dedinsky@wisconsin.gov

-----Original Message-----

From: Jeff Phillips <Jeff@ultrafiberglass.com>
Sent: Sunday, June 10, 2018 7:00 PM
To: Dedinsky, Paul - DATCP <Paul.Dedinsky@wisconsin.gov>
Subject:

Paul,

It was a pleasure meeting you on Thursday. I got the feeling that you would like to meet the reindeer. We should make that happen soon.

Attached you will find copies of my talk as well as a few letters from customers and one from the president of Reindeer Owners and Breeders Association. Below is a link to the video that I was telling you about (its on you tube, Reindeergames 2017) Thank you for any consideration. We have just become aware that a reindeer in Northern Il. was found to have CWD, as well as an elk in WI. The timing seems a little odd. I hope that our being double fenced will allow us to continue taking the reindeer out during the holidays.

Thank you for your consideration.

https://secure-web.cisco.com/1ZqrodVvuRDpEC4utz4D1uENbRIS1oije7lQTeAxfjcGSBHfH8CpLdVVZzn5BjE_V1AIQ_1HdEaAmqfdoe7BphWFkPkuAgV6hAcOctz1OOQTcBRIP8S3pJ63k7gIXt_csEOGtuAMmut2aZrY7C5yxPv-rnlbWWBgLd4aBRX8dW2-RS1TY27w4EcRR74__Zuay_BpkcmXQB6anx3kc3DLrtzbUDY4S0c25APLcfOVPzKas5pJRUMxVV5jekJD4DM6StsVPj7kYQEWXBYfE-TX3RO4OM7_3JVdQRFwpw9yNNZY/https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DxUoWvQ2U91%26feature%3Dyoutu.be

Jeff Phillips
Reindeergames
262.224.1199



June 7, 2018

Secretary Harsdorf, DATCP staff and board members. Thank you for inviting us here today to give our testimony.

My name is Jeff Phillips, my wife Cindy and I own a reindeer farm in Hartford near Holy Hill. I am the Central Region Director for Reindeer Owners and Breeders Association.

We feel that reindeer should be exempt from this "emergency rule regarding farm-raised deer movement and fencing" for several reasons.

If this passes as currently written it would shut our business down. And that would affect more than just our family.

It would affect our community. We have spent over 15 years building Reindeergames by investing all of our available cash and a lot of hard work. We contribute to the local economy in that we buy straw and hay from local farmers, feed from the co-op and our vet is on the farm on a regular basis. We also purchase other items that support our farm, equipment, and animals.

We have been compliant with DATCP and the USDA. Our herd is CWD free for over 16 years.

I think we have a case of unintended consequences where we are trying to address the CWD issue prevalent in the wild white tail herd. I don't think Governor Walker intended to include reindeer in this rule. Reindeer are important to tourism in our state. We exhibit in dozens of communities during the holiday season and we draw thousands of shoppers into these downtown areas.

After they see reindeer, they buy coffee, gas, and go shopping. One of our clients collects over 22,000 toys for charity during their event.

Reindeer should not be considered "captive" animals as there are no wild reindeer in the US. Reindeer have been domesticated longer than any hooved stock on the planet. Most reindeer herds are small, and like us these owners do a wellness check on each animal at least once a day

Reindeer Games • 5751 East Waterford Road • Hartford, WI 53027 • 262/670-9515

www.reindeergames-wi.com

"Believe"

Reindeer are one of the most regulated animals in the country and raising them is already a challenge, as we test for TB, Brucellosis and CWD 100%. Our veterinarian inspects our herd every 30 days during the holidays as well as often during the year.

I also have a point to make about enhanced fencing.

Over 10 years ago when the state proposed that we double fence we were told that if or when CWD came into our county we would not be locked down. So we spent the money to double fence. I think that it is important that we all do what is best to control the spread of CWD while we find ways to allow commerce to continue.

The income from our reindeer business is critical to the existence of the family farm. The health and comfort of the reindeer is our highest priority. Due to the high value of these animals, they are handled and treated more like pets than livestock.

Thank you,

Jeff Phillips, Owner
Reindeer Games
Hartford, WI

WI Farm Registration #19-000480
USDA Certificate #35-C-0226
WI TB #35-ATB0166
WI CWD #35-CW-02-275
ROBA Farm #129
WLIC Premise #003ARKX
WDATCP Reg 128351-AC

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www.reindeergames-wi.com
"Believe"

Carlson, Michael M - DATCP

From: kama amidon <kamis42002@yahoo.com>
Sent: Wednesday, June 13, 2018 11:29 AM
To: Carlson, Michael M - DATCP
Subject: CWD on deer farms

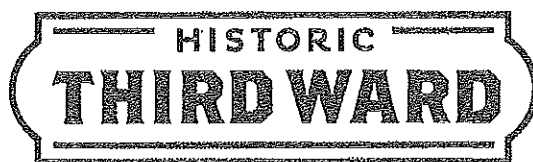
Hello,

I'm writing to inform you that I do NOT support the Governor's proposed emergency rules to combat CWD. Banning live animal movement for farm-raised deer and requiring deer farms to double fence will only put small businesses out of business, not reduce CWD. The government should be investing money into research, and if these farms can longer continue to be in business it will also stop research that is currently being conducted by farms on genetic resistance to CWD. Deer farmers are a victim of CWD, not the cause and we need to all work together to reduce the spread.

Thank you for your consideration,

Kama Amidon PirkI
Monticello WI 53570

Sent from Yahoo Mail for iPhone



May 31, 2018

The Honorable Scott Walker
Governor of Wisconsin
115 East State Capitol
PO Box 7863
Madison, WI 53707

Dear Governor Walker,

We've recently been made aware of your executive order meant to contain the spread of Chronic Wasting Disease (CWD) in white-tailed deer populations. Unfortunately, this order was broad enough to also include reindeer and as such, directly impacts our business.

This year, the Historic Third Ward Association will be celebrating the 30th Anniversary of our signature event, Christmas in the Ward. This event brings the community together for an old-fashioned tree lighting ceremony in the heart of Milwaukee's Historic Third Ward neighborhood.

Last year's event was, by all accounts, the biggest and best event in recent memory attracting nearly 5,000 visitors to downtown Milwaukee and the Historic Third Ward. Neighborhood retailers and restaurants benefit directly from the visitors attending the event. And in 2017, cookie sales at the event allowed us to donate over \$1,700 to Ronald McDonald House Charities of Eastern Wisconsin.

Since you were on hand to help light the tree as Milwaukee County Executive in 2006, you know that in addition to the tree lighting, we offer chestnuts roasting on an open fire, horse-drawn carriage rides, a cookie sale, fireworks over the river, photos with Santa, and live reindeer provided by Reindeer Games located in Hartford, Wisconsin.

We've worked with Cindy and Jeff Phillips from Reindeer Games since 2006. They are an absolute delight to work with and their reindeer are an essential component of our event. Part of the allure of the event for parents is helping their children believe in the spirit of Christmas. When the children see Santa's reindeer and get to whisper their Christmas wishes to the jolly old elf himself it provides the children with a sense of magic and wonder around the holiday.

Since reindeer are a separate animal from white-tailed deer, I respectfully ask you please amend the order to allow for movement of reindeer. This change will allow the reindeer continue being part of making children's holiday dreams come true at community events such as Christmas in the Ward and others around the state.

Sincerely,

A handwritten signature in black ink, appearing to read "Jim Plaisted". The signature is stylized and cursive.

Jim Plaisted
Executive Director
Historic Third Ward Association

Carlson, Michael M - DATCP

From: Riley, Chris <Chris.Riley@adm.com>
Sent: Wednesday, May 16, 2018 3:46 PM
To: Harsdorf, Sheila E - DATCP
Cc: McClain, Bruce; Dalke, Brad
Subject: CWD - chronic wasting disease

Follow Up Flag: Follow up
Flag Status: Flagged

Secretary Harsdorf, I hope you are doing well. ADM would like to express our concerns on Governor Walker's recent announcement of initiatives to combat CWD. The concern arises if deer farmers do go out of business with the proposed plan. ADM sells around 2500 tons of feed per year to these customers. I understand there is a lot more involved than that, but feel there are facts that are being overlooked and encourage the administration to continue to work with Whitetails of Wisconsin, of which ADM Animal Nutrition is a member.

On this email I have included two of my colleagues from Animal Nutrition if you would be interested in getting any additional information from ADM.

Thanks for your time, and I hope to see you soon. You should have received an invitation from Mike Naig regarding the Farm Progress Show in Boone, Iowa for dinner on August 28 and to attend the show on August 29. Ben Brancel attended once, and Lt. Gov. Kleefisch has attended a couple of times. We do a similar day at the FPS for LG's.

Chris

Christopher T. Riley | Director – State Government Relations | Archer Daniels Midland Co.
4666 Faries Parkway | Decatur, IL 62526 | ☎: 217.451.4403 | 📠: 217.848.0671 | ✉: Chris.Riley@adm.com

Confidentiality Notice:

This message may contain confidential or privileged information, or information that is otherwise exempt from disclosure. If you are not the intended recipient, you should promptly delete it and should not disclose, copy or distribute it to others.

Carlson, Michael M - DATCP

From: Amy Robinson <robinson@yousq.net>
Sent: Thursday, June 14, 2018 2:01 PM
To: Carlson, Michael M - DATCP
Subject: Cervid emergency rules

I am writing to voice my concerns and disagreement with Governor Walkers proposed cervid movement rules. These changes would put farmers out of business and destroy an industry without helping anyone. The professional cervid farmers of the state and country are working to gain knowledge and understanding and control of this disease. Killing the industry and putting these people out of business will only hurt their research. Please reconsider inhibiting movement with rules that make no sense and help no one. Listen to their plans and help them to find answers that will help all deer, farmed and wild. Make Wisconsin better not worse. Do not make this proposal law!!

A concerned veterinarian and citizen,

Amy Robinson

Amy Robinson DVM
Military Ridge Veterinary Service
4788 County Rd. YZ
Dodgeville, WI 53533
608-935-1406
608-574-9811

Carlson, Michael M - DATCP

From: Carley Devine <cdevi648@gmail.com>
Sent: Tuesday, June 12, 2018 9:41 PM
To: Carlson, Michael M - DATCP
Subject: Walker Cwd Proposal Comment

Good evening,

I wanted to share with you my verbal testimony as well as reiterate in this message my opposition to governor Walker's CWD proposal. I find it extremely horrific that it is possible to blatantly attack an industry without just cause or scientific proof to support the decision. Preventing the movement of animals in cwd impacted counties is wrong for two reasons: first, the deer owners have absolutely nothing to do with cwd positive animals in the wild (nor is it their fault) and second, it will completely end their businesses. If these individuals can't move their animals, they can't make money to feed their animals and they will all die.

As a previous Walker supporter, and someone who would want him to do well in the upcoming election, I worry that this will reflect poorly on his image (destroying small businesses in Wisconsin and thousands of animals dying as a direct result of his decision). Please share with him that this would devastate everyone involved (himself- his reputation as a small business supporter- included), and have no effect on cwd in Wisconsin. There are better options that would do less damage to families, businesses and animals. I strongly believe solutions can be found that help everyone involved (and reduce cwd) if you invite deer farmers to work together with you. Thank you and feel free to contact me with any other questions or concerns. (Thoughts continued below)

Hello and thank you very much for hearing my voice and all the voices in this room that have livelihoods at stake with this decision. I met and fell in love with a man who's had a passion for deer farming since the day I met him. He's worked on a deer farm in some degree for the last 9 years. I didn't grow up outdoorsy, my dad never took me hunting. But when I met Ryan, the way he talked about hunting and his eyes would light up, I thought I could try this. Last summer I got my hunters safety- I was the oldest person there. Looking around at all the young kids practicing gun safety and holds made me excited to share this tradition some day with my future children. I learn something new about wildlife from this man every day. Him and the rest of the deer farmers care as much about what's happening with deer and cwd as those that wrote the proposal. Which is why it hurts me to now be forced to watch him and others fight for what they love. Deer farmers go through great lengths to avoid getting cwd and comply with all the regulations to reduce the chances of getting it. We are not the enemy, we should not be the scapegoat to this issue. How would it look to demolish an entire Wisconsin industry which then trickles into so many others, and then be no closer to eliminating cwd?? I think it's a mistake to peg this industry as the problem when really we want a solution to cwd too. Destroying a huge resource, this industry, is counterproductive, if the true intention really is to mitigate cwd.

My dad always told me to respect everyone even if they have a different opinion as you. Therefore, I'd like to respectfully say that the people who support this proposal are fighting for something that costs them nothing. It doesn't take away their lives. This decision costs us everything, our farms, our income,

our passion for the business and animals. They lose nothing by this proposal not passing and we lose everything if it does.

Another point I'd like to make is that other livestock farms are not being faced with the possibility of not being able to move their animals or animal products like beef, sheep or dairy farms (when there are diseases that can occur within their industries), so it's not right that we are being discriminated against with this proposal.

Finally, I want to talk you about WHO this decision affects. I'm talking about the little kid who's parents farm has to euthanize everything on it because they can no longer feed the animals because they can't sell them because an unfounded proposal says they can't move them. I'm talking about the young mans dream who will die right before it ignites into making a difference in this industry. I'm talking about the farmer and his wife who can't afford rent or feed because their farm will go under. I'm talking about the young man who wont be able to carry on in his fathers footsteps, to pursue his passion of working with animals and take over the family farm. These are the impending realities of Wisconsin families in this room and those who couldn't make it today should this proposal pass. Do we really want to destroy families and farms on a guess- on an assumption not founded in science, that deer farmers are to blame for perpetuating cwd?

Thank you for listening and I compel you to consider the hundreds of Wisconsin families lives who are at stake with this decision. I also ask that if you too want to find an answer to the cwd problem, to not eliminate an avenue to the solution. Don't approve this proposal. Thank you for your consideration.

Sincerely,
Carley Rodenkirch

Carlson, Michael M - DATCP

From: roadz@charter.net
Sent: Tuesday, June 12, 2018 6:20 PM
To: Carlson, Michael M - DATCP
Subject: Emergency Proposal Comments

To Whom it may concern, i am writing this email as my formal comments. I am writing this comment to say that we DO NOT support the proposal regarding whitetail deer fencing or movement. DATCP already has control of double fencing and this issue should be solely theirs to deal with. This issue is 100% political and has no science base. As farmers yourselves, we hope the board understands the this issue from our point of view. Groups against deer farming keep bringing up escapes. They can not even get the actual number correct (shows how much their own bias is playing into their argument). Last year there was 20 escapes, not 30, not 25. These animals were all euthanized and tested for CWD. No cost to the state or anyone besides the farmer, no CWD found. They seem to think these numbers are significant, 20 escapes is 1% of 1% of the captive cervid population in Wisconsin. If escapes are the issue why should farmers double fence their entire property? Would gates not be sufficient? Or are they worried about wild cwd positive animals infecting farm raised deer? Farmers are victims and wanting to be a part of solution. Thank you, Ron and Terri Rodenkirch

Carlson, Michael M - DATCP

From: Ryan Rodenkirch <ryanroads32@gmail.com>
Sent: Saturday, June 9, 2018 3:46 PM
To: Carlson, Michael M - DATCP
Subject: Comments for DATCP Board

Board, I want to thank you for taking the time to let me speak today. My concerns today are with what should be the goal of every individual in this room, a solution to CWD. So I must ask are we trying to find a solution to CWD or are we trying to regulate an industry out of business? Whether individuals support cervid farming or not, is it not in everybody's vested interest to do away with the disease for the species long term? In 2001, when CWD was first identified researchers stated in 15 years CWD would wipe out the population. 2018 has brought no population decrease due to disease, no transfer to humans, and bias sampling techniques. Wildlife management is not about managing wildlife, but the management of the people utilizing the resources. The management decisions from the early 2000's have been deemed a major failure, especially when it comes to public perception and trust. Should we not learn from history rather than repeat it? If you ask the average Wisconsin hunter about CWD they are going to tell you CWD is a political disease. Yet here we find ourselves today.

So I must ask, do those opposed to cervid farming have their own agenda in mind or the species that is so important to Wisconsin culture and economics. To me, it seems destroying an industry with a number of potential solutions to chronic wasting disease is more important than saving the Whitetail Deer. They can say our solutions aren't valid, but where is the science? I have yet to read a published journal showing farmed cervids transferring cwd to the wild.

Over the last month I find myself asking the reasoning behind the governor's recent proposals. Is the fencing proposal meant to protect farmed cervids from those in the wild? The wild currently has a CWD prevalence rate many times higher than captive cervids. The state has also been moving in and releasing untested elk into the wild for years. Why would farmers be responsible for paying for any of this when our animals are regulated and properly managed under a federal program? Why should cervid farmers be punished for the lacking management strategies of wild cervid populations? Hunter harvest sampling is not a solution to CWD. My county currently has 1 positive wild deer harvested in 2017, and no positive captive animals. Why should this affect my business and animals? How could I have prevented this? The 14th amendment states, innocent until proven guilty, but why are Cervid farmers guilty until proven innocent?

As one of the 600,000 Wisconsin hunters, I like a majority completely disagree with these proposals. I ask this board to do what is right, and say no to the unjust politics. Thank you all for your time.

Carlson, Michael M - DATCP

From: Ryan Rodenkirch <ryanroads32@gmail.com>
Sent: Thursday, June 14, 2018 10:08 AM
To: Carlson, Michael M - DATCP
Subject: Comments

To whom it may concern, I am writing this comment in regards to Mr. George Meyer. Mr. Meyer, the head of the Wisconsin Wildlife Federation, claims to be the voice of 600,000 hunters and 200+ affiliate clubs. However, I have made contact with some of these groups listed as affiliates under the WWF banner and they are not familiar with Mr. Meyer, and are unaware of the opinions he holds and also presents on their behalf. It appears most groups receive an affiliate membership to the WWF for projects they have done for their own organization, and no assistance from the WWF. As a sportsmen and deer breeder this issue is quite upsetting to me. Someone who claims to have the voice of many, and then is relaying this to the board for decisions that affect livelihoods and Wisconsin's resources, but is more geared towards personal opinion and politics. The WWF website is also very outdated. Many of the affiliate websites do not work, if communication between the organizations existed this should not occur! I would request that the board do their due diligence on this matter. Thanks, Ryan Rodenkirch Whitetails of Wisconsin

Sent from my iPhone

Carlson, Michael M - DATCP

From: mproses@charter.net
Sent: Monday, June 11, 2018 1:34 PM
To: Carlson, Michael M - DATCP
Subject: CWD Research

To Whom It May Concern,

My name is Shelly Rose and I am a Wisconsin, concerned citizen. The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The three-step plan will prevent the genetic resistant research to continue what has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,

Shelly Rose

Eaton Highland Farm
5587 State Hwy 29
Denmark, WI 54208

Gretchen Schmidt DVM
Samuel Vainisi DVM

920-863-3609



May 23,2018

My name is Gretchen Schmidt. I am a veterinarian and a deer farmer from the Green Bay area. In 1994 we bought a family dairy farm and repurposed it into a deer farm. This kept the acreage from being developed into a housing development.

As a deer farmer, I hate CWD as much as anyone. In order to combat this disease I think we should learn from the USDA's genetics based flock clean up plan for Scrapie in sheep. Scrapie is the oldest known TSE and through genetic testing it has been controlled and is no longer a threat to the sheep industry.

Current research in cervid genetics is on going and we all know that some cervids such as mule deer are very susceptible to CWD while others such as fallow and red deer are not. There are some markers in white-tail deer that look promising for resistance to CWD. These are being identified and if prove to be true would be an excellent way to reduce the disease in the white tail herd by introducing these genetics. We as deer farmers are supporting this research through our foundations so both the farmed deer and the wild herd will benefit. If you destroy our industry, this source of funding will disappear.

A handwritten signature in black ink that reads 'Gretchen Schmidt DVM'. The signature is written in a cursive, flowing style.

Gretchen Schmidt DVM

Eaton Highland Red Deer Farm
557 State Hwy 29
Denmark, WI 54208
920-863-3609
eyevets@msn.com

June 7, 2018
Public Hearing on Emergency Rule for CWD

Re: Unable to move live deer if CWD positive deer in the county

My name is Gretchen Schmidt. I am a veterinarian and a deer farmer. I raise red deer which are very resistant to CWD. I have tested 10% of my herd yearly for CWD since 2001. I have been double fenced since 2002. There are no cases of CWD in my county as YET but it is coming.

Not all deer/elk farms raise animals solely for hunting purposes which is how the news media and therefore the public portray us.

Farm raised venison is a major source of the income for many deer farms. We transport the live animals to a state approved facility outside of the county where they are inspected on the hoof, humanely slaughtered, post-mortem inspected by a state inspector, processed, and vacuum packaged for resale to the public and restaurants. If we are not allowed to transport these animals, the state inspectors, the processing facility, packaging, labeling, farmer's markets, and restaurants that serve this venison will lose income.

This rule for the inability to transport live animals if a CWD positive deer is detected in the county of origin, has not been well researched for its ramifications to many associated industries. Please re-think this portion of the emergency rule.

Thank you,


Gretchen Schmidt

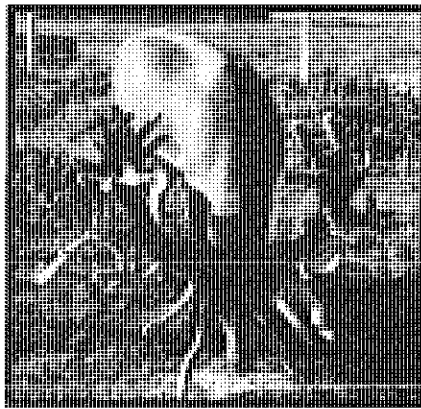
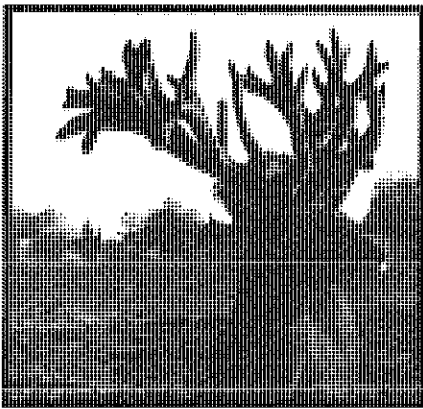

Samuel Vainisi



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Carlson, Michael M - DATCP

From: Jerry Schooff <schooffjerry@gmail.com>
Sent: Tuesday, June 12, 2018 7:27 PM
To: Carlson, Michael M - DATCP
Subject: Deer farms

I do NOT support the emergency rules for farm raised deer movement and enhanced fencing.

Jerry W. Schooff
202 E. 4th Ave.
Brodhead, WI 53520

Carlson, Michael M - DATCP

From: Marc Schultz <schultzamarc@gmail.com>
Sent: Wednesday, June 13, 2018 11:49 AM
To: DNR Administrative Rules Comments; Girard, Alexander C - DATCP
Cc: Wetzel, John; Meyer, George
Subject: Proposed CWD rules

The La Crosse County Conservation Alliance supports three proposed Chronic Wasting Disease rules regarding prohibiting inter-county movement of harvested unprocessed deer; requiring double fencing for deer farms and prohibiting the movement of deer farm deer from CWD counties. We understand that the proposed rules will require rule changes and additions by both WDNR and WDATCP.

We support the stated positions of both the Wisconsin Conservation Congress and the Wisconsin Wildlife Federation regarding these proposed rules.

We encourage the State of Wisconsin to strongly consider the ongoing growth and expansion of Chronic Wasting Disease in Wisconsin as a serious and potential public health concern as well as a significant threat to the long term health of the State deer herd.

The Alliance encourages the state of Wisconsin to expand statewide to every county the existing CWD detection and testing program and also to provide for convenient and safe disposal of deer carcasses in every Wisconsin county. Together these two additional measures can make the proposed rules more acceptable to the public, particularly hunters.

Thank you for the opportunity to offer our opinion on this important matter.

Marc A Schultz
PO Box 933
La Crosse WI 54601

Carlson, Michael M - DATCP

From: Heather Schwark <hjschwark@gmail.com>
Sent: Tuesday, June 12, 2018 9:00 AM
To: Carlson, Michael M - DATCP
Subject: Emergency Rules for Farm Raised Deer Movement

Hello,

I am writing to state that I do NOT support "The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing" as this will destroy many people's businesses and livelihoods that in several cases the farmers and owners have spent more than half of their lives to build.

Please work WITH these farmers to come up with a better solution to CWD.

Sincerely,

Heather Schwark
Albany, WI



Virus-free. www.avast.com

Carlson, Michael M - DATCP

From: Julie Schwartzlow <julie_schwartzlow@yahoo.com>
Sent: Tuesday, June 12, 2018 8:17 AM
To: Carlson, Michael M - DATCP
Subject: Farm raised deer moement

I do NOT support the Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing.

Julie Schwartzlow
Monticello, WI

Carlson, Michael M - DATCP

From: Charly <charly@myewa.org>
Sent: Wednesday, June 13, 2018 1:10 PM
To: Carlson, Michael M - DATCP; DNRAAdministrativeRulescomments@wisconsin.gov
Subject: DATCP comments to the proposed emergency rule

I am currently the Executive Director of the Exotic Wildlife Association, an international association, based in Texas. I also serve on the CWD task force in Texas and am the Vice Chairman of the Farmed Cervid Committee of the United States Animal Health Association. I would like to make the following comments in reference to the proposed emergency rule proposed for the deer farmers in the state of Wisconsin:

1. This rule, if put into place will destroy the farmed deer industry in Wisconsin by placing undue economic burdens on these farmers and ranchers while doing absolutely nothing to alleviate the spread of CWD. Research has shown that there is very little nose to nose contact among cervids so therefore double fencing, which is cost prohibitive for most farmers, will be of little value in the overall plan for stopping the spread of CWD.
2. Double fencing will carry a tremendous negative appearance to the public. Making the private farms double fence while there is nothing on the free range side of the issue will definitely make the public believe that CWD and its spread is from the breeder side of the double fence.
3. Science has to prevail in these matters. The uninformed public will certainly allow their emotional side to prevail but those of us who follow the science know the answer to the control of CWD is not from an emotional state but from research. Stop the deer farmers and very valuable research will be lost.
4. Genotyping farmed deer and the science learned will most definitely stem the flow of CWD in the future as well and preserve the natural resource.
5. Wisconsin has shown that trying to eradicate the disease is not the answer. There is absolutely no reason to place any EMERGENCY rule into place and destroy a very viable industry. The wild herds are not being affected and those areas that are showing a decline in population can be traced to the predators and human encroachment in those areas.

Thank you in advanced for allowing comments in this matter. Please use the best known science we have available and avoid placing this rule into effect through emotion and junk science.

Carlson, Michael M - DATCP

From: Laurie Seale <maplehillfarms@centurytel.net>
Sent: Tuesday, May 22, 2018 5:14 AM
To: Stamm, Christine A - DATCP
Subject: FW: Emailing: CWD Best Management Practice
Attachments: CWD Best Management Practice1.docx

Hi Christine,

On behalf of Whitetails of Wisconsin, please forward the following email and attachment to the Ag Board.

The attachment was put together by Whitetails of Wisconsin to show what steps the deer farmers are taking (and have been taking for more than 15

years) to mitigate the risks of spreading CWD within our farms. No deer farmer wants to contract CWD. It is a death sentence for a farm.

Everything we have invested into our farms can be jeopardized with just one CWD positive test and that is why we go above and beyond to prevent CWD.

Thanks,
Laurie Seale

Carlson, Michael M - DATCP

From: Laurie Seale <maplehillfarms@centurytel.net>
Sent: Tuesday, May 22, 2018 5:14 AM
To: Stamm, Christine A - DATCP
Subject: FW: Deer farming in the united states
Attachments: Deer Farming in the US 1908.pdf

Hi Christine,
Please forward this email to the Ag Board.

The attached document is from 1908. President Teddy Roosevelt was promoting deer and elk farming way back then! I have taken a few of the sections and pasted them below just in case you don't want to read the entire document. Deer and elk farmers can take marginal land not fit for any other agriculture and turn it into a profit making entity. Back in 1908, the concern was to save the species. Today, deer farmers are engaged in the CWD genetic resistant research as a way to breed an animal that is resistant to CWD. We need to remain in business in order to continue breeding for CWD resistant deer and elk, therefore ensuring that the species will survive and thrive.

Thanks,
Laurie Seale

DEER FARMING IN THE UNITED STATES. INTRODUCTION.

The present bulletin discusses briefly the economic possibilities of raising deer and elk in the United States. It is believed that when the restrictions now imposed by State laws are removed this business may be made an important and highly profitable industry, especially since it will be the means of utilizing much otherwise unproductive land. The raising of venison should be, and is naturally, as legitimate a business as the growing of beef or mutton, and State laws should be so modified as to permit the producer, who has stocked a preserve with deer at private expense, to dispose of his product at any time, under reasonable regulations, either for breeding purposes or for food. The growing scarcity of game mammals and birds in the United States and the threatened extinction of some of them over large parts of their present ranges make the preservation of the remnant highly important. Very important also is the increase of this remnant so as to make game once more abundant. It is believed that by means of intelligent game propagation, both by the States and by private enterprise, many of our depleted ranges can be restocked with big game.

THE DOMESTICATION OF DEER.

A number of species of the deer family have been proved to be susceptible to domestication. The reindeer, however, is the only one that has been brought fully under the control of man. The fact that the European red deer and the fallow deer have been bred in parks for centuries without domestication does not prove that they are less susceptible to the process than the reindeer. The purposes for which they have been held captive and the environment given them have been markedly different. It must be remembered, also, that few attempts have been made to rear and domesticate deer under intelligent management. The work has been largely a matter of chance experiment. If they had been as long under careful management as cattle, they would now, probably, be equally plastic in the hands of the skillful breeder. . . But raising deer for profit does not necessarily imply their complete domestication. They may be kept in large preserves with surroundings as nearly natural as possible and their domestication entirely ignored. Thus the breeder may reap nearly all the profit that could be expected from a domestic herd, while the animals escape most of the dangers incident to close captivity. But the breeder who aims at the ultimate domestication of the animals, and whose herd approaches nearest to true domesticity, will in the end be most successful.

SUMMARY.

The domestication of deer and elk offers an interesting field for experiment, as well as remunerative returns for the investment of capital. The wapiti and the Virginia deer can be raised successfully and cheaply under many different conditions of food and climate. The production of venison and the rearing of both species for stocking parks may be made profitable industries in the United States. **Instead of hampering breeders by restrictions, as at present, State laws should be so modified as to encourage the raising of deer, elk, and other animals as a source of profit to the individual and to the State.** Safeguards against the destruction and sale of wild deer in place of domesticated deer are not difficult to enforce. For this purpose, a system of licensing private parks, and of tagging deer or carcasses sold or shipped, so that they may be easily identified, is recommended. It is believed that with favorable legislation much otherwise ,waste land in the United States may be utilized for the production of venison so as to yield profitable returns, and also that this excellent and nutritious meat, instead of being denied to 99 per cent of the population of the country, may become as common and as cheap in our markets as mutton.

Carlson, Michael M - DATCP

From: Laurie Seale <maplehillfarms@centurytel.net>
Sent: Tuesday, May 22, 2018 5:14 AM
To: Stamm, Christine A - DATCP
Subject: FW: Fence line contact research with deer
Attachments: Fence line contact research with deer.docx

Hi Christine,

Please forward the following email and attachment to the Ag Board.

The attachment shows the research that was conducted back in 2007 in regards to fence line contact between farm raised deer and free ranging deer. The attachment is only the conclusion of the research. If you would like to view the entire research document, please let me know and I will forward it to you.

Research shows there is very little fence line contact and therefore a single fence poses a very low risk for contributing to the spread of CWD.

The proposed rule to force all deer and elk farmers to double fence is a government overreach that is designed to put many hard working farmers out of business. There is no proof that a double fence will prevent CWD. In fact, there were two facilities this past year that tested positive for CWD (1 in Wisconsin and 1 in Michigan) that had been double fenced for 12 years and were closed herds for more than 9 years (meaning they had not brought in any live animals for 9 years) and yet they tested positive for CWD; proof positive that a double fence is not going to stop CWD. Both of these farms were following the rules to the T and were in total compliance with the rules governing our industry. Research has shown that birds of prey and predators can ingest the prions and then spread the prions. No double fence is going to stop the prions from being spread around the state.

Our industry is asking this board to evaluate the science and not carry forward a rule that was implemented due to a small group of individuals who are uninformed of the science regarding CWD. Please do not force an unfunded mandate on an industry that is doing everything possible to protect our animals from the diseased free ranging herd. We also do not see a need to spend taxpayer's dollars to help fund a double fence mandated by the state when it will NOT prevent CWD from continuing to spread throughout the state.

Thank you for your consideration,
Laurie Seale

Carlson, Michael M - DATCP

From: Laurie Seale <maplehillfarms@centurytel.net>
Sent: Tuesday, May 22, 2018 5:14 AM
To: Stamm, Christine A - DATCP
Subject: FW: This Map Spells Trouble for the Future of Deer Hunting | QDMA

Hi Christine,

Please forward the following email and link to the Ag Board. The following link takes you to an article written by QDMA. The article shows the risk that CWD infected carcasses pose to the spread of CWD. It also shows how most hunters are not living/hunting in fear of CWD. Hunters flocked to the 4 most highly infected counties in Wisconsin to hunt for trophy bucks! (please see below the quotes by Dr. Kroll in regards to the CWD zone and the video link where he makes the statements.) The two trophy bucks shown in the article both tested positive for CWD, but yet their body condition and antlers do not support a "sick" deer.

Thanks,
Laurie Seale

Here are the quotes from Dr. Kroll that can also be found in the YouTube video..click the link to hear more of what Dr. Kroll has to say.

Here is a list of the good things that are happening in the CWD zone according to Dr. Kroll.

1. The only management units where the deer herds are growing in Wisconsin are in the zone.
2. The buck that nearly broke the state record came from the zone.
3. 20-50%, depending on the weapon, of the best bucks killed in Wisconsin are taken from the zone.

Carlson, Michael M - DATCP

From: Laurie Seale <maplehillfarms@centurytel.net>
Sent: Thursday, June 14, 2018 4:37 PM
To: Carlson, Michael M - DATCP
Subject: FW: 2018 June hearing for DNR
Attachments: Wisconsin DNR population estimates.pdf; QDMA article.pdf; map showing deer farms and CWD wild infection.pdf; 2018 June testimony for DATCP.docx; Fence line contact research with deer.docx

Attachments include:

Statement by Laurie Seale-Gilman, WI

DNR population estimates directly from the Wisconsin DNR. Clearly shows the herd has doubled in infected counties since first discovered in WI in 2002.

QDMA article showing where the hunters came from that hunted in the 4 most highly infected counties in Wisconsin and the risk that infected carcasses play in the spread of this disease.

Two maps of Wisconsin-first one shows where the deer farms are located in the state and the second one shows where the wild CWD areas in the state are as well as the deer farms. Clearly shows that if deer farms were the problem, CWD would be wide spread throughout the state.

Fence line contact research showing the low risk for transmission through the fence.

Thanks,
Laurie Seale

My name is Laurie Seale and I have been deer farming in Taylor County for 30 years and I am an avid hunter.

The management plan that Dr. Kroll developed years ago, along with the Wisconsin DNR, is working. Only 10% of the positive animals in 2017 were found outside of the 4 original CWD counties with a combined infection rate of 2%. CWD in Wisconsin does not warrant an emergency rule!

Here is some more proof of why I say it's not an emergency. The chart shows the DNR estimated deer populations. Take a look at the 4 most highly infected counties in the state: Dane, Iowa, Richland and Sauk. In two of the 4 counties the population has almost doubled since CWD was first discovered in 2002 and in the other two counties the population has doubled. Please tell me how CWD is an emergency according to these numbers?

According to Dr. Kroll, there are also some good things happening in the CWD zone.

1. The buck that nearly broke the state record came from the zone
2. 20-50%, depending on the weapon, of the best bucks killed in Wisconsin are taken from the zone.

The recent article published by QDMA stated that hunters from 49 different states and most all of northern Wisconsin flocked to the 4 most highly infected counties in Wisconsin to hunt, so not all hunters are listening to the CWD gloom and doom spouted by a few. First, it shows that 32,000 hunters must not be too concerned about eating the meat because most did not test their deer for CWD. Second, the article tells me they flocked there because there are trophy deer unlike northern Wisconsin where the wolves have decimated the population. And third, the map clearly shows how CWD infected carcasses are being transported all over the country and not much is being done to educate these hunters of the risk carcasses pose. I commend the DNR for bringing that risk to light, but unfortunately it is 15 years too late.

As for the double fencing of deer farms, the Wisconsin DNR must take into consideration the economic impact an emergency rule will have on small

businesses. The double fencing alone is estimated to be well over \$20 million so that is more than a moderate to significant economic impact. For the hunting ranches, just the cost of bulldozing the perimeter to be able to put up an enhanced fence, the cost is going to be astronomical. And why would a hunting ranch that cannot move live animals be forced to spend money on a fence that will not accomplish anything? These ranches pose very low risk due to not moving live animals. This proposed unfunded mandate will do nothing to prevent the spread of CWD, but it will put good, hard-working people out of business just to say “we did something”. What the Wisconsin government is trying to do to our industry right now is just wrong.

And what is going to happen to all the animals inside the fence when the hunting ranch owners refuse to spend one more dime on a mandate that just makes our government feel like they are doing something? Who is going to kill all these healthy animals and what will this accomplish? The problem with government today is they impose laws that do not cost them anything individually, but the rules they impose many times have severe consequences for those they are regulating. This rule will not personally cost any of you anything, but it will cost our industry everything...it will put us out of business.

The Governor’s additional fencing proposal has no scientific basis and it puts forth a negative perception of deer farmers to the general public, making it look like we MUST be the problem if all of these additional regulations are necessary. Emotional politically driven ideas that are not founded by science may be appealing to the uninformed public but it won’t stop CWD. Social media and governmental agencies have not accurately portrayed the problem and by proposing unfounded mandates, it further damages the deer industry and does nothing to solve the problem.

The cervid industry has spent over a decade working to prevent CWD, but unfortunately the wildlife agencies have not done their part. They have allowed CWD infected carcasses to move freely all over the country and have allowed free ranging, unmonitored and untested elk to be released into the wild in non-affected counties. In the county that these elk originated in Kentucky, they only

tested ONE elk for CWD. This is hardly a satisfactory surveillance and yet everyone turned a blind eye to the risk these elk imposed. Elk are known to travel greater distances than whitetail deer so now we have these elk traveling to CWD counties and then traveling back to non-CWD affected counties. Are we going to stop this movement as well to prevent CWD from spreading or are we only going to concentrate our efforts on one side of the fence?

The genetic research by Dr. Nicholas Haley to develop CWD resistant animals is very promising. I was amazed to realize how many of the resistant animals I actually have in my herd. Deer farmers can now take this knowledge and create resistant herds in a short amount of time. We are asking our government to allow us to remain in business in order to advance this research that could be the solution to CWD. Let's work together to help solve the CWD issue instead of implementing more rules that won't solve anything.

Governor Walker hired Dr. Kroll to develop a CWD management plan (and it's working). Last year, all parties with a vested interest in CWD were invited to the table to review the CWD management plan. Dr. McGraw was able to relay the message that deer farmers are doing everything they can to prevent CWD from entering their farms. He explained all the rules that are already in place to help prevent the spread of CWD on our farms. He relayed the message that our farms are very low risk due to the high regulation of our industry. At the end of all these meetings, it was agreed by all parties (even George Meyer) that a double fence was not necessary with the exception of an electric fence for the CWD positive facilities that choose to stay in business. The Department of Ag was charged with the task to develop the electric fence protocol, not the DNR even though the DNR regulates whitetail deer fencing. We are here today to ask for the fencing portion of Governor Walker's proposal stay with the DATCP. They already do the double fence inspections and have language in the rule for double fencing. The DNR currently only inspects one fence and we would like it to stay that way in order to simplify the process for us and the departments.

The following map clearly shows that we are not the problem and the fence research shows there is very low risk at the fence line. Let's use the science and

the research that we have available to work together and not jump into harsh regulations that will do nothing to stop the disease.

Lastly, I am a hunter and most of my family members are hunters. None of us agree with George Meyer's position on the Governor's proposal. George highly exaggerates the amount of people he and his association represent. At all of the hearings, there have only been a total of four people in favor of the Governor's proposals compared to the amount of people opposed. This should tell our government something, so please listen to the majority and not the minority who only have an agenda to get rid of deer farms that truly are the victims of this disease. Even if our state successfully regulates all deer farms out of business, the disease is still going to spread and then who will people blame?

My name is Laurie Seale and I have been deer farming in Taylor County for 30 years.

DATCP must take into consideration the economic impact an emergency rule will have on small business

Emergency rule-someone from DATCP needs to explain what criteria they are using to implement this emergency rule

- Public peace, health, safety or welfare necessitates placing a rule into effect prior to the time it could take effect as a permanent rule
- All one needs to do is to take a look at the DNR deer population estimates-4 most highly infected counties in the state show that the population has doubled in two of the counties and almost doubled in the other two counties since CWD was first discovered in Wisconsin in 2002. What is the emergency? The herd is obviously not in jeopardy.

Last time we were here you heard testimony from deer farming families who have invested everything into this business. Deer farming is a family venture and the people who deer farm absolutely love what they do...that was very obvious by the testimony you heard. What other agricultural industry can take a small partial of marginal land and turn it into a family run business that is profitable? Our government should be promoting small business and agriculture instead of trying to destroy it. The article I shared with you a few weeks ago from 1908 where President Teddy Roosevelt was encouraging states to legalize deer and elk farming, is a perfect example of how government should be promoting agriculture of marginal land. What we are seeing now from our Wisconsin government is so wrong.

We should be promoting family farms where our children are taught to respect animals and how to care for them. They learn to respect hard work and learn good work ethics, instead of sitting in front of a TV or video game. The families you heard from last week and today love what they do and love the fact that the entire family can enjoy raising deer.

Let's work together to find solutions to CWD instead of battling this out at the legislature or the courts. I trust that all of you who are farmers see the value in

what deer farming provides to our families, our economy, and the future of farming. Farming in general is under attack nationwide and we should all be bannin together to preserve the family farms we all love so dearly.

Latest two CWD cases, one an elk farm and one a double fenced deer farm, once again show that the program is working to find the disease. Because of our mandatory ID system and mandatory reporting system, the DATCP can quickly identify the positive farms and also conduct trace backs and trace forwards to see where and when deer were moved in or out.

No livestock industry is free of risk, but our industry can honestly say we are very low risk due to all the requirements enforced by Dr. McGraw and his team. They should be commended right along with the deer and elk industry for doing everything in their power to try and prevent the spread of not only CWD but TB and Brucellosis as well. We know that a few of these latest positive farms were not from animals moved into the herds nor was it nose to nose due to the double fence. These latest cases show me that our industry is the victim of the diseased wild herd and we need to work together to promote research to help us determine what the vector is that is spreading CWD to our herds. Is it hay that has dirt baled up in it, is it birds of prey, is it water shed, is it predators? We need answers to these questions, not more restrictions and rules that won't help solve the issue.

Carlson, Michael M - DATCP

From: Colvin, Alan R - GOV
Sent: Wednesday, May 9, 2018 11:23 AM
To: Stamm, Christine A - DATCP
Subject: Referral

Christine,

Agency referral

Thanks

Al

From: Governor Scott Walker
Sent: Wednesday, May 09, 2018 8:58 AM
To: Colvin, Alan R - GOV <Alan.Colvin@wisconsin.gov>
Subject: FW: CWD management

From: no-reply@wi.gov <no-reply@wi.gov>
Sent: Wednesday, May 09, 2018 8:31 AM
To: Governor Scott Walker <GOVGeneral@wisconsin.gov>
Subject: CWD management

Contact Name: Jim Sensenbrenner
Email: jbsensen@gmail.com

Message: Dear Governor Walker: It was good to read that you want to better control the spread of chronic wasting disease (CWD). In addition to the more restrictive fencing measures for deer game farms, I urge you to strongly consider establishing deer kill registration stations. The checkin stations will allow observation of all deer killed and also CWD testing. The current system of phone or internet deer kill check in does not allow for physical observation and it does not work for hunters in rural areas. Authorized check in stations and tagging give the state the best ability to monitor and manage CED and have accurate kill data. I encourage you to establish the authorized check in stations for the 2018 hunting season. Sincere J. B. Sensenbrenner

Carlson, Michael M - DATCP

From: rich@rcranchllc.com
Sent: Monday, June 11, 2018 2:01 PM
To: Carlson, Michael M - DATCP
Subject: [WARNING: ATTACHMENT(S) MAY CONTAIN MALWARE]Follow up from public hearing 6/7/2018
Attachments: WCDEFA letter to Dept of Ag.2.doc

Hello Michael,

I spoke to the listening panel on 6/7/2018.

I neglected to leave a written copy of my comments with you.

Please find the written version of my comments attached.

Also, if needed, you can find information about the new business we are creating in Soldiers Grove WI. The local newspapers have written articles about our business planning. We have already completed the process of review from the Village of Soldiers Grove planning board. We have also had the Department of Agriculture regional supervisor Cindy Klug and Rita Funk to our facility for a pre-construction planning question and answer session.

As I mentioned during my verbal communication to the listening panel on 6/7, my hope is that the Department will reconsider the stringent emergency rules that governor Walker is placing on cervid farmers. The double fence will do nothing to stop or slow the spread of CWD. The double fence will be a waste of money to whomever ends up having to pay for the second fence.

Thank you for taking the time to hear from the deer and elk farmers of Wisconsin.

Thank you,

Rich n Corky
www.rcranchllc.com



My name is Richard A. Sitarski

I came to Wisconsin from Illinois to start an elk farm 15 years ago. My goal was to establish the farm, gain a deep understanding of the industry and then get serious about the elk farming business. My approach has been methodical, structured and sincere.

I have worked to insure the quality of my fencing meets Wisconsin Department of Agriculture standards and guidelines. I have been diligent in making certain our farm follows the rules set by the Department. I have kept all my required records and the Department has inspected my records without any noted problems or concerns.

Additionally, I am in the process of starting a much-needed new butcher shop business in the town of Soldiers Grove WI. The new company plans on providing needed butchering service to the areas, beef, hog, lamb, cervid and bison farms. We plan on opening later this year.

I have invested quite a bit of time, effort and money into Wisconsin.

Governor Walkers order has made me question as to whether I should continue to move forward here in Wisconsin. If after following all the current rules and regulations, I will now be forced to comply with additional very costly and burdensome regulations, I cannot see the logic in moving forward. Where will the new rule and regulations ever stop? This appears to be a politically motivated mandate and good farmers like me will become the innocent fatalities of this political move.

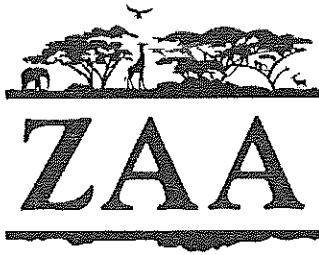
I feel the Governors mandate is not founded or based on science and research. CWD will continue to expand regardless of whether our industry is forced to double fence and or shut down. Good cervid farmers are the best guardians of helping to make sure this disease is monitored properly. Nature will continue to expand this disease thru multiply paths that fences will not stop. CWD will also continue to expand by deer carcass movement, wild animal movement, and live animal relocations to WI from other states.

This disease has never affected a human. I am more concerned with Lyme's disease than I have ever been about CWD? Lyme's disease has had severe effects on many of my friends here in WI. Yet you don't ever hear about Lyme's disease being a concern of government regulation. This makes me wonder what is really going on here?

My hope is that Wisconsin will work with the cervid farmers rather than literally mandating them out of business. Cervid farmers are very interested in providing the farming community alternatives to the struggles that traditional farms are facing.

Cervid farming is better for marginal land, provides competitive alternative products, and can become an American farm success story if the government allows this to happen.

I urge the governor to reconsider his mandate and realize that our industry is already under enough regulation. Thank you for hearing my concerns.



ZOOLOGICAL ASSOCIATION
OF AMERICA

Wisconsin Department of Agriculture, Trade and Consumer Protection
ATTN: Alex Girard
Small Business Regulatory Coordinator
P.O. Box 8911
Madison, WI 53708-8911

June 14, 2018

RE: Opposition to Scope Statement for Emergency Board
Order WM-11-18(E) and Board Order WM-12-18

Dear Mr. Girard:

With more than sixty accredited members, the Zoological Association of America (ZAA) is the second largest trade association in the zoological sector. We count among our members some of the finest zoological facilities in the United States, including Wildwood Wildlife Park in Minocqua. As it happens, the park has been licensed by the state as a deer farm for more than six decades, due to the pleasure the deer bring to 160,000 visitors every year.

Our organization and its many members are strongly opposed to the proposed rules, which can be easily demonstrated to trade hypothetical public protection, which to this day remains unjustified by animal veterinary science, for serious financial burdens which threaten to make many small businesses uneconomic. In the case of Wildwood, for instance, which already is double-fenced externally, the potential burden of doing the same for every single enclosure where the deer are allowed to be inside the park would effectively terminate the critical experience of interaction for all of our visitors. For what do we make the sacrifice of 20,000 experiences of just students on field trips every year? For nothing that has been demonstrated to mitigate CWD in wild deer herds. For the past 17 years the deer on the Wildwood property have been tested and certified by the state research program, and none have tested positive.

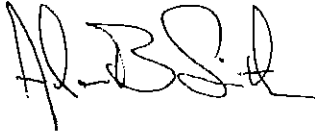
All of the research to date shows not only that there is little contact at the fence line in the first place, and that double-fencing has not been shown to be efficacious. Beyond that, combining the two proposals would mean that movement within the state would be prohibited whether or not a facility is double-fenced, which seems to us to be the classic worst kind of government regulation.

One of the most egregious parts of the proposed regulation from our point of view, is that the definition of "farm-raised deer" does not include a cervid kept by an institution accredited by a rival trade association. There cannot possibly be an argument based on health and safety of cervids or people that would exempt animals that belong to a particular trade association if their collections are exposed to the same environmental conditions as animals in other accredited facilities. But if this were to be supposed, it would only make sense to exempt us as well, since we maintain the same high standards for animal welfare and public safety. It would make a lot more sense to just write a law based on the best available science, as other states have done, because all accredited institutions must comply with state and local laws to remain accredited.

Based on what we know, the proposed regulation is only designated as an emergency because the huge and emerging negative reaction from stakeholders in a multimillion dollar industry illustrates the difficulty of doing this through a process of thoughtful consideration. The breadth of the opposition demonstrated at the hearings and the rural radio talk shows should have signaled that this is an area where the state should be as well-informed as possible before doing something which offers demonstrable harm to gain an illusory public benefit.

Please feel free to reach out to us and other state and national organizations that are invested in solutions to zoonotic disease transfer and have been watching this situation develop around the country. Indiana is one nearby state that has dealt extensively with the CWD problem to the satisfaction of nearly all those affected by it one way or another.

Respectfully,

A handwritten signature in black ink, appearing to read 'A. B. Smith', with a stylized flourish at the end.

Alan B Smith
National Legislative Affairs Director
Zoological Association of America
(614) 893-9999
asmith@zaa.org

June 6, 2018

Hello,

This letter is written in response to the proposed changes from the Governor regarding CWD. It is my understanding the Governor's 3-step plan is outlined below:

1. Requiring enhanced deer farm fencing through a new DATCP and DNR rule. Currently, farms are required to have an eight-foot fence. Enhanced fencing would require either: a second eight-foot-high fence, an electric fence, or an impermeable physical barrier to meet the emergency rule's requirements.
2. Controlling the movement of potentially infected deer through the creation of a new DATCP rule banning the movement of live deer from deer farms in CWD-affected counties.
3. Preventing contamination from hunted deer carrying CWD by tasking the DNR to create emergency and permanent rules banning the movement of deer carcasses from CWD-affected counties. Under the proposed rule, hunters can still quarter the deer within the county it was harvested and then take the meat anywhere in the state, but no portion of the spinal cord may be attached or moved. A hunter who harvests a deer in a CWD-affected county may only move a whole carcass outside of the county if the carcass is delivered to a licensed taxidermist or meat processor.

I would like to begin by saying that I am a very passionate person when it comes to Whitetail deer. The last thing I would want to do is jeopardize "our" state deer herd, as I personally have a significant amount of money invested in land used exclusively for hunting. As a gun or bow hunter or as a deer farmer, for the last 45 years I have enjoyed the Wisconsin outdoors. A few years back, I decided to elevate my passion for the Whitetail deer by starting a deer farm and currently own a small deer farm near Osseo, WI called Woodhaven Whitetails.

There is no doubt the deer farmer has been unjustly "blamed" for the spread of CWD. Most media sources have no clue on the disease and the people that read the media information have only what they read to believe. Yes, as deer farmers we transport deer; some farmers more than others. However, we are required to comply with specific requirements when shipping an animal. In the meantime, we hear very little about the transport of a carcass from an out of state hunting trip or from general hunting carcass movement.....

So where are we at and what to do? I would like to address some of the issues, as I see them. And please remember, I am as passionate of a *deer hunter* as I am a *deer farmer*.

- Fencing for deer farms – No farm or hunting ranch wants CWD, but redundant fencing would cost millions of dollars to install, while bans on transporting deer between controlled environments would choke farms and hunting ranches. Double fencing every deer farm in the state is not going to stop free-ranging deer from continuing to spread CWD. Even if every deer farm in the state is put out of business, free-ranging deer are still going to continue to spread CWD. If the State chooses to require enhanced fencing, the State must compensate farms and ranches for 100% of the cost involved to protect our deer from the diseased free ranging herd. Double fencing would cost me around \$10,000 - \$15,000.
- Controlling deer movement – Although I have heard the most about the fencing part of the Governor's proposal, the controlled movement part is the one that is **most devastating** to the deer farming industry. My farm could have **triple** fencing and if I happened to be located in a county where there is a CWD positive, I could no longer ship deer. Bear in mind, if I don't sell deer, I have no income to pay

the bills that are associated with this type of farming. If I have no income, this becomes a hobby that I can't afford to keep. Thus, **this one provision will shut down nearly 100% of the deer farms in Wisconsin!** Bear in mind also that... even IF I live in a county that is ***not currently*** affected by a CWD positive result, who in their right mind would want to go through the process to double fence their farm this month, only to have a CWD positive in their county the next month and be shut down from selling any animals! Again... no sales = no business.

- The deer movement issue is a tough issue to resolve, because I see it being very difficult to stop deer movement from deer farmers without putting them out of business – AND – I see it being very difficult to eliminate the movement of deer carcasses in general. Even if the Wisconsin hunters are required to quarter their harvest at the harvest location (which I don't see how that will help AT ALL and probably make the situation worse in terms of the spreading the disease, but will comment more on that in next section), **what about all the animals that are transported into our state from out of state hunts?** Here is what I see as the end result to the current proposal:
 - The deer farmers will be gone and no longer someone to blame, but CWD still be spreading.
 - Some of the Wisconsin hunters will quarter their harvest at the harvest site. But let's be realistic, as we know only a portion will. The ones that quarter their harvest in the field, will leave the carcass, to be used as food for other animals such as birds, coyotes, etc., which will be consumed and then spread to various other parts of that specific area.
 - **THOUSANDS** of animals will be transported annually **into** Wisconsin, from out of state hunts, with **minimal** or **no** requirements on their transport OR carcass disposal. **AND, *EVEN if*** rules are implemented to address animals brought in from out of state, what about the animals traveling **THROUGH** the state from one state to another after a hunting trip. Just think of how many vehicles come and go at the local gas station, which is the same one that the local farmer stops at....
- Carcass movement – First of all, leaving the spine and other parts in the field is a terrible idea. What better way to spread the disease, but to leave those items exposed for birds and other animals to spread around. In regards to allowing a carcass to be moved if only going to a taxidermist or processing plan – how will that be monitored? You know that once that animal is in the vehicle, it will be very difficult to track.
- So the deer farmers will be gone, but the transport of carcasses and spread of CWD will continue....

Probably the biggest disappointment for me, as a deer farmer **AND** deer hunter, is the work that I am currently doing with my deer herd to raise animals that would be more resistant to CWD. This is similar to the how the sheep industry basically "bred out" the scrapie disease in their species. As I mentioned above, I have a pretty small deer farm, which includes 9 does and a couple generations of bucks. What is **exciting** is that I have been working with genotype testing on my breeding animals for CWD resistance. Out of my 9 does, I have **two** that test 226K/96S genotype! That specific genotype has a **<0.1% CWD susceptibility rate and <0.3% of deer have that specific genotype** **and I own two of them.** My goal would be to use these two does as the foundation of my future breeding herd and in 3- 5years have an entire herd that consists of CWD resistant animals. Who knows, maybe these does are the foundation of a future CWD resistant state herd.....

I realize that CWD is a tough issue, but would ask that you take some of the above items into consideration as a potential approach to finding solutions to the problem.

Respectfully,

Brian A. Smith

*** Please see the following page for additional comments regarding the effects of the CWD proposal.

1. Wisconsin has one of the strictest CWD programs in the country and the program is working to find the disease in the early stages. Deer farms are closed, fenced environments that already test 100% of their animal deaths (over 12 months of age) to ensure they are free of CWD. In the off chance CWD is detected on a farm, the disease is contained and can be eliminated—unlike with free-ranging deer that have spread CWD across Wisconsin and other states.
2. Wisconsin deer farmers are contributing to research to help fight CWD. Whitetails of Wisconsin is funding research projects to study the effects of CWD on infected captive animals. These studies are helping us better understand many things about CWD that can and will never be identified through studies of the wild deer herd in Wisconsin. **The deer industry is also funding genetic resistant research which could prove to be a solution to CWD.** Wisconsin deer farmers, along with CWD positive hunting ranches, are spending tens of thousands of dollars working with researchers to find deer with greater resistance to CWD than were previously known to exist.
4. According to an official with the US Geological Survey, **infected carcasses moved by hunters probably pose the biggest risk of CWD transmission.** Carcasses are moved around the state to non-infected areas and then birds of prey feast on these infected carcasses, further spreading the prions. In the 2016-2017 season Wisconsin hunters from northern Wisconsin and 49 other states harvested animals from Dane, Iowa, Rusk, and Sauk Counties, which have the highest wild prevalence of CWD in the state.
5. There is no evidence of a need for “emergency” regulations. CWD was first found in Wisconsin in 2002, and research released from the University of Wisconsin-Madison found “no evidence that CWD was substantially increasing mortality rates during the duration of our study from 2003-2007.”
6. The rules suggested would put my deer farm out of business, even though I am already doing whatever I can to stop CWD by participating in the Federal CWD program. If a deer farmer in affected area cannot move their deer, there will be no income to feed their herd or operate. Our deer farm spends annually \$6,000 on feed and another \$10,000 to operate. We will be forced to put down 23 healthy deer. In the State of Wisconsin that will be thousands of healthy deer destroyed for no reason. **Deer Farms are the victims of CWD not the problem!**

Carlson, Michael M - DATCP

From: Dwayne Splan <dysplan@netnet.net>
Sent: Monday, June 11, 2018 4:13 PM
To: Carlson, Michael M - DATCP
Subject: cwd rules

Mr Carlson

My name is Dwayne Splan and I have been doing deer nutrition work for 5 years with deer farms in wisconsin. My customers will be greatly impacted with the rule changes that Gov walker is talking about doing. some points

1. double fencing or electrifying will make these farms expensive to run.
2. having no animals move to other farms will cause alot of smaller farms that dont have hunting preserves to go out of business. What do they do with the bucks that they raise. Will you buy all these animals to slaughter?
3. the whitetail industry in Wis complies with alot of rules and testing. Do u need more rules or whats in place is working
4. this will do nothing for the wild deer herd. cwd is there already.

Hunting

1. the rule of moving any deer shot during hunting season from one county to another cannot be enforced. alot of people have camps and lease land in different counties

So what can u do

1. there has been some research with lichens that show a glimmer of hope. I have tried for a year to get the USGS to look at other products that could help(useless).
there is no new research from Wisconsin at looking at other ways to control. Look up Dr frank Bastian at LSU. he thinks cwd starts as a bacterial challenge.
We have had some lowered cwd cases on a farm that we have been doing this? just antedodal but promising
2. there are feed related companies that are looking on how to lower cases in fenced farms. but the market isn't big so they dont want to spend alot of money
3. There is a arizona lab that is showing some deer are immune to CWD?
4. how about spending some research money on some alternative theories. I got one for You

Thanks

Dwayne Splan
cell 920-373-4448

Carlson, Michael M - DATCP

From: Emma Steinhauser <emmaevesteinhauser@gmail.com>
Sent: Tuesday, June 12, 2018 8:49 AM
To: DNR Administrative Rules Comments; Carlson, Michael M - DATCP
Subject: Deer

To whoever this concerns,

I (Emma Steinhauser) do NOT support the emergency rules for farm raised deer movement and enhanced fencing.

Emma Steinhauser, dairy farmer
W3550 Sylvester Rd Monroe WI 53566

6/6/18

DATCP
Division of Animal Health
PO Box 8911
Madison, WI 53708-8911

To whom it may concern:

The following are comments concerning the emergency order pending the movement of farmed deer, new fencing requirements and the movement of harvested whitetail deer from affected counties.

I would first like to introduce myself and express why I am concerned with these rules. My name is Michael Strobush and am a licensed and accredited large animal veterinarian practicing for the last 35 years in central Wisconsin. I have worked for many deer farmers in Wisconsin since 2001. I have been involved in testing deer and elk herds for tuberculosis, brucellosis as well as sampling deer and elk for CWD testing that have died either on a deer farm or hunting ranch. I have worked diligently to make sure my deer farms are in compliance and follow the regulations specified by DATCP.

The rule prohibiting the movement of farmed cervids from any affected county does not make any scientific sense. Currently farmed deer can only move in the state to other deer farms or hunting preserves with a health certificate issued by the herd veterinarian. Deer that are moved have no exposure to wild deer. They are confined behind a fence. All farmed deer that die that are over 12 months old are tested for CWD and hunting ranches must test 50% of the deer killed on the ranch. The system that we currently use allows deer farmers to move deer from a farm with a positive test to hunting ranches in a way to market their deer. No taxpayer money is needed for indemnity purposes as their farm is not depopulated. Prohibiting the movement of farm raised deer in affected counties will not allow these farms to sell any of their animals which will result in severe financial losses. This will result in healthy deer being killed for no reason since they will be too expensive to feed without any income in deer sales.

Over the last 16 years, thousands of farmed deer have been tested for CWD. Several of these deer herds in Wisconsin have had a positive CWD test after testing deer for many years. Many

of these farms have been closed herds and have not brought any new deer into the herd. Several of these newly positive herds have also been double fenced. I believe that if you look hard enough for a disease you will find it. This is what has happened with CWD in Wisconsin. Deer farmers must test all deer that die. If wild whitetail deer were tested at the same frequency as farmed deer, I believe CWD would be found throughout Wisconsin. Hunter killed deer that are tested for CWD each fall represent a very small percentage of the deer killed annually. This number of tested deer compared to the actual live population of whitetail deer in the state is very small. You can see that when asked to test all dead deer from deer farms, the percentages are not the same. Our current system of testing farmed deer losses for CWD is working. I would be more concerned about the lack of testing in the wild deer herd.

As for the requirement to have double fencing for farmed raised deer, I don't believe this will slow the spread of CWD. A new herd in Dane county that was double fenced since 2009 recently was found to have CWD. There have been other double fenced farms and hunting ranches that suddenly test positive for CWD after years of testing. This disease just shows up if you test long enough for it. Double fencing has not stopped the spread of CWD.

Prohibiting the movement of deer harvested by hunters from affected counties could possibly have some affect in stopping the spread of CWD. It makes sense to stop spreading the infectious prions from infected deer to another county. A better suggestion would be to somehow require a minimum amount of CWD testing from each county to get a real percentage of deer tested to better reflect the true amount of test positive deer in that county.

Deer in Wisconsin rarely die from CWD. They do not live long enough to develop the symptoms of the disease. They can test positive as young as 2 years old but can take years to die from the disease. There is a tremendous amount of things that we do not know about CWD. No one has proved how it is spread. These potential rules should be based on science and not be a political issue. This is an animal health issue and we should respect these farmers as businessmen who love what they do. Deer farming is the most highly regulated agricultural industry in Wisconsin that does not need any unproven regulations to put them out of business.

Sincerely

Michael Strobush DVM
Grassland Veterinary Service
Granton WI 54436 715-937-4780

Carlson, Michael M - DATCP

From: glenn stumpf <gfstumpf@gmail.com>
Sent: Wednesday, June 13, 2018 5:15 PM
To: Rep.Rob.Brooks@legis.wisconsin.gov
Cc: Sen.Stroebele - LEGIS; Carlson, Michael M - DATCP; Brian Wolf
Subject: CWD proposed legislation would shut down an entire industry.

Hello Rob,

Hope all is going well for you and your family. And I hope you are finding satisfaction in your position as an assemblyman.

I enjoyed working with you when we were on the Ozaukee County Board together.

I am contacting you in regards to the newly proposed legislation to combat CWD in the wild deer population. As a hunter and environmentalist I am strongly in favor of fact oriented rules and regulation like the banning of baiting and feeding of wild deer.

However the latest regulations that our Governor has proposed are not based on facts and would shut down the deer and elk farming industry.

The rules as proposed would not allow a farmer in a known CWD area to move his animals even to a slaughter house to be butcher for meat.

A very good friend of mine owns and runs an elk farm with about 35 elk.

He has installed a double fence, at great expense to him, so that CWD could never be transmitted from wild deer to his elk [which have never tested positive for CWD]

Why would he not be allowed to take his animals to be slaughtered???

As this legislation works it's way through the system I trust you will base your vote on the facts.

Thanks Rob

My best to you and Dawn

Glenn Stumpf

Carlson, Michael M - DATCP

From: Nicole Timm <n_disrud@yahoo.com>
Sent: Tuesday, June 12, 2018 8:19 PM
To: Carlson, Michael M - DATCP
Subject: Deer

I do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing

Sincerely,
Nicole Timm
Monticello, WI
Sent from my iPhone

June 14, 2018

Division of Animal Health
Department of Agriculture, Trade and Consumer Protection
P.O. Box 8911
Madison, WI 53708-8911

TO: michael.carlson@wisconsin.gov

RE: Public comment on the proposed Emergency Scope Statement Regarding Farm-Raised Deer Movement and Fencing

As an owner of Tannenbaum Acres, a choose-and-cut Christmas Tree Farm west of Janesville, WI, we are also a Wisconsin Licensed Deer Farm because of a Reindeer we have on our property for marketing purposes. Our Reindeer is a big draw for us during the Christmas season especially for our customers coming all the way from the northern suburbs of Chicago. Many times I have said that Christmas Trees is just a by-product of our business in that what we really sell is a Wisconsin Ag-Tourism experience of Starting out the holiday season by shopping and cutting down a Christmas Tree in our field. It's amazing how many people really appreciate coming and visiting our farm and petting zoo to see a White Face Cow none the less a Reindeer! As a resident of Wisconsin, I don't think we realize how disconnected suburban America is now days with agriculture and the family farm.

As for the CWD problem in Wisconsin and the Midwest, Wisconsin Licensed Deer Farms are very much aware of the situation and are very concerned about it's continued progression. In our situation, our farm is a little different than most Deer Farms because we are not in the business of buying and selling deer. Our deer are more like pets and are esthetically appealing to our customer base at the farm and are frequent subjects of customer photo shoots.

As for the double fencing proposal, I think double fencing makes sense because it protects captive CWD Certified Deer from unknown, untested Wild deer that might be infected with the disease. Many of the Deer Farms that I know already have implemented a double fence in order to comply with current DATCP rules and also to protect their investment. Our farm is quite small compared to some which occupy several hundred acres. Thus, our investment in a double fence would be no where near what some Deer Farms have to invest to double fence their farm. Maybe the State or the DNR can come up with some program to help or financially assist these larger Deer Farmers to Double Fence their property. If the state can help giant Foxconn why can't it come up with some way to help it's own Deer Farmers. Wisconsin Licensed Deer Farms have been working closely with DATCP for quite sometime now in monitoring, testing and working out specific issues with the Wisconsin captive heard while the DNR has tried and failed in many areas with preventing the spread of CWD in the wild herd.

As for the proposed rule of banning the movement of farm-raised deer in any county that is affected by CWD, I am in **total opposition**. This proposed rule would devastate Wisconsin Licensed Deer Farms. It's been estimated that this rule alone would force 80% of Wisconsin Licensed Deer Farms out of business. Unlike my little farm, most deer farms thrive on buying and selling deer which involves the movement of

deer. If they can't move deer, they would not be able to exist financially and feed their herd. This proposed rule would force them to put down their herd which would create a financial crisis if not bankruptcy! Does it seem fair that Wisconsin residents owning Wisconsin Licensed Deer Farms which have been paying Wisconsin taxes and complying with current DATCP regulations be banned from moving their registered herd while, Deer in the Wisconsin Wild are free to roam wherever they want to with little accountability or testing being done spreading the disease throughout the Wisconsin countryside?

On the non-financial side, Many farmers trade their bucks with other farmers to prevent in-breeding which in itself can cause other health issues and diseases. The proposed ban on the movement of farm-raised deer would abolish this practice thus causing more in-breeding within the captive herd which would be very unhealthy. In the wild, bucks roam freely breeding at will, populating the diseased portion of the wild herd with no accountability.

Lately when I'm driving throughout Wisconsin I see dead deer along side the road due to vehicle deer hits. Many of these dead deer have been laying in our Wisconsin road ditches for days and weeks. I always wonder how many of those deer were infected with CWD and how many disease prions are laying there contaminating the area. Are these deer tested like Farm-Raised deer are? Are these deer being disposed of like farm-Raised deer in order to control the spread of CWD?

Lately, I asked a Biology student in passing how we could get control of the spread of CWD. After some thought he suggested that in theory we need to split the unhealthy animals from the healthy ones and then eradicate the unhealthy ones. This way we would have the healthy animals left over to re-populate with. The takeaway here is that we work with our controlled herds and eradicate the uncontrolled.

In closing, I think the proposed ban on the movement of farm-raised deer is not the solution to preventing the spread of CWD. If we take away the ability to move farm-raised deer, we are shutting down the farm-raised deer industry which could possibly eliminate the controlled herd. Why are we penalizing the Deer Farmer here when they are probably the potential solution for the problem? The state needs to work with these farmers to eradicate this disease. If we put the Deer Farmer out of business, we will still have CDW in the wild herd.

Thank You for the opportunity to comment on this issue

Mark Utzig
Tannenbaum Acres

Carlson, Michael M - DATCP

From: vaadekitta04 <vaadekitta04@gmail.com>
Sent: Wednesday, June 13, 2018 5:29 PM
To: Carlson, Michael M - DATCP

Please do NOT support The Emergency Rules for Farm Raised Deer Movement and Enhanced Fencing.
Nakitta Vaade
Brodhead, WI

Red Deer
Trakehner Horses
Farm Telephone:
(920) 863-3609 or 863-3730



Fax: (920) 863-3709

Animal Eye Clinic
Samuel J. Vainisi, DVM
Gretchen M. Schmidt, DVM
Diplomates—American College
Veterinary Ophthalmologists
Clinic Telephone:
(920) 863-3160

Governor Scott Walker
115 East Capitol Ave
Madison, WI 53702

May 3, 2018

Dear Governor Walker:

Please take the time to read our criticism of your new rules for controlling CWD in Wisconsin deer

After sixteen years of ridiculous DNR management of CWD, which by the way was very likely introduced to the Mt Horeb area by University of Wisconsin researchers mishandling of CWD infected tissue from Colorado, your recommendations are not logical

Your plan sounds more political than rational and is 16 years too late. Fencing enhancement by double fencing should have been required from the get go. We have had a closed herd since 1994 and double fence in 2002 when Dept of Agriculture offered to pay 50 % of the installation. Electronic fencing is no guarantee of preventing nose to nose contact.

Preventing movement of live deer from any county that has a positive CWD deer is meant to cripple and eventually end deer farming in Wisconsin. Eventually all counties will come up with a CWD infected deer. The only Red deer in the USA that was positive for CWD was a female (hind) in Doug Harpers herd just outside of Minneapolis. His herd like ours was a closed herd for over 20 years, the entire herd, over 200 deer were needlessly destroyed. APHIS is completely mystified how the animal became infected, (birds, wild small game??), so this can happen in any county in Wisconsin.

There are whitetail deer that are genetically resistant to CWD in a sense, that instead of taking 1-3 years to show symptoms, it can take 6-8 years or longer. Deer farmers are paying premium prices for these deer with the more resistant chromosomes. The goal of the DNR should be to introduce deer with these genetics into our wild herd, this is how the sheep industry solved their problem with scrapies, also a prion disease.

Please do not destroy our industry. Look at ways to work with our industry. Use science, not politics.

Sincerely, Samuel Vainisi DVM, Gretchen Schmidt DVM

Cc,
Dr Paul McGraw, Dr Darlene Konkle
Senator Robert Cowles

Eaton Highland Farm
5587 State Hwy 29
Denmark, WI 54208

Gretchen Schmidt DVM
Samuel Vainisi DVM

920-863-3609



June 7, 2018

Public hearing on CWD

My name is Sam Vainisi. I am a veterinarian and have been a Red Deer farmer for twenty four years.

I would like to comment on two proposals in the rule that I feel will have no impact on the spread of CWD prions in our wild herd.

First: Shutting down the movement of farm raised deer if only one report of CWD is found in your county. This makes no sense at all. How does shutting down my taking deer to slaughter or shipping them out of state to hunting ranches have anything to do with stopping the spread of CWD? All deer taken to market as you well know are tested for CWD .

Second: Enhanced fencing. We have been double fenced for sixteen years. No infected deer will ever make nose to nose contact with our herd ; yet we are not naïve enough to think that CWD prions could not gain access to our farm via birds or wild varmints or God knows whatever.

Please, please use common sense in considering this rule. Let's not make it a political football.

Gretchen Schmidt

Sam Vainisi

Carlson, Michael M - DATCP

From: Dan Van Ooyen <dvowhitetails@gmail.com>
Sent: Thursday, May 17, 2018 10:49 PM
To: Stamm, Christine A - DATCP
Subject: Meeting May 24th - Animal Diseases and Movement

Christine,

Please forward to the board members.

We are Dan and Joni Van Ooyen of Van Ooyen Whitetails. We have been raising whitetail deer for 30 years. We have about 17 acres high fenced which is sectioned off into breeding pens. We have been enrolled in the CWD Monitoring Program for the state of Wisconsin from the beginning. We must test 100% of the deaths over twelve months of age to ensure they are free of CWD.

The county we live in is Langlade and our county is affected because of a wild deer harvested within 10 miles of our north county line. Our county is now considered affected. With the new emergency rule we will no longer be able to sell and move any of our animals. We have 100+ adult deer and expecting 50+ fawns this spring. The rule suggested will put our farm out of business even though we are doing everything we can by participating in the Federal CWD program.

Our deer farm spends \$45,000 per year on feed and \$25,000 in operating expenses.. We will be forced to put down our entire herd with additional expenses of close to \$10,000 just to CWD test the adult animals. In the state of Wisconsin that will be thousands of healthy deer destroyed for no reason. Deer farms are the victims of CWD not the problem.

To double fence our farm it will cost a minimum of \$100,000 to add the additional fencing and redesign some of the interior pens. None of the deer farmers in the counties that have a CWD positive, or counties within 10 miles of a CWD positive will double fence because they're not allowed to sell and move their animals. With no income they will have to destroy their herds.

There are approximately 285 deer farms affected by the proposed rulings. This number is 76% of the deer farmers in Wisconsin.

Sincerely,

Dan and Joni Van Ooyen
Van Ooyen Whitetails
715-216-6342

Carlson, Michael M - DATCP

From: Zachary Waechter <zacharywaechter@gmail.com>
Sent: Tuesday, June 12, 2018 9:28 PM
To: Carlson, Michael M - DATCP
Subject: CWD Research

To Whom it may concern,

My name is Zach Waechter and I am a Wisconsin hunter and concerned voting citizen. The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The three-step plan will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,

Zach

Carlson, Michael M - DATCP

From: Josh Webber <webber.josh80@gmail.com>
Sent: Monday, June 11, 2018 1:33 PM
To: Carlson, Michael M - DATCP
Subject: Deer Hunters

To Whom It May Concern,

My name is Josh Webber and I am a Wisconsin, hunter/concerned voting citizen. The recent proposals for combating CWD of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The three-step plan will prevent the genetic resistant research to continue what has the potential to sustain the farmed and free range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely, Josh Webber

Carlson, Michael M - DATCP

From: wildwalk@charter.net
Sent: Sunday, June 10, 2018 3:00 PM
To: Carlson, Michael M - DATCP
Subject: DNR deer farm hearing and rules

Wilderness Walk
9503 N State Rd 27
Hayward, WI 54843

TO WHOM IT MAY CONCERN:

We are the owners, Dan and Diane Weber of Wilderness Walk in Hayward. It is a privately owned zoo that has been in existence for 50 years. We are the third owners and have owned the zoo for 18 years. I've worked here for 10 years prior to ownership (28 years all together).

These new rules WDATCP and DNR are trying to impose on deer herds will totally shut down our business (leaving 25 people unemployed) or force us to slaughter all the cervids in our possession at this time. Double fencing would be impossible to do in this setting and situation, besides never being able to pay for it. The deer are a significant part of our business (**one of Hayward's premiere attractions.**) It would be extremely detrimental to our business. We have abided by the laws and have been testing for CWD since 2003. We've paid all vet and lab costs for each deer that has died or is culled out of the herd out of our own pockets. We do not sell or move any deer. We have them for the pleasure of our guests.

If forced to kill all our deer, every TV station (MN and WI near us), newspapers, radio stations, will be notified to witness and film the slaughtering of our herd. Along with huge posters telling who is making us do it.

It has also been brought to attention that, it has been also discussed the possibility of fencing off bovines, goats, and etc... That would mean every dairy farmer, beef farmer, and hobby farm, would have to double fence all their herds against the wild deer herds. Which would mean many lives would be ruined and not to mention Wisconsin would NO longer be the dairy state!! Not to mention the feed businesses that would go out of business. This again would be impossible in our setting as a zoo.

This also means **DNR** would **NOT** be able to move any elk from county to county or bring in anything from another state. It has not been **scientifically proven with data and facts**, where CWD has **exactly** come from and **exactly** how it is spread. **It is not been definitely proven it came from any deer farms or wild deer.** Can anyone **definitely** prove and provide data that it

isn't passed through a raccoon, squirrel, and bird and shows up as a different form of diseases??? NO!!

Maybe things we have read or heard has been interpreted wrong...but the fact remains it would be impossible for us to follow these new rules and would be devastating to us our business and many, many others. Lives and businesses would change forever.

Sincerely,

Dan & Diane Weber

9503N State Rd 27

Hayward, WI 54843

715-634-2893

Carlson, Michael M - DATCP

From: woodysway31@gmail.com
Sent: Monday, June 11, 2018 3:36 PM
To: Carlson, Michael M - DATCP
Subject: Governor Walker's Whitetail Deer Proposals

To Whom It May Concern,

My name is Brent Westphal and I am an avid hunter and outdoorsman. The recent proposals of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The proposals will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free-range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,

Brent Westphal

1999 Springdale Center Road

Verona WI 53593

Carlson, Michael M - DATCP

From: Steve Westphal <steve@westphals.org>
Sent: Monday, June 11, 2018 11:18 AM
To: Carlson, Michael M - DATCP
Subject: Proposals

To Whom It May Concern,

My name is Steve Westphal from Brooklyn WI, I am a past whitetail deer farmer an avid hunter and outdoorsman. The recent proposals of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The proposals will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free-range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed. Please don't allow these proposals to halt the research that is being done.

Sincerely,

Steve Westphal
W1850 State Rd 92
Brooklyn WI 53521

6/5/2018

Comments on the "Statement of Scope" from DATCP regarding Animal Diseases and Movement

In ATCP 10:

Statement in 1. Finding/nature of emergency : " Wisconsin has made efforts to slow the progression of the disease by restricting baiting and feeding and by requiring additional fencing that restricts contact between wild deer and captive populations. These efforts have not prevented the spread of CWD"

Comment: If there is an emergency, it is not in the "fenced-in" elk industry in Wisconsin. There have been few CWD positive animals found to date in this population, 1 of which was an imported elk from Minnesota. The real emergency is in the spread of CWD in the "wild" deer population which increases the possibility of spreading to the captive cervid population.

The DNR must be expected to do more. Additional and extended deer hunting seasons will reduce the deer population and the spread of CWD. Barring animal remains could possibly decrease the CWD prion spread by limiting the exposure to carnivores feeding on the carcass. Incineration of animal remains is needed if the animal is suspect of disease or if barring the carcass is impossible to remove the CWD prion from the landscape. *Genetic selection = Nature will solve the problem!*

The governor has asked the cervid industry to do their fair share to control CWD. The cervid industry has already been doing its fair share. Animals in my herd are accounted for annually, their health is monitored daily, and signs of any disease is promptly reported to my veterinarian.

Statement in 2. Description of the objective of the rule: "Secondly, the rule would institute a ban on movement of farm-raised deer in any county that is affected by CWD.

Since a case of CWD was recently found in Dodge County, I now live in an affected county and would be subject to this ban on movement. This ban would eliminate my 2 sources of income. 1) Selling elk meat at my local farmers markets and 2) Selling my bulls to a hunt ranch. In addition, I would continue to have my usual expenses of making hay, buying feed, watering, registration and vet bills. This ban would create extreme financial hardship and force me out of business.

I feel that I should be able to take my animals to slaughter if I meet fencing requirements and if every animal is tested for CWD.

My herd was started in 2001 and I have been in the CWD monitoring program since its inception in 2002. All of the animals which died on the farm or died at slaughter have tested negative for the CWD prion. No signs of this disease have ever been present. Please see attached letter from my veterinarian for the past 6 years.

Thank you.

Brian Wolf, owner of Bugling Pines Elk Farm

Mark S. Williams, D.V.M.
Waupun Veterinary Service LLP
95 S. Harris Ave., Suite 203
Waupun, WI 53963
May 13, 2018

Division of Animal Health
2811 Agriculture Drive
P.O. Box 8911
Madison, WI 53708-8911

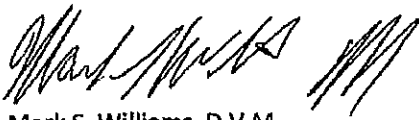
To whom it may concern:

I am writing this letter for Brian Wolf to inform you of the health status of their elk herd for the voluntary chronic wasting disease program.

I have been working with the herd for around 6 years and have not seen any signs of CWD in the herd. The herd is on a regular vaccination and deworming program. The herd appears to be in good health with no signs of disease present.

If you have any further questions concerning this herd feel free to contact me at (920) 324-3831.

Professionally,


Mark S. Williams, D.V.M.

Carlson, Michael M - DATCP

From: Brian Wolf <bwolf2@frontier.com>
Sent: Thursday, June 14, 2018 10:09 AM
To: Carlson, Michael M - DATCP
Subject: Emergency Ruling regarding DNR and DATCP

Dear Sirs (DNR and DATCP Board members),

I am writing today to inform you that I am against Governor Scott Walkers Emergency Rule regarding CWD and movement of animals.

I am an elk farmer and under the current wording, I would be unable to take my animals to slaughter, even though the animals would be tested for the CWD prion. Furthermore, this ban would put most and eventually all cervid farmers out of business, which would stop any research efforts which they are engaged in regarding developing genetic resistance to CWD. Implementation of these rules would be a step backwards and cost many hard working farmers to lose their farms and animals.

Also vote down this emergency rule as there is no emergency. CWD only affects cervids, not humans. Until it does, there is no emergency.

Thank you.

Sincerely,

Brian Wolf

Carlson, Michael M - DATCP

From: kraig wurst <kraig.wurst@gmail.com>
Sent: Wednesday, June 13, 2018 9:19 PM
To: Carlson, Michael M - DATCP
Subject: Deer and elk regulations

I would like to comment on the fencing and movement regulations that Wisconsin is considering. I think double fencing is an expensive rule that wouldn't make a difference. For every case of CWD you find behind fence there are a hundred in the wild already. All that regulation would do is put deer and elk farmers out of business.

As for the movement issue, I don't see a risk when the farmed herds are tested as vigorously as they are. What needs to be clamped down on are the carcass movements of wild deer before CWD testing.

Thank you for taking the time to read my comments.

Kraig Wurst

Carlson, Michael M - DATCP

From: Jim Wysocki <jim.wysocki@rpesud.com>
Sent: Thursday, May 10, 2018 3:31 PM
To: Harsdorf, Sheila E - DATCP; Ripp, Keith - DATCP
Cc: Diercks, Andy
Subject: Emergency deer rule

Follow Up Flag: Follow up
Flag Status: Completed

I'm sure your first thought is why is a potato and dairy farmer writing on deer!
Well, I and my 2 brother-in-laws own a deer farm (Stonehurst Woods, LLC) next to my house in Portage county.

I know your time is short but here are 5 of my thoughts on the rule:

1. **Genetic testing** – The WOW captive deer farmers are aggressively working on finding CWD resistant genetic strains. This is the same approach that was used for sheep Scabies that was commercially successful. Captive farms is the only place that this testing and then selection for breeding is possible and it can be successful in a short time period. Genetic markers have been found and deer selection could begin in a short time period.
 - a. Once captive deer are bred for resistance it may be possible to use that research to add resistance to the wild populations in the highest infestation areas.
2. **Ability to move captive deer** – This rule as proposed will lead to the closure of approx. 50% of deer farms because they raise deer but do not have hunting facilities.
 - a. I disagree with not allowing a captive farm that is compliant on the testing and has no CWD detections to not be able to ship deer. How does closing a 100% tested CWD free herd stop the spread of CWD yet we allow deer to roam freely in the wild in known 20%+ infected areas? I don't disagree with CWD infected herds not being able to be moved.
 - b. My second concern is why is it tied to the county? Wild deer don't pay attention to county lines nor does the disease. This is a proximity issue to the closest CWD positive location to the deer farm location. Please set the "affected area" based on deer travel distance not county lines. County lines are easier but then you needed to add within ten miles of an adjacent county. Please use science with a rule that states a deer farm within ten miles of a wild CWD find is in an affected area.
3. **Fencing** – Double fencing for the spread of CWD is mostly political and heavily requested by the conservationist community. I understand that those are real forces and understand this may be part of the public compromise but let's make sure we are realistic in the rules
 - a. There is no way that many miles of fence can be installed before 2018 hunting season. They are not that many installers.
 - b. It is unfair to make the farmers install fencing to protect the wild population from a disease free herd at the owners expense. There needs to be grants that will pay for this cost.
 - c. A maximum of 16' spacing between fences does nothing to prevent escapes or CWD spread. The corners are automatically wider than 16'. Adding a second fence where it was not designed for it and still managing to take care of the land between the fences to clear growth will be problematic. Please remove the maximum distance or at least increase it to 100'. This would allow me in places to close off to deer a penned area rather than building or moving an existing fence.
4. **Carcass disposal** – I agree with not transporting deer skulls and spines from the area the deer was harvested but it does not go far enough. This rule is designed to reduce a known vector of CWD transmission. **Carcass disposal sites should be set up so that all carcasses (wild and captive) could be landfilled to keep the prions from coming into contact with other wild animals.** Locating collection points that then haul to landfill that will keep covered and buried especially in affected areas is the surest way to stop spread and achieve compliance with this rule. How does a deer hunter that drive 30 miles from home and harvests a deer quarter it in

November. Is the hunter supposed to do in at the kill site? Next to his vehicle along the road? Or take it home crossing the County or Ten mile radius and then quartering it? Then does the carcass go back to the hunting site, back of the house, a rural road in the middle of the night, the garbage can wrapped up well? How would we enforce not moving deer out of the county if some were moving only a short distance? If we provide a location I think people will also begin to offer hunters a quartering service for a fee as well. AGAIN I really like this provision but I want it to be feasible and accomplish its full potential.

Please share this with the DATCP and DNR boards and department managers as needed.

Thank you for your help

Jim Wysocki – PART TIME DEER FARMER
Chief Financial Officer Wysocki Family of Companies

• • • • •
715.335.8060 ext. 220
jim.wysocki@rpespud.com
rpespud.com

Produce Experts for Potatoes & Onions



Carlson, Michael M - DATCP

From: rzurfluhstockfarm@tds.net
Sent: Tuesday, June 12, 2018 8:26 PM
To: Carlson, Michael M - DATCP
Subject: Re: Governor's Emergency Rule

To Whom It May Concern,

My name is Robert Zurfluh and I am a farmer, whitetail hunter and outdoor enthusiast . The recent proposals of Governor Walker have been brought to my attention. I am writing this letter to the board to state that I do not agree with said proposals. The proposals will prevent the genetic resistant research to continue that has the potential to sustain the farmed and free-range whitetail deer populations in Wisconsin long into the future. Potential cures for CWD may be lost if these proposals are passed.

Sincerely,

Robert R Zurfluh

W3817 cty rd C

Monticello, WI 53570

The Host Range of Chronic Wasting Disease Is Altered on Passage in Ferrets

Jason C. Bartz, Richard F. Marsh, Debbie I. McKenzie, and Judd M. Aiken¹

Department of Animal Health and Biomedical Sciences, University of Wisconsin, 1655 Linden Drive, Madison, Wisconsin 53706

Received June 5, 1998; returned to author for revision July 17, 1998; accepted September 15, 1998

Chronic wasting disease (CWD), a member of the transmissible spongiform encephalopathies (TSEs), was first identified in captive mule and black-tail deer in 1967. Due to the failure to transmit CWD to rodents, we investigated the use of ferrets (*Mustela putorius furo*) as a small animal model of CWD. The inoculation of CWD into ferrets resulted in an incubation period of 17–21 months on primary passage that shortened to 5 months by the third ferret passage. The brain tissue of animals inoculated with ferret-passaged CWD exhibited spongiform degeneration and reactive astrocytosis. Western blot analysis of ferret-passaged CWD demonstrated the presence of PrP-res. Unlike mule deer CWD, ferret-passaged CWD was transmissible to Syrian golden hamsters (*Mesocricetus auratus*). Increasing the passage number of CWD in ferrets increased the pathogenicity of the agent for hamsters. **This increase in host range of a field isolate on interspecies transmission emphasizes the need for caution when assessing the potential risk of transmission of TSEs, such as bovine spongiform encephalopathy, to new host species.** © 1998 Academic Press

INTRODUCTION

Chronic wasting disease (CWD) of deer and elk is a member of the transmissible spongiform encephalopathies (TSEs), a group of insidious neurological diseases that have preclinical incubation periods of months to years. Other animal TSEs include bovine spongiform encephalopathy, transmissible mink encephalopathy (TME), and scrapie of sheep and goats. In humans, the TSEs are Creutzfeldt–Jakob disease (CJD), Gerstmann–Sträussler–Scheinker syndrome, fatal familial insomnia, and kuru. TSEs share a common neuropathology that includes spongiform degeneration, reactive astrocytosis, and deposition of an abnormal isoform of the host prion protein (PrP-res). Although the precise composition of the TSE agent is not known, a considerable body of evidence supports the hypothesis that the TSE agent contains PrP-res (Prusiner, 1982).

CWD was first identified in captive mule deer and black-tail deer in 1967 (Williams and Young, 1980) and later in captive Rocky Mountain elk (Williams and Young, 1982). Recently, CWD has been detected in wild populations of mule deer, white-tailed deer, and Rocky Mountain elk (Spraker *et al.*, 1997). Although CWD has been primarily identified in northcentral Colorado and southeastern Wyoming, whether it is limited to this geographical area or is present in other locations is unknown (Williams and Young, 1992).

The etiology and mode of transmission of CWD are unknown. It is unclear whether CWD is the result of the

transmission of sheep scrapie to deer and elk or represents a naturally occurring TSE of cervids. Regardless of the origin, CWD clearly is a self-sustaining disease. Although CWD can be transmitted horizontally in captive populations (Williams and Young, 1992), it is unknown whether horizontal transmission occurs in wild populations.

Experimental transmission of CWD to other species has had mixed results. CWD has been successfully transmitted to mink, squirrel monkeys (R. F. Marsh, unpublished data), mule deer, and a domestic goat (Williams and Young, 1992). Multiple attempts to transmit CWD to Syrian golden hamsters have been unsuccessful (Williams and Young, 1992), whereas transmission to mice is very inefficient (Williams and Young, 1992; M. Bruce, personal communication). In this study, we report the successful transmission of CWD of mule deer to ferrets. The adaptation of CWD to ferrets results in an altered host range as demonstrated by the transmission of ferret-adapted CWD to hamsters, a host nonpermissive to mule deer CWD.

RESULTS

Transmission studies of CWD to ferrets and hamsters

To determine the susceptibility of ferrets and hamsters to CWD, a 10% brain homogenate from a mule deer clinically affected with CWD from northcentral Colorado (a gift from Dr. Beth Williams) was used to intracerebrally inoculate 20 hamsters and eight weanling ferrets. None of the hamsters inoculated with mule deer CWD had developed neurological symptoms by 1 year after inoculation, at which time the experiment was terminated. Two ferrets died at ~12 months of age from unrelated disease. The remaining six ferrets were killed at 17–21

¹ To whom reprint requests should be addressed. Fax: (608) 262-7420. E-mail: jma@ahabs.wisc.edu.

TABLE 1
Affected Animals and Incubation Period

Passage no.	No. affected/no. inoculated	Incubation period (mo)
1	6/8 ^a	17–21
2	11/12	8–9
3	5/5	5

^a Two intercurrent deaths.

months after inoculation and had clinical signs of neurological disease, ataxia, and lethargy, lasting 1–6 weeks (Table 1). Serial transmission (10% w/v brain homogenate) of first passage ferret CWD into 12 ferrets resulted in 11 affected ferrets with an incubation period of 8–9 months and clinical signs lasting from 1–4 weeks (Table 1). Serial transmission of second passage CWD into five ferrets produced disease in all animals with an incubation period of 5 months and clinical signs lasting 1–3 weeks (Table 1). Subsequent passages in ferrets did not significantly alter the incubation period. All buffer-only inoculated ferrets and hamsters remained asymptomatic throughout the duration of the experiment.

Western blot analysis of CWD mule deer and ferrets

PrP-res-enriched preparations from the brain of a mule deer infected with CWD, a ferret infected with CWD, a ferret infected with scrapie, and a hamster infected with Hyper-TME were analyzed by Western blot using the polyclonal anti-mink PrP-res antibody (Fig. 1). The disease-specific isoform of PrP, PrP-res, is present in both the CWD-infected mule deer and ferrets. The polyclonal anti-mink PrP-res antibody recognizes mule deer and ferret PrP-res but not hamster PrP-res (Fig. 1).

Histology of CWD ferrets

Hematoxylin-eosin-stained sections from the brain of CWD-infected ferrets demonstrated extensive spongiform degeneration that was mainly observed in the gray matter neuropil of multiple regions of the brains of ferrets affected with CWD (Fig. 2A). This phenomenon was accompanied by a reactive astrocytosis as determined by immunohistochemistry for the astrocyte-specific protein glial fibrillary acidic protein (Fig. 2B). Unlike mule deer and elk CWD (Williams and Young, 1993), we observed no amyloid plaques in CWD-infected ferret brain.

Transmission of ferret-adapted CWD to hamsters

To investigate the effect that interspecies transmission may have on TSE agent host range, we inoculated hamsters with ferret-passaged CWD. Both second and fourth passage ferret-adapted CWD was examined for pathogenicity in hamsters. Of the 24 hamsters inoculated with second ferret-passaged CWD, two hamsters developed

a progressive neurological disorder at 132 days after inoculation, and a third hamster developed similar symptoms at 187 days after inoculation (Fig. 3). The remaining 21 hamsters inoculated with second ferret-passaged CWD, as well as the mock-inoculated controls, were asymptomatic at 400 days after inoculation (Fig. 3). The inoculation of fourth ferret-passaged CWD into 20 Syrian golden hamsters resulted in 16 hamsters developing a progressive neurological disorder at 152 ± 44 days after infection. The onset of clinical symptoms ranged from 100–239 days after inoculation (Fig. 3). The remaining four hamsters, in addition to the mock-inoculated controls, were asymptomatic at 300 days after inoculation (Fig. 3). A 10% brain homogenate from a hamster that developed clinical symptoms on day 132 was used to inoculate 14 Syrian hamsters. All 14 hamsters developed a progressive neurological disorder characterized by hyperexcitability and ataxia at 53 days after inoculation. A 10% brain homogenate from a second passage hamster was inoculated into 10 Syrian hamsters, resulting in all 10 of the hamsters developing hyperexcitability and ataxia at 50 ± 2 (days \pm SEM) after inoculation.

A 10% brain homogenate from a hamster that developed clinical symptoms at 107 days after inoculation was used to inoculate 22 Syrian hamsters. All of these hamsters developed a progressive neurological disorder characterized by hyperexcitability and ataxia at 56 ± 2 days after inoculation. A 10% brain homogenate from a pool of three of the second passage hamsters was used to inoculate 30 Syrian hamsters. All 30 hamsters developed hyperexcitability and ataxia at 58 ± 4 days.

Western blot analysis of hamsters infected with ferret-passaged CWD

Western blot analysis was used to assay for the presence of PrP-res in hamsters inoculated with second and

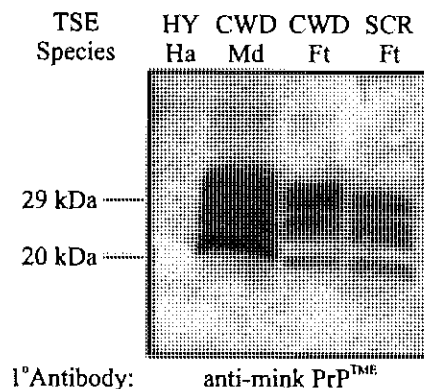


FIG. 1. Western blot analysis of mule deer CWD and ferret-adapted CWD PrP-res. PrP-res-enriched preparations from a CWD-infected mule deer (CWD MD), a CWD-infected ferret (CWD Ft), a scrapie-infected ferret (SCR Ft), and a hamster infected with the Hyper strain of TME (HY Ha) were analyzed by Western blotting using an anti-mink PrP^{TME} antibody. The positions of the 29- and 20-kDa molecular weight markers are indicated (left).

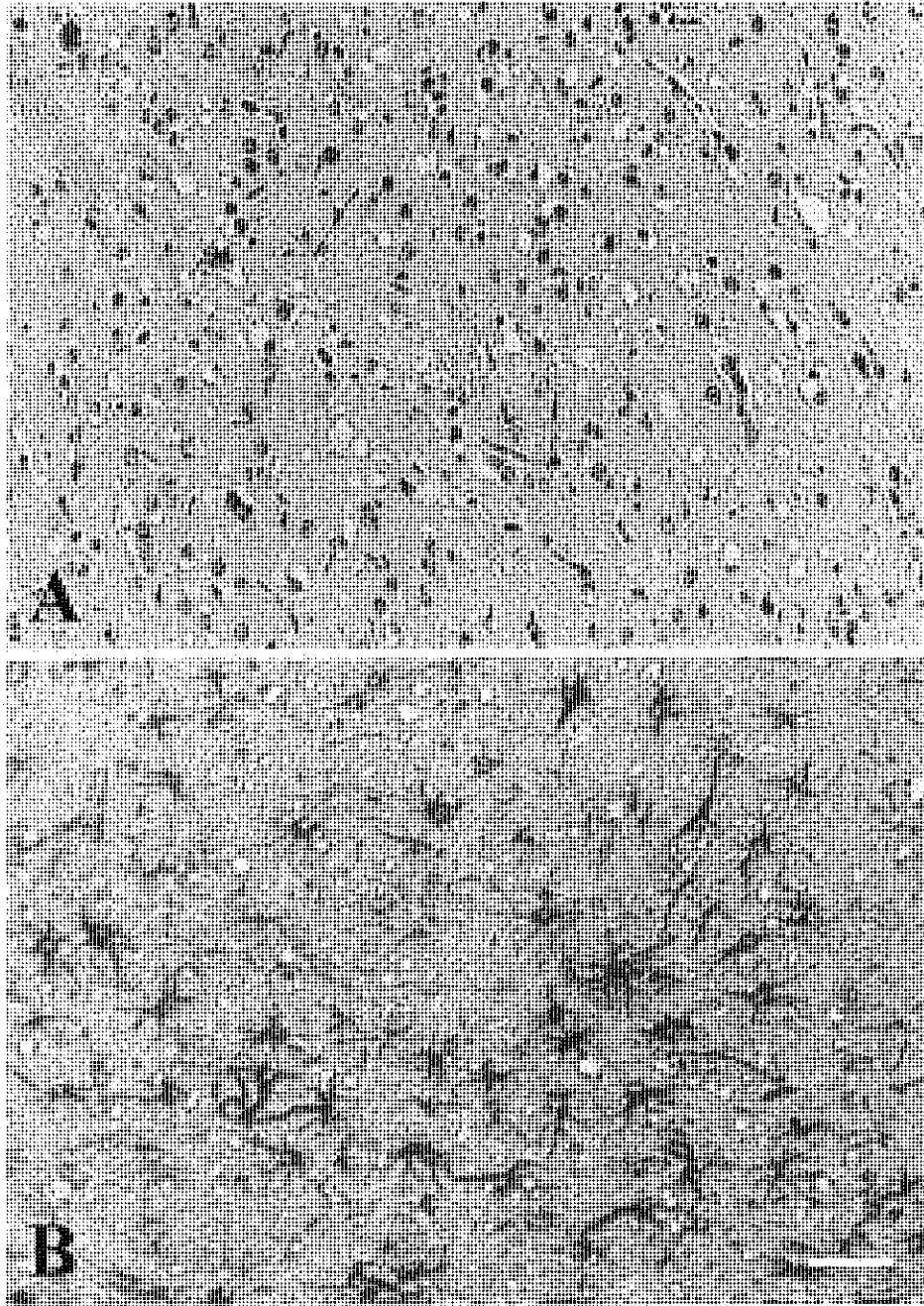


FIG. 2. Histopathology of ferret-adapted CWD. Representative spongiform degeneration (A, hematoxylin and eosin) and reactive astrocytosis (B) (GFAP immunohistochemistry) in the posterior sigmoidal gyrus of ferrets inoculated with ferret-passaged CWD. (Scale bar = 50 μ m).

fourth ferret-passaged CWD. Whole brain homogenates (5 μ l of a 10% homogenate) of the hamster passages were analyzed by Western blot using the 3F4 antibody indicated the presence of PrP-res (Fig. 4).

DISCUSSION

CWD is an emerging TSE originally recognized in captive mulé deer and elk (Williams and Young, 1992, 1993), which has also been recently identified in wild populations (Spraker *et al.*, 1997). The identification of a small animal

model of CWD is essential for the characterization of this TSE. Due to the inability to transmit CWD to rodents, we examined the susceptibility of ferrets to CWD. We found CWD to be readily transmitted to ferrets, thus providing a useful animal model for future CWD transmission studies.

Interspecies transmission of TSEs has received heightened interest in recent years due to the bovine spongiform encephalopathy (BSE) epizootic in Great Britain. BSE has been demonstrated to be experimentally transmissible to numerous species, including sheep, mice, pigs, and mon-

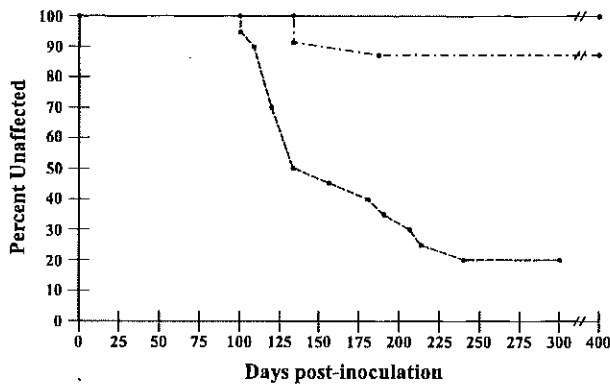


FIG. 3. Interspecies transmission of ferret-adapted CWD to Syrian hamsters. The points represent time to onset of clinical disease in hamsters inoculated intracerebrally with 30 μ l of a 10% brain homogenate from second ferret-passaged and fourth ferret-passaged CWD. Inoculum, second ferret-passaged CWD (dotted and dashed line), fourth ferret-passaged (dashed line), or buffer alone (solid line).

keys (Bradley, 1996), and there is increasing evidence that BSE has been transmitted to humans in the form of new variant CJD (Bruce *et al.*, 1997; Will *et al.*, 1996). It is suspected that BSE originated from the transmission of scrapie into cattle and that once adapted to cattle, the agent exhibited an altered host range.

Experimental transmission of the BSE agent often results in modification of the agent strain properties but does not alter the host range of the agent because the agent is very host specific and is restricted to infecting species and strains (BSE, bovine; vCJD, variant CJD). There are a few examples, however, of species that are capable of infection by agents of the BSE agent. Although humans are not susceptible to bovine spongiform encephalitis, they are thought susceptible to the agent after passage in mice (Liu *et al.*, 1997), demonstrating that interspecies transmission has increased the host range of the agent to include species that were not originally susceptible.

Another CWD has not been as host specific as bovine spongiform encephalitis and variant CJD. Members can be infected with ferret-passaged CWD (Farkas and Johnson, 1997) demonstrating that passage of CWD in ferrets expands the agent's host range. The passage of CWD in

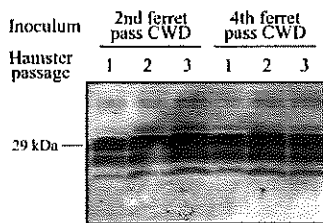


FIG. 4. Western blot analysis of PrP-res from CWD-infected hamsters. PK-treated brain homogenates (5 μ l of 10% w/v) of the first three hamster passages of second and fourth ferret-passaged CWD were analyzed by Western blot with the 3F4 antibody. The position of the 29-kDa molecular weight marker is indicated (left).

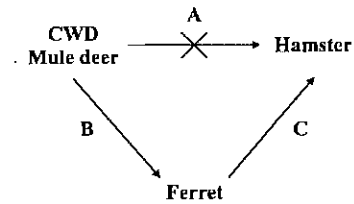


FIG. 5. CWD transmission summary. Mule deer CWD is unable to infect Syrian golden hamsters (A). Passage of mule deer CWD through ferrets (B) modifies tropism of the CWD agent, expanding the host range and allowing for infection of hamsters (C).

ferrets provides an example of an expansion of the agent's host range due to passage through a host species. Further passage in ferrets increases the pathogenicity for hamsters, but does not alter the host range. It is important that the agent be able to infect another species to expand the host range. It is unlikely that the ferret-adapted CWD strain which is pathogenic for hamsters was present in the original CWD mule deer brain because this would require a route to reach hamsters, suggesting that the agent requires the ferret as a necessary step in the ferret passage history.

In this study we experimentally expanded the host range of the CWD agent to include the ferret, an agent that can serve as a useful model for future CWD transmission studies. Furthermore we demonstrated that interspecies transmission of CWD by ferrets expands the agent's host range of the agent to include a previously resistant species, the hamster. These data illustrate the routes that must be used when host range predictions are based on the characteristics of the original BSE

MATERIALS AND METHODS

Bioassay

Weanling ferrets (*Mustela putorius furo*) or Syrian golden hamsters (*Mesocricetus auratus*) were inoculated intracerebrally with 30 μ l of a 10% w/v brain homogenate (CWD mule deer, CWD ferret, or CWD hamster) in PBS. Brain homogenates were prepared with disposable syringes in disposable plasticware. Control animals were inoculated with buffer alone. Hamsters were housed in new boxes and racks in an animal room that had not been previously used for TSE bioassays. All animals were observed daily for the onset of neurological disease. The date of the second positive scoring for neurological disease was used to calculate the incubation period. Animals were killed by CO₂ asphyxiation, and brain tissue was removed with new instruments for further analysis.

PrP-res-enriched preparations

An equal volume of 20% N-lauroyl-sarcosine (Sigma) was added to 600 μ l of 10% brain homogenate, vortexed, and incubated for 30 min at room temperature. The

mixture was centrifuged at 19,000 rpm in a TLA-45 rotor (Beckman) for 30 min at 20°C. The supernatant (1 ml) was removed and centrifuged at 45,000 rpm in a TLA-45 rotor (Beckman) for 60 min at 20°C, and the resulting pellet was resuspended in 100 μ l of PBS. The samples were sonicated in a cup-horn sonicator (Fisher) for 1 min and stored at -20°C until use.

Western blot analysis

Brain homogenates (5 μ l of 10%) or PrP-res-enriched preparations (10-mg brain equivalents) were digested with 50 μ g/ml Proteinase K (Boehringer-Mannheim) for 30 min at 37°C. The samples were size fractionated on 15% SDS-PAGE, transferred to Immobilon P (Millipore) using a semidry (Hoefer) apparatus, and incubated with polyclonal hamster anti-mink PrP antibody (1:500) for 16 h at room temperature. The membrane was washed (50 mM Tris, pH 7.4, 150 mM NaCl, 1 mM EDTA, 0.05% Tween 20) and incubated with anti-hamster IgG-AP (1:1000; Kirkegaard and Perry). The membrane was then washed and developed with 50 μ g/ml nitro blue tetrazolium chloride and 100 μ g/ml 5-bromo-4-chloro-3-indolyl phosphate in developing buffer (50 mM Tris, pH 9.5, 3 mM MgCl₂).

Antibody preparation

The brain of a mink clinically affected with TME was homogenized to 10% (w/v) in Tris-buffered saline (TBS) and centrifuged at 5000 g for 3 min in a TLA-45 rotor at 4°C. The supernatant was discarded, and the pellet (P1) was resuspended in 500 μ l of TBS and centrifuged at 5000 g for 3 min in a TLA-45 rotor at 4°C. The resulting pellet (P2) was saved, and the supernatant was recentrifuged at 20,000 g for 40 min at 4°C. The supernatant was removed and discarded, and the pellet (P3) was saved. The P2 and P3 pellets were combined and treated with 99% formic acid (Sigma) for 2 h on ice. After evaporation of the formic acid, 1 ml of TBS containing 0.1% Nonidet P-40 was added. The antigen was emulsified with complete Freund's adjuvant (Bacto) before immunization. Syrian golden hamsters were injected with 200 μ l of the antigen i.p. and 150 μ l i.m. Hamsters were boosted by i.p. injection of 200 μ l of antigen 1 month after the primary immunization. Blood was collected from the hamsters by cardiac puncture and incubated at 37°C for 1 h followed by 16 h at 4°C. The blood clot was removed, and the serum was centrifuged (2000 g) for 10 min. The supernatant was transferred and stored at -80°C.

Histology

Brain tissue was fixed in Formalin, embedded in paraffin, sectioned (8 μ m), and stained with hematoxylin-eosin. For immunohistochemical analysis, unstained slides were deparaffinized with xylene and rehydrated in

a 100–70% ethanol gradient with a final incubation in water before incubation with a rabbit anti-cow GFAP (DAKO; 1:1000 dilution) primary antibody in 0.1% goat serum in TBS with 0.1% Tween 20. Biotinylated anti-rabbit IgG secondary antibody and Vectastain ABC reagent (Vector Labs, Burlingame, CA) were used according to manufacturer's instructions. Immunoreactivity was developed with 0.5% 3,3'-diaminobenzidine and 0.03% H₂O₂. Slides were counterstained with Mayer's hematoxylin and mounted in Permount.

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REFERENCES

- Bessen, R. A., and Marsh, R. M. (1992). Identification of two biologically distinct strains of transmissible mink encephalopathy in hamsters. *J. Gen. Virol.* 73, 329–334.
- Bradley, R. (1996). Bovine spongiform encephalopathy distribution and update on some transmission and decontamination studies. In "Bovine Spongiform Encephalopathy: The BSE Dilemma" (C. Gibbs, ed.), pp. 11–27. Springer, New York.
- Bruce, M. E., Will, R. G., Ironside, J. W., McConnell, I., Drummond, D., Suttie, A., McCardle, L., Chree, A., Hope, J., Birkett, C., Cousens, S., Fraser, H., and Bostock, C. J. (1997). Transmissions to mice indicate that 'new variant' CJD is caused by the BSE agent. *Nature* 389, 498–501.
- Gibbs, C. J., Safar, J., Sulima, M. P., Bacate, A. E., and San Martin, R. A. (1996). Transmission of sheep and goat strains of scrapie from experimentally infected cattle to hamsters and mice. In "Bovine Spongiform Encephalopathy: The BSE Dilemma" (C. Gibbs, ed.), pp. 84–91. Springer, New York.
- Kimberlin, R. H., and Walker, C. A. (1977). Characteristics of a short incubation model of scrapie in the golden hamster. *J. Gen. Virol.* 34, 295–304.
- Kimberlin, R. H., and Walker, C. A. (1978). Evidence that the transmission of one source of scrapie agent to hamsters involves separation of agent strains from a mixture. *J. Gen. Virol.* 39, 487–496.
- Prusiner, S. B. (1982). Novel proteinaceous infectious particles cause scrapie. *Science* 216, 136–144.
- Spraker, T. R., Miller, M. W., Williams, E. S., Getzy, D. M., Adrian, W. J., Schoonveld, G. G., Spowart, R. A., O'Rourke, K. I., Miller, J., and Merz, P. A. (1997). Spongiform encephalopathy in free-ranging mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*) and Rocky Mountain elk (*Cervus elaphys nelsoni*) in northcentral Colorado. *J. Wildlife Dis.* 33, 1–6.
- Will, R. G., Ironside, J. W., Zeidler, M., Cousens, S. N., Estibeiro, K., Alperovitch, A., Poser, S., Pocchiari, M., Hofman, A., and Smith, P. G. (1996). A new variant of the Creutzfeldt-Jakob disease in the UK. *Lancet* 347, 921–925.
- Williams E. S., and Young, S. (1980). Chronic wasting disease of captive mule deer: A spongiform encephalopathy. *J. Wildlife Dis.* 16, 89–98.
- Williams, E. S., and Young, S. (1982). Spongiform encephalopathy of Rocky Mountain elk. *J. Wildlife Dis.* 18, 465–471.
- Williams, E. S., and Young, S. (1992). Spongiform encephalopathies in Cervidae. *Rev. Sci. Tech.* 11, 551–567.
- Williams, E. S., and Young, S. (1993). Neuropathology of chronic wasting disease of mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus nelsoni*). *Vet. Pathol.* 30, 36–45.

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Prion protein gene sequence and chronic wasting disease susceptibility in white-tailed deer (*Odocoileus virginianus*)

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ABSTRACT

Go to:

The sequence of the prion protein gene (*PRNP*) affects susceptibility to spongiform encephalopathies, or prion diseases in many species. In white-tailed deer, both coding and non-coding single nucleotide polymorphisms have been identified in this gene that correlate to chronic wasting disease (CWD) susceptibility. Previous studies examined individual nucleotide or amino acid mutations; here we examine all nucleotide polymorphisms and their combined effects on CWD. A 626 bp region of *PRNP* was examined from 703 free-ranging white-tailed deer. Deer were sampled between 2002 and 2010 by hunter harvest or government culling in Illinois and Wisconsin. Fourteen variable nucleotide positions were identified (4 new and 10 previously reported). We identified 68 diplotypes comprised of 24 predicted haplotypes, with the most common diplotypes occurring in 123 individuals. Diplotypes that were found exclusively among positive or negative animals were rare, each occurring in less than 1% of the deer studied. Only one haplotype (C, odds ratio 0.240) and 2 diplotypes (AC and BC, odds ratios of 0.161 and 0.108 respectively) has significant associations with CWD resistance. Each contains mutations (one synonymous nucleotide 555C/T and one nonsynonymous nucleotide 286G/A) at positions reported to be significantly associated with reduced CWD susceptibility. Results suggest that deer populations with higher frequencies of haplotype C or diplotypes AC and BC might have a reduced risk for CWD infection – while populations with lower frequencies may have higher risk for infection. Understanding the genetic basis of CWD has improved our ability to assess herd

susceptibility and direct management efforts within CWD infected areas.

KEYWORDS: CWD, diplotype, G96S, *PRNP*, prion, synonymous polymorphism, haplotype

Abbreviations

Go to:

AA amino acid

CWD chronic wasting disease

IDNR Illinois Department of Natural Resources

MCMC Markov Chain Monte Carlo

PRNP prion protein gene

PrP Prion protein

TSE transmissible spongiform encephalopathy

INTRODUCTION

Go to:

Transmissible spongiform encephalopathies (TSEs) or prion diseases are fatal neurological disorders caused by the misfolding of a common protein (PrP^C) into an infectious conformation (PrP^{SC}).¹ Chronic wasting disease (CWD) is a TSE that occurs in free ranging cervids, including white-tailed deer, mule deer, elk, and moose.^{2,3} Originally CWD was described in the 1970s in northern Colorado and southern Wyoming^{4,5} and has since spread to a number of other US states and Canadian provinces.^{6,7} The first case of CWD detected east of the Mississippi river was in Wisconsin in 2002⁸ and then Illinois later that year.⁹⁻¹²

CWD is transmitted horizontally (and possibly vertically¹³) within white-tailed deer by pathogenic prions shed from the infected host in blood, saliva, urine and feces.^{14,15} Furthermore, prions have been shown to persist in the environment potentially remaining infectious and causing CWD infection long after affected deer have dispersed.¹⁶⁻¹⁸ Cross-species infection of TSEs are rare but fatal, most notably being variant Creutzfeldt-Jakob disease which is the result of bovine spongiform encephalopathy transmission to humans.¹⁹ Chronic wasting disease is not known to affect humans; though, there is no consensus among researchers about the possibility of human infection. Studies using mouse²⁰ and primate²¹ models suggest a strong barrier to human disease transmission. However, under certain experimental conditions cervid PrP^{SC} is capable of converting human PrP^C to produce PrP^{SC}.^{22,23}

The *PRNP* gene was shown to affect prion disease susceptibility and progression in several species.^{10,24-29} Because CWD is influenced by the expressed protein,¹ many studies have focused on the inferred amino acid sequence of *PRNP*. In white-tailed deer 2 polymorphisms at amino acid positions (aa) Q95H and G96S have been detected that are associated with reduced disease susceptibility.^{26,27,30} In a captive deer herd in Nebraska, individuals with at least one copy of serine (S) at aa96 were less likely to test positive for CWD.³⁰ Similarly, free ranging deer in Wisconsin were found to have reduced susceptibility to CWD among individuals with a histidine (H) at aa95 or one copy of aa96S; however, complete genetic resistance was not detected and further analysis linked aa96S to slowed disease progression.^{26,27} Analyses of the *PRNP* nucleotide sequences corroborated the significance of aa95 and aa96, but also revealed that synonymous mutations were associated with CWD susceptibility.^{10,28} Furthermore, the cumulative number of nucleotide deviations (both

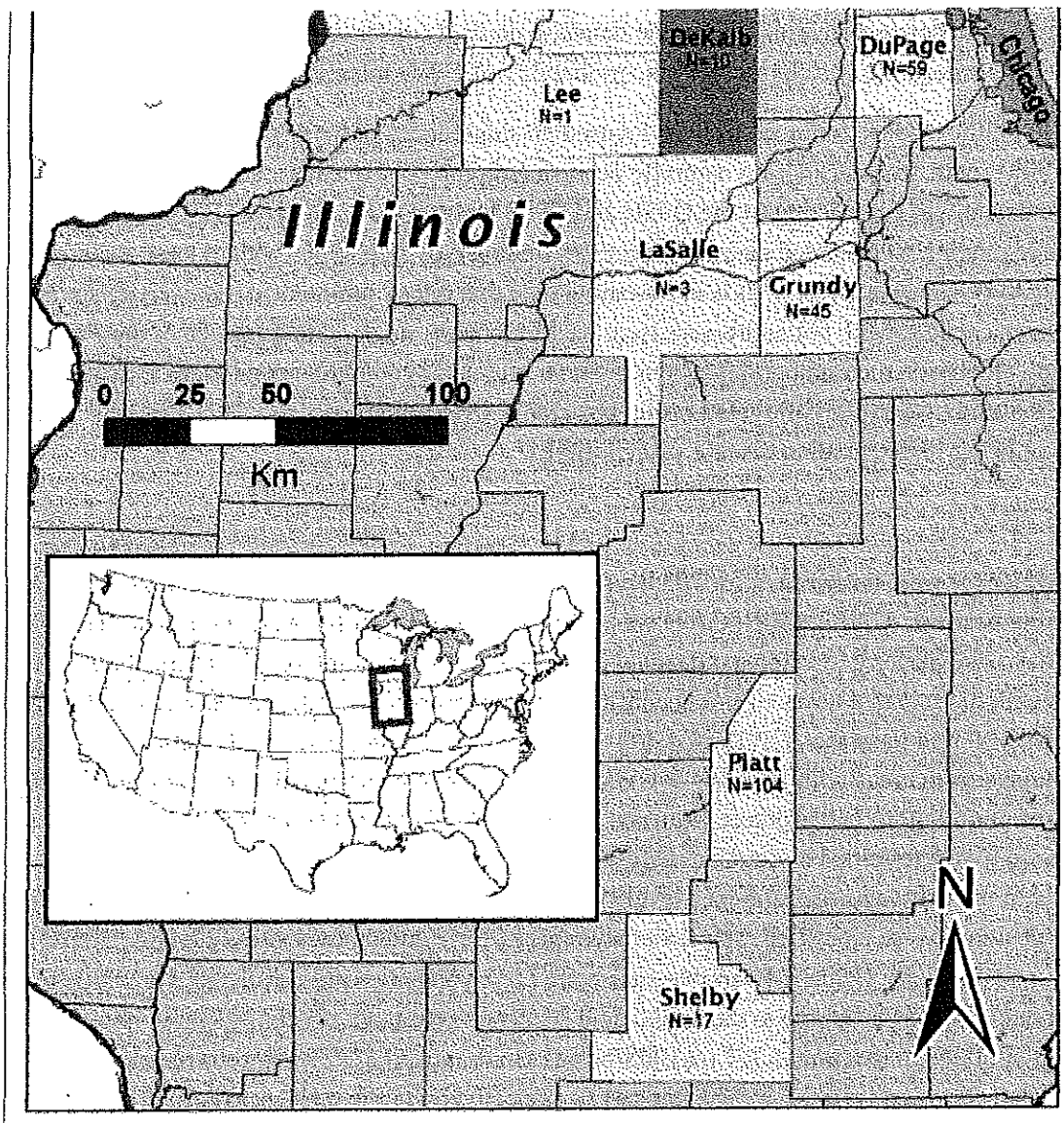
synonymous and non-synonymous) from the database derived consensus sequence for *PRNP* was found to have a negative correlation with the probability of CWD infection among white-tailed deer.¹⁰

A majority of the studies to this point have focused on single locus polymorphisms and CWD susceptibility, with few considering naturally occurring diplotype sequences. One study examined 4 amino acid genotypes consisting of the Q95H and G96S loci (QQ/GG, QQ/GS, QQ/SS, and QH/GG) among free ranging white-tailed deer in Wisconsin, finding only genotypes with at least one copy of S less likely to be CWD positive.²⁹ It is important to note that only 2 amino acid loci were examined and synonymous changes were not addressed. Here we examine the nucleotide sequence of the *PRNP* gene comparing all observed combinations of synonymous and non-synonymous mutations in white-tailed deer. In this study we explore the relationship between *PRNP* diplotypes and CWD disease status with the goal of better understanding disease susceptibility.

RESULTS

Go to:

PRNP sequences were determined for 703 deer by PCR and Sanger sequencing: 579 tested for CWD (105 testing positive, 474 for which CWD was not detected) and 124 that were not tested. Analyses of disease risk were performed using a reduced dataset (N = 240) consisting of deer originating in counties with more than 5 cases of CWD confirmed by government monitoring between 2002–2010 (henceforth referred to as the “CWD infection area;” [Fig. 1](#)). Additional tested and untested samples were obtained from areas with low risk of CWD (counties with fewer than 5 or no confirmed cases at the time of sampling) to better detect sequence variations, haplotypes, and diplotypes. Statistical significance was determined by logistic regression using the most frequent haplotype, diplotype, genotype, or nucleotide as the reference level. Within the analyzed 626 bp region of the *PRNP* gene 14 variable positions were identified, 10 previously reported^{10,28} and 4 novel sites (299G/A, 308A/T, 367G/A, and 372G/A). Of the 14 variable sites 6 are non-synonymous (3 novel and 3 previously reported) and result in a change to the amino acid sequence ([Table 1](#)). It is important to note that mutations at nt299, nt308, and nt367 (aa100S/N, aa103N/I and aa123A/T respectively) are of interest as the human equivalents (aa97, aa100, and aa120 respectively) are in close proximity to polymorphisms associated with prion disease susceptibility in humans.³¹⁻³³



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FIGURE 1.

Map of Illinois (orange) and Wisconsin (pink), showing the study area for samples collected between 2002 and 2010. Samples were collected from all counties in gray by hunter harvest or government culling. Counties within the CWD infection area (at least 5 confirmed cases of CWD during the sample period) are darkly shaded; statistical analyses of CWD susceptibility were restricted to individuals originating from these locations thus increasing the probability of disease exposure. Number of samples from each county is indicated below the county name.

TABLE 1.

Variable nucleotide positions for reconstructed haplotypes within the 629bp region of the *PRNP* gene

<i>M</i>	C	C	T	A	G	A	A	A	G	G	G	C	C	C	1	<	0.01
<i>N</i>	T	C	T	C	A	G	A	A	G	G	G	C	C	C	3	<	0.01
<i>O</i>	T	T	T	A	G	G	A	A	G	G	G	C	C	C	2	<	0.01
<i>P</i>	C	C	T	A	A	G	A	A	G	G	G	C	C	C	1	<	0.01
<i>Q</i>	C	C	T	A	A	G	A	A	A	G	G	C	T	C	3	<	0.01
<i>R</i>	C	T	T	A	G	G	A	A	G	G	G	C	T	C	2	<	0.01
<i>S</i>	C	C	T	A	A	A	A	A	G	G	G	C	T	C	3	<	0.01
<i>T</i>	C	T	T	A	G	G	A	A	G	G	A	C	C	C	2	<	0.01
<i>U</i>	C	T	T	A	G	G	T	A	G	G	G	C	C	C	2	<	0.01
<i>V</i>	C	T	T	A	A	G	A	A	G	G	G	C	C	C	2	<	0.01
<i>W</i>	T	C	T	A	A	G	A	A	G	G	G	C	C	C	2	<	0.01
<i>X</i>	T	C	A	A	A	G	A	A	G	G	G	C	C	C	3	<	0.01

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Haplotypes were generated from unphased sequences in PHASE v2.1. Nucleotide positions are based on Kelly et al. 2008. Non-synonymous mutations are in bold face, and the 4 novel mutations are indicated by asterisks. N_m is the number of nucleotide deviations from haplotype A, which is the most abundant haplotype among all sampled deer. f is the frequency of haplotypes among all sampled deer. The number of haplotype copies (N=1406) are shown among (+) CWD positive deer, (-) CWD negative deer, and (NT) deer that were not tested for CWD.

Haplotypes were generated from unphased sequences using PHASE v2.1.^{34,35} Twenty-four haplotypes were predicted from 703 deer (N=1406 possible haplotype copies), with haplotype A occurring most

frequently (**Table 1**). Nine haplotypes are found exclusively among negative (haplotypes L, Q, S, T, and W), positive (haplotype R) or untested deer (haplotypes U, V, and X); however, each of these haplotypes is rare with a frequency of occurrence less than 1% (**Table 1**). Seventeen haplotypes occurred within the CWD infection area and only haplotype C is significantly less likely to be found among deer infected with CWD ($P < 0.001$, OR = 0.240 and 95% CI = 0.104–0.503) (**Table 2**).

TABLE 2.

Disease association for unique *PRNP* haplotypes among deer within the CWD infection area

Haplotype	<i>f</i>	(+)	(-)	P-val	Odds Ratio
<i>A</i>	0.34	76	87	—	—
<i>B</i>	0.31	75	74	0.513	—
<i>C</i>	0.11	9	43	<0.001	0.240 (0.104–0.503)
<i>D</i>	0.11	30	22	0.166	—
<i>E</i>	0.05	6	17	0.070	—
<i>F</i>	0.02	2	9	0.086	—
<i>G</i>	0.02	5	5	0.836	—
<i>I</i>	<0.01	2	0	0.992	—
<i>J</i>	<0.01	1	3	0.408	—
<i>K</i>	<0.01	0	2	0.992	—
<i>M</i>	<0.01	0	2	0.992	—
<i>N</i>	<0.01	0	1	0.995	—
<i>O</i>	<0.01	1	2	0.651	—
<i>P</i>	<0.01	1	1	0.924	—
<i>R</i>	<0.01	2	0	0.992	—
<i>S</i>	<0.01	0	1	0.995	—
<i>T</i>	<0.01	0	1	0.995	—

Haplotypes were generated from unphased sequences in PHASE v2.1. To avoid spurious results, this analysis includes only deer from the CWD infection area (counties with at least 5 confirmed cases of CWD). Only haplotypes that occurred in the CWD infection area are shown. *f* is the frequency of each haplotype. The number of haplotype copies (N=480) are shown among (+) CWD positive deer and (-) CWD negative deer. Odds ratios and 95% confidence intervals (parentheses) are shown for significant parameters ($P < 0.05$) determined by logistic regression against haplotype A, as it occurs most frequently among the sampled deer.

Diploypes were determined from unique *PRNP* sequences. *f* is the frequency of diploypes among all sampled deer. The number of deer (N=703) with each diploype are shown for (+) CWD positive deer, (-) CWD negative deer, and (NT) deer that were not tested for CWD. Fifty diploypes were considered rare, each occurring in less than 1% of the total sampled deer and are summarized collectively.

TABLE 4.

Disease association with *PRNP* diploypes among white-tailed deer within the CWD infection area

<i>BB</i>	0.08	12	8	0.474	—
<i>BD</i>	0.08	12	7	0.346	—
<i>AC</i>	0.06	2	12	0.023	0.161 (0.024–0.654)
<i>AD</i>	0.06	8	6	0.668	—
<i>BC</i>	0.04	1	9	0.040	0.108 (0.006–0.623)
<i>AE</i>	0.03	3	4	0.691	—
<i>CD</i>	0.03	1	5	0.144	—
<i>BE</i>	0.02	1	4	0.216	—
<i>BG</i>	0.02	3	2	0.693	—
<i>CC</i>	0.02	1	4	0.216	—
<i>DD</i>	0.02	4	1	0.237	—
<i>AF</i>	0.02	2	2	0.975	—
<i>EC</i>	0.02	1	3	0.339	—
<i>AI</i>	0.01	2	0	0.995	—
<i>BR</i>	0.01	2	0	0.995	—
<i>BF</i>	0.01	0	2	0.995	—
<i>BO</i>	0.01	0	2	0.995	—
<i>EJ</i>	0.01	0	2	0.995	—
<i>EF</i>	0.01	0	2	0.995	—
<i>PC</i>	0.01	1	1	0.982	—
<i>DG</i>	0.01	1	1	0.982	—
Rare (N=15)	< 0.01	3	12	> 0.050	—

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A total of 68 unique diplotypes were identified among all sampled deer (including both tested and untested individuals from all sampled areas, $N = 703$). Diplotype AB is the most frequently detected, occurring in 123 deer (positive, negative, and untested deer; [Table 3](#)). One diplotype (BF) is found exclusively among negative deer; 9 individuals (1%) carried this diplotype, of which 2 are found within the CWD infection area ([Tables 3 and 4](#)). Fifty diplotypes are considered rare having a frequency of occurrence less than 1% and 38 of these are found exclusively among positive, negative or untested deer (3, 26, and 9 diplotypes respectively). Diplotypes AC and BC are significantly less likely to be found among deer infected with CWD ($P < 0.05$). Odd ratios for these diplotypes are 0.161 and 0.108 (95% CI = 0.024–0.654 and 0.006–0.623) respectively ([Table 4](#)).

TABLE 3.

Frequency of *PRNP* diplotypes among all sampled white-tailed deer

Diplotype	<i>f</i>	(+)	(-)	NT
AB	0.17	32	73	18
AA	0.10	13	49	7
AC	0.08	2	40	14
BC	0.08	1	38	14
AD	0.07	8	32	10
BB	0.06	12	26	5
BD	0.06	12	22	6
CC	0.04	1	25	4
CD	0.03	1	18	3
AE	0.03	3	10	6
AF	0.02	2	9	4
DD	0.02	4	10	1
AG	0.02	1	10	1
BE	0.02	1	10	0
EC	0.02	1	8	2
BG	0.01	3	7	0
BF	0.01	0	9	0
DG	0.01	1	7	1
Rare ($N=50$)	< 0.01	7	71	28

<i>Allele</i>								
285	A	Q	0.975	208	260	—	—	—
	C	H	0.025	2	10	0.076	—	—
286	G	G	0.879	198	224	—	—	—
	A	S	0.121	12	46	<0.001	0.295 (0.146–0.556)	—
<i>Single Position Genotype</i>								
285	AA	QQ	0.954	103	126	—	—	—
	AC	QH	0.041	2	8	0.139	—	—
	CC	HH	<0.01	0	1	0.987	—	—
286	GG	GG	0.796	95	96	—	—	—
	GA	GS	0.167	8	32	0.001	0.253 (0.104–0.552)	—
	AA	SS	0.038	2	7	0.127	—	—
<i>Two Position Genotype</i>								
285/286	AA/GG	QQ/GG	0.758	93	89	—	—	—
	AA/GA	QQ/GS	0.163	8	31	<0.001	0.247 (0.101–0.542)	—
	AA/AA	QQ/SS	0.033	2	6	0.169	—	—
	AC/GG	QH/GG	0.033	2	6	0.169	—	—
	AC/GA	QH/GS	0.004	0	1	0.991	—	—
	AC/AA	QH/SS	0.004	0	1	0.991	—	—
	CC/GG	HH/GG	0.004	0	1	0.991	—	—

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To avoid spurious results, this analysis includes only deer from the core CWD infection area (counties with at least 5 confirmed cases of CWD). Nt is the nucleotide at each position, and AA is the resulting amino acid for each nucleotide mutation. *f* is the frequency of each variable. The number of alleles (N=480) or genotypes (N=240) is shown for (+)CWD positive deer and (-)CWD negative deer. Odds ratios and 95% confidence intervals (parentheses) are shown for significant parameters ($P < 0.05$) determined by logistic regression.

DISCUSSION

Go to:

In this study, we find reduced susceptibility to CWD infection among white-tailed deer with haplotype C ([Table 2](#)). We still observed individual deer positive for CWD with this haplotype, demonstrating a reduced susceptibility rather than a complete genetic resistance as is seen with other TSEs (e.g., scrapie^{36,37}). This haplotype had 2 different polymorphisms, 1 synonymous and 1 non-synonymous,

Diploypes were determined from unique *PRNP* sequences. To avoid spurious results, this analysis includes only deer from the CWD infection area (counties with at least 5 confirmed cases of CWD). Only diploypes that occurred in the CWD infection area are shown. *f* is the frequency of each diploype. The number of deer (N=240) with each diploype are shown for (+) CWD positive deer and (-) CWD negative deer. Odds ratios and 95% confidence intervals (parentheses) are shown for significant parameters ($P < 0.050$) determined by logistic regression against diploype AB, as it occurs most frequently among the sampled deer. Rare diploypes (N=15) each occurred in less than 1% of deer in this reduced data set and are summarized collectively.

Previous studies determined that polymorphisms aa95H and aa96S (nt285C and nt286A respectively) were significantly associated with reduced CWD susceptibility.^{10,26-29} We reexamined these positions within our data (including only deer from the CWD infection area, N = 240), confirming aa96S as having a significant effect in reducing infection. We observed no difference in infection between deer with aa95H or aa95Q (nt285A or nt258C; N = 12 and 468 respectively; $P = 0.076$). However, CWD is less common among aa96S deer than aa96G deer (nt286A and nt286G respectively; N = 58 and 422 respectively; $P < 0.001$, OR = 0.295, 95% CI = 0.146–0.556) (**Table 5**). Furthermore, deer aa96 heterozygous are significantly less likely to be CWD positive compared to deer aa96G homozygous ($P = 0.001$, OR = 0.247, 95% CI = 0.104–0.552) (**Table 5**). Among the observed 2 locus genotypes (aa 95/96) only QQ/GS is significant ($P < 0.001$), having a reduced odds ratio (OR = 0.247, 95% CI = 0.101–0.542; **Table 5**). It is important to note that while we did not observe a significant difference in infection among deer with the aa95H allele or aa96SS genotype, susceptibility might only be evident with a larger sampling providing greater statistical power.

TABLE 5.

Confirmation of *PRNP* nucleotide positions 285 and 286 (amino acid positions 95 and 96) previously reported as significant for reduced CWD susceptibility

(specifically AC and BC) were less likely to test positive for CWD (Table 4). Other diplotypes containing at least one copy of haplotype C (mutations at aa96S and nt555T) had a low frequency of occurrence (<1%); therefore, individually these less frequent diplotypes may not be significant for CWD resistance but they could play a vital role in decreasing population-level susceptibility by increasing the frequency of the C haplotype over time through inheritance (i.e. herd immunity). Under ideal circumstances, determining genetic association with disease status is examined under controlled experimental conditions to account for all confounding factors,^{41,42} though, this is not always possible when studying free ranging animals. To address this, other studies have attempted to use matched-case or paired-case control design to increase the likelihood that samples have a similar genetic background.²⁹ For this study, perfectly paired samples were not obtainable due to the nature of sampling through management and hunter harvest. Nonetheless, negative deer were selected from available samples to match with positive deer on the basis of age, sex, and geographic origin to minimize any potential bias. Additional samples were randomly selected outside of the CWD infection area. To avoid spurious results, statistical analyses were restricted to deer originating in the infected area as these animals are more likely to have been exposed to the disease than deer from counties without identified cases of CWD. The relationship between *PRNP* sequence and CWD status was found in multiple geographic locations at distances greater than the average home range of Illinois white-tailed deer⁴³⁻⁴⁵ (i.e., deer with haplotype C were not restricted to one county and were found throughout the study area), suggesting that relatedness and family groups were not a confounding factor and that these results are a strong indication of low genetic susceptibility.

The *PRNP* gene is variable within all species with some mutations affecting susceptibility to TSEs.⁴⁶⁻⁴⁸ Scrapie infection in sheep is the classic example of genetic resistance to a prion disease, where individuals with 2 copies of amino acid sequence V136, R154, Q171 are susceptible to scrapie, and those with 2 copies of the sequence A136, R154, R171 are resistant.^{36,37} Changes in the protein coding sequence have been shown to affect the ability of pathogenic prions to convert normal prion proteins³¹; accordingly, many studies have heavily examined the amino acid variations associated with CWD. Synonymous or silent mutations are often overlooked, but may have a greater effect on protein expression and conformation than expected.⁴⁹⁻⁵³ Other studies have found significant associations between individual synonymous mutations and CWD susceptibility.^{10,28} The specific mechanisms involved between nucleotide variation (specifically synonymous mutations) and CWD are not known, but the rate at which PrP^C conformations that are more favorable to PrP^{SC} conversion are produced may be slowed by the presence of certain synonymous mutations.⁵¹ Due to the low frequency of haplotypes with similar mutations as haplotype C, we cannot accurately conclude whether or not the specific combination of mutations or any one mutation alone is responsible for reduced CWD susceptibility. Nevertheless, haplotype and diplotype analyses provide more insight in gene-disease association than those restricted to alleles and genotypes⁵⁴ which are unable to detect additive effects.

A solid understanding of the genetics of CWD in white-tailed deer is vital to improve management of CWD on the landscape. Most TSEs are found in domestic or captive animals where management of infected individuals is feasible. For example, scrapie infected flocks can be handled through a process generally involving genetic testing, removal and destruction of infected or suspect animals, followed by decontamination of facilities and equipment.⁵⁵ Containment of free ranging deer in wild

both reported to be associated with decreased infection; nt286A (aa96S) and nt555T.^{10,26,29,30} Other haplotypes have similar mutations at nt286 and nt555 (e.g., haplotypes I, Q, and S); though, within the CWD infection area these haplotypes are not found at all (haplotype Q), occur infrequently ($f < 0.01$, haplotypes I and S), or are found exclusively among positive deer (haplotype I). A number of other haplotypes have the same mutations at either nt286 or nt555; again most are absent (haplotypes H, V, W and X), infrequent ($f < 0.01$, haplotypes N and P), or are found abundantly among positive deer (haplotype B) in the CWD infection area (**Table 2**). Rarity of these haplotypes prevents any meaningful association with changes in susceptibility (**Table 2**). The effects of mutations at nt286 and nt555 alone or in concert are unclear as other haplotypes with these polymorphisms occur infrequently and with varied susceptibility. An even larger sampling may be necessary to resolve this interaction.

Neither haplotypes with aa95H (nt285C) had a significantly reduced susceptibility to CWD (**Table 2**). Some previous studies reported the occurrence of this mutation among CWD negative deer only, which was interpreted as CWD resistance.^{26,29} In this study and in the study by Kelly *et al.*¹⁰ the aa95H mutation was found among deer positive for CWD; however, we find in a larger sampling (N=240) the frequency of aa95H to be lower than that found by Kelly *et al.*¹⁰ and not significantly associated with resistance. We cannot preclude the importance of this mutation given that a significant difference in disease susceptibility may be possible with an even larger sample size providing greater statistical power (data not shown).

The presence of aa96S has been associated with slowed disease progression, longer life span among captive deer,^{26,27} and does not appear to affect the rate at which prions are shed from infected individuals.³⁸ Additionally, CWD infected mule deer have been found to excrete pathogenic prions while asymptomatic.³⁹ This contributes to concerns that wild deer with aa96S may be shedding infectious prions into the environment for longer periods of time than deer lacking the mutation, but are not symptomatic or detectable by immunohistochemical procedures. On the other hand, studies using epidemiological modeling suggest that deer with aa96S under certain conditions may have a selective advantage for CWD resistance over those without.⁴⁰ With our data, we are unable to make accurate conclusions about detection, longevity, or increased risks of exposure to infectious prions. Nonetheless, our results do corroborate the importance of the polymorphism at G96S in reduced CWD susceptibility (**Table 5**).^{26,30}

Kelly *et al.*¹⁰ found a negative correlation between the number of nucleotide deviations from the *PRNP* consensus sequence and CWD infection. The database derived consensus sequence reported is the same as the most common haplotype (haplotype A) in this study (**Table 1**). Haplotype C has 2 deviations from haplotype A; other haplotypes were found containing more deviations but were exceedingly rare (**Table 1**). These haplotypes (namely haplotypes I, N, Q, S, and X) were largely absent among CWD positive deer (only 2 positive deer were found each with a single copy of haplotype I) and their combined frequency was less than 1%. An increased number of polymorphisms may improve resistance to CWD, but the large sample size of this study (N=703) suggests that haplotypes with more than 2 nucleotide deviations are rare and would not be likely to have an appreciable effect on resistance or susceptibility within the population.

Examination of *PRNP* diplotypes revealed that individuals with at least one copy of haplotype C

populations potentially infected with CWD and decontamination of the environment is not reasonably possible. The long term effects of CWD are not yet known but it is conceivable that an unmanaged infected population would be gradually extirpated as the disease progresses^{56,57} or at least reduced to low densities with high disease prevalence.^{58,59} Either outcome would have severe ecological effects (e.g., deer play a major role in affecting plant communities⁶⁰ and as a prey source^{61,62}) as well as negative economic impacts to hunting. Overall disease prevalence has remained at relatively low levels in Illinois compared to Wisconsin.¹¹ It is important to note that at the time of sampling, CWD had been found in 6 Illinois counties and has since been detected in 14.⁹ Complete eradication of CWD among free ranging white-tailed deer may not be possible; however, an active containment effort in Illinois appears to have prevented significant increases in prevalence.^{9,11,12} Further examination of *PRNP* haplotype and diplotype frequencies across northern Illinois and southern Wisconsin in conjunction with population structure and movement^{45,63,64} will be useful in identifying localities with greater or reduced susceptibility risk. Effectiveness of CWD containment efforts can be aided through genetic testing and redirecting management resources.

MATERIALS AND METHODS

Go to:

Deer Sampling and CWD Testing

Seven hundred three samples were collected between 2002 and 2010 from wild free-ranging white-tailed deer in Illinois and southern Wisconsin from both public hunting and government culling. For Illinois samples, obex and retropharyngeal lymph nodes were tested using USDA approved immunohistochemical (IHC) procedures to detect protease-resistant prion protein (PrP^{SC}) at the Illinois Department of Agriculture Diagnostic Laboratories in Galesburg or Centralia and most positives were confirmed at the National Veterinary Services Laboratory. Untested samples originated from areas where CWD had not been detected or where there was a low risk at the time of sampling; these were included to determine the extent of *PRNP* variability. Tissue samples (skeletal muscle, mainly tongue) were archived for both CWD positive and negative deer. Wisconsin samples were tested for CWD by the Wisconsin Veterinary Diagnostic Laboratory by IHC or ELISA based procedures with all positives confirmed by IHC. At the time of sampling, detailed information including location (1.6 × 1.6 km area), sex, and age was recorded. Deer for this study were selected from a larger sampling; those originating outside of the CWD infected area were chosen randomly. Within the infected area to minimize bias, CWD negative deer were selected to match with positive deer on the basis of age, sex, and geographic origin.

PRNP Amplification and Sequencing

Genomic DNA was isolated from skeletal muscle using the Wizard Genomic DNA purification kit (Promega, Madison, WI) following the manufacturer's recommended protocol. A 626 bp region of the *PRNP* gene was amplified by polymerase chain reaction using previously published primers CWD-13 and CWD-LA⁶⁵ or primers 223 and 224.³⁰ Amplification was performed in 40 ul reaction volumes following previously published protocols.^{10,65}

PCR amplicons were purified using the Wizard SV Gel and PCR Clean-Up System (Promega,

Madison, WI). Products were then sequenced using the BigDye Terminator system (ABI), purified, and resolved on an ABI 3730XL DNA Sequencer at the University of Illinois Keck Center for Functional and Comparative Genomics. The software *Sequencher* (Gene Codes Corporation, Ann Arbor, MI) was used to edit and concatenate sequences. The identities of DNA sequences were confirmed using NCBI BLAST (<http://www.ncbi.nlm.nih.gov/blast/Blast.cgi>) and variable positions were identified by comparison to published DNA sequence. Open reading frames were confirmed and sequences translated in MEGA v6.0.⁶⁶ Sequences were checked for the absence of the aa138 mutation to ensure that all sequences were *PRNP* and not the processed pseudogene²⁶; asparagine (N) at aa138 (nt413A) would indicate amplification of the pseudogene. If aa138N was detected with primers CWD-13 and CWD-LA, then the sequence was verified with primers 223 and 224 which were specifically designed to only amplify the functional gene.³⁰ Though it is possible that this mutation could also occur in the functional gene, we did not observe aa138N in any deer when both primer sets were used.

Analysis

Haplotypes were generated from unphased sequences using PHASE v2.1.^{34,35} Markov chain Monte Carlo (MCMC) samples were taken from a minimum of 100,000 steps, with a discarded burn-in of 10,000; samples were drawn every 100 MCMC steps. Five repetitions were performed and haplotype frequencies compared to verify consistent assignment. Logistic regression was calculated for haplotype, diplotype, genotype, or nucleotide, with each variable treated as categorical data and the most frequent for each as the reference level. Disease status was binary, with infected deer as one and uninfected deer as zero. Odds ratios were calculated for significant variables (alpha 0.05); ratios less than one were considered to have reduced CWD susceptibility. All calculations were performed in R version 3.0.0⁶⁷ with R Studio v0.98.1083.⁶⁸

DISCLOSURE OF POTENTIAL CONFLICTS OF INTEREST

Go to:

No potential conflicts of interest were disclosed.

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REFERENCES

Go to:

1. Prusiner SB. Prions. *Proc Natl Acad Sci U S A* 1998; 95:13363-83; PMID:9811807; <http://dx.doi.org/10.1073/pnas.95.23.13363> [PMC free article] [PubMed] [Cross Ref]

Stewart P, Goldmann W, et al. Mother to offspring transmission of chronic wasting disease in Reeves' Muntjac deer. *Plos One* 2013; 8:e71844; <http://dx.doi.org/10.1371/journal.pone.0071844> [PMC free article] [PubMed] [Cross Ref]

14. Gough KC, Maddison BC. Prion transmission prion excretion and occurrence in the environment. *Prion* 2010; 4:275-82; PMID:20948292; <http://dx.doi.org/10.4161/pri.4.4.13678> [PMC free article] [PubMed] [Cross Ref]

15. Haley NJ, Mathiason CK, Carver S, Zabel M, Telling GC, Hoover EA. Detection of chronic wasting disease prions in salivary, urinary, and intestinal tissues of deer: potential mechanisms of prion shedding and transmission. *J Virol* 2011; 85:6309-18; PMID:21525361; <http://dx.doi.org/10.1128/JVI.00425-11> [PMC free article] [PubMed] [Cross Ref]

16. Johnson CJ, Phillips KE, Schramm PT, McKenzie D, Aiken JM, Pedersen JA. Prions adhere to soil minerals and remain infectious. *PLoS Pathog* 2006; 2:e32-e; PMID:16617377; <http://dx.doi.org/10.1371/journal.ppat.0020032> [PMC free article] [PubMed] [Cross Ref]

17. Nichols TA, Pulford B, Wyckoff AC, Meyerett C, Michel B, Gertig K, Hoover EA, Jewell JE, Telling GC, Zabel MD. Detection of protease-resistant cervid prion protein in water from a CWD-endemic area. *Prion* 2009; 3:171-83; PMID:19823039; <http://dx.doi.org/10.4161/pri.3.3.9819> [PMC free article] [PubMed] [Cross Ref]

18. Kuznetsova A, McKenzie D, Banser P, Siddique T, Aiken JM. Potential role of soil properties in the spread of CWD in western Canada. *Prion* 2014; 8:92-9; PMID:24618673; <http://dx.doi.org/10.4161/pri.28467> [PubMed] [Cross Ref]

19. Maheshwari A, Fischer M, Gambetti P, Parker A, Ram A, Soto C, Concha-Marambio L, Cohen Y, Belay ED, Maddox RA, et al. Recent US case of variant Creutzfeldt-Jakob disease - global implications. *Emerg Infect Dis J* 2015; 21:750; <http://dx.doi.org/10.3201/eid2105.142017> [PMC free article] [PubMed] [Cross Ref]

20. Kurt TD, Telling GC, Zabel MD, Hoover EA. Trans-species amplification of Prp(CWD) and correlation with rigid loop 170N. *Virology* 2009; 387:235-43; PMID:19269662; <http://dx.doi.org/10.1016/j.virol.2009.02.025> [PubMed] [Cross Ref]

21. Race B, Meade-White KD, Miller MW, Barbian KD, Rubenstein R, LaFauci G, Cervenakova L, Favara C, Gardner D, Long D, et al. Susceptibilities of nonhuman primates to chronic wasting disease. *Emerg Infect Dis* 2009; 15:1366-76; PMID:19788803; <http://dx.doi.org/10.3201/eid1509.090253> [PMC free article] [PubMed] [Cross Ref]

22. Barria MA, Telling GC, Gambetti P, Mastrianni JA, Soto C. Generation of a new form of human PrP^{Sc} in vitro by interspecies transmission from cervid prions. *J Biol Chem* 2011; 286:7490-5; PMID:21209079; <http://dx.doi.org/10.1074/jbc.M110.198465> [PMC free article] [PubMed] [Cross Ref]

23. Davenport KA, Henderson DM, Mathiason CK, Hoover EA. Insights into CWD and BSE species barriers using real-time conversion. *J Virol* 2015; 89(18):9524-31; PMID:26157118 [PMC free article] [PubMed]

2. Belay ED, Maddox RA, Williams ES, Miller MW, Gambetti P, Schonberger LB. Chronic wasting disease and potential transmission to humans. *Emerg Infect Dis* 2004; 10:977-84; PMID:15207045; <http://dx.doi.org/10.3201/eid1006.031082> [PMC free article] [PubMed] [Cross Ref]
3. Baeten LA, Powers BE, Jewell JE, Spraker TR, Miller MW. A natural case of chronic wasting disease in a free-ranging moose (*Alces alces shirasi*). *J Wildl Dis* 2007; 43:309-14; PMID:17495319; <http://dx.doi.org/10.7589/0090-3558-43.2.309> [PubMed] [Cross Ref]
4. Williams ES, Young S. Chronic wasting disease of captive mule deer - spongiform encephalopathy. *J Wildl Dis* 1980; 16:89-98; PMID:7373730; <http://dx.doi.org/10.7589/0090-3558-16.1.89> [PubMed] [Cross Ref]
5. Williams ES, Young S. Spongiform encephalopathy of Rocky-Mountain elk. *J Wildl Dis* 1982; 18:465-71; PMID:7154220; <http://dx.doi.org/10.7589/0090-3558-18.4.465> [PubMed] [Cross Ref]
6. Chronic wasting disease: Frequently asked questions [Internet] Springfield, Illinois: Illinois Department of Natural Resources, 2015. [cited 2015 Aug 6] Available from: <http://www.dnr.illinois.gov/programs/CWD/Pages/FAQs.aspx>.
7. Richards BJ, Slota P. Chronic wasting disease (CWD) [Internet]. Madison, Wisconsin: USGS National Wildlife Health Center, 2015. [cited 2015 Apr 29] Available from: http://www.nwhc.usgs.gov/disease_information/chronic_wasting_disease/.
8. Joly DO, Ribic CA, Langenberg JA, Beheler K, Batha CA, Dhuey BJ, Rolley RE, Bartelt G, Van Deelen TR, Samuel MD. Chronic wasting disease in free-ranging Wisconsin white-tailed deer. *Emerg Infect Dis* 2003; 9:599-601; PMID:12737746; <http://dx.doi.org/10.3201/eid0905.020721> [PMC free article] [PubMed] [Cross Ref]
9. Shelton P, McDonald P. Illinois chronic wasting disease: 2013-2014 surveillance and management report [Internet]. 2014:1-15. [Cited 2015 Aug 6] Available from: <https://www.dnr.illinois.gov/programs/CWD/Documents/CWDAnnualReport20132014.pdf>.
10. Kelly AC, Mateus-Pinilla NE, Diffendorfer J, Jewell E, Ruiz MO, Killefer J, Shelton P, Beissel T, Novakofski J. Prion sequence polymorphisms and chronic wasting disease resistance in Illinois white-tailed deer (*Odocoileus virginianus*). *Prion* 2008; 2:28-36; PMID:19164895; <http://dx.doi.org/10.4161/pri.2.1.6321> [PMC free article] [PubMed] [Cross Ref]
11. Manjerovic MB, Green ML, Mateus-Pinilla N, Novakofski J. The importance of localized culling in stabilizing chronic wasting disease prevalence in white-tailed deer populations. *Prev Vet Med* 2014; 113:139-45; PMID:24128754; <http://dx.doi.org/10.1016/j.prevetmed.2013.09.011> [PubMed] [Cross Ref]
12. Mateus-Pinilla N, Weng H-Y, Ruiz MO, Shelton P, Novakofski J. Evaluation of a wild white-tailed deer population management program for controlling chronic wasting disease in Illinois, 2003-2008. *Prev Vet Med* 2013; 110:541-8; PMID:23558033; <http://dx.doi.org/10.1016/j.prevetmed.2013.03.002> [PubMed] [Cross Ref]
13. Nalls AV, McNulty E, Powers J, Seelig DM, Hoover C, Haley NJ, Hayes-Klug J, Anderson K,

35. Stephens M, Smith NJ, Donnelly P. A new statistical method for haplotype reconstruction from population data. *Am J Hum Genet* 2001; 68:978-89; PMID:11254454; <http://dx.doi.org/10.1086/319501> [PMC free article] [PubMed] [Cross Ref]
36. Baylis M, Goldmann W. The genetics of scrapie in sheep and goats. *Curr Mol Med* 2004; 4:385-96; PMID:15354869; <http://dx.doi.org/10.2174/1566524043360672> [PubMed] [Cross Ref]
37. Roden JA, Nieuwhof GJ, Bishop SC, Jones DA, Haresign W, Gubbins S. Breeding programmes for TSE resistance in British sheep - I. Assessing the impact on prion protein (*PrP*) genotype frequencies. *Prev Vet Med* 2006; 73:1-16; PMID:16169614; <http://dx.doi.org/10.1016/j.prevetmed.2005.08.002> [PubMed] [Cross Ref]
38. Henderson DM, Denkers ND, Hoover CE, Garbino N, Mathiason CK, Hoover EA. Longitudinal Detection of Prion Shedding in Saliva and Urine by CWD-Infected Deer by RT-QuIC. *J Virol* 2015; JVI 01118-15. [PMC free article] [PubMed]
39. Tamgüney G, Miller MW, Wolfe LL, Sirochman TM, Glidden DV, Palmer C, Lemus A, DeArmond SJ, Prusiner SB. Asymptomatic deer excrete infectious prions in faeces. *Nature* 2009; 461:529-U90; PMID:19741608; <http://dx.doi.org/10.1038/nature08289> [PMC free article] [PubMed] [Cross Ref]
40. Robinson SJ, Samuel MD, Johnson CJ, Adams M, McKenzie DI. Emerging prion disease drives host selection in a wildlife population. *Ecol Appl* 2012; 22:1050-9; PMID:22645831; <http://dx.doi.org/10.1890/11-0907.1> [PubMed] [Cross Ref]
41. Jewell JE, Conner MM, Wolfe LL, Miller MW, Williams ES. Low frequency of *PrP* genotype 225SF among free-ranging mule deer (*Odocoileus hemionus*) with chronic wasting disease. *J Gen Virol* 2005; 86:2127-34; PMID:16033959; <http://dx.doi.org/10.1099/vir.0.81077-0> [PubMed] [Cross Ref]
42. Race B, Meade-White K, Miller MW, Fox KA, Chesebro B. In vivo comparison of chronic wasting disease infectivity from deer with variation at prion protein residue 96. *J Virol* 2011; 85:9235-8; PMID:21697479; <http://dx.doi.org/10.1128/JVI.00790-11> [PMC free article] [PubMed] [Cross Ref]
43. Brinkman TJ, Deperno CS, Jenks JA, Haroldson BS, Osborn RG. Movement of female white-tailed deer: Effects of climate and intensive row-crop agriculture. *J Wildl Management* 2005; 69:1099-111; [http://dx.doi.org/10.2193/0022-541X\(2005\)069%5b1099:MOFWDE%5d2.0.CO;2](http://dx.doi.org/10.2193/0022-541X(2005)069%5b1099:MOFWDE%5d2.0.CO;2) [Cross Ref]
44. Nixon CM, Mankin PC, Etter DR, Hansen LP, Brewer PA, Chelsvig JE, Esker TL, Sullivan JB. White-tailed deer dispersal behavior in an agricultural environment. *American Midland Naturalist* 2007; 157:212-20; [http://dx.doi.org/10.1674/0003-0031\(2007\)157%5b212:WDDBLA%5d2.0.CO;2](http://dx.doi.org/10.1674/0003-0031(2007)157%5b212:WDDBLA%5d2.0.CO;2) [Cross Ref]
45. Green ML, Manjerovic MB, Mateus-Pinilla N, Novakofski J. Genetic assignment tests reveal dispersal of white-tailed deer: implications for chronic wasting disease. *J Mammal* 2014; 95:646-54; <http://dx.doi.org/10.1644/13-MAMM-A-167> [Cross Ref]
46. Novakofski J, Brewer MS, Mateus-Pinilla N, Killefer J, McCusker RH. Prion biology relevant to bovine spongiform encephalopathy. *J Anim Sci* 2005; 83:1455-76; PMID:15890824 [PubMed]

24. Carlson GA, Kingsbury DT, Goodman PA, Coleman S, Marshall ST, Dearmond S, Westaway D, Prusiner SB. Linkage of prion protein and scrapie incubation-time genes. *Cell* 1986; 46:503-11; PMID:3015416; [http://dx.doi.org/10.1016/0092-8674\(86\)90875-5](http://dx.doi.org/10.1016/0092-8674(86)90875-5) [PubMed] [Cross Ref]
25. White SN, Spraker TR, Reynolds JO, O'Rourke K. Association analysis of *PRNP* gene region with chronic wasting disease in Rocky Mountain elk. *BMC Res Notes* 2010; 3:7pp.-pp; <http://dx.doi.org/10.1186/1756-0500-3-314> [PMC free article] [PubMed] [Cross Ref]
26. Johnson C, Johnson J, Vanderloo JP, Keane D, Aiken JM, McKenzie D. Prion protein polymorphisms in white-tailed deer influence susceptibility to chronic wasting disease. *J Gen Virol* 2006; 87:2109-14; PMID:16760415; <http://dx.doi.org/10.1099/vir.0.81615-0> [PubMed] [Cross Ref]
27. Johnson CJ, Herbst A, Duque-Velasquez C, Vanderloo JP, Bochsler P, Chappell R, McKenzie D. Prion protein polymorphisms affect chronic wasting disease progression. *Plos One* 2011; 6:e17450. [PMC free article] [PubMed]
28. Wilson GA, Nakada SM, Bollinger TK, Pybus MJ, Merrill EH, Coltman DW. Polymorphisms at the *PRNP* gene influence susceptibility to chronic wasting disease in two species of deer (*Odocoileus Spp.*) in western Canada. *J Toxicol Environ Health A* 2009; 72:1025-9; <http://dx.doi.org/10.1080/15287390903084264> [PubMed] [Cross Ref]
29. Blanchong JA, Heisey DM, Scribner KT, Libants SV, Johnson C, Aiken JM, Langenberg JA, Samuel MD. Genetic susceptibility to chronic wasting disease in free-ranging white-tailed deer: Complement component C1q and Prnp polymorphisms. *Infect Genet Evol* 2009; 9:1329-35; <http://dx.doi.org/10.1016/j.meegid.2009.08.010> [PubMed] [Cross Ref]
30. O'Rourke KI, Spraker TR, Hamburg LK, Besser TE, Brayton KA, Knowles DP. Polymorphisms in the prion precursor functional gene but not the pseudogene are associated with susceptibility to chronic wasting disease in white-tailed deer. *J Gen Virol* 2004; 85:1339-46; PMID:15105552; <http://dx.doi.org/10.1099/vir.0.79785-0> [PubMed] [Cross Ref]
31. Asante EA, Smidak M, Grimshaw A, Houghton R, Tomlinson A, Jeelani A, Jakubcova T, Hamdan S, Richard-Londt A, Linehan JM, et al. A naturally occurring variant of the human prion protein completely prevents prion disease. *Nature* 2015; 522:478-+; PMID:26061765; <http://dx.doi.org/10.1038/nature14510> [PMC free article] [PubMed] [Cross Ref]
32. Collinge J, Palmer MS, Dryden AJ. Genetic predisposition to iatrogenic Creutzfeldt-Jakob Disease. *Lancet* 1991; 337:1441-2; PMID:1675319; [http://dx.doi.org/10.1016/0140-6736\(91\)93128-V](http://dx.doi.org/10.1016/0140-6736(91)93128-V) [PubMed] [Cross Ref]
33. Ghetti B, Dlouhy SR, Giaccone G, Bugiani O, Frangione B, Farlow MR, Tagliavini F. Gerstmann-Straussler-Scheinker disease and the Indiana kindred. *Brain Pathol* 1995; 5:61-75; PMID:7767492; <http://dx.doi.org/10.1111/j.1750-3639.1995.tb00578.x> [PubMed] [Cross Ref]
34. Stephens M, Scheet P. Accounting for decay of linkage disequilibrium in haplotype inference and missing-data imputation. *Am J Hum Genet* 2005; 76:449-62; PMID:15700229; <http://dx.doi.org/10.1086/428594> [PMC free article] [PubMed] [Cross Ref]

PMID:19536340; <http://dx.doi.org/10.1111/j.1365-2664.2008.01576.x> [PMC free article] [PubMed] [Cross Ref]

59. Miller MW, Swanson HM, Wolfe LL, Quartarone FG, Huwer SL, Southwick CH, Lukacs PM. Lions and prions and deer demise. *Plos One* 2008; 3:e4019. [PMC free article] [PubMed]

60. Rooney TP, Waller DM. Direct and indirect effects of white-tailed deer in forest ecosystems. *Forest Ecol Management* 2003; 181:165-76; [http://dx.doi.org/10.1016/S0378-1127\(03\)00130-0](http://dx.doi.org/10.1016/S0378-1127(03)00130-0) [Cross Ref]

61. Kilgo JC, Ray HS, Vukovich M, Goode MJ, Ruth C. Predation by coyotes on white-tailed deer neonates in South Carolina. *J Wildl Management* 2012; 76:1420-30; <http://dx.doi.org/10.1002/jwmg.393> [Cross Ref]

62. Kunkel KE, Mech LD. Wolf and bear predation on white-tailed deer fawns in northeastern Minnesota. *Canadian J Zool-Revue Canadienne De Zoologie* 1994; 72:1557-65; <http://dx.doi.org/10.1139/z94-207> [Cross Ref]

63. Kelly AC, Mateus-Pinilla NE, Brown W, Ruiz MO, Douglas MR, Douglas ME, Shelton P, Beissel T, Novakofski J. Genetic assessment of environmental features that influence deer dispersal: implications for prion-infected populations. *Population Ecology* 2014; 56:327-40; <http://dx.doi.org/10.1007/s10144-013-0427-9> [Cross Ref]

64. Kelly AC, Mateus-Pinilla NE, Douglas M, Douglas M, Brown W, Ruiz MO, Killefer J, Shelton P, Beissel T, Novakofski J. Utilizing disease surveillance to examine gene flow and dispersal in white-tailed deer. *J Appl Ecol* 2010; 47:1189-98; <http://dx.doi.org/10.1111/j.1365-2664.2010.01868.x> [Cross Ref]

65. Johnson C, Johnson J, Clayton M, McKenzie D, Aiken J. Prion protein gene heterogeneity in free-ranging white-tailed deer within the chronic wasting disease affected region of Wisconsin. *J Wildl Dis* 2003; 39:576-81; PMID:14567218; <http://dx.doi.org/10.7589/0090-3558-39.3.576> [PubMed] [Cross Ref]

66. Tamura K, Stecher G, Peterson D, Filipinski A, Kumar S. MEGA6: Molecular Evolutionary Genetics Analysis Version 6.0. *Mol Biol Evol* 2013; 30:2725-9; PMID:24132122; <http://dx.doi.org/10.1093/molbev/mst197> [PMC free article] [PubMed] [Cross Ref]

67. R Core Team R: A language and environment for statistical computing (version 3.0.0). 2013. Vienna, Austria: R Foundation for Statistical Computing. Available at <http://www.R-project.org/>

68. RStudio RStudio: Integrated development environment for R 2012.

Articles from Prion are provided here courtesy of **Taylor & Francis**

47. Heaton MP, Leymaster KA, Freking BA, Hawk DA, Smith TPL, Keele JW, Snelling WM, Fox JM, Chitko-McKown CG, Laegreid WW. Prion gene sequence variation within diverse groups of US sheep, beef cattle, and deer. *Mamm Genome* 2003; 14:765-77; PMID:14722726; <http://dx.doi.org/10.1007/s00335-003-2283-y> [[PubMed](#)] [[Cross Ref](#)]
48. Robinson SJ, Samuel MD, O'Rourke KI, Johnson CJ. The role of genetics in chronic wasting disease of North American cervids. *Prion* 2012; 6:153-62; PMID:22460693; <http://dx.doi.org/10.4161/pri.19640> [[PubMed](#)] [[Cross Ref](#)]
49. Duan JB, Wainwright MS, Comeron JM, Saitou N, Sanders AR, Gelernter J, Gejman PV. Synonymous mutations in the human dopamine receptor D2 (*DRD2*) affect mRNA stability and synthesis of the receptor. *Hum Mol Genet* 2003; 12:205-16; PMID:12554675; <http://dx.doi.org/10.1093/hmg/ddg055> [[PubMed](#)] [[Cross Ref](#)]
50. Kudla G, Murray AW, Tollervey D, Plotkin JB. Coding-sequence determinants of gene expression in *Escherichia coli*. *Science* 2009; 324:255-8; PMID:19359587; <http://dx.doi.org/10.1126/science.1170160> [[PMC free article](#)] [[PubMed](#)] [[Cross Ref](#)]
51. Sauna ZE, Kimchi-Sarfaty C. Understanding the contribution of synonymous mutations to human disease. *Nat Rev Genet* 2011; 12:683-91; PMID:21878961; <http://dx.doi.org/10.1038/nrg3051> [[PubMed](#)] [[Cross Ref](#)]
52. Biro JC. Coding nucleic acids are chaperons for protein folding: A novel theory of protein folding. *Gene* 2013; 515:249-57; PMID:23266645; <http://dx.doi.org/10.1016/j.gene.2012.12.048> [[PubMed](#)] [[Cross Ref](#)]
53. Pereira RM, Mesquita P, Batista M, Baptista MC, Barbas JP, Pimenta J, Santos IC, Marques MR, Vasques MI, Pereira MS, et al. Doppel gene polymorphisms in Portuguese sheep breeds: Insights on ram fertility. *Anim Reprod Sci* 2009; 114:157-66; PMID:19028030; <http://dx.doi.org/10.1016/j.anireprosci.2008.10.003> [[PubMed](#)] [[Cross Ref](#)]
54. Zuo L, Wang K, Luo X. Use of diplotypes - matched haplotype pairs from homologous chromosomes - in gene-disease association studies. *Shanghai Arch Psychiatry* 2014; 26:165-70; PMID:25114493 [[PMC free article](#)] [[PubMed](#)]
55. US. Department of Agriculture - Animal and Plant Health Inspection Service Scrapie eradication uniform methods and rules. 2005.
56. Gross JE, Miller MW. Chronic wasting disease in mule deer: disease dynamics and control. *J Wildl Management* 2001; 65:205-15; <http://dx.doi.org/10.2307/3802899> [[Cross Ref](#)]
57. Almberg ES, Cross PC, Johnson CJ, Heisey DM, Richards BJ. Modeling routes of chronic wasting disease transmission: environmental prion persistence promotes deer population decline and extinction. *Plos One* 2011; 6:e19896; PMID:21603638; <http://dx.doi.org/10.1371/journal.pone.0019896> [[PMC free article](#)] [[PubMed](#)] [[Cross Ref](#)]
58. Wasserberg G, Osnas EE, Rolley RE, Samuel MD. Host culling as an adaptive management tool for chronic wasting disease in white-tailed deer: a modelling study. *J Appl Ecol* 2009; 46:457-66;

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Current Scientific Knowledge About CWD

April 2018



American Cervid Alliance Introduction

American Cervid Alliance Introduction

In an ongoing effort to keep the public apprised of the latest in scientific facts as they relate to Chronic Wasting Disease, the American Cervid Alliance is endorsing the following scientific paper prepared by Dr.'s Don Davis, James Kroll, Greg Stewart, and Ken Waldrup, which dispels much of the mythology surrounding CWD.

This well-prepared paper, sponsored by the ACA, uses science-based facts, giving the reader a clear view of what is known and not known about the disease in contrast to what some are merely theorizing about CWD by using non-scientific opinions, theories, and beliefs to further a biased agenda.

We welcome you to share this document with your legislators and wildlife or animal health officials, as well as members of the media and the public to give a more accurate perspective about a disease that is affecting all segments of deer and elk populations.

Basic Facts Surrounding CWD

Basic Facts Surrounding CWD

A

If an individual deer of a species susceptible to CWD is exposed to a sufficient number of infectious CWD prions, morbidity and mortality may be induced after a prolonged incubation period of 17 months to more than 4 years. After the onset of clinical signs caused by spongiform encephalopathy (holes in the brain) the disease is usually fatal and rapidly so.

B

CWD is a fairly rare disease with a prevalence less than 1% in the over million deer tested nationally over the last 20 years, and a prevalence of 11.2% in the 196 CWD positive counties in the 23 CWD positive States. After 30 years, the CWD test positive prevalence rates in a few states have been reported to be 35-40%. Actual data shows much less. CWD test positive prevalence is an indication of infection and exposure, but CWD test positive prevalence is not a measure of and does not equal mortality from CWD.

C

CWD has continued to be found in new areas since the 1960's. This is a function of increased surveillance testing, natural animal movement, commercial transportation of animals, and the occasional spontaneous genetic mutation of the CWD prion.

D

In spite of the expenditure of over \$100,000,000 of public funding, and thousands of animals killed, none of prevention, control, or eradication methods employed by the various States since 1998 have been shown to be effective in either preventing increased prevalence of CWD or the increased geographic distribution.

Basic Facts Surrounding CWD

E

CWD is neither a “wild deer” disease nor a “captive deer” disease but can be found in both. There are 3 States with CWD only in captive deer herds and 8 States with CWD only in wild free-ranging populations. Based on USDA positive test prevalence numbers, CWD is more common in wild cervids than in captive cervids.

F

In small populations in localized areas of Wyoming, CWD may possibly be a factor along with many other factors in causing population declines. Deer populations in the Western States have been declining at 18-20% for over a decade in both states with CWD and those without CWD. Wildlife agencies report that habitat fragmentation, habitat loss, severe weather (droughts and bad winters), human disruption (oil exploration, real estate development), malnutrition, and predation are thought by biologists to have more influence on populations than disease (all disease including EHD, parasites, and CWD).

G

Predictive computer simulation models are just predictions not known facts. They are based on currently available information or assumed information on many variables. If either new scientific data becomes known or conditions such as climate change in the future, then the predictions generated by the model become invalid.

H

Since CWD primarily is a frequency dependent disease in wild deer instead of a density dependent disease, and the benefits of supplemental feeding in most cases far outweigh any possible problems associated with crowding. There is no published scientific data regarding the risk of CWD transmission associated with supplemental feed.



The exact modes of CWD transmission in wild deer are unknown. The numbers of CWD prions shed by infected deer in natural conditions is unknown. The length and timing of CWD shedding by infected deer is unknown. The genetic effects on CWD susceptibility and resistance to infection are unknown in susceptible species. All the above unknowns should be given an increased research priority.

Table of Contents

<i>I. General Concepts and Definitions</i>	9-10
<i>II. Host Distribution</i>	11
<i>III. Occurrence and Geographic Distribution</i>	12-14
<i>IV. Diagnosis</i>	15-16
<i>V. Transmission</i>	17-22
<i>VI. CWD and Population Declines</i>	23-25
<i>VII. Prevention and Control</i>	26-30

I. General Concepts And Definitions

Chronic Wasting Disease (CWD) is well-known Transmissible Encephalopathy (TSE) of several species of Cervidae or the Deer Family primarily found in North America. Centers for Disease Control (CDC) defines CWD as follows:

“Chronic wasting disease (CWD) is a prion disease that affects deer, elk, reindeer, sika deer and moose. It has been found in some areas of North America, including Canada and the United States, Norway and South Korea. It may take over a year before an infected animal develops symptoms, which can include drastic weight loss (wasting), stumbling, listlessness and other neurologic symptoms.” CDC Aug 2017

Note: CWD has very recently been diagnosed in the remains of a 15 year old European Elk (moose) in Finland. https://yle.fi/uutiset/osas/news/first_case_in_finland_elk_dies_due_to_chronic_wasting_disease/10108115

The etiologic agent of CWD and other TSEs based on available data is thought to be prions. Prions are self-replicating proteins and are found in their natural structure in normal animals and humans. An atypical structured prion causes pathologic changes in the susceptible host.

“Prion diseases or transmissible spongiform encephalopathies (TSEs) are a family of rare progressive neurodegenerative disorders that affect both humans and animals. They are distinguished by long incubation periods, characteristic spongiform changes associated with neuronal loss, and a failure to induce inflammatory response.” CDC Aug 2017

“The causative agents of TSEs are believed to be prions. The term “prions” refers to abnormal, pathogenic agents that are transmissible and are able to induce abnormal folding of specific normal cellular proteins called prion proteins that are found most abundantly in the brain. The functions of these normal prion proteins are still not completely understood. The abnormal folding of the prion proteins leads to brain damage and the characteristic signs and symptoms of the disease. Prion diseases are usually rapidly progressive and always fatal.” CDC Aug 2017

There are a number of TSEs that occur in humans and animals.

All of the Animal Prion Diseases with the exception of BSE (vCJD in humans) have never been found to be transmissible to humans.

Human Prion Diseases

- Creutzfeldt-Jakob Disease (CJD) (found in 1 per million worldwide, WHO)
- Variant Creutzfeldt-Jakob Disease (vCJD) (Total worldwide 229 cases)
- Gerstmann-Straussler-Scheinker Syndrome
- Fatal Familial Insomnia
- Kuru

Animal Prion Diseases

- Bovine Spongiform Encephalopathy (BSE)
- Chronic Wasting Disease (CWD)
- Scrapie (sheep)
- Transmissible mink encephalopathy
- Feline spongiform encephalopathy
- Ungulate spongiform encephalopathy

Note; All of the Animal Prion Diseases with the exception of BSE (vCJD in humans) have never been found to be transmissible to humans. This is discussed in detail below in other sections.

II. Host Distribution

Naturally Occurring in Free-Ranging

Mule Deer (*Odocoileus hemionus*)

Rocky Mountain Elk (*Cervus elaphus nelsoni*)

White-tailed Deer (*Odocoileus virginianus*)

Shiras Moose (*Alces alces shiras*)

NOTE: More recently in Reindeer (Rangifer spp) and European Elk (Alces spp) in Norway and European elk remains in Finland.

Other Susceptible Cervidae (Deer Family)

Sika Deer (*Cervus nippon*) one in Korea in captive situation with other imported animals.

Red Deer (*Cervus elaphus*) – in captive and experimental infections

Muntjac deer (*Elaphodus muntiacus*) – experimental infection

NOTE: Fallow deer (Dama dama) resisted attempts to infect them for 7 years by USDA. Axis deer (Axis axis) have been tested in surveillance programs without finding any positives.

NOTE: There has been speculation since the 1980's about possible transmission to humans. To date, there has NOT been a single case of CWD in humans. This is discussed in detail in later sections.

III. Occurrence And Geographic Distribution

CWD was first observed as an unnamed clinical syndrome in 4 captive mule deer and elk groups of wild origin at Colorado State University (CSU) in the 1960's. (Spraker). That fact does not imply or in any fashion confirm that CWD originated in captive deer at CSU. There are several theories about the possible origins of CWD and all are not proven and never will be. The same may be said about the origins of BSE, scrapie, CJD, or any of the other naturally occurring TSEs.

The best review of the early cases of CWD at CSU and the Early History of CWD can be found in the "Chronic Wasting Disease: A Review for Health Canada" 105 pages by Dr. Terry Spraker from CSU.

The first published article on CWD was by Williams and Young in 1980 in the Journal of Wildlife Disease titled "Chronic Wasting Disease of Captive Mule Deer: A Spongiform Encephalopathy."

In 1981, CWD was found in a free-ranging 18 month old male elk in the Rocky Mountain Park. Then CWD was found in a 4-5 year old mule deer buck near CSU in 1984. The first case of CWD in a white-tailed deer was found in 1985 in a wild adult male near Loveland Colorado.

Now after more than 40 years, the rest, as they say, "is history". Presently as of Feb 2018, CWD has been found in 23 States and 2 Canadian Provinces, in Korea, Norway, and Finland. Uninformed and misinformed pundits often characterize CWD as a "common", "widespread" and/or "rapidly

expanding" disease. A closer examination and even casual glance at the available scientific data refutes those claims.

According to CDC in 2012, "More than 1,060,000 cervids have been reportedly tested for CWD, and ~6,000 cases have been identified." (Prevalence of positives = 0.56% which is 5 test positives per 1000 tested). USDA Records from 1998-2012. Dr. Patrice Klein USDA/APHIS on April 2012.

Total Farmed Surveillance

170,120 403 positives (0.2%)

Total Wild Cervid Surveillance

848,706 3,600+ positives (0.4%)

Total Tested

1,018,826 4,003 positive (0.39%)

Data from the Texas Veterinary Diagnostic Laboratory (TVMDL)

From 2013-2018 98,524 deer tested for CWD, with 87 positives (0.88%)

CWD Distribution By Counties

In the US, there are 3,144 Counties. As of February 2018 there are 196 Counties with CWD Positive Deer (CDC Jan 2018). That equals to 6.2% of the Counties in the US with CWD. That also means 93.8% of the US is free of CWD.

In the 23 States (counting Mississippi) that have CWD, there are 1,714 Counties. So according to CDC in January 2018, there

Occurrence And Geographic Distribution cont.

are 196 counties with CWD positive animals in the 1,714 total counties in the 23 CWD positive States. That equals 11.4%. Which means that even in the 23 CWD Positive States 88.6% of the counties are free of CWD as on February 2018, and some only have one positive.

CWD Test Positive Prevalence - SCWDS Briefs. January 2018. Michigan since 2015, 1.9 % (57/30,000); Missouri 2016-2017, 0.24% (58/323,456); Nebraska since 1997, 0.99% (499/51,000); Wisconsin, since 1999, 1.99% (4174/209,700). Wyoming Game and Fish, January 2018, in 2017, 8.8%, 342/3883).

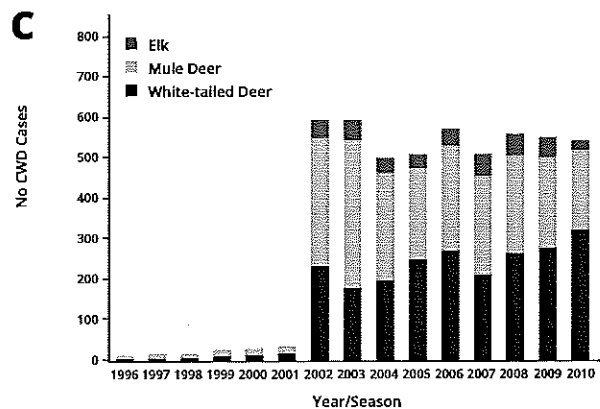
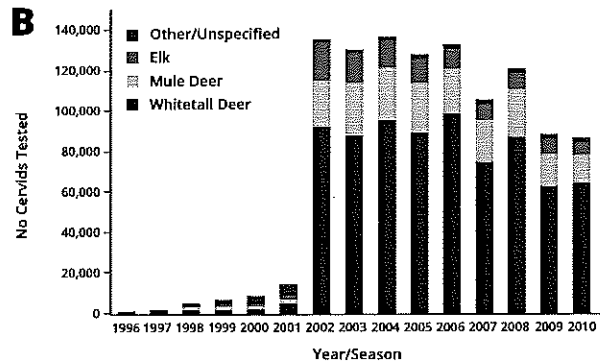
NOTE: The numbers above from SCWDS do not even approach the exaggerated prevalence numbers frequently and widely reported in the popular media sources.

It must be pointed out that the entire US and Texas do not entirely represent the CWD situation in all of the individual States. Wyoming, for example, has been reported to have a 35% prevalence of CWD in tested animals, there are CWD test positive animals in 16 of the 23 Counties in Wyoming, and the disease has been there for about 40 years. Wisconsin has recorded CWD in 20 of the 72 counties from 2002-2018. But the CWD situation in Wyoming and similar States should not be extrapolated to or used to make policy decisions in other States.

The five states of Wyoming (16/23), Colorado (20/64), Wisconsin (20/72), Nebraska (35/93) and Kansas (22/105) have 113 of the 196 or 58% of the CWD infected counties. There are 15 States that have less than 10 Counties

each with CWD.

DATA from CDC that clearly shows that CWD is NOT Increasing in Prevalence Since 2002 When Surveillance Drastically Increased



Bottom Line on Occurrence and Distribution

Prevalence rates of less than 1% for CWD, like all the other TSE, shows that CWD is a fairly rare disease on a national scale. "Widespread" also depends on the scale by which it is measured. By total State is 44%, by Counties in the US it is 6.2%, by positive counties in the 23 positive states it is 11.2%.

Current Scientific Knowledge About CWD
2014

Current Scientific Knowledge About CWD
2014

Even with the dramatic increase in surveillance and the number of deer tested since 2002, the prevalence has not increased nationally, however the increase in the number of States with CWD can be attributed to: 1) the natural movement of deer, 2) the transportation/translocation involved in deer commerce, and 3) the increase in required CWD testing.

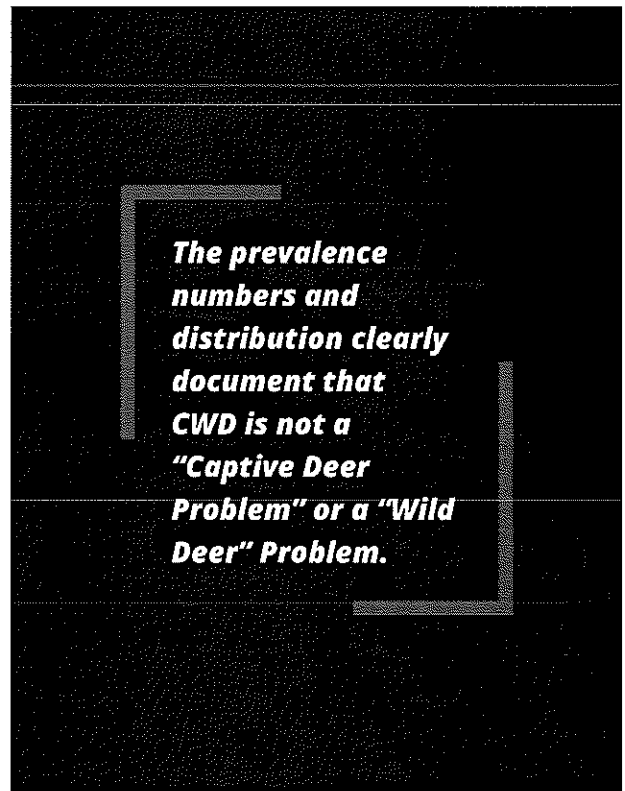
It should also be noted that some of the "spread" of CWD could be cases due to spontaneous mutations. All TSEs have spontaneous cases of atypical forms of prions. Diagnostic testing for Spontaneous CWD is rarely done. This will be discussed at length in TRANSMISSION.

NOTE: The prevalence numbers and distribution also clearly document that CWD is not a "Captive Deer Problem" or a "Wild Deer Problem."

According to USDSA/APHIS, "since 2001, CWD has been identified in free-ranging cervid populations in 23 States: Colorado, Illinois, Kansas, Maryland, Minnesota, Mississippi, Montana, North Dakota, Nebraska, New York, New Mexico, South Dakota, Utah, Virginia, Wisconsin, West Virginia, Iowa, Michigan, Missouri, Pennsylvania, Arkansas, Texas, and Wyoming.

Since 1997, CWD has been found in farmed cervids in 16 States: Colorado, Kansas, Michigan, Minnesota, Missouri, Montana, New York, Oklahoma, South Dakota, Iowa, Nebraska, Ohio, Pennsylvania, Texas, Utah and Wisconsin."

NOTE: There are 3 States (Oklahoma, Ohio, and Utah) with CWD only in captive herds. There are 8 States (Arkansas, Illinois, Maryland, Mississippi, New Mexico, West Virginia, Virginia, and Wyoming) with CWD only in wild populations.



IV. Diagnosis

Testing by USDA/APHIS, 2018.

"Currently, definitive diagnosis is based on immunohistochemistry (IHC) testing of the obex area of the brain stem or the medial retropharyngeal lymph nodes. Gross lesions seen at necropsy reflect the clinical signs of CWD, primarily emaciation and sometimes aspiration pneumonia, which may be the primary (acute?) cause of death. On microscopic examination, lesions of CWD in the central nervous system resemble those of other spongiform encephalopathies."

At this time, abnormal prion proteins can be detected using immunohistochemistry (IHC), Western blotting, enzyme-linked immunosorbent assay (ELISA), prion misfolding cyclic amplification (PMCA), and real-time quaking induced conversion (RT-QuIC), however, approved diagnostic assays are limited to IHC and ELISA.

Research is being conducted to develop live-animal diagnostic tests for CWD. The rectal biopsy test, while not yet approved for routine regulatory testing, appears promising but may have limited applicability due to the number of positive animals in the early stages of the disease that may not be detected.

Ante-mortem rectal and tonsil biopsy tests are presently being utilized and evaluated by the Texas Animal Health Commission in captive cervids.

Official CWD tests are performed only at APHIS-approved University, State, or Federal

At even a 1% CWD mortality rate, there should be 45,000 dead wild deer and a 1,000 captive deer annually available to be found in Texas. This obviously has not been observed.

veterinary diagnostic laboratories. If the animal to be tested is a farmed deer or elk, accredited veterinarians should check with Federal or State regulatory veterinarians for information on sample collection and appropriate sample submission. If the animal to be sampled is a wild deer or elk that is suspected of having CWD, accredited veterinarians should inform State and Federal authorities and work with their State wildlife management agency to find out how officials would like the sample collected and submitted."

Handwritten signatures and notes at the top left of the page.



"If the animal to be sampled is a clinically normal wild animal that an individual hunter would like tested, accredited veterinarians should also work with their State wildlife management agency or department of agriculture to find out how best to proceed. Several approved laboratories exist with sufficient capacity to provide fee-for-service testing for samples collected by individual hunters. Accredited veterinarians should always check with the diagnostic laboratory to make sure samples are properly collected, packaged, and shipped." USDA

NOTE: All the Official IHC tests are post-mortem tests and are done on tissues collected from dead animals.

The vast majority of the samples from free-ranging animals and submitted by wildlife agencies were either hunter harvested or road kills. Therefore at the time of death the animals were mobile and not exhibiting the advanced clinical signs compatible with CWD.

The majority of postmortem IHC tests on captive cervids are from animals euthanized during depopulation of CWD exposed herds and by mandatory mortality testing requirements imposed by the States. Again at the time of death, clinical signs compatible with CWD are extremely rare.

A clinical case of CWD in Texas with over 4.5 million deer and over 100,000 captive cervids has never been observed.

NOTE: At even a 1% CWD mortality rate, there should be 45,000 dead wild deer and a 1,000 captive deer annually available to be found in Texas. This obviously has not been observed.

A positive IHC test does not document spongiform encephalopathy, nor does it document CWD as the cause of death.

Much of what is known about CWD in free-ranging cervids is based on prevalence based on the results of IHC testing. Prevalence is an indication of exposure rates and infection rates. Prevalence for diseases including prevalence for CWD does not equal morbidity or mortality from that disease.

V. Transmission

Modes Of Disease Transmission In Regard To Cwd

Most epidemiologists that are familiar with the scientific literature about TSEs in general and CWD specifically hypothesize that CWD is mainly transmitted in the wild by:

1. Frequency dependent direct contact.
2. Indirect through environmental contamination.

The most comprehensive publication on the subject is by Jenelle et. al, 2014. PLOS. "Transmission of Chronic Wasting Disease in Wisconsin White-tailed Deer: Implications for Disease Spread and Management", which is a retrospective study of 10 years of CWD data. It clearly shows that in wild deer CWD transmission is frequency dependent rather than density dependent.

The other view, "The mode of transmission of CWD is unknown."(USGS National Wildlife Health Center).

USDA –"The routes of transmission are still unknown. Epidemiologic evidence suggests that this disease is transmitted laterally, from animal to animal. It is thought that CWD can be transmitted through nose-to-nose contact. It also appears that CWD also can be spread indirectly through the environment; contaminated pastures seem to be the source of exposure in some outbreaks. Vertical transmission may occur, but does not seem to be important in maintaining epidemics and cannot explain many cases."

Currently the scientific evidence about the modes of transmission of CWD in wild, free-ranging cervids is extremely limited. Most of the known data are entirely based on artificial experimental infections of captive deer in pens as evidenced below. (The highlights below are those of the editor's).

From CDC 2017. "Scientists **believe** CWD proteins (prions) **likely** spread between animals through body fluids like feces, saliva, blood, or urine, either through direct contact or indirectly through environmental contamination of soil, food or water. Once introduced into an area or farm, the CWD protein is contagious within deer and elk populations and can spread **quickly**. Experts **believe** CWD prions can remain in the environment for a **long time**, so other animals can contract CWD from the environment even after an infected deer or elk has died."

There is a serious problem in objective science when terms such as "believe", "likely", or even "suggest", and "perhaps" are used. Subjective terms like "quickly" and "long time" should be avoided.

Science is, or should be, based on demonstrable data. When those highlighted terms above are used, they are a euphemism for "we are not sure" and "we don't really know".

There is also a serious issue when data from very small numbers of experimental captive animals in one location are extrapolated

**The Chance of
Bottled Urine
Transmitting
CWD Is Virtually
Zero" and that
puts things into
prospective.**

to free-ranging populations everywhere. Experiments may show what is possible in laboratory conditions but may not reflect what is probable in the real world.

Let's examine some examples in detail. First is in regard to "spread between animals by body fluids like feces, saliva, blood, or urine".

Blood – A single white-tailed fawn experimentally injected intravenously (**IV**) **with 250 ml** of blood from CWD positive deer, and 2 other fawns injected intraperitoneally (IP) with 250 ml of blood from CWD positive deer. All 3 fawns became CWD positive by 18 months post injection.

NOTE: Where in nature in free-ranging deer receive 250 ml of blood in a IV transfusion, or 250 ml of blood injected IP?

Urine and Feces– 3 fawns (one died) orally inoculated with a total 50 ml each of urine and feces over 3 days from CWD infected deer. The 2 remaining fawns were CWD negative at 180 days.

Saliva – 3 fawns were orally exposed to **50 ml of saliva** from CWD infected deer. By 180 days post-oral exposure, all 3 fawns were CWD Positive.

NOTE: Where in nature are free-ranging deer exposed to 50 ml of saliva in 3 days?

The above results were published in a very prestigious journal- Science 2006: Mathiason et al., "Infectious prions in the saliva and blood of deer with chronic wasting disease."

The big problem is that scientific results like the above are misunderstood, misquoted, and extrapolated by others. It is a fact that CWD prions can be found in saliva, blood, urine and feces in experiments, but perhaps only the numbers of prions in saliva in large doses are capable of transmitting CWD by normal routes of infection in nature.

Another excellent CWD researcher Dr. Nicholas j. Haley (et al.) published an article in the Journal of Virology 2011. "Detection of Chronic Wasting Disease Prions in Salivary, Urinary, and Intestinal Tissues of Deer: Potential Mechanisms of Prion Shedding and Transmission." That investigation showed

V. Transmission cont.

that prions are shed in very low numbers in feces and urine and could only be detected by special amplification methods (serial protein misfolding cyclic amplification or sPMCA) which result in a million fold concentration of the prions to allow detection.

More recently Dr. Haley ranked the infectivity of various bodily fluids in relation to potential CWD transmission. They are ranked as follows from highest to lowest in terms of CWD prions present.

Brain

Carcass

Lymphoid Tissue

Deboned Meat

Digestive Tissue

Blood

Saliva

Feces

Urine – takes 33,000 gallons of infected urine to equal 1 gm of infected brain

Unfortunately public policy often is made even in the face of published science. Urine lure bans commonly are imposed by State wildlife agencies, but a quote from Dr. Haley (who did the research) is “The Chance of Bottled Urine Transmitting CWD Is Virtually Zero” and that puts things into perspective.

TRANSMISSION BY CLOSE CONTACT

Miller et al., 2004. Experimentally placed 9 CWD naïve mule deer in 3 pens of 3 with that contained mule deer carcasses that died

of CWD. 19% of the CWD naïve mule deer became infected.

TRANSMISSION BY ENVIRONMENTAL CONTAMINATION

Miller et al., 2004. Experimentally 3 groups of 3 deer each of CWD naïve mule deer were placed in pens at Colorado State University. One set of 3 pens that had been occupied by CWD infected animals 2 years ago, another set of 3 pens with a CWD carcass, and a third set of 3 pens with a CWD infected animal. A total of 16% of the CWD naïve deer in the 3 experimental conditions in 9 pens became infected, and 84% did not become infected.

OTHER POSSIBLE MODES OF CWD TRANSMISSION

1. More recently evidence of in utero transmission of CWD has been reported by:

A. Selariu et al., 2015. Journal of General Virology, “In utero transmission and tissue distribution of chronic wasting disease-associated prions in free-ranging Rocky Mountain elk”.

B. Nalls, et al., 2013. PLOS, “Mother to Offspring Transmission of Chronic Wasting Disease in Reeve’s Muntjac Deer.”

2. By Predators and Scavengers

A. Nuwer, 2012. Smithsonian.com. “Brain-Eating Crows May Help Spread Prion Diseases”.

B. Nichols et al., 2015. Prion. “CWD prions

remain infective after passage through the digestive system of coyotes (*Canis latrans*)”

POSSIBLE CWD TRANSMISSION BY PLANTS

A. Pritzkow et al., 2015. Plants were exposed to prion (not solely CWD prions) positive Hamster Brain Homogenates, then plant material injected back into hamsters.

NOTE: Hamsters are not deer, the prions used were not all CWD, and injection is not a normal route of CWD transmission.

B. Rasmussen et al., 2014 found that plants were unable to transport sufficient amounts of CWD prions from roots to wheat stems to be infectious

NOTE: Never in nature or under experimental conditions have CWD prions in plants been documented to be infectious to deer.

TRANSMISSION BY SEMEN

NOTE: No prions of any TSE have ever been isolated from semen from any species.

CWD TRANSMISSION TO OTHER SPECIES INCLUDING HUMANS

FROM CDC – “The CWD prion has been shown to experimentally infect squirrel monkeys, and also laboratory mice that carry some human genes. In addition, a study begun in 2009 by Canadian and German scientists is evaluating whether CWD can be transmitted to macaques, a type of monkey that is

genetically closer to people than any other animal that has been infected with CWD previously. On July 10, 2017, the scientists presented a summary of the study's progress in recorded presentation in which they showed that CWD was transmitted to monkeys that were fed infected meat (muscle tissue) or brain tissue from CWD-infected deer and elk. Some of the meat came from asymptomatic deer that had CWD (i.e., deer that appeared healthy and had not begun to show signs of the illness yet). Meat from these asymptomatic deer was also able to infect the monkeys with CWD. CWD was also able to infect the macaques that had the infectious material placed directly into their brains.

Data reported from this unpublished Canadian presentation showed different results than a previous published study, which had not shown successful transmission of CWD to macaques. The reasons for the different experimental results from the Canadian study and other studies are unknown.

More recently it was shown definitively that “Chronic wasting disease (CWD) did not cross the species barrier to infect *Cynomolgus* macaque monkeys during a lengthy investigation by National Institutes of Health scientists” exploring possible risks to humans.

In the NIH study, titled “Lack of Transmission of Chronic Wasting Disease to *Cynomolgus* Macaques” which was published in 2018 in the *Journal of Virology*, “14 macaques

V. Transmission cont.

were cerebrally and orally exposed to brain matter from CWD-infected deer and elk, and then monitored for up to 13 years."

Researchers screened tissues for prion disease using several tests--including the highly sensitive Real-Time Quaking-Induced Conversion (RT-QuIC) assay--and found "no clinical, pathological or biochemical evidence suggesting that CWD was transmitted" to the macaques.

To date, there is no strong evidence for the occurrence of CWD in people, and it is not known if people can get infected with CWD prions. Nevertheless, these experimental studies raise the concern that CWD may pose a risk to people and suggest that it is important to prevent human exposures to CWD.

Additional studies are under way to identify if any prion diseases could be occurring at a higher rate in people who are at increased risk for contact with potentially CWD-infected deer or elk meat. Because of the long time it takes before any symptoms of disease appear, scientists expect the study to take many years before they will determine what the risk, if any, of CWD is to people.

From CWD Alliance - No cases of human prion disease have been associated with CWD. In fact, current research from Colorado confirms that the incidence of Creutzfeldt-Jakob disease in humans living within 7 CWD endemic counties has not significantly increased between the years of 1970-2001 and no case of a human prion disease

resulting from CWD exposure has ever been documented (McWhinney et al., 2006). The tendency toward a natural "species barrier" reducing human susceptibility to CWD and other prion diseases has been demonstrated by in vitro studies; in those studies, PrPCWD inefficiently converted human PrPC to the abnormal isoform as compared to homologous PrPCWD to cervid PrPC conversions. Cervid PrPCWD to human PrPC conversions were essentially equivalent to conversions of human PrPC by scrapie and BSE PrPres. However, lingering uncertainty about interpreting these data and assessing any potential risk that CWD may pose to humans is fostered by differing experiences with two more common animal TSEs. Although there is a long history of human exposure to scrapie through handling and consuming sheep tissues, including brain, there is no evidence that this presents a risk to human health. In contrast, massive exposure of British and perhaps other European citizens to the BSE agent resulted in approximately 106 deaths due to variant Creutzfeldt-Jakob disease as of February 2002.

In the absence of complete information on risk, and in light of similarities of animal and human TSEs, public health officials and wildlife management professionals recommend that hunters harvesting deer and elk in the endemic area, as well as meat processors and taxidermists handling cervid carcasses, should take some common sense measures to avoid exposure to the CWD agent and to other known zoonotic pathogens. Because TSE agents have never

been demonstrated in skeletal muscle, boning game meat is recommended as an effective way to further reduce the potential for exposure. Raw velvet antler, a product unique to the farmed cervid industry, may deserve further evaluation for presence of PrPCWD in order to preserve markets for this commodity.

NOTE: Many of the experiments in other species used intracranial injection (IC) of CWD infected brain homogenates containing millions of CWD prions through a hole in the skull. This is both a huge dose of prions and a completely abnormal route of infection. Results from studies using IC injections should be viewed with some skepticism.

NOTE: Cattle, sheep, goats, and fallow deer resisted experimental infections.

NOTE: Some corrections of the above statements are needed. Transgenic mice with humanized immune systems resisted CWD infections while transgenic mice with elk immune systems became infected.

NOTE: To date NOT one single case of CWD has been found in humans in spite tens of thousands of CWD test positive deer and elk being ingested by people.

NOTE: the macaque study was not a published study. The total number of prions contained in the meat, and the total amount of meat fed are unknown. The time interval of feeding, and or number of feedings of infected material is also unknown. The chimpanzee is more closely related to humans than macaques. Completely

extrapolating results from one species to another is scientifically inappropriate. As an example, in 2 related species, CWD in elk is known to be a different disease from CWD in white-tailed deer.

To date, NOT one single case of CWD has been found in humans despite tens of thousands of CWD test positive deer and elk being ingested by people.

VI. CWD And Deer Population Declines

"The total U.S. deer population in 2014 was about 32.2 million; 28.6 million whitetails and 3.6 million mule deer, blacktails, and other. That's down from 33.5 million in 2013; 29.9 million whitetails and 3.6 million mule deer, blacktails, and other. Recent peak U.S. deer population is estimated to have occurred around the year 2000 at 38.1 million, 33.5 million whitetails and 4.6 mule, blacktails, and other. The estimate is based on population information from state agencies and other groups collected on this website, discussed on each state page that can be accessed by clicking on the drop-down menus above. The estimate also relies on harvest data for each state, available using the links at the top of the column at right. As illustrated in the figure below, the U.S. deer harvest has fallen by 18.8 percent since 2000, a few state numbers are unavailable and estimated."

Deer Friendly 2018

Over the past decade, there has been a steady decline of 18-20% in deer populations in the Western US in States both with and without CWD .

Two of the most recent published and most frequently quoted articles on deer population declines are:

A. "Chronic Wasting Disease Drives Population Decline of White-tailed Deer" Edmunds, et al., PLOS 2016.

B. "Endemic chronic wasting disease causes mule deer population decline in Wyoming" DeVivo, et al., PLOS 2017

Both are well-designed studies for Doctor of Philosophy Degrees to gather data from radio-collared deer. There is a great deal of helpful information generated by the two investigations.

They do, however, have several understandable limitations in scope. First of all, they both were conducted on small populations in a localized area. DeVivo captured and radio-collared 143 mule deer (118 females and 25 males) in Converse County, Wyoming for 4 years. Edmunds captured and radio-collared 175 deer (112 fawns, 57 females -55 males; 63 adults (27 female-55 male) on the VR Ranch and surrounding area. Did the sex-ratio and age

It is also notable that fecundity in this localized population was extremely low of (74%) when compared to that observed in normal white-tailed deer populations.

class of the research deer represent and reflect deer populations across Wyoming? Did the localized study areas represent the habitat fragmentation, plants, soils, stocking rates, predation levels, human disruption, weather conditions, and concomitant disease of deer as the rest of Wyoming?

DeVivo 2017 documented 97 mortalities in the 143 radio-collared deer. The causes were determined (in some cases subjectively) to be as follows: 20 mountain lion predation; 14 'clinical' CWD (which were CWD test positives with no other overt signs of trauma, etc); 4 hunter harvest; 2 poaching; and 37 undetermined cause of death. One wonders why the title of the paper is "CWD causes Decline", instead of "Mountain Lions cause Decline", or better yet "Undetermined Causes are Responsible for the Majority of Population Decline".

Edmunds 2016 – similar criticisms can be made on the data collected from the 175 white-tailed deer in a localized geographic area. Also the variable of possible immigration into the population was not considered. It is also notable that fecundity in this localized population was extremely low of (74%) when compared to that observed in normal white-tailed deer populations.

NOTE: Edmunds in his dissertation in 2013 wrote on page 14, "... further few deer and no elk populations are considered in danger of decline due to CWD." On page 18 Edmunds wrote "However, no population of mule deer or white-tailed deer in either Colorado or Wyoming where endemic CWD have occurred for greater than 50 years have been lost."

NOTE: In the Wyoming studies, there was a brief mention of the relationships between apparent susceptibility to CWD and genetics. Apparent resistance was explained by saying that a deer with resistant genetics may also have negative behavioral traits, negating the positive effect of resistance.

NOTE: Both the results of the 2 Wyoming studies have been misinterpreted, misrepresented, and misreported by others not familiar with statistical procedures. An example – 'Survival of CWD-negative deer in these studies was 30-40% greater than survival of CWD-positive deer' was erroneously used to show a "cause and effect" relationship between CWD and population declines. CWD and Survival is a correlation not a cause and effect statistical relationship. There are many other factors that can be correlated with survival, but a correlation value (R) does not equal cause in statistics.

NOTE: The most serious problems associated with the two above studies are the erroneous extrapolations of these investigations to white-tailed deer and mule deer in other locations with notable differences in population dynamics, climate, topography, plant communities, habitat fragmentation, soil composition, minerals, domestic animal stocking rates, predation, and other sympatric wildlife.

Both the 2 above, and all other CWD computer simulation models that are utilized to predict the possible population effects for 25-40 years have inherent limitations. Simulation models are designed to incorporate the interactions of multiple independent and dependent variables that control how a dynamic process works. Data both past and

VI. CWD And Deer Population Declines cont.

present are required to design the simulation model as well as knowledge of the process.

If the fundamental assumptions that are used to design the model are not reflective of the actual process simulated, then model will not be valid. If the fundamental assumptions of the model are valid but the required data inputs are erroneous or missing, the model will make inaccurate and erroneous predictions.

The most common misunderstanding and false assumptions concerning predictive computer simulation models are associated with the validity of their predictive value. Predictions or projections of such models **are not absolute facts.** They are **simply predictions** and their predictive outcomes are made based on current knowledge about the condition of variables and the interactions of these variables. If those variables and their interactions change in the future, the model will be invalid. In plain English, if a model is constructed about the effects of CWD on a deer population in a location for the next 25-40 years, and there is a drought, a very hard winter, another disease, or an increase of human disruption (i.e. the conditions change) during the next 25-40 years, then the model is and will be invalid.

Bottom Line on Models of CWD Causing Population Declines

Over the last 20 years, there have been many computer simulation models generated predictions of the long-term population effects of CWD. They all have been uniformly wrong. Schaubert and Woolf, 2003 wrote an article "Chronic Wasting Disease in Deer

and Elk: a Critique of Current Models and Their Applications. The authors stated "CWD will remain at a relatively low prevalence indefinitely". Obviously there interpretation of the available data does not support "population decimation". They were well ahead of their time. Predictive models on CWD have not been either accurate or reliable.

NOTE: Wyoming Deer Population – "An estimated population of 423,000 deer in 2015, up from 400,000 in 2014. The population was trending higher after three mild winters into 2016, but a very harsh winter for 2016-17 west of the continental divide resulted in very low fawn survival. Also an EHD die-off. A total population of about 578,000 in 1991. "Deer Friendly, 2018.

NOTE: Colorado Deer Population – "An estimated population of 419,000 in 2017, 436,000 deer in 2016, a decline in part as a result of a harsh winter. In 2015, about 445,000 deer. The mild 2014-15 winter allowed for better survival, especially in the northwest. The 2014 post-hunt population was estimated at 424,190 compared to 391,000 in 2013. "Deer Friendly, 2018.

Deer populations in Colorado and Wyoming (as well as in other States) have historically increased and decreased over time because of several reasons previously discussed, but disease is rarely listed as a major cause of these variations with the exception of epizootic hemorrhagic disease (EHD).

VII. Prevention And Control

Control Strategies

CDC 2018 – “No treatment is available for animals affected with CWD. Once clinical signs develop, CWD is invariably fatal. Affected animals that develop pneumonia may respond temporarily to treatment with antibiotics, but ultimately the outcome is still fatal. Similarly, no vaccine is available to prevent CWD infection in deer or elk. It follows that controlling CWD is problematic. Long incubation periods, subtle early clinical signs, absence of a reliable ante-mortem diagnostic tests, extremely resistant infectious agent, possible environmental contamination, and incomplete understanding of transmission all constrain options for controlling or eradicating CWD.”

CDC 2018 – “In captive facilities, management options currently are limited to quarantine or depopulation of CWD-affected herds. Two attempts to eradicate CWD from cervid research facilities failed; the causes of these failures were not determined, but residual environmental contamination following depopulation and/or facility clean-up was likely in both cases. Attempts to eliminate CWD from farmed elk populations are more recent, and consequently the efficacy of these attempts remains uncertain. Whether contaminated environments can ever be completely disinfected remains questionable. Until effective cleaning and disinfection procedures are identified, captive cervids should not be reintroduced into commercial facilities where CWD has occurred; moreover, free-ranging cervids also should be excluded from previously-infected premises. Establishment of free-

-ranging reservoirs of infection in the vicinity of infected game farms, as exemplified by probable cases in Saskatchewan and Nebraska, could severely impair attempts at eradication from captive facilities. Inherent difficulties in managing infected herds and premises underscore the need for aggressive surveillance to prevent movements of infected animals in commerce.”

Wisconsin has had the most experience with CWD prevention and control. Since the appearance of CWD in southwestern Wisconsin in 2002, that state has become somewhat of a “testing laboratory” for reducing or eradicating CWD. The Wisconsin Department of Natural Resources (WDNR) instituted a host of strategies to eradicate CWD from the “CWD Eradication Zone,” including sharp-shooting and a confusing array of hunting seasons and bag limits. The response plan included depopulation of a 287 square mile zone, containing an estimated 15,000 deer. During 2004-2005, hunters killed a total of 27,032 deer in the “Zone,” and sharp shooters shot 1,383 and trapped 102 (total 1,484), at a cost of approximately \$478 per deer. By 2006, about \$35+ million was expended on these efforts, the result of which was loss of public confidence and failure to eradicate CWD. In 2006, the Wisconsin Legislature conducted an audit of the program, concluding, the efforts had not been effective, and the approach should be re-evaluated. By 2012, some 172,000 deer had been removed from the Eradication Zone, where the initial population estimate was 15,000. In 2011, Governor Scott Walker appointed a White-tailed Deer Trustee to evaluate these and other issues of deer

VII. Prevention And Control cont.

In 2017, the number of counties having CWD positive deer that year actually was 18, not the 40+ "affected" counties being reported in the popular press.

that CWD in Wisconsin has "exploded," and there now are over 40 "affected counties." Distribution of CWD sampling by the WDNR in 2015-16. – showed that the vast majority of samples came either from the four original "Zone" counties or counties immediately surrounding these counties. (Source: WDNR CWD monitoring database.)

In 2017, the number of counties having CWD positive deer that year actually was 18, not the 40+ "affected" counties being reported in the popular press. Of the 9,766 deer tested in 2017, a total of 595 testing positive (6.1%); however, 534 (89.7%) of these positives came from the original four counties (Dane, Iowa, Richland, and Sauk). One hardly can accept that CWD has "exploded" in Wisconsin.

There also have been claims that the approach Illinois has used (sharp-shooting, increased bag limits) has been effective. From 2003 to 2017, the number of counties with CWD positive animals has increased from 7 counties to 17 counties.

(www.dnr.illinois.gov/programs/CWD/Documents/CWDAnnualReport20162017.pdf); Again, not successful by any analysis. Hence, eradication or even control of CWD does not seem to be possible using the most common approach to this time.

CDC 2018- "Managing CWD in free-ranging animals presents even greater challenges. Long-term, active surveillance programs to monitor CWD distribution and prevalence have been instituted in the endemic area to determine the extent of the endemic area and to assist in evaluating both temporal changes

management in Wisconsin. The June 10, 2012 report confirmed the program had not been successful and recommended a drastically different approach of containment and intensified monitoring to detect "spark outs." Since, there has been little spread of CWD, in spite of what has been published in popular outlets. In addition, the DTR report found sampling bias had greatly inflated infection rate estimates. In 2015-16, for example, the vast majority of the 3,156 CWD samples came either from the original four county area or the immediate zone around these counties.

There have been many popular articles published in the last five years asserting

and effects of management intervention. Management programs established to date focus on containing CWD and reducing its prevalence in localized areas. Ultimate management goals vary among affected states and provinces. In areas where CWD may not yet be endemic, eradication could be considered as an ultimate goal for CWD management. In endemic states like Colorado and Wyoming however, managers have refrained from committing to eradication because it appears unattainable in their situations.

A variety of specific strategies for managing CWD in free-ranging wildlife have been adopted in affected jurisdictions. Translocating and artificially feeding cervids in endemic areas have been banned in attempts to limit range expansion and decrease transmission. Selective culling of clinical suspects has been practiced throughout the endemic area of Colorado and Wyoming for a number of years, but this approach alone has proven insufficient to reduce prevalence in affected populations. Localized population reduction in an area of high CWD prevalence has been undertaken in Colorado as a management experiment, but efficacy remains to be determined. Although it seems intuitive that lowered herd densities should reduce both transmission and likelihood of emigration by affected animals to adjacent areas, historic migration patterns and social behaviors characteristic of some deer and elk populations may diminish the effectiveness of wholesale density reduction in controlling CWD. Models of CWD epidemic dynamics suggest early, aggressive intervention via selective culling

or more generalized population reduction show the greatest promise of preventing new endemic foci from being established; unfortunately, surveillance limitations (both cost and sensitivity) may delay detection of newly infected free-ranging populations for a decade or more after CWD has been introduced or spontaneously occurred. In both Nebraska and Saskatchewan, for example, aggressive reductions of deer numbers in newly identified endemic foci have been undertaken in attempts to eliminate CWD from these areas. Although the development of tonsil biopsy as an ante-mortem test for CWD in deer might aid control efforts under some conditions, large-scale applications to free-ranging populations seem impractical."

NOTE: On Feeding Bans - Many States have instituted ban on supplemental feeding and/or baiting in an attempt to reduce the risk of transmission of CWD. There is not a single published article based on hard scientific data that addresses either the positive or negative effects of a feeding ban in regard to CWD transmission.

There are many articles on feeding bans in regard to the transmission of bovine tuberculosis (TB) in deer in Michigan and Minnesota. Michigan initiated feeding bans in 1998 and now in 2018 (twenty years later), the geographic distribution of TB in deer dramatically, TB has been found in other wildlife species, TB has been found in many cattle herds. One must conclude from the data that the feeding ban has been ineffective.

NOTE: Over the last 20+ years and to date, all

VII. Prevention And Control cont.

control and prevention strategies including population reduction, supplemental feeding bans, baiting bans, importation of live cervids (even species not susceptible to CWD), importation of deer carcasses from CWD areas, bans on importation of trophies, restrictions on taxidermists, and bans on the use of urine based lures have not been effective.

NOTE: Population Management Programs. Zebal 2016, PLOS. "Chronic Wasting Disease: Transmission Mechanisms and the Possibility of Harvest Management." In an evaluation of 4 different harvest strategies and their effects on disease prevalence Zebel found that harvest strategies were not effective and were not well accepted by the public. Uehlinger et al., 2016. BioMed Central. "Systematic review of management strategies to control chronic wasting disease in wild deer populations in North America" wrote "After a review of 9 individual studies (3 of which were based on observational data, and 9 were predictive models), evaluating *four unique techniques they concluded that "Control efforts to date have been largely unsuccessful, resulting in continuing spread and increasing prevalence."*

NOTE: *The history of CWD in New York State often is quoted as an example of a successful CWD eradication program. New York Department of Environmental Conservation (NYDEC) "Status of CWD" in 2017 does not even mention the term "eradication". They instead state, "No new Chronic Wasting Disease (CWD) cases have been identified in New York since 2005". "No new cases have been identified" does not equal eradication. NYDEC also states more than 31,000 wild deer were tested from 2002 through 2010,*

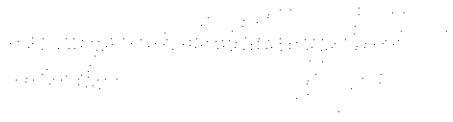
and "no new cases were detected." Again that does not mean New York State is free of CWD in wild deer. From 2011 to 2017, 13,992 deer have been tested which is an average of 1,749 deer tested per year. Hunter Harvest in NY in 2017 was over 219,000 from a deer population in excess of 1.5 million. So in summary, testing less than 0.79% of the Hunter Harvest and less than 0.1% of the population is not a very aggressive surveillance and monitoring program for a disease with a prevalence rate of less 0.02% (7 pos/35,000 tested) in NY. It would be very easy to miss a disease at that prevalence and at that testing rate.

CWD VACCINES

Pilon et al., 2013. Journal of Wildlife Diseases "Immunization with a Synthetic Peptide Vaccine Fails to Protect Mule Deer (*Odocoileus hemionus*) from Chronic Wasting Disease. All the vaccinated deer produced antibodies but all the vaccinated animals eventually became infected (CWD test positive).

Taschuk et al, 2017. Prion. "Induction of PrPsc-specific systemic and mucosal immune responses in white-tailed deer with an oral vaccine for chronic wasting disease." Was done in 10 deer and they developed antibodies. No exposure to CWD prions was done so no evaluation of protection was established.

NOTE: *A vaccine that confers a significant level of protection against CWD infection potentially might be a boon to the captive deer industry if it did not interfere with diagnostic testing, but without an effective vaccine delivery system suitable for free-ranging animals, the vaccine would have no application for wild deer and elk.*



BOTTOM LINE ON CWD PREVENTION AND CONTROL EFFORTS

A review of the literature based on actual data (not predictive models) clearly shows that that any past combination of quarantines, containment zones, surveillance zones, depopulation, elective harvest, increased harvest limits, supplemental feeding bans, baiting bans, bans on the importation of live cervid species, bans on the importation, of carcasses, bans on the importation of trophies, and bans on urine based lures, HAVE NOT been effective in preventing, controlling, or eradicating CWD in any State. These programs have cost in excess of \$100,000,000 of public funding and the killing of thousands of deer without any measurable positive results.

Research shows human prion proteins resist chronic wasting disease



By Horace Gore, Wildlife Biologist

A recent study by a research team at UC San Diego has shown that a small loop in the human prion protein prevents corruption of human proteins when exposed to elk prions. This study, published Feb. 23, 2017 in the Journal of Clinical Investigations identified the small loop in the human prion protein that confers resistance to chronic wasting disease. CWD is an infectious disease caused by prions that affect cervids (elk, deer, moose), but has not shown to affect humans. The importance of this finding cannot be over-emphasized, since Texans consume some fifteen million pounds of deer and elk venison annually.

"Since the loop has been found to be a key segment in prion protein aggregation, this site could be targeted for the development of new therapeutics designed to block prion conversions," said Christine Sigurdson, DVM, PhD; associate professor of UC San Diego and UC Davis and senior author of the study.

Prions aren't microorganisms like bacteria and viruses; they are simply protein aggregates. Some protein diseases are caused by an inherited genetic mutation, while others are caused by exposure to infectious prions in food. Acquired protein diseases are triggered when a foreign, misfolded prion protein causes the body's own natural prion

proteins to misfold and aggregate.

“We suspected that a loop in the human prion protein structure may block the cervid (elk) prions from binding, as the sequences did not appear to be complete.” Sigurdson said.

To test this hypothesis, Sigurdson and her team developed a transgenic mouse that expresses a prion protein that is identical to the human version—except for a small loop that was swapped out for the elk sequence. When these mice were exposed to the cervid (elk) prions, they developed chronic wasting disease (CWD).

In contrast, control mice expressing the normal human sequences, resisted infection when exposed to the same material—just as humans seem to, even those who consume venison meat.

“This finding suggests that the loop structure is crucial to prion conversion, and that sequence compatibility with the host prion protein at this site is required for the transmission of certain prion diseases,” Sigurdson said.

Co-authors of the study were Timothy D. Kurt, Cyrus Bett, Jun Liu, Tom Yang, UC San Diego; Lin Jiang, David Eisenberg, UC Los Angeles and Howard Hughes Medical Institute; Natalia Fernandez-Borges, CIC bio GUNE, Spain; Terry R. Spraker, Colorado State University, Fort Collins; Joaquin Castilla, CIC bio GUNE and Basque Foundation for Science, Spain; and Qingzhong Kong, Case Western Reserve University.

Author’s Note: The clinical effects of CWD on cervids is much too slow to cause population reductions in elk, deer, and moose herds. Reproduction far exceeds mortality, and coupled with the results of this study, which suggests that CWD cannot affect humans as a result of eating venison, Texans should continue to enjoy America’s healthiest red meat.

“The California study has merit, and explains why the consumption of ten-of-millions of pounds of venison has shown no ill effect on humans,” said Dr. James “Dr.Deer” Kroll in a recent interview.

It appears that State and Federal Agencies have spent a lot of time, resources, and money trying to control or eradicate a malady that is irrelevant and immaterial.

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Estimating chronic wasting disease susceptibility in cervids using real-time quaking-induced conversion.

Haley NJ¹, Rielinger R², Davenport KA³, O'Rourke K⁴, Mitchell G⁵, Richt JA².

Author information

Abstract

In mammals, susceptibility to prion infection is primarily modulated by the host's cellular prion protein (PrP^C) sequence. In the sheep scrapie model, a graded scale of susceptibility has been established both in vivo and in vitro based on PrP^C amino acids 136, 154 and 171, leading to global breeding programmes to reduce the prevalence of scrapie in sheep. Chronic wasting disease (CWD) resistance in cervids is often characterized as decreased prevalence and/or protracted disease progression in individuals with specific alleles; at present, no PrP^C allele conferring absolute resistance in cervids has been identified. To model the susceptibility of various naturally occurring and hypothetical cervid PrP^C alleles in vitro, we compared the amplification rates and amyloid extension efficiencies of eight distinct CWD isolates in recombinant cervid PrP^C substrates using real-time quaking-induced conversion. We hypothesized that the in vitro conversion characteristics of these isolates in cervid substrates would correlate to in vivo susceptibility - permitting susceptibility prediction for the rare alleles found in nature. We also predicted that hypothetical alleles with multiple resistance-associated codons would be more resistant to in vitro conversion than natural alleles with a single resistant codon. Our studies demonstrate that in vitro conversion metrics align with in vivo susceptibility, and that alleles with multiple amino acid substitutions, each influencing resistance independently, do not necessarily contribute additively to conversion resistance. Importantly, we found that the naturally occurring whitetail deer QGAK substrate exhibited the slowest amplification rate among those evaluated, suggesting that further investigation of this allele and its resistance in vivo is warranted.

KEYWORDS: Prion; RT-QuIC; chronic wasting disease; deer; elk; susceptibilityPMID: 29058651 PMCID: [PMC5845664](#) DOI: [10.1099/jgv.0.000952](#)[Indexed for MEDLINE] **Free PMC Article**

Amendment history:

- Erratum (June 2015)

Human prion protein sequence elements impede cross-species chronic wasting disease transmission

Timothy D. Kurt, ... , Qingzhong Kong, Christina J. Sigurdson

J Clin Invest. 2015;125(4):1485-1496. <https://doi.org/10.1172/JCI79408>.

Research Article**Infectious disease**

Chronic wasting disease (CWD) is a fatal prion disease of North American deer and elk and poses an unclear risk for transmission to humans. Human exposure to CWD occurs through hunting activities and consumption of venison from prion-infected animals. Although the amino acid residues of the prion protein (PrP) that prevent or permit human CWD infection are unknown, NMR-based structural studies suggest that the $\beta 2$ - $\alpha 2$ loop (residues 165–175) may impact species barriers. Here we sought to define PrP sequence determinants that affect CWD transmission to humans. We engineered transgenic mice that express human PrP with four amino acid substitutions that result in expression of PrP with a $\beta 2$ - $\alpha 2$ loop (residues 165–175) that exactly matches that of elk PrP. Compared with transgenic mice expressing unaltered human PrP, mice expressing the human-elk chimeric PrP were highly susceptible to elk and deer CWD prions but were concurrently less susceptible to human Creutzfeldt-Jakob disease prions. A systematic in vitro survey of amino acid differences between humans and cervids identified two additional residues that impacted CWD conversion of human PrP. This work identifies amino acids that constitute a substantial structural barrier for CWD transmission to [...]

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Human prion protein sequence elements impede cross-species chronic wasting disease transmission

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Chronic wasting disease (CWD) is a fatal prion disease of North American deer and elk and poses an unclear risk for transmission to humans. Human exposure to CWD occurs through hunting activities and consumption of venison from prion-infected animals. Although the amino acid residues of the prion protein (PrP) that prevent or permit human CWD infection are unknown, NMR-based structural studies suggest that the β 2- α 2 loop (residues 165–175) may impact species barriers. Here we sought to define PrP sequence determinants that affect CWD transmission to humans. We engineered transgenic mice that express human PrP with four amino acid substitutions that result in expression of PrP with a β 2- α 2 loop (residues 165–175) that exactly matches that of elk PrP. Compared with transgenic mice expressing unaltered human PrP, mice expressing the human-elk chimeric PrP were highly susceptible to elk and deer CWD prions but were concurrently less susceptible to human Creutzfeldt-Jakob disease prions. A systematic *in vitro* survey of amino acid differences between humans and cervids identified two additional residues that impacted CWD conversion of human PrP. This work identifies amino acids that constitute a substantial structural barrier for CWD transmission to humans and helps illuminate the molecular requirements for cross-species prion transmission.

Introduction

Infectious prions cause rapidly progressive, fatal neurodegenerative diseases that can be transmitted zoonotically. For example, bovine spongiform encephalopathy (BSE) prions spread from cattle to humans, causing 229 human deaths from variant Creutzfeldt-Jakob disease (vCJD) as of June 2014 (1–3). In North America, chronic wasting disease (CWD) in deer and elk spreads by horizontal transmission and is remarkably infectious, with a reported incidence of 89% in one captive population (4). Human exposure to CWD prions likely occurs through consumption of venison from CWD-infected deer (5), as both muscle and fat from deer have been shown to contain infectious prions (6, 7). An active surveillance of more than 17,000 US residents revealed that nearly 20% hunt deer or elk, and more than two-thirds have consumed venison (8), yet the risk of developing a prion infection through dietary exposure to CWD remains unclear. Human prion protein-expressing (PrP-expressing) transgenic mice resist CWD infection, suggesting a strong barrier for CWD transmission to humans (9–12); however, certain non-human primates are CWD susceptible (13–16). Similarly conflicting results from studies performed *in vitro* showed that CWD prions either efficiently or poorly convert human PrP to a pathogenic isoform (14, 17–19). Thus, no consen-

sus has emerged on the susceptibility of humans to CWD prions, and the transmission of CWD to humans remains a major public health concern.

Cross-species prion transmission is influenced by (a) the sequence similarity between the cellular prion protein (PrP^C) and the misfolded, aggregated conformer (PrP^{Sc}) and (b) the PrP^{Sc} conformation (20). PrP^C has an unstructured N terminus and a globular C-terminal domain, arranged in three α -helices and a short anti-parallel β -sheet, together comprising approximately 210 amino acids (21). The tertiary structure of PrP^C is highly conserved among mammals; however, specific amino acid differences between species are hypothesized to impact the intermolecular binding of PrP^C and PrP^{Sc} (22). One segment of high sequence diversity is the β 2- α 2 loop, consisting of residues 165–175 (human numbering) in which only 3 amino acids (P165, Y169, and Q172) are strictly conserved (23, 24).

Nuclear magnetic resonance-based (NMR-based) structural studies suggest that residue differences within the β 2- α 2 loop and the C terminus would preserve the global shape of PrP but may alter surface hydrogen bonding patterns that influence protein-protein interactions (22). Indeed, β 2- α 2 loop substitutions were shown to impair prion conversion *in vitro* (25–28) and *in vivo*, as transgenic mice that express PrP with 168R or with Y169G, S170N, and N174T substitutions resist infection with mouse-adapted prions (29, 30). Collectively, these studies provide a rationale for investigating the role of the β 2- α 2 loop in barriers to human infection with CWD.

Conflict of interest: The authors have declared that no conflict of interest exists.

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Reference information: *J Clin Invest.* 2015;125(4):1485–1496. doi:10.1172/JCI79408.

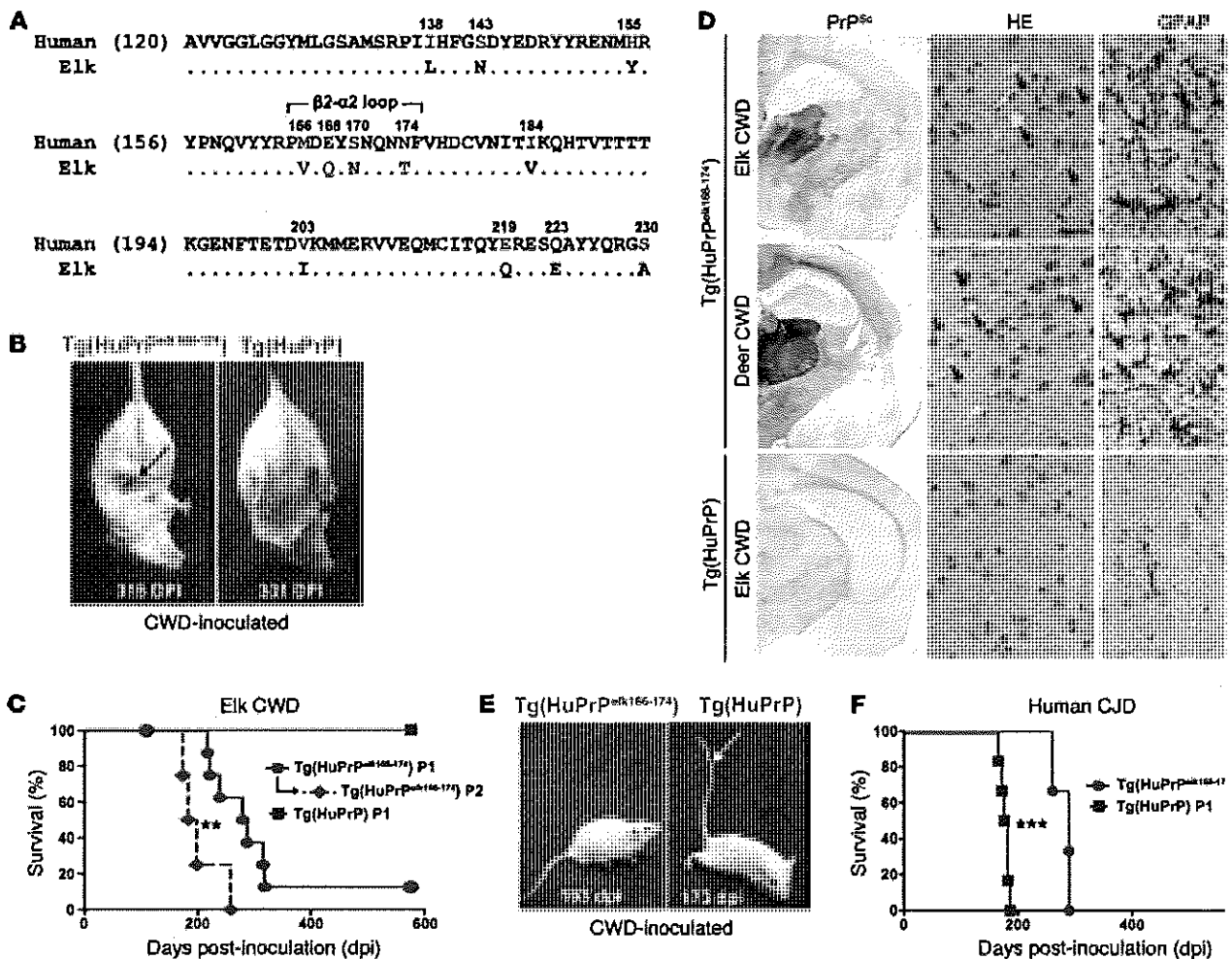


Figure 1. Mice expressing a human-elk chimeric PrP^c are infected by CWD prions. (A) Human PrP^c sequence with elk residue differences shown below. The human residue Q223 is also present in mule deer, but is E223 in elk. Amino acid substitutions present in the Tg(HuPrP^{elk166-174}) mice are in red. (B) Neuropathic signs in CWD-inoculated Tg(HuPrP^{elk166-174}) mice included hind limb clasp (arrow) typical of prion disease, whereas the hind limb splay of Tg(HuPrP) mice was normal. (C) Kaplan-Meier survival curves of CWD-inoculated Tg(HuPrP^{elk166-174}) mice reveal a significant decrease in the incubation period on second passage. One mouse died with intercurrent disease at 109 dpi. No Tg(HuPrP) mice developed clinical signs of infection after CWD inoculation. Prion infection status was confirmed by biochemical and histologic assays. P1 and P2, passages 1 and 2. (D) Diffuse PrP^{Sc} deposition, spongiform degeneration (arrowheads) (H&E), and astrogliosis (GFAP) localize to the thalamus of deer or elk CWD-inoculated Tg(HuPrP^{elk166-174}) mice, but do not occur in elk CWD-inoculated Tg(HuPrP) mice. Scale bar: 50 μ m. (E) The CJD-inoculated Tg(HuPrP) mice manifested neurologic signs, including a stiff tail (arrow), by 173 dpi. (F) Tg(HuPrP) mice inoculated with human sCJD prions developed terminal disease by 186 dpi, whereas Tg(HuPrP^{elk166-174}) animals developed terminal disease between 260 and 290 dpi. ** $P < 0.01$; *** $P < 0.001$; log-rank (Mantel-Cox) test.

We engineered transgenic mice expressing human PrP^c with four elk amino acid substitutions at positions 166, 168, 170, and 174 within the β 2- α 2 loop and inoculated the mice with CWD prions from elk and deer. Here we show that the human-elk chimeric mice were highly susceptible to CWD infection yet showed a delayed disease progression after exposure to human sCJD prions. Testing other human-cervid residue differences in vitro revealed that only residues 143 and 155 further impacted human PrP^c conversion by CWD. Last, we provide evidence that the amyloid-forming propensity of key segments of PrP^c promotes prion conversion, even when PrP sequence differences exist. Taking these data into the context of prior work on microcrystal structures of the β 2- α 2 loop, we propose a structural mechanism for the barriers underlying interspecies prion

transmission. Together our results reveal specific amino acids that impair CWD transmission to humans as well as a new determinant for cross-species prion transmission.

Results

Engineering transgenic mice expressing a human-elk chimeric PrP construct. We developed transgenic mice expressing human PrP with four amino acid residues from elk PrP on a *Prnp*^{-/-} background (Figure 1A), referred to as Tg(HuPrP^{elk166-174}) mice. Transgenic mice expressing human PrP [Tg(HuPrP)] were used as controls (9), and the same plasmid vector was used to generate the two transgenic mouse lines. The Tg(HuPrP^{elk166-174}) mice and the Tg(HuPrP) control mice had comparable PrP^c levels in the brain, i.e., approximately 1- to 2-fold higher than those of WT mice (Supplemen-

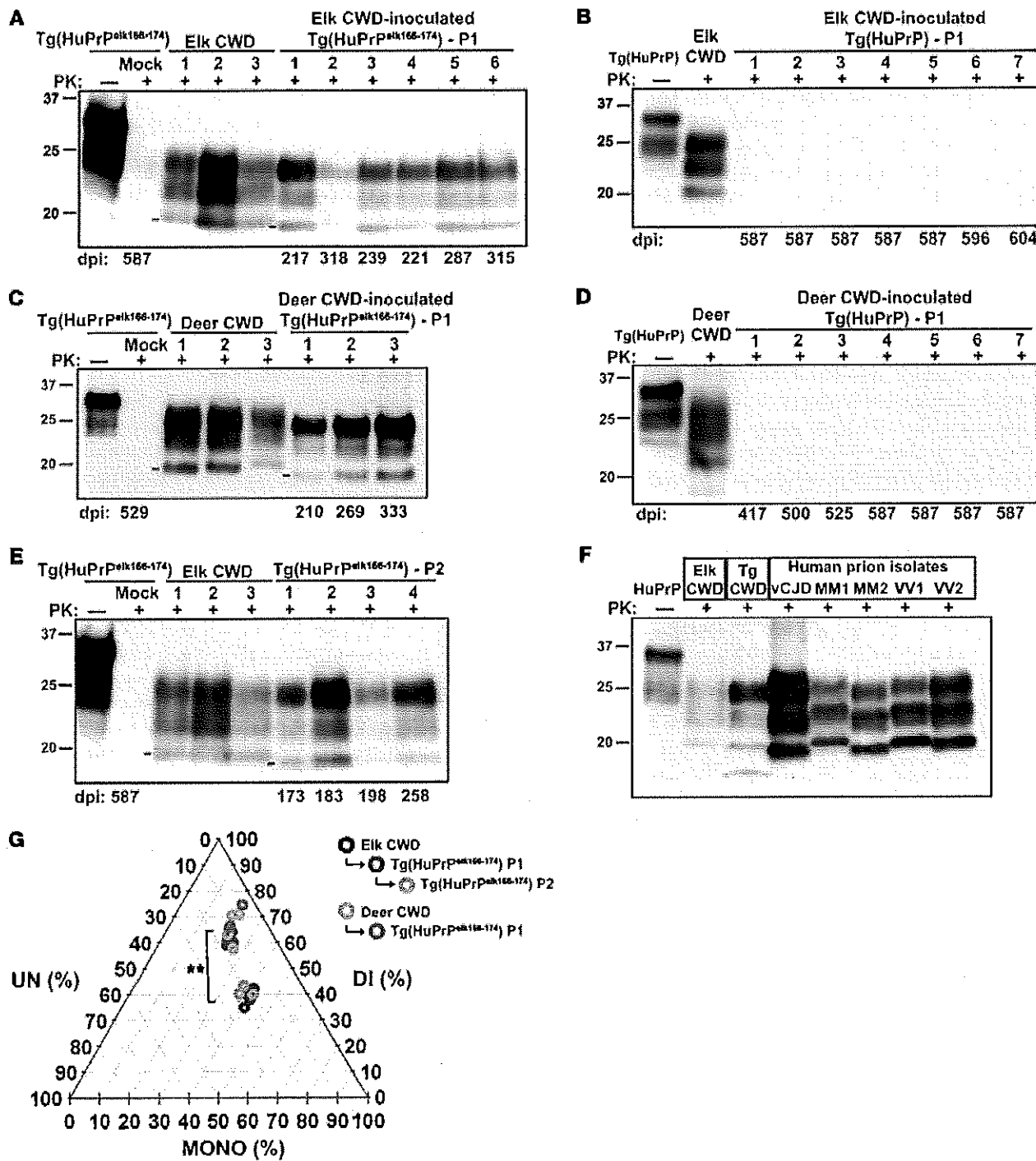


Figure 2. CWD prions differ biochemically in Tg(HuPrP^{Delk166-174}) mice as compared with cervid CWD or human CJD. (A) PrP^{Sc} from Tg(HuPrP^{Delk166-174}) brain migrates faster and has a glycoform pattern (ratio of di-, mono-, and un-glycosylated PrP^{Sc}) different from that of elk CWD by Western blot analysis. Results for six of the seven positive mice are shown here. Red dashes indicate migration of unglycosylated PrP^{Sc}, even after NaPTA precipitation. (B) In Tg(HuPrP) mice inoculated with elk CWD, the brain shows no detectable PrP^{Sc}, even after NaPTA precipitation. (C) Tg(HuPrP^{Delk166-174}) mice infected with deer CWD show a PrP^{Sc} electrophoretic migration and glycoform pattern indistinguishable from that of Tg(HuPrP^{Delk166-174}) mice inoculated with elk CWD. (D) As in B, no Tg(HuPrP) mice inoculated with deer CWD have detectable PrP^{Sc} in the brain. (E) Sub-passaged CWD-Tg(HuPrP^{Delk166-174}) (P2) in Tg(HuPrP^{Delk166-174}) mice revealed no change in the electrophoretic mobility or glycoform pattern of PrP^{Sc} as compared with PrP^{Sc} from P1. (F) Comparison of Tg(HuPrP^{Delk166-174})-CWD prions with human sporadic and variant CJD prions. Isolates consisted of type 1 or type 2 sporadic CJD prions from individuals homozygous for methionine (MM) or valine (VV) at PRNP codon 129; Tg CWD, CWD-infected Tg(HuPrP^{Delk166-174}). (G) Measurements of di-, mono-, and un-glycosylated PrP^{Sc} from CWD-inoculated Tg(HuPrP^{Delk166-174}) mice differed significantly from those of CWD-infected elk and deer. ***P* < 0.01; 2-tailed, unpaired Student's *t* test comparing ratio of di- and monoglycosylated PrP (*n* = 3–6 animals per group).

tal Figure 1A; supplemental material available online with this article; doi:10.1172/JCI79408DS1). We confirmed that PrP^C in Tg(HuPrP^{Delk166-174}) mice was processed similarly to WT PrP, as both were glycosylated and anchored in lipid rafts together with flotillin (Supplemental Figure 1B). Since certain transgenic mice expressing mutant PrP develop spontaneous prion disease, we examined 29 aged Tg(HuPrP^{Delk166-174}) mice (350–676 days old), yet found no evidence of prion disease. Mice had no evidence of neurological impairment, PrP deposits on histologic sections, or PrP aggregates detected by biochemical assays (Supplemental Figure 1C).

Tg(HuPrP^{Delk166-174}) mice develop CWD prion infection. We inoculated Tg(HuPrP^{Delk166-174}) and Tg(HuPrP) mice with CWD prions from a naturally infected elk or with uninfected cervid brain (mock control). Animals were examined every other day for behavioral changes or neurologic impairment. None of the Tg(HuPrP) mice inoculated with elk prions developed clinical disease by ≥ 587 days after inoculation ($n = 12$) (Figure 1, B and C), consistent with previous reports (9). Three of 12 mock-inoculated Tg(HuPrP^{Delk166-174}) mice died of non-prion-related causes. In contrast, 7 of 8 (88%) Tg(HuPrP^{Delk166-174}) mice inoculated with elk CWD prions manifested terminal signs of neurologic disease, including immobility, progressive weight loss, hind leg clasp, and disorientation (268 ± 16 days post-inoculation [dpi], mean \pm SEM) (Figure 1, B and C, and Supplemental Videos). Tg(HuPrP^{Delk166-174}) mice were also susceptible to mule deer prions (3 of 4 mice infected, incubation period 271 ± 35 dpi).

Tg(HuPrP^{Delk166-174}) mice show a delay in developing human prion infection. We reasoned that the new elk $\beta 2$ - $\alpha 2$ loop sequence in human PrP may have created a barrier to human sporadic CJD (sCJD) prions, and therefore we inoculated Tg(HuPrP^{Delk166-174}) and Tg(HuPrP) mice with sCJD. Subsequently, all Tg(HuPrP) mice developed terminal prion disease by 177 ± 3 dpi ($n = 6$), whereas all 3 Tg(HuPrP^{Delk166-174}) mice developed terminal prion disease by 280 ± 10 dpi, an approximately 60% lengthening of the incubation period (Figure 1, E and F, and Supplemental Figure 2). These findings indicate that elk residues at positions 166, 168, 170, and 174 of human PrP enable CWD-induced conversion yet delay the development of terminal CJD infection.

Thalamic and hypothalamic prion deposits in CWD-infected Tg(HuPrP^{Delk166-174}) mice. Neuropathologic assessment of brains from CWD-inoculated Tg(HuPrP^{Delk166-174}) mice showed lesions typical of prion disease, including focal spongiform change, gliosis, and diffuse and punctate PrP^{Sc} deposits in the thalamus and hypothalamus (Figure 1D). Lesions were specific to CWD-inoculated Tg(HuPrP^{Delk166-174}) mice, since CWD-inoculated Tg(HuPrP) mice lacked spongiform change, gliosis, or PrP^{Sc} deposition (Figure 1D). We also compared the distribution of brain lesions in CWD-infected Tg(HuPrP^{Delk166-174}) mice with those in transgenic mice expressing cervid PrP (same promoter). The lesion distribution in the Tg(HuPrP^{Delk166-174}) mice differed profoundly from the distribution in transgenic mice expressing cervid PrP [Tg(CerPrP) mice] that were CWD-inoculated in a previous study (9). Although PrP^C was widely expressed, the Tg(HuPrP^{Delk166-174}) mice showed lesions restricted primarily to the thalamus and hypothalamus, whereas the Tg(CerPrP) mice showed severe, widespread spongiform changes in the cerebral cortex, hippocampus (dentate gyrus), and putamen, with severe neuronal loss in the cerebellum (9).

The proteinase K-resistant (PK-resistant) core of PrP, a hallmark of prion infection, was detected biochemically in all elk CWD-inoculated Tg(HuPrP^{Delk166-174}) mice with terminal disease ($n = 7$) but in none of the Tg(HuPrP) mice (Figure 2, A and B). Inoculation with deer CWD produced similar results in Tg(HuPrP^{Delk166-174}) and Tg(HuPrP) mice (Figure 2, C and D). Thus, the CWD-inoculated Tg(HuPrP^{Delk166-174}) mice presented the classic features of prion disease in the brain, both histopathologically and biochemically. HuPrP^{Delk166-174}-CWD prions from one infected mouse were inoculated into Tg(HuPrP) and Tg(HuPrP^{Delk166-174}) mice. No clinical or biochemical evidence of prion disease was detected in any Tg(HuPrP) mice by 545 dpi ($n = 5$), whereas all Tg(HuPrP^{Delk166-174}) mice developed terminal prion disease by 203 ± 19 dpi ($n = 4$), indicating that a substantial barrier exists between the two groups despite the fact that they differ by only 4 residues.

Human-elk chimeric prions show altered biochemical properties as compared with elk CWD prions. The PrP^{Sc} conformation may be preserved or changed profoundly when transmitted to a species with a different PrP sequence (31). We therefore compared the biochemical properties of HuPrP^{Delk166-174}-CWD with those of elk CWD prions and found consistent evidence supporting the former's unique conformation. First, the electrophoretic mobility of PK-resistant HuPrP^{Delk166-174}-CWD increased, indicating a smaller PK-resistant core (Figure 2, A and C), which also differed from human sporadic and variant CJD (Figure 2F). Second, in HuPrP^{Delk166-174} prions, we noted a clear predominance of diglycosylated PrP^{Sc}, whereas elk prions contained nearly equal proportions of di- and monoglycosylated PrP^{Sc} (60:20:20 versus 40:40:20, di-, mono-, and unglycosylated PrP^{Sc}, respectively) (Figure 2G). Third, HuPrP^{Delk166-174} prions were consistently more resistant to guanidine HCl-induced (Gdn-HCl-induced) unfolding (32) than elk CWD (Figure 3, A–C). Last, the relative levels of PK-resistant PrP^{Sc} differed; HuPrP^{Delk166-174} prions were composed of approximately two-thirds PK-resistant PrP^{Sc} ($66\% \pm 5\%$; mean \pm SEM), whereas elk contained 3-fold less PK-resistant PrP^{Sc} ($20\% \pm 3\%$) (Figure 3, D and E, and Supplemental Figure 3). These four independent measures indicated that elk and HuPrP^{Delk166-174} CWD vary biochemically, consistent with a change in the CWD conformation upon conversion to the human-elk chimeric sequence. The elk residues also modified the CJD glycoform profile (Figure 3, F and G), an outcome that lends further support to the concept that the $\beta 2$ - $\alpha 2$ loop region impacts PrP^C-PrP^{Sc} interactions.

We next investigated adaptation of the new human-elk chimeric prions by further passaging in Tg(HuPrP^{Delk166-174}) and Tg(HuPrP) mice. Sub-passage of HuPrP^{Delk166-174} prions in Tg(HuPrP^{Delk166-174}) mice revealed no significant change in the electrophoretic mobility, glycoform pattern (Figure 2E), or PrP^{Sc} deposition sites (Supplemental Figure 4), indicating that the dominant conformation was preserved. Notably, the incubation period decreased significantly (24%, $P < 0.05$, Student's t test) upon second passage. To assess whether these findings could be reproduced in vitro in a conversion assay, we performed protein misfolding cyclic amplification (PMCA) using brains from the Tg(HuPrP^{Delk166-174}) and Tg(HuPrP) mice as PrP^C substrates. Indeed, the HuPrP^{Delk166-174} was converted by CWD within five rounds, whereas the HuPrP was not converted by CWD, even after 10 rounds of amplification (Table 1 and Supplemental Figure 5).

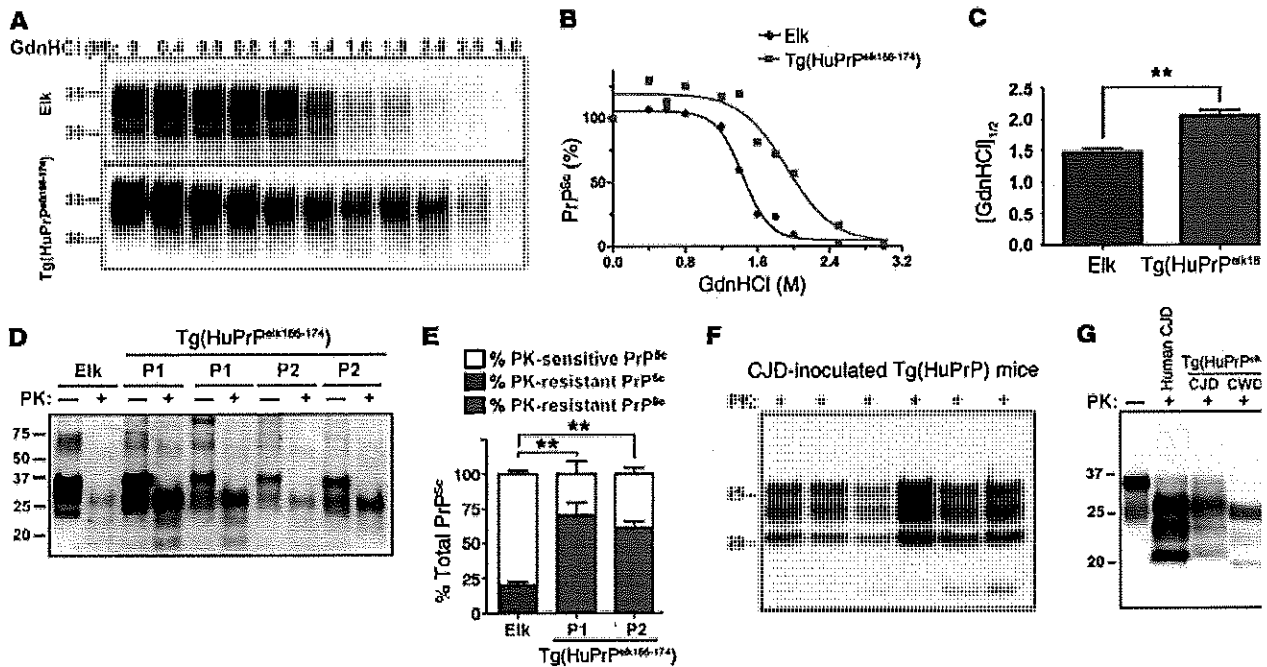


Figure 3. Tg(HuPrP^{E166-174})-CWD prions display increased stability in chaotropes and resistance to enzyme degradation as compared with elk CWD. PrP^{Sc} stability as assessed by guanidine hydrochloride (GdnHCl) denaturation was significantly greater in Tg(HuPrP^{E166-174}) mice than in elk. (A) Western blots and (B) denaturation curves show a representative example from four independent experiments. (C) The bar graph shows the GdnHCl concentration at which half the PrP has been PK-digested ([GdnHCl]_{1/2}) (n = 4 mice and 4 replicates of one elk); results are from four experiments (mean ± SEM). (D) PrP^{Sc} was separated from PrP^C by size exclusion chromatography, then samples were split and either treated with PK and analyzed by Western blot. (E) Quantification of blots shows that significantly more PrP^{Sc} is PK resistant in Tg(HuPrP^{E166-174}) mice than in elk. (F) Brain homogenates from Tg(HuPrP) mice inoculated with sCJD prions show PK-resistant PrP^{Sc} by Western blot. (G) Brain homogenates from Tg(HuPrP^{E166-174}) mice inoculated with sCJD or CWD prions show different PK-resistant PrP^{Sc} migration patterns. **P < 0.01, 2-tailed, unpaired Student's t test.

168Q and 170N substitutions markedly reduce the barrier for CWD conversion of human PrP. To address how each of the four residue substitutions impacts conversion by CWD prions, we generated human PrP^C having single elk substitutions at positions 166, 168, 170, or 174 in a PrP^C-deficient RK13 cell line. Cell lysates containing the human PrP^C variants or cervid PrP^C were seeded with elk CWD prions and subjected to repeated cycles of sonication for 24 hours in a cell lysate-based PMCA assay (26, 33, 34), which previously reproduced in vivo prion susceptibility (28). Here, we found that HuPrP with either the E168Q or S170N substitution was converted by CWD, albeit at low levels (17%–26%) relative to conversion of cervid PrP^C (Figure 4, A and B). We next tested HuPrP with elk substitutions at 168 and 170 together, and found remarkably robust conversion equivalent to that of cervid PrP^C (Figure 4, C and D). Intriguingly, HuPrP with elk substitutions at positions 166, 168, 170, and 174 resulted in only approximately 10% conversion, revealing more efficient conversion in HuPrP with two versus four elk substitutions (Figure 4, C and D).

Since the efficiency of cross-species prion conversion depends on amino acid sequence similarity, the less-efficient conversion with four versus two residue substitutions was surprising and unexpected. As residue 166 interacts with the C-terminal segment of helix α3 (residues 218–226) (35), we tested whether a long-range interaction between residues 166 and 219, where human and cervid PrP differ, could explain the low con-

version efficiency. Thus, we next measured conversion of HuPrP with elk residues at 166, 168, 170, 174, as well as 219, yet found only a negligible increase in conversion with the addition of the 219 substitution (Figure 4, C and D), suggesting that the previous results were due to local effects within the β2-α2 loop. Further testing of HuPrP with elk residues at 166, 168, and 170, or at 168, 170, and 174, revealed that the N174T elk substitution was impairing CWD-induced conversion of human-elk chimeric PrP (Figure 4, C and D).

We noted that together, the E168Q and S170N elk substitutions in HuPrP created an asparagine- and glutamine-rich, highly aggregation-prone β2-α2 loop sequence (QYNNQNNF, from 168 to 175) identical to that of bank vole, a species known to be remarkably susceptible to prions from many different species (36). Thus, these data collectively suggest that a highly aggregation-prone β2-α2 loop segment can override PrP^{Sc}-PrP^C amino acid sequence mismatches. We propose that prion conversion between two species is determined not only by (a) PrP amino acid sequence similarity and (b) PrP^{Sc} conformation, but also (c) the amyloid-forming propensity of key segments of the host PrP^C protein.

Positions 143 and 155 also impact the CWD species barrier. To identify other amino acids that impact CWD-seeded conversion of human PrP^C, we generated human PrP^C having the single elk substitutions I138L, S143N, H155Y, I184V, and V203I. At each cervid polymorphic site, the human PrP sequence matched the cervid

Table 1. Summary of CWD- and CJD-seeded conversion of HuPrP^{elk166-174} and HuPrP by PMCA

Seed	Substrate	PMCA round number ^a									
		1	2	3	4	5	6	7	8	9	10
CWD1	Tg(HuPrP)	ND	ND	0/4	0/4	0/4	0/4	0/4	0/4	0/4	0/4
CWD1	Tg(HuPrP ^{elk166-174})	ND	ND	0/4	0/4	4/4	4/4	4/4	4/4	4/4	4/4
CWD2	Tg(HuPrP)	ND	ND	0/4	0/4	0/4	0/4	0/4	0/4	0/4	0/4
CWD2	Tg(HuPrP ^{elk166-174})	ND	ND	0/4	0/4	3/4	4/4	4/4	4/4	4/4	4/4
CJD	Tg(HuPrP)	ND	ND	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
CJD	Tg(HuPrP ^{elk166-174})	ND	ND	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
No seed	Tg(HuPrP)	ND	ND	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2
No seed	Tg(HuPrP ^{elk166-174})	ND	ND	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2

^aRepresentative results of two experiments in which samples were seeded with either of two CWD isolates (CWD1 and CWD2) or the MM1 subtype of CJD. The number of positive samples (bold) is shown as a fraction of the total replicates per experiment.

residue associated with highest CWD susceptibility (G96, M132, and S225 [cervid numbering]); thus, these sites were not modified. Cell lysates containing the PrP^C variants were then seeded with elk CWD prions and subjected to cell lysate PMCA. Of these variants, only human PrP with an S143N or H155Y substitution showed more than 5% of the level of cervid PrP^C conversion, at 19% and 15%, respectively (Figure 4, E and F), suggesting that human residues S143 and H155 also contribute to the CWD to human transmission barrier.

Discussion

In 1996, ten cases of new variant CJD were reported in the UK with suspected links to the BSE epidemic (37, 38), and extensive evidence now supports that cattle BSE crossed the species barrier and infected humans (39, 40). With the realization that animal prions could transmit to humans, concerns arose that CWD in cervids may lead to cases of a novel form of CJD. Nevertheless, four laboratories have independently reported that transgenic mice expressing human PrP resist CWD infection, suggestive of a strong barrier to infection (9–12). Here we have identified the specific residues in human PrP that modulate CWD transmissibility. We report that CWD transmits to mice expressing a human-elk chimeric PrP^C and show that the CWD-human species barrier is largely maintained by the human-specific amino acids within the β 2- α 2 loop. Within the loop, human residues E168 and S170 are significant inhibitors of CWD conversion, as evidenced by in vitro conversion experiments. Human residues S143 and H155 likely also contribute to the CWD barrier. Collectively, these results help define the structural barriers that limit CWD transmission to humans.

Elucidating the determinants of cross-species prion transmission. Prions can transmit between different species; however, infection of a new species is typically characterized by prolonged, variable incubation periods and low attack rates (41, 42). Known determinants of interspecies prion conversion are (a) PrP^C and PrP^{Sc} sequence similarity and (b) the conformation of the infectious prion (43, 44). Here we propose to add a third determinant, the presence of glutamines or asparagines in host PrP^C within key interaction segments. These key segments will vary depending upon exposure in the PrP^{Sc} conformation. We found that human PrP with the E168Q and S170N substitutions was readily converted by CWD, whereas adding the N174T

substitution, which increases homology with elk CWD but removes an asparagine, paradoxically led to a massive decrease in conversion. These results suggest that for CWD, the β 2- α 2 segment is accessible and interacts with host PrP^C. These data also indicate that the presence of N/Qs in the loop can be a strong determinant for conversion that overrides certain sequence differences.

Glutamine- and asparagine-rich protein segments are proposed to play a role in protein aggregation due to side chain hydrogen bonding among amide groups that stabilizes adjacent β -strands (45–47). Asparagine residues are prevalent in the PrP^C of bank voles, a species that is highly susceptible to CWD, sheep scrapie, and CJD, despite having many PrP^C sequence mismatches with these infectious prions (48–51). Indeed, bank voles were recently designated the “universal acceptor for prions” (36). Similar to the bank vole, hamsters are susceptible to CWD and other prions (42, 52–54) and also have an N/Q-rich loop. Thus, it is possible that the bank vole-like sequence in the human β 2- α 2 loop creates a permissive host PrP^C sequence that is converted by prions from other species, despite sequence mismatches. Consistent with the observation that N/Q residues lead to a lower species barrier, fewer N/Qs in key segments may be protective, as polymorphisms that replace a single N/Q residue — for example, Q168R in sheep PrP^C (55, 56), Q219K in mouse PrP^C (30), and Q219K in goat PrP^C (57) (all human numbering) — correlate with profound resistance to certain prions in vivo.

Accumulating evidence suggests that the β 2- α 2 loop governs certain prion transmission barriers and conformational properties, reminiscent of Sup35 yeast prion segments, also shown to govern species barriers and strains (58). In transgenic mice, S170N and N174T loop substitutions increased susceptibility to CWD and hamster prions, led to resistance to sheep or cattle prions, and altered the RML mouse prion conformation (59). Here we show that replacing four human amino acids in the β 2- α 2 loop enabled infection with elk CWD and created a partial barrier for human CJD, as evidenced by the delayed infection kinetics. Additionally, HuPrP^{elk166-174}-CJD showed a different glycosylation pattern as compared with human CJD prions, suggesting the emergence of a new CJD conformation. Surprisingly, passage of HuPrP^{elk166-174}-CWD prions revealed efficient infection of all Tg(HuPrP^{elk166-174}) mice, but not Tg(HuPrP) mice, despite only four amino acid differences in PrP.

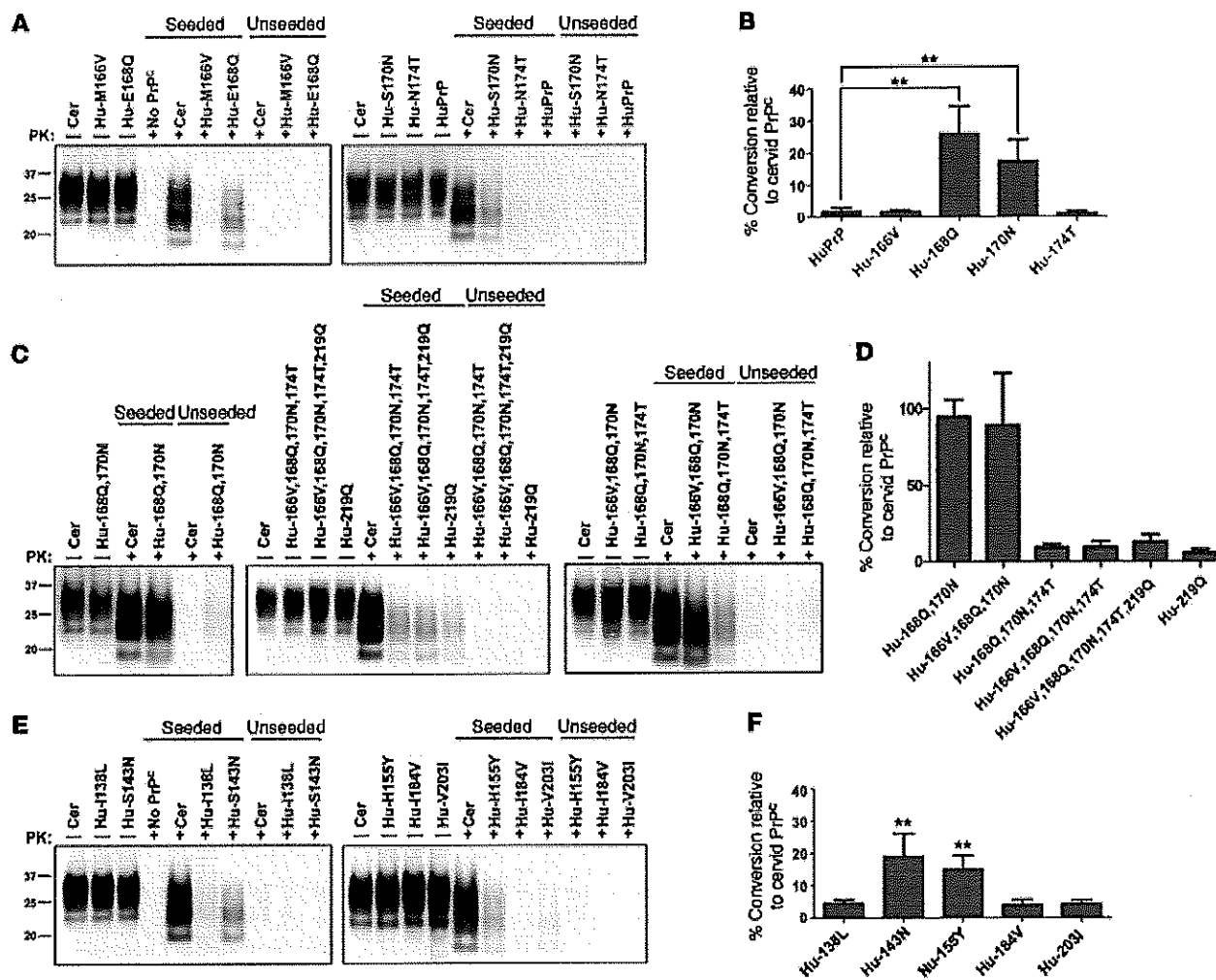


Figure 4. Two elk residue substitutions in the β 2- α 2 loop of human PrP^C enable 100% conversion by CWD prions in a cell lysate-based PMCA. (A) CWD-seeded conversion of human PrP^C with a single M166V, E168Q, S170N, or N174T substitution showed conversion of HuPrP-168Q and HuPrP-170N. Human PrP^C was not converted by CWD prions. Samples without PK show that PrP^C levels were equivalent. Cer, cervid. (B) Quantification of CWD-seeded human PrP^C variants relative to cervid PrP^C. (C) CWD-seeded conversion of HuPrP-168Q,170N and cervid PrP^C showed similar levels of conversion. (D) Quantification of CWD-seeded human PrP^C variants relative to cervid PrP^C. The conversion of HuPrP-168Q,170N and HuPrP-166V,168Q,170N was not significantly different than that of cervid PrP^C. (E) CWD-seeded conversion of human PrP^C with a single M138L, S143N, I155Y, I184V, or Y203I substitution. (F) Quantification of CWD-seeded human PrP^C variants relative to cervid PrP^C. In A and E, the “No PrP^C” lane shows untransfected RK13 cell lysate that was seeded and subjected to PMCA as a control. There was no detection of the seed as shown here. ***P* < 0.01, 2-tailed, unpaired Student’s *t* test, relative to conversion of HuPrP (*n* = 3–6 experimental replicates each).

A proposed structural mechanism for the CWD-to-human transmission barrier. How do short PrP segments control prion conversion? Microcrystal structures of segments from amyloid-like fibers invariably reveal pairs of tightly packed β -sheets, in which complementary side chains interdigitate in a dry “steric zipper” interface (60). We hypothesize that efficient prion conversion requires donor and recipient PrP loop segments to form a tight steric zipper, whereas side chain mismatches lead to steric clashes and cavities, prevent conversion, and may account for species barriers in prion disease (61, 62). Consistent with this hypothesis, microcrystal structures of human and cervid β 2- α 2 loop segments belong to different classes of steric zippers (60, 62), and our computational analysis suggests that the human and cervid loop segments do not form complementary steric zippers (Figure 5, Supplemental Figure 6, and Supplemental

Table 1). We found that the S170 (human) and N170 (elk) side chains leave a cavity within the zipper core due to poor packing (Figure 5 and Supplemental Figure 6). Also, the E168 (human) and Q168 (elk) residues sterically clash, which hinders tight, highly complementary side chain interactions between β -sheets in the zipper models (Figure 5 and Supplemental Figure 6). In summary, the zipper models suggest that residue mismatches between human and elk PrP at positions 168 and 170 would not support efficient conversion and may explain our results at the atomic level.

In conclusion, we have identified the β 2- α 2 loop sequence of human PrP^C as a major barrier to PrP conversion by CWD prions. The human-specific residues in the β 2- α 2 loop, particularly E168 and S170, appear to substantially raise the energetic barrier for conversion of human PrP by CWD prions, making conversion of

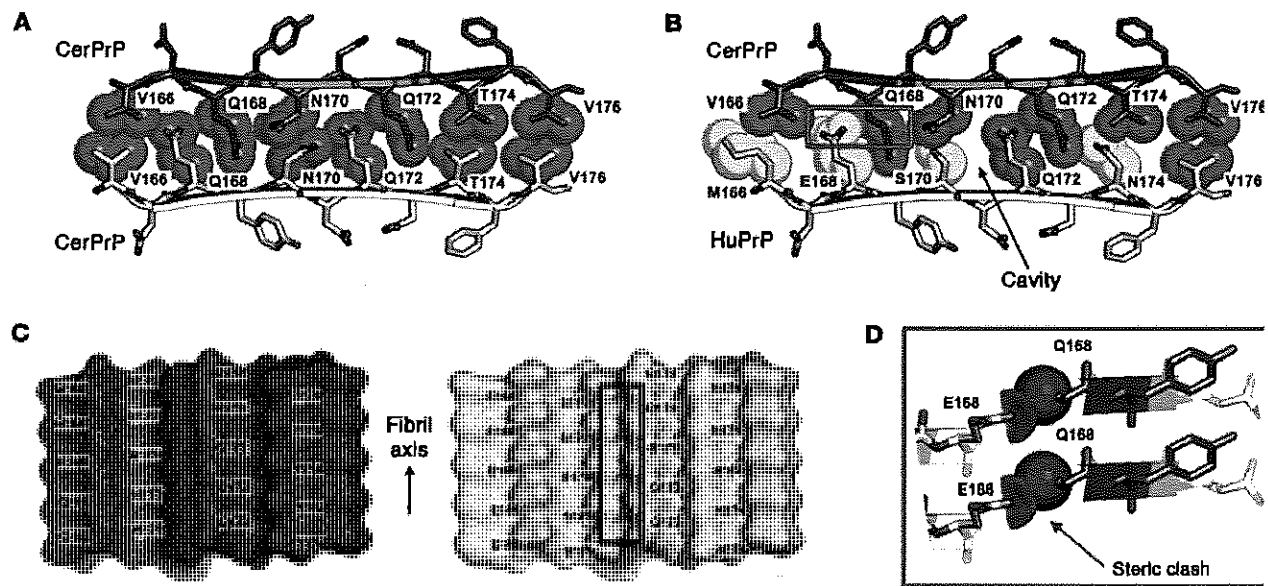


Figure 5. Atomic space-filling and surface representations of the PrP loop highlight the side chain interactions at the zipper interface. (A) Atomic space-filling model illustrates the view down the fibril axis. The amino acid side chains of donor cervid PrP (gray) and recipient cervid PrP (white) interdigitate in a class 3 steric zipper. **(B)** In contrast, the zipper interactions between the donor cervid PrP (gray) and the recipient human PrP (white), which contain yellow side chains (M166, E168, S170, N174), generate a cavity (arrow) between human S170 and cervid N170, as well as steric clash (blue rectangle) between human residue E168 and cervid residue Q168. **(C)** A side view of the surface of the cervid PrP loop modeled as a β -sheet (red). The interacting β -sheet has been removed to provide a clear view of the interface. A similar side view of the β -sheet surface of the human PrP loop (yellow) reveals cavities near residue S170 in the core of the zipper interface (black rectangle). **(D)** A magnified, rotated view of the inset in **B** shows the clash between human residue E168 (yellow) and cervid residue Q168 (red).

human PrP highly unfavorable. Thus we propose the $\beta 2$ - $\alpha 2$ loop as a critical initial PrP^C-PrP^{Sc} interaction site during the templating of human PrP^C by either CWD or CJD prions. Although we cannot exclude the involvement of additional PrP segments that include 143 and 155, the $\beta 2$ - $\alpha 2$ loop may act as an important gatekeeper that promotes or impairs conversion, depending on the sequence (58). Since the loop substitutions in human PrP also markedly delayed infection with CJD, the $\beta 2$ - $\alpha 2$ loop segment may also be a key site for PrP^C-CJD prion interaction and may indicate a potential therapeutic target for rationally designed stable peptides (63, 64) or inhibitors that block PrP^C-PrP^{Sc} interaction and impede the progression of prion disease.

Methods

Generation of transgenic mice. Development of the Tg(HuPrP)-expressing mice was previously described (9). Constructs for the HuPrP^{Prk166-174} transgenes were based on the same human PrP in the half-genomic plasmid (pHGPRP) used for the Tg(HuPrP) mice (9, 65). Site-directed mutagenesis was performed to replace the sequence coding for 166, 168, 170, and 174. The final construct was confirmed by sequencing. One error-free clone was chosen for the creation of transgenic mice by pronuclear microinjection, performed at the UC San Diego Transgenic Mouse Core facility. Founder pups were screened by tail DNA PCR using the following primers: forward, 5'-CAACCGAGCTGAAGCATTC; reverse, 5'-CCCTCTCGTACTGGGTGATAC. All founder mice that carried the transgene were bred with FVB/*Prnp*^{0/0} mice (provided by Stanley Prusiner's laboratory, UCSF, San Francisco, California, USA) to achieve transgenic mice with a *Prnp*^{0/0} back-

ground. Zygosity of the Tg(HuPrP^{Prk166-174}) mice was determined by TaqMan qPCR performed at the UC Davis Mouse Biology Program. PrP expression in the brains of transgenic and WT mice was assessed by Western blot analysis using the anti-PrP monoclonal antibody POM19 (provided by Adriano Aguzzi, University Hospital of Zurich, Zurich, Switzerland) (66). Mice were maintained under specific pathogen-free conditions.

Prion inoculations. WT (FVB), Tg(HuPrP^{Prk166-174}), or Tg(HuPrP) (homozygous mice generated from the previously reported Tg40) transgenic mice (groups of $n = 4$ –10 mice) were intracerebrally inoculated into the left parietal cortex with 20–30 μ l of brain homogenate (1%–5%) containing CWD prions from a naturally infected elk or mule deer previously shown to contain infectious prions (67) or from a human with sporadic CJD. Uninfected brain homogenates were inoculated into mice of the same genotypes as negative controls. Mice were monitored three times weekly, and TSE was diagnosed according to clinical criteria including ataxia, kyphosis, stiff tail, hind leg clasp, and hind leg paresis. Mice were sacrificed at the onset of terminal neurologic disease when showing such signs as weight loss, tremors, slow movements, and severe kyphosis, or at approximately 600 dpi. Incubation period was calculated as the day of inoculation to the day of terminal clinical disease.

Sodium phosphotungstic acid precipitation and Western blotting. 10% brain homogenates from all prion-inoculated mice were prepared in PBS using a Beadbeater tissue homogenizer (BioSpec Products). Samples were subjected to sodium phosphotungstic acid (NaPTA) precipitation as previously described (68). Briefly, 25–100 μ l aliquots of 10% brain homogenate were mixed with an equal volume of 4% sar-

kosyl and digested with an endonuclease (Benzonase, Sigma-Aldrich), followed by treatment with 20 µg/ml proteinase K at 37°C for 30 minutes. After the addition of NaPTA, MgCl₂, and protease inhibitors (Complete-TM, Roche), extracts were incubated at 37°C for 30 minutes and centrifuged at 18,000 g for 30 minutes at 37°C. Pellets were resuspended in LDS loading buffer (Invitrogen), and samples were heated to 95°C prior to electrophoresis through a 10% Bis-Tris gel (Invitrogen) and transferred to a nitrocellulose membrane by wet blotting. Proteins were detected with anti-PrP antibodies 3F4 (MAB1562, Millipore) and POM19 (66), followed by an HRP-conjugated anti-mouse IgG antibody (Jackson ImmunoResearch Laboratories Inc.). Signals were visualized using a chemiluminescent substrate (Super-signal West Dura, Thermo Scientific) and an LAS-4000 imager (Fuji-film). Prion-infected or uninfected brain samples were also subjected to NaPTA precipitation and blotting to serve as controls.

Histopathology and immunohistochemistry. Five-micrometer-thick sections were cut onto positively charged glass slides and stained with hematoxylin and eosin or immunostained using antibodies for glial fibrillary acidic protein (GFAP). For GFAP staining, sections were deparaffinized, rehydrated, and quenched with 3% hydrogen peroxide for 10 minutes. Sections were then incubated in 20 µg/ml PK for 10 minutes, blocked, and incubated with anti-GFAP monoclonal antibody (MO761, Dako) for 45 minutes, followed by biotinylated anti-mouse IgG (Jackson ImmunoResearch Laboratories Inc.) for 30 minutes, streptavidin-HRP (Jackson ImmunoResearch Laboratories Inc) for 30 minutes, and DAB substrate for 7 minutes. Sections were counterstained with hematoxylin.

Paraffin-embedded tissue blots. Five-micrometer-thick sections were collected onto 0.45-µm nitrocellulose membranes (Bio-Rad) and dried at room temperature overnight and then at 55°C for 30 minutes. Membranes were then incubated in xylene and serially rehydrated in 100% isopropanol, 70% isopropanol, and distilled water with 0.1% Tween-20 for 10 minutes each. To improve tissue adherence, membranes were dried. After a brief rinse with TBST (10 mM Tris-HCl [pH 7.8], 100 mM NaCl, 0.05% Tween-20), membranes were incubated in 50 µg/ml PK in 10 mM Tris-HCl (pH 7.8), 100 mM NaCl, and 0.1% Brij-35 at 56°C for 16 hours; washed twice in TBST; incubated in 4 M guanidine isothiocyanate in 10 mM Tris-HCl for 30 minutes; and washed in TBST. Membranes were blocked in casein (Sigma-Aldrich) and immunolabeled with anti-PrP monoclonal antibody 12F10 (189710, Cayman Chemical) for 2 hours, biotinylated goat anti-mouse IgG (Jackson ImmunoResearch Laboratories Inc.) for 1 hour, streptavidin-HRP (Jackson ImmunoResearch Laboratories Inc.) for 30 minutes, and DAB substrate for 5 minutes. Color development was stopped in distilled water, and membranes were dried overnight.

PMCA. In vitro prion replication experiments were performed as previously described (69). Briefly, 50 µl of brain homogenate from Tg(HuPrP^{Sk166-174}) and Tg(HuPrP) mice was seeded with 5 µl CWD or sporadic CJD prion seed and subjected to sonication (model S-700MPX, QSonica). The sonicator settings were: 20 seconds at a power setting of 70%–80% followed by 30 minutes of incubation for a total of 24 hours for each round, performed at 37–38°C. Up to ten serial rounds of PMCA were performed. To test for PrP^{Sc}, all sonicated samples were digested with 50–100 µg/ml PK for 1 hour at 42°C and analyzed by Western blot. Blots were probed with anti-PrP monoclonal antibody 6H4 (01-010, Prionics). Two experimental PMCA repeti-

tions were performed on brain homogenates from Tg(HuPrP^{Sk166-174}) and Tg(HuPrP) mice using brain from a single CWD-infected mule deer (CWD1) and brains from a pool of 28 CWD-infected mule deer (CWD2) to seed separate reactions, with four replicates analyzed in each experiment.

Cell lysate-based PMCA. Cervid *Prnp* (G96, M132, S225, Q226 [cervid numbering]) and human *PRNP* (M129) in the pcDNA3.1C vector (Invitrogen) containing the 3F4 epitope tag (109M, 112M) were generated by site-directed mutagenesis as previously described (28). PrP contained the highly conserved amino-terminal coding sequence (residues 23–111) of cervid *Prnp* and the cervid alanine residue at position 230. Site-directed mutagenesis (Agilent) was used to generate an array of cervid *Prnp* and human *PRNP* plasmids, each with amino acid substitutions as described in Results. Human *PRNP* with the M112V was not generated, as this would have removed the 3F4 epitope used for detection. The final constructs were confirmed by sequencing. The M132 genotype (cervid numbering) of the elk CWD seed material was verified by standard PCR and sequencing (primers: forward, 5'-CTGACACCCTCTTTATTTT; reverse, 5'-CTATCCTACTATGAGAAAAATG). Confluent, PrP-deficient RK13 cells (ATCC) were transfected with 4–5 µg of plasmid DNA using Lipofectamine 2000 (Invitrogen). At 24 hours after transfection, cells were washed twice, harvested in 1 ml PBS, and centrifuged at 1,000 g for 1 minute. The pellet was resuspended in PMCA buffer (PBS containing 1% Triton X-100, 0.05% saponin, 150 mM NaCl, and 5 mM EDTA), passed twice through a 27-gauge needle, and clarified by centrifugation at 2,000 g for 1 minute.

For the PMCA reaction, 45 µl of RK13 cell lysate was seeded with 5 µl of CWD-infected elk brain homogenate and subjected to sonication with the following settings: 5 seconds at a power setting of 50%–60%, followed by 10 minutes of incubation for 24 hours, with continuous rotation at 37°C. Samples were digested with 100 µg/ml PK for 30 minutes at 37°C and analyzed by Western blot for PrP using anti-PrP monoclonal antibody 3F4. PrP^C levels were measured in lysates by blotting 1 µl from samples seeded with CWD-negative elk brain homogenate together with the seeded samples. Signals were quantified using a Fujifilm LAS-4000 imager and Multi Gauge software. For quantification of conversion efficiency, the PK-resistant PrP for each PrP^C mutation was compared with control samples according to the formula $[(PrP^{Sc}/PrP^C)_{mutant}/(PrP^{Sc}/PrP^C)_{control}] \times 100$. Experiments in which PrP^C densitometric signals were within 0.8–2× the cervid PrP^C signal were used for quantification, and no PrP^C concentration-dependent effects were observed within this range. Lysates seeded with uninfected elk brain were included in all experiments, and no signals were observed in these samples. At least 3 experimental replicates were performed.

Velocity gradient sedimentation. 10% brain homogenates prepared in PBS containing 9% sucrose and protease inhibitors (CompleteMini, Sigma-Aldrich) were centrifuged at 750 g for 5 minutes at 4°C. Supernatant was mixed with an equal volume of 2% Triton X-100 in PBS containing 9% sucrose. Samples were brought to a final concentration of 40% OptiPrep (Sigma-Aldrich) using flotation buffer, then overlaid with 30% and 5% OptiPrep prepared using flotation buffer (10 mM MES containing 1% Triton X-100, 2 mM EDTA, 1 mM DTT, and protease inhibitors). All steps were performed on ice. Samples were centrifuged at 200,000 g for 18 hours at 4°C using an MLA-80 rotor (Beckman-Coulter). Fractions 1–13 were collected from top to bottom.

Size exclusion chromatography of PrP^{Sc}. CWD-infected elk and CWD-infected Tg(HuPrP^{Sc}¹⁶⁶⁻¹⁷⁴) mouse brain homogenates were digested using Benzonase (Millipore) with 50 mM MgCl₂ for 20 minutes at 37°C, mixed with 1% sarkosyl for 20 minutes at 37°C, and centrifuged at 2,000 g for 5 minutes. Supernatants were injected onto a Fast Performance Liquid Chromatography (FPLC) column (Superose 6, 3.2/30, GE Healthcare Life Sciences) using running buffer (50 mM sodium acetate [pH 8.5] containing 0.1% sarkosyl) at a flow rate of 60 µl/min, and 24 fractions were collected. Fractions 2–23 from CWD-infected or uninfected elk and CWD-infected or uninfected Tg(HuPrP^{Sc}¹⁶⁶⁻¹⁷⁴) mice were subjected to SDS-PAGE, followed by Western blotting using anti-PrP antibodies POM19 (elk) and 3F4 (mice).

15B3 immunoprecipitation for PrP^{Sc}-specific detection. To semiquantitatively measure PrP^{Sc} in FPLC fractions, PrP^C- and PrP^{Sc}-containing fractions (fractions 1–7 and fractions 8–24, respectively) were each pooled and analyzed for PrP^{Sc}. Pooled fractions were incubated in PBS and protease inhibitors (Roche), 0.1% sarkosyl, and rat anti-mouse Dynabeads (Invitrogen) overnight at 22°C with rotation to remove proteins that bind to unlabeled beads. Beads were removed, and each sample was incubated with anti-PrP antibody 15B3-conjugated Dynabeads for 3 hours at 22°C with rotation. The beads were washed four times with wash buffer (10 mM Tris-HCl [pH 7.4] containing 1% Triton X-100, 150 mM NaCl, and 5 mM EDTA) and boiled in loading dye for 5 minutes prior to SDS-PAGE and detection using biotinylated monoclonal antibody POM1 (66).

Computational analysis of zipper models for PrP conversion. To understand the molecular mechanism of cross-species prion transmission, we sought structural models of elk and human PrP side chains within the β2-α2 loop to explain the effects of different amino acid substitutions on CWD conversion in vitro. The modeling strategy was similar to one that was previously described (28). The zipper structure of PrP peptides was built using Rosetta software (<https://www.rosetta-commons.org/>). The segments were modeled as a parallel β-sheet by using the template backbone structures of both the elk prion NNQNTF (PDB code 3FVA; ref. 70) and the yeast prion Sup35 GNNQQNY zipper (PDB code 1YJP; ref. 71). The pair of β-sheets was assembled by exploring all four possible arrangements (class 1–3; the class 1 zipper structure has 2 arrangements) (60). The zipper structure of PrP peptides was then refined by simultaneously optimizing the rigid-body degree of freedom between the β-sheets, side chain and backbone torsions of each β-strand, guided by full-atom Rosetta energy functions. Taking advantage of the recently developed symmetry implementation in Rosetta, the fibril symmetry of each peptide subunit is restrained to assure that symmetrical geometry is satisfied during the

whole optimization process. Finally, the models were ranked based on Rosetta full-atom energy (the sum of Lennard-Jones potential for non-bond interactions, implicit solvation energy, hydrogen bond energy, and others) and the packing (shape complementary score and buried solvent-accessible surface area) between β-sheets. Two final zipper models with strongest predicted Rosetta energy and best shape complementary score were selected (classes 1 and 3).

For each selected final structure (classes 1 and 3), the amino acid substitutions were introduced by RosettaDesign. The new models for each substitution were optimized using the same refinement procedure. The Rosetta full-atom energy and the packing between β-sheets for different substitutions were calculated. The analysis and scores of the class 3 zipper structure are summarized in Supplemental Table 1.

Statistics. *P* values of less than 0.05 were considered statistically significant. The incubation periods for groups of prion-infected mice were compared by log-rank (Mantel-Cox) test. The average incubation period upon first and second passage of elk CWD in Tg(HuPrP^{Sc}¹⁶⁶⁻¹⁷⁴) mice was additionally compared by a 2-tailed Student's *t* test. The ratios of di- and monoglycosylated PrP^{Sc} and PrP^{Sc} stability in prion-infected brains were assessed by 2-tailed unpaired Student's *t* tests. Results from in vitro conversion experiments (*n* = 3–6 experimental replicates) using human PrP variants were compared by 2-tailed unpaired Student's *t* test. All data are presented as mean ± SEM unless otherwise noted.

Study approval. All procedures involving live animals were approved by the UC San Diego IACUC (protocol number S08037).

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- Centers for Disease Control and Prevention. Fact sheet: Variant Creutzfeldt-Jakob disease. http://www.cdc.gov/ncidod/dvrd/vcjd/factsheet_nvcjd.htm. Accessed February 17, 2015.
- Prusiner SB. Prion diseases and the BSE crisis. *Science*. 1997;278(5336):245–251.
- Head MW. Human prion diseases: molecular, cellular and population biology. *Neuropathology*. 2013;33(3):221–236.
- Miller MW, Williams ES. Prion disease: horizontal prion transmission in mule deer. *Nature*. 2003;425(6953):35–36.
- Garruto R, et al. Risk behaviors in a rural com-

munity with a known point-source exposure to chronic wasting disease. *Environ Health*. 2008;24(7):31.

- Angers RC, et al. Prions in skeletal muscles of deer with chronic wasting disease. *Science*. 2006;311(5764):1117.
- Race B, Meade-White K, Oldstone MB, Race R, Chesebro B. Detection of prion infectivity in fat tissues of scrapie-infected mice. *PLoS Pathog*. 2008;4(12):e1000232.
- Abrams JY, Maddox RA, Harvey AR, Schonberger LB, Belay ED. Travel history, hunting, and venison consumption related to prion disease expo-

sure, 2006–2007 FoodNet Population Survey. *J Am Diet Assoc*. 2011;111(6):858–863.

- Kong Q, et al. Chronic wasting disease of elk: transmissibility to humans examined by transgenic mouse models. *J Neurosci*. 2005;25(35):7944–7949.
- Tamguney G, et al. Transmission of elk and deer prions to transgenic mice. *J Virol*. 2006;80(18):9104–9114.
- Sandberg MK, et al. Chronic wasting disease prions are not transmissible to transgenic mice overexpressing human prion protein. *J Gen Virol*. 2010;91(pt 10):2651–2657.

12. Wilson R, et al. Chronic wasting disease and atypical forms of bovine spongiform encephalopathy and scrapie are not transmissible to mice expressing wild-type levels of human prion protein. *J Gen Virol*. 2012;93(pt 7):1624-1629.
13. Barria MA, Ironside JW, Head MW. Exploring the zoonotic potential of animal prion diseases: in vivo and in vitro approaches. *Prion*. 2014;8(1):85-91.
14. Barria MA, Telling GC, Gambetti P, Mastrianni JA, Soto C. Generation of a new form of human PrP(Sc) in vitro by interspecific transmission from cervid prions. *J Biol Chem*. 2011;286(9):7490-7495.
15. Marsh RF, Kincaid AE, Bessen RA, Bartz JC. Interspecies transmission of chronic wasting disease prions to squirrel monkeys (*Saimiri sciureus*). *J Virol*. 2005;79(21):13794-13796.
16. Race B, Meade-White KD, Phillips K, Striebel J, Race R, Chesebro B. Chronic wasting disease agents in nonhuman primates. *Emerg Infect Dis*. 2014;20(5):833-837.
17. Barria MA, et al. Molecular barriers to zoonotic transmission of prions. *Emerg Infect Dis*. 2014;20(1):88-97.
18. Raymond GJ, et al. Evidence of a molecular barrier limiting susceptibility of humans, cattle and sheep to chronic wasting disease. *EMBO J*. 2000;19(17):4425-4430.
19. Luers L, et al. Seeded fibrillation as molecular basis of the species barrier in human prion diseases. *PLoS One*. 2013;8(8):e72623.
20. Vanik DL, Surewicz KA, Surewicz WK. Molecular basis of barriers for interspecies transmissibility of mammalian prions. *Mol Cell*. 2004;14(1):139-145.
21. Riek R, Hornemann S, Wider G, Billeter M, Glockshuber R, Wüthrich K. NMR structure of the mouse prion protein domain PrP (121-231). *Nature*. 1996;382(6587):180-182.
22. Billeter M, Riek R, Wider G, Hornemann S, Glockshuber R, Wüthrich K. Prion protein NMR structure and species barrier for prion diseases. *Proc Natl Acad Sci U S A*. 1997;94(14):7281-7285.
23. Wopfner F, et al. Analysis of 27 mammalian and 9 avian PrPs reveals high conservation of flexible regions of the prion protein. *J Mol Biol*. 1999;289(5):1163-1178.
24. Premzl M, et al. The prion protein gene: identifying regulatory signals using marsupial sequence. *Gene*. 2005;349:121-134.
25. Atarashi R, Sim VL, Nishida N, Caughey B, Katamine S. Prion strain-dependent differences in conversion of mutant prion proteins in cell culture. *J Virol*. 2006;80(16):7854-7862.
26. Geoghegan JC, Miller MB, Kwak AH, Harris BT, Supattapone S. Trans-dominant inhibition of prion propagation in vitro is not mediated by an accessory cofactor. *PLoS Pathog*. 2009;5(7):e1000535.
27. Kaneko K, et al. Evidence for protein X binding to a discontinuous epitope on the cellular prion protein during scrapie prion propagation. *Proc Natl Acad Sci U S A*. 1997;94(19):10069-10074.
28. Kurt TD, Jiang L, Bett C, Eisenberg D, Sigurdson CJ. A proposed mechanism for the promotion of prion conversion involving a strictly conserved tyrosine residue in the β 2- α 2 loop of PrP^C. *J Biol Chem*. 2014;289(15):10660-10667.
29. Kurt TD, et al. Prion Transmission Prevented by Modifying the beta2-alpha2 Loop Structure of Host PrP^C. *J Neurosci*. 2014;34(3):1022-1027.
30. Perrier V, et al. Dominant-negative inhibition of prion replication in transgenic mice. *Proc Natl Acad Sci U S A*. 2002;99(20):13079-13084.
31. Safar JG, et al. Conserved properties of human and bovine prion strains on transmission to guinea pigs. *Lab Invest*. 2011;91(9):1326-1336.
32. Peretz D, et al. Strain-specified relative conformational stability of the scrapie prion protein. *Protein Sci*. 2001;10(4):854-863.
33. Saborio GP, Permanne B, Soto C. Sensitive detection of pathological prion protein by cyclic amplification of protein misfolding. *Nature*. 2001;411(6839):810-813.
34. Mays CE, et al. In vitro amplification of misfolded prion protein using lysate of cultured cells. *PLoS One*. 2011;6(3):e18047.
35. Christen B, Hornemann S, Damberger FF, Wüthrich K. Prion protein NMR structure from tammar wallaby (*Macropus eugenii*) shows that the beta2-alpha2 loop is modulated by long-range sequence effects. *J Mol Biol*. 2009;389(5):833-845.
36. Watts JC, Giles K, Patel S, Oehler A, DeArmond SJ, Prusiner SB. Evidence that bank vole PrP is a universal acceptor for prions. *PLoS Pathog*. 2014;10(4):e1003990.
37. Will RG, et al. A new variant of Creutzfeldt-jakob disease in the UK. *Lancet*. 1996;347(9006):921-925.
38. Latest NCJDRSU CJD Monthly Statistics. National CJD Research & Surveillance Unit web site. <http://www.cjd.ed.ac.uk/documents/figs.pdf>. Accessed January 26, 2015.
39. Collinge J, Sidle KC, Meads J, Ironside J, Hill AF. Molecular analysis of prion strain variation and the aetiology of 'new variant' CJD. *Nature*. 1996;383(6602):685-690.
40. Bruce ME, et al. Transmissions to mice indicate that 'new variant' CJD is caused by the BSE agent. *Nature*. 1997;389(6650):498-501.
41. Pattison IH, Jones KM. Modification of a strain of mouse-adapted scrapie by passage through rats. *Res Vet Sci*. 1968;9(5):408-410.
42. Kimberlin RH, Walker C. Characteristics of a short incubation model of scrapie in the golden hamster. *J Gen Virol*. 1977;34(2):295-304.
43. Scott M, et al. Propagation of prions with artificial properties in transgenic mice expressing chimeric PrP genes. *Cell*. 1993;73(5):979-988.
44. Piening N, et al. Conversion efficiency of bank vole prion protein in vitro is determined by residues 155 and 170, but does not correlate with the high susceptibility of bank voles to sheep scrapie in vivo. *J Biol Chem*. 2006;281(14):9373-9384.
45. La Spada AR, Wilson EM, Lubahn DB, Harding AE, Fischbeck KH. Androgen receptor gene mutations in X-linked spinal and bulbar muscular atrophy. *Nature*. 1991;352(6330):77-79.
46. Osheroovich LZ, Weissman JS. Multiple Gln/Asn-rich prion domains confer susceptibility to induction of the yeast [PSI(+)] prion. *Cell*. 2001;106(2):183-194.
47. Perutz MF, Pope BJ, Owen D, Wanker EE, Scherzinger E. Aggregation of proteins with expanded glutamine and alanine repeats of the glutamine-rich and asparagine-rich domains of Sup35 and of the amyloid beta-peptide of amyloid plaques. *Proc Natl Acad Sci U S A*. 2002;99(8):5596-5600.
48. Di Bari MA, et al. The bank vole (*Myodes glareolus*) as a sensitive bioassay for sheep scrapie. *J Gen Virol*. 2008;89(pt 12):2975-2985.
49. Di Bari MA, et al. Chronic wasting disease in bank voles: characterisation of the shortest incubation time model for prion diseases. *PLoS Pathog*. 2013;9(3):e1003219.
50. Nonno R, et al. Efficient transmission and characterization of Creutzfeldt-Jakob disease strains in bank voles. *PLoS Pathog*. 2006;2(2):e12.
51. Agrimi U, et al. Prion protein amino acid determinants of differential susceptibility and molecular feature of prion strains in mice and voles. *PLoS Pathog*. 2008;4(7):e1000113.
52. Raymond GJ, et al. Transmission and adaptation of chronic wasting disease to hamsters and transgenic mice: evidence for strains. *J Virol*. 2007;81(8):4305-4314.
53. Kimberlin RH, Cole S, Walker CA. Transmissible mink encephalopathy (TME) in Chinese hamsters: identification of two strains of TME and comparisons with scrapie. *Neuropathol Appl Neurobiol*. 1986;12(2):197-206.
54. Chandler RL, Turfrey BA. Inoculation of voles, Chinese hamsters, gerbils and guinea-pigs with scrapie brain material. *Res Vet Sci*. 1972;13(3):219-224.
55. Hunter N, Foster JD, Goldmann W, Stear MJ, Hope J, Bostock C. Natural scrapie in a closed flock of Cheviot sheep occurs only in specific PrP genotypes. *Arch Virol*. 1996;141(5):809-824.
56. Hunter N, Goldmann W, Benson G, Foster JD, Hope J. Swaledale sheep affected by natural scrapie differ significantly in PrP genotype frequencies from healthy sheep and those selected for reduced incidence of scrapie. *J Gen Virol*. 1993;74(pt 6):1025-1031.
57. Aguilar-Calvo P, et al. Role of the goat K222-PrP(C) polymorphic variant in prion infection resistance. *J Virol*. 2014;88(5):2670-2676.
58. Tessier PM, Lindquist S. Prion recognition elements govern nucleation, strain specificity and species barriers. *Nature*. 2007;447(7144):556-561.
59. Sigurdson CJ, et al. A molecular switch controls interspecies prion disease transmission in mice. *J Clin Invest*. 2010;120(7):2590-2599.
60. Sawaya MR, et al. Atomic structures of amyloid cross-beta spines reveal varied steric zippers. *Nature*. 2007;447(7143):453-457.
61. Apostol MI, Sawaya MR, Cascio D, Eisenberg D. Crystallographic studies of prion protein (PrP) segments suggest how structural changes encoded by polymorphism at residue 129 modulate susceptibility to human prion disease. *J Biol Chem*. 2010;285(39):29671-29675.
62. Apostol MI, Wiltzys JJ, Sawaya MR, Cascio D, Eisenberg D. Atomic structures suggest determinants of transmission barriers in mammalian prion disease. *Biochemistry*. 2011;50(13):2456-2463.
63. Horiuchi M, Baron GS, Xiong LW, Caughey B. Inhibition of interactions and interconversions

- of prion protein isoforms by peptide fragments from the C-terminal folded domain. *J Biol Chem.* 2001;276(18):15489–15497.
64. Sievers SA, et al. Structure-based design of non-natural amino-acid inhibitors of amyloid fibril formation. *Nature.* 2011;475(7354):96–100.
65. Fischer M, et al. Prion protein (PrP) with amino-proximal deletions restoring susceptibility of PrP knockout mice to scrapie. *EMBO J.* 1996;15(6):1255–1264.
66. Polymenidou M, et al. The POM monoclonals: a comprehensive set of antibodies to non-overlapping prion protein epitopes. *PLoS One.* 2008;3(12):e3872.
67. Sigurdson CJ, et al. Strain fidelity of chronic wasting disease upon urine adaptation. *J Virol.* 2006;80(24):12303–12311.
68. Wadsworth JD, et al. Tissue distribution of protease resistant prion protein in variant CJD using a highly sensitive immuno-blotting assay. *Lancet.* 2001;358(9277):171–180.
69. Castilla J, Morales R, Saa P, Barria M, Gambetti P, Soto C. Cell-free propagation of prion strains. *EMBO J.* 2008;27(19):2557–2566.
70. Wiltzius JJ, et al. Molecular mechanisms for protein-encoded inheritance. *Nat Struct Mol Biol.* 2009;16(9):973–978.
71. Nelson R, et al. Structure of the cross- β spine of amyloid-like fibrils. *Nature.* 2005;435(7043):773–778.

Wm. L. G. Johnson

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U. S. DEPARTMENT OF AGRICULTURE.

FARMERS' BULLETIN 330.

DEER FARMING IN THE UNITED STATES.

BY

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CONTENTS.

	Page.
Introduction.....	5
Importance of the deer family.....	5
The domestication of deer.....	6
Species to be selected for breeding.....	7
The wapiti, or Rocky Mountain elk.....	7
Habits of elk.....	9
Elk venison.....	9
Domestication of elk.....	10
Management of elk in inclosures.....	11
Range.....	12
Food.....	12
Fence.....	12
Cost of stock.....	12
Vicious male elk.....	13
Breeding the Virginia deer.....	13
Experiences of breeders.....	15
Management of Virginia deer.....	17
Wild deer in private game preserves.....	17
Game laws in relation to deer farming.....	18
Summary.....	20

ILLUSTRATIONS.

	Page.
Rocky Mountain elk.....	8
Tame herd of Virginia deer.....	14

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF BIOLOGICAL SURVEY,
Washington, D. C., June 3, 1908.

SIR: I have the honor to transmit the accompanying manuscript on the subject of Deer Farming in the United States, and to recommend its publication as Farmers' Bulletin No. 330. As a result of the growing scarcity of game animals in this country the supply of venison is wholly inadequate to the demand, and the time seems opportune for developing the industry of deer farming, which may be made profitable alike to the State and the individuals engaged therein. The raising of venison for market is as legitimate a business as the growing of beef and mutton, and State laws, when prohibitory, as many of them are, should be so modified as to encourage the industry. Furthermore, deer and elk may be raised to advantage in forests and on rough, brushy ground unfitted for either agriculture or stock raising, thus utilizing for profit much land that is now waste. An added advantage is that the business is well adapted to landowners of small means.

Respectfully,

C. HART MERRIAM,
Chief, Biological Survey.

Hon. JAMES WILSON,
Secretary of Agriculture.

330

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DEER^a FARMING IN THE UNITED STATES.

INTRODUCTION.

The present bulletin discusses briefly the economic possibilities of raising deer and elk in the United States. It is believed that when the restrictions now imposed by State laws are removed this business may be made an important and highly profitable industry, especially since it will be the means of utilizing much otherwise unproductive land. The raising of venison should be, and is naturally, as legitimate a business as the growing of beef or mutton, and State laws should be so modified as to permit the producer, who has stocked a preserve with deer at private expense, to dispose of his product at any time, under reasonable regulations, either for breeding purposes or for food.

The growing scarcity of game mammals and birds in the United States and the threatened extinction of some of them over large parts of their present ranges make the preservation of the remnant highly important. Very important also is the increase of this remnant so as to make game once more abundant. It is believed that by means of intelligent game propagation, both by the States and by private enterprise, many of our depleted ranges can be restocked with big game.

IMPORTANCE OF THE DEER FAMILY.

The members of the deer family (Cervidæ) rank next to the cattle and sheep family (Bovidæ) in general utility, and are the most important of the big game animals of America.

Wherever obtainable in quantity the flesh of deer of different kinds has always been a staple article of diet, and under present market conditions it is hardly necessary to say that venison is perhaps the most important game, being a favorite with epicures and also having a wide use as a substitute for beef and mutton, which meats it resembles in texture, color, and general characteristics. Its flavor

^aThe term "deer" is here used in its general sense, in which it includes the elk, the reindeer or caribou, the moose, and other species, besides those usually referred to as deer.

is distinctive, though it suggests mutton rather than beef. In chemical composition it is very similar to beef, though, judging from available data, it is not so fat as stall-fed cattle. The following figures show how it compares with beef and mutton: A lean venison roast before cooking has been found to contain on an average 75 per cent of water, 20 per cent of protein or nitrogenous material, and 2 per cent of fat; a lean beef rump, some 65 to 70 per cent of water, 20 to 23 per cent of protein, and 5 to 14 per cent of fat; and a lean leg of mutton, 67 per cent of water, 19 per cent of protein, and 13 per cent of fat.

Venison, beef, and other common meats are very thoroughly digested, whatever the method of cooking. Venison may be roasted, broiled, pan-broiled, or used for making stews, in much the same way as beef. Venison, particularly steak, to be at its best, should be eaten as soon as possible after it is cooked.

The general popularity of venison is so great and the demand for it so widespread that overproduction is improbable. The other products of the deer—skins and horns—are of considerable importance, and in countries where deer are abundant and especially where large herds are kept in semidomestication, the commerce in both is very extensive.

THE DOMESTICATION OF DEER.

A number of species of the deer family have been proved to be susceptible to domestication. The reindeer, however, is the only one that has been brought fully under the control of man. The fact that the European red deer and the fallow deer have been bred in parks for centuries without domestication does not prove that they are less susceptible to the process than the reindeer. The purposes for which they have been held captive and the environment given them have been markedly different. It must be remembered, also, that few attempts have been made to rear and domesticate deer under intelligent management. The work has been largely a matter of chance experiment. If they had been as long under careful management as cattle, they would now, probably, be equally plastic in the hands of the skillful breeder.

But raising deer for profit does not necessarily imply their complete domestication. They may be kept in large preserves with surroundings as nearly natural as possible and their domestication entirely ignored. Thus the breeder may reap nearly all the profit that could be expected from a domestic herd, while the animals escape most of the dangers incident to close captivity. But the breeder who aims at the ultimate domestication of the animals, and whose herd approaches nearest to true domesticity, will in the end be most successful.

SPECIES TO BE SELECTED FOR BREEDING.

The number of species of deer suited for breeding in inclosures in the United States is great, though the chances for success are by no means the same for all. As a rule those native to America are to be preferred, since they are already acclimated. In selecting any species, similarity between its natural habitat and that to which it is to be transferred must be considered. Important, also, is its adaptability to varied conditions, as shown by former attempts to acclimatize it.

Unless they have shown a peculiar adaptability to such change, deer should not be taken from arid parts of the United States to humid parts. To a disregard of this principle are probably due many of the failures that have attended experiments in breeding the American antelope, the Columbia blacktail deer, the moose, and other animals in places differing widely from their natural ranges.

The history of attempts to acclimatize the several kinds of deer shows that some readily adapt themselves to a great variety of conditions, and efforts to introduce them into new countries have been almost uniformly successful. Such has been the experience with the axis deer, the Japanese and Pekin sikas, the red and the fallow deer of Europe, and especially with the wapiti, or Rocky Mountain elk, and the Virginia deer. While experiments with the foreign species named offer every promise of success to the owners of American preserves, there are obvious reasons for recommending the two native animals just mentioned as best suited for the production of venison in the United States.

THE WAPITI, OR ROCKY MOUNTAIN ELK.

The wapiti (*Cervus canadensis*), including two related species and a geographic race, and known generally in America as the elk, is, next to the moose, the largest of our deer. It was once abundant over the greater part of the United States, whence its range extended northward to about latitude 60° in the Peace River region of the interior of Canada. In the United States the limits of its range eastward were the Adirondacks, western New Jersey, and eastern Pennsylvania; southward it reached the southern Alleghenies, northern Texas, southern New Mexico, and Arizona; and westward the Pacific Ocean.

For the practical purposes of this bulletin all the forms of the wapiti are treated as a single species. At the present time the range of these animals has so far diminished that they occur only in a few scattered localities outside of the Yellowstone National Park and the mountainous country surrounding it, where large herds remain. Smaller herds still occur in Colorado, western Montana, Idaho, east-

ern Oregon, Manitoba, Alberta, British Columbia, and the coast mountains of Washington, Oregon, and northwestern California. A band of the small California valley elk still inhabits the southern part of the San Joaquin Valley.

The herds that summer in the Yellowstone National Park and in winter spread southward and eastward in Wyoming are said to num-

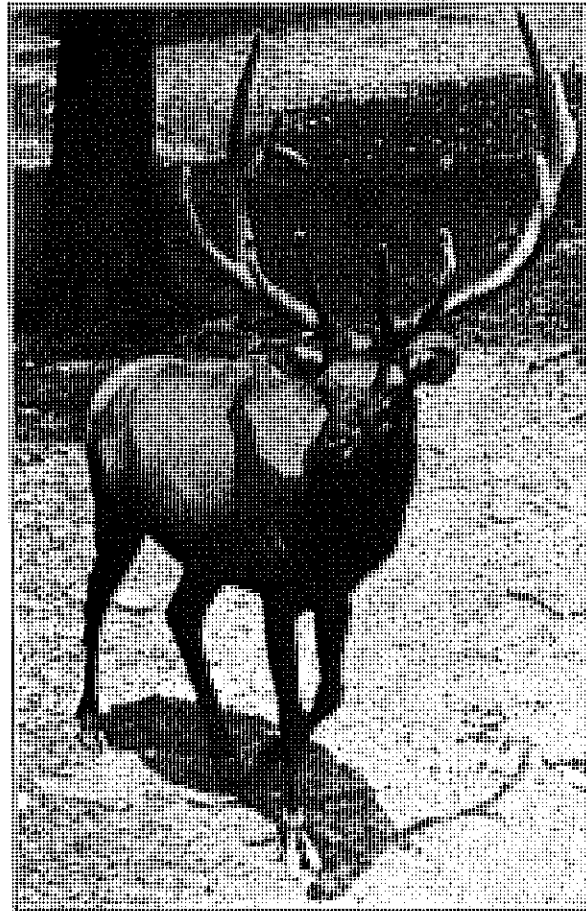


FIG 1.—Rocky Mountain elk.

ber about 30,000 head, and constitute the only large bands of this noble game animal that are left. Although protected in their summer ranges and partially safeguarded from destruction in winter by the State of Wyoming, there is yet great danger that these herds may perish from lack of food in a succession of severe winters. Partial provision for winter forage has been made within the National Park, but the supply is inadequate for the large numbers of animals.

Further safeguards are needed to place the Wyoming elk herds beyond the reach of winter starvation.

In addition to the wild herds, there are a considerable number of elk in private game preserves and parks, as well as in nearly all the public zoological parks and gardens of this country. The herds in captivity form the nucleus from which, under wise management, some of the former ranges of this animal may be restocked and from which a profitable business of growing elk venison for market may be developed. At the present time this species affords a most promising field for ventures in breeding for profit.

HABITS OF ELK.

The elk is both a browsing and a grazing animal. While it eats grasses freely and has been known to subsist entirely upon pasture, it seems to prefer a mixture of grass and browse.

The elk is extremely polygamous. The adult bulls shed their antlers annually in March or April, and new ones attain their full size in about ninety days. The "velvet" adheres until about August. While the horns are growing the bulls usually lead solitary lives; but early in September, when the horns are fully matured, the rutting season begins. Fights for supremacy then take place, and the victor takes charge of as many cows as he can round up and control. The period of gestation is about $8\frac{1}{2}$ months. The female does not usually breed until the third year, and produces but one calf at a time.

Although the elk is less prolific than the common deer and some other species that have been bred in parks, it increases fully as rapidly as the common red deer of Europe. Moreover, it makes up for any lack of fecundity by its superior hardiness and ease of management. It has been acclimatized in many parts of the world, and shows the same vigor and hardiness wherever it has been transplanted. In Europe it has been successfully crossed with the Altai wapiti and the red deer, and in both instances the offspring were superior in size and general stamina to the native stock.

ELK VENISON.

The flesh of the elk, although somewhat coarse, is superior in flavor to most venison. That of the bulls is in its best condition about the time the velvet is shed. By the time the rut is over, in October, their flesh is in the poorest condition. As the open season for elk is usually in October and November, and only bulls are killed, it follows that hunters often obtain the venison when it is poorest. The meat is not best when freshly killed, but should be left hanging for four or five days before it is used. Of course fat elk are better eating than lean, and it is said that venison from castrated bulls is superior to any other.

DOMESTICATION OF ELK.

With few exceptions the early attempts to domesticate elk were made by men who were wealthy enough to disregard all thought of profit in raising them. They were usually placed under the care of servants, and the bucks were left uncastrated until they became old and unmanageable. Soon the serious problem of controlling them outweighed the novelty of their possession, and one by one the attempts at domestication were abandoned.

A desire to preserve this important game animal has caused a renewal of attempts to breed it in confinement, and at present there are small herds under private ownership in many places in the United States. The Biological Survey has recently obtained much information from owners of herds in regard to their experience in breeding and rearing the animals, and also their opinions as to the possibility of making the business of raising them profitable. Of about a dozen successful breeders,^a nearly all are of the opinion that raising elk for market can be made remunerative if present laws as to the sale of the meat are modified.

One especially important fact has been developed by the reports from breeders. It is that the elk readily adapts itself to almost any environment. Even within the narrow confines of the paddocks of the ordinary zoological park the animal does well and increases so that periodically the herds have to be reduced by sales.

The fullest reports that have been received by the Department of Agriculture from breeders of elk are from George W. Russ, of Eureka Springs, Ark., through H. N. Vinall, of the Bureau of Plant Industry.

Mr. Russ has a herd of 34 elk. They have ample range in the Ozarks on rough land covered with hardwood forest and abundant underbrush. The animals improve the forest by clearing out part of the thicket. They feed on buds and leaves to a height of 8 feet, and any growth under this is liable to be eliminated if the range is restricted. If not closely confined, elk do not eat the bark from trees, nor do they eat evergreens. In clearing out underbrush from thickets they are more useful than goats, since they browse higher. Goats, however, eat closer to the ground; and as the two animals get along well together, Mr. Russ recommends the use of both for clearing up brushy land and fitting it for tame grasses.

The increase of elk under domestication is equal to that of cattle. Fully 90 per cent of the females produce healthy young. An adult male elk weighs from 700 to 1,000 pounds; a female, from 600 to 800 pounds. The percentage of dressed meat is greater than with

^a The experiences of these breeders are, in the main, reserved for a more extended bulletin on the domestication of game mammals.

cattle, but, owing to hostile game laws, experience in marketing it is very limited. An offer of 40 cents a pound for dressed meat was received from St. Louis, but the law would not permit its export. Mr. Russ says:

From the fact that as high as \$1.50 per pound has been paid for this meat in New York City and Canada, and that the best hotels and restaurants pronounce it the finest of all the meats of mammals, we are of the opinion that if laws were such that domesticated elk meat could be furnished it would be many years before the supply would make the price reasonable compared with other meats. Elk meat can be produced in many sections of this country at less cost per pound than beef, mutton, or pork.

Mr. Russ thinks that large areas of rough lands in the United States not now utilized, especially in localities like the Ozarks and the Alleghenies, could be economically used to produce venison for sale, and he regards the elk as especially suited for this purpose.

Another feature of Mr. Russ's report is of more than passing interest. He says:

We find from long experience that cattle, sheep, and goats can be grazed in the same lots with elk, providing, however, that the lots or inclosures are not small; the larger the area the better. We know of no more appropriate place to call attention to the great benefit of a few elk in the same pasture with sheep and goats. An elk is the natural enemy of dogs and wolves. We suffered great losses to our flocks until we learned this fact; since then we have had no loss from that cause. A few elk in a thousand-acre pasture will absolutely protect the flocks therein. Our own dogs are so well aware of the danger in our elk park that they can not be induced to enter it.

Judge Caton, in his *Antelope and Deer of America*, also remarks on the animosity of elk toward dogs, and says that the does always lead in the chase of dogs that get into the elk park. If elk will attack and vanquish dogs and coyotes and thus help to protect domestic animals grazing in the same pastures, a knowledge of the fact may be of great advantage to stockmen who desire to give up herding sheep and to resort to fenced pastures instead. The addition of a few elk in the pasture may be an efficient protection from dogs, coyotes, and wolves. However, outside of fenced pastures elk do not always show themselves hostile to dogs and coyotes.^a

MANAGEMENT OF ELK IN INCLOSURES.

Lorenzo Stratton, of Little Valley, Cattaraugus County, N. Y., began experiments in breeding elk about sixty years ago. His plan of management consisted essentially in taming the calves when very

^a President Roosevelt reports in *Outdoor Pastimes of an American Hunter* that he saw a coyote walking unnoticed among a band of elk in Yellowstone Park; and Thomas Blagden, of Washington, D. C., informs the writer that noisy dogs were used to drive unconfined elk from the lawns of summer cottages at Saranac Inn, in the Adirondacks.

young and continuing the petting process with the entire herd. He visited the animals daily in the pasture and always carried dainties to feed them. As the bulls became old and developed signs of viciousness, they were castrated, younger animals being used for breeding. He thus developed a thoroughly domesticated herd.

For economic reasons, it is not always possible to follow Mr. Stratton's plan. Those who grow the animals for venison and in large preserves would find it impracticable to tame all the calves. However, if elk or deer are grown for stocking parks or private preserves, the tamer they are the easier it will be to handle and ship them.

Range.—In choosing a range for elk, the natural food supply is important. They thrive best in preserves having a variety of food plants—grasses, bushes, and trees. Rough lands, well watered with clear streams and having some forested area, are well adapted to their needs. About as many elk can be kept on such a range as cattle on an equal area of fair pasture. There should be thickets enough to furnish winter browse, but this should be supplemented by a supply of winter forage.

Food.—Except when deep snows cover the ground, elk will keep in good condition on ordinary pasture and browse; but a system of management that provides other food regularly will be found more satisfactory. Hay and corn fodder are excellent winter forage; but alfalfa hay has proved to be the best dry food for both elk and deer. A little oats or corn—whole or chopped—may be fed each day. Elk are fond of corn, and feeding it affords excellent opportunities for winning their confidence and taming them. The same may be said of salt, which should be furnished liberally to all deer kept in inclosures. Running water, although not essential, is of great importance in maintaining elk in good condition.

Fence.—Elk are much less nervous than ordinary deer, and less disposed to jump fences. When they escape from an inclosure they usually return of their own accord. If tame, they may be driven like cattle. Ordinarily, a 5-foot fence of any kind will confine elk. Henry Binning, of Cora, Wyo., writes us that a 4-foot woven-wire fence is ample for these animals. A small inclosure in which a vicious bull elk is to be kept should be higher and of stronger material. Mr. Russ's report, already partly quoted, states that where lumber for posts is cheap a good elk fence may be built for \$200 a mile. But the actual cost will, of course, vary greatly according to style, price of labor, nearness to market, and other circumstances.

Cost of stock.—The cost of stocking an elk preserve is not great. Usually surplus stock from zoological parks or small private preserves may be obtained at low cost, varying with the immediate demand for the animals. At times they have sold for less than \$20 a

head, and with the present restrictions on sale, low prices are likely to continue. A few years ago T. J. Wilson, of Lewisburg, Ohio, paid \$165 for three animals. A Michigan breeder recently offered to deliver a dozen head, sex and age not given, all fine specimens, for \$500. This is, of course, a low price, not more than cattle would bring and less than the venison would be worth if it could be sold. If restrictions on the sale and shipment of venison from private preserves were removed, prices of the stock would, of course, soon advance, and necessitate a greater outlay in starting the business.

Vicious male elk.—The male elk is ordinarily docile, but in the rutting season the older ones often become ill-tempered and dangerous. Several tragedies connected with attempts to domesticate elk are matters of history. One was recorded by Judge Caton in his *Antelope and Deer of America* as having occurred in his own park. Another took place at Bull City, Osborne County, Kans., in October, 1879, and resulted in the instant death of Gen. H. C. Bull, the mortal wounding of two other men, and the serious injury of another, from the attacks of an infuriated bull elk that had previously been regarded as extremely gentle.

Wild and unconfined deer and elk flee from man under nearly all circumstances, but when wounded and closely pressed they have been known to attack hunters. It is unlikely that, even in the rutting season, a wild bull elk would attack a human being. But the tame or partially tame animals that have become familiar with man are to be feared and should not be approached in that season without extreme caution. A male elk or deer that has once shown viciousness can not again be trusted.

The remedy for viciousness in the male elk is castration. It is unsafe to keep an uncastrated male elk over 4 years old, unless he is in a strongly fenced inclosure from which visitors are excluded. The effects of castration are to make the animal docile and to greatly enhance his value for venison. This is in accord with observed results in the production of beef, pork, and mutton. Venison grown in domestication under a system in which the male animals intended for slaughter are castrated should be uniformly of the highest grade and far superior to that obtained in the wild state during the usual open season for hunting. This consideration is of the greatest importance in fixing the final status of venison grown under domestication.

BREEDING THE VIRGINIA DEER.

The Virginia, or whitetail, deer (*Odocoileus virginianus*) is the common deer of the United States. Including the half dozen geographic races that occur within our borders, it is distributed over most of the country, except Nevada and the major portions of Utah,

Arizona, Washington, Oregon, and California. It is extinct in Delaware and practically so in a number of States in the Middle West. South of our borders a number of closely related species occur.

In view of the wide natural range of the whitetail deer, its adaptability to nearly all sections of the United States can not be doubted. Testimony as to its hardiness in parks and preserves is not so unanimous as that concerning the wapiti; but the general experience of breeders is that with suitable range, plenty of good water, and reason-



FIG. 2.—Herd of domesticated Virginia deer belonging to R. H. Harris, Clarkesville, Tex.

able care in winter, raising this deer for stocking preserves or for venison may be made as profitable as any other live-stock industry. Not only do deer thrive on land unsuited for cattle or horses, but, like elk, they may be raised to great advantage in brushy or timbered pastures fully stocked with cattle or horses, as the food of deer rarely includes grass.

Advocates of the Angora goat industry state that within the United States there are 250,000,000 acres of land not suited to tillage or to the pasture of horses, cattle, or sheep, which are well adapted to goats. Much of this land is suited also to deer and elk, and can be utilized

for these animals with less injury to the forest cover than would result from its browsing by goats.

The whitetail deer has often been the subject of experiments in domestication. The beauty of these animals, especially the fawns, appeals to every admirer of wild life, and early settlers of the country soon learned how easily they could be tamed and how promptly they attached themselves to the persons who fed them. The dangerous character of the same pets, especially the males, when grown up was soon learned also. It followed that the domesticating process usually ended with the maturity of the first subject, which was soon disposed of or banished to a safe inclosure.

The propagation of the Virginia deer has seldom been undertaken in a systematic way. The animals have often been bred in parks for pleasure or in large preserves for sport, but the economic possibilities in raising them have received little attention. Recently breeders have recognized the fact that they are profitable under proper management and would be much more so were conditions for marketing live animals and venison more favorable.

EXPERIENCES OF BREEDERS.

The Biological Survey has reports of successful experience in raising Virginia deer from more than a dozen persons, located in different parts of the country, who are now engaged in the business. The management of the herds varies slightly with the surroundings and the object for which they are kept.

Thomas Blagden, of Washington, D. C., began raising deer in 1874. After an experience of over a third of a century he is confident that the business can be made profitable. In his own herds he has carefully avoided in-breeding by securing new bucks from time to time. His stock is vigorous and of the large size characteristic of the Adirondack and other northern deer. Consequently the animals are in demand for breeding purposes, the bucks bringing \$50 each and the does \$75. He feeds grain, using corn and a mixture of bran and meal, and during the summer cuts as much wild forage as possible. He finds that the animals prefer the rankest weeds to the choicest grass. Of the various kinds of hay, they prefer alfalfa. He provides abundant water at all times.

John W. Griggs, of Goodell, Iowa, writes that he has been engaged in raising deer for about fourteen years. Until two years ago he sold all his surplus stock for parks, but since then has disposed of about half of it for venison. For park purposes he gets \$20 to \$30 a head, but they bring fully as much or more when fattened for venison. As to management of deer, Mr. Griggs writes:

In raising a large herd the park should be divided into two or three lots, and one plowed each year and sown to red clover, mustard, rape, and seeds of different kinds of weeds. Bluegrass and timothy are useless. Corn is the

principal grain I feed. I feed it winter and summer. In winter I feed also clover hay, oat straw, and weedy wild hay. Deer when rightly handled are very prolific, and from 50 does one can count on 75 fawns. They can be raised profitably for venison—very profitably until overdone; but I would not advise one to go into it on a large scale without previous experience with deer.

The report received from C. H. Roseberry, of Stella, Mo., although less enthusiastic than others, is quoted because his herd approaches more nearly a state of true domestication. Under the date of January 13, 1908, Mr. Roseberry wrote as follows:

My experience in breeding the common or Virginia deer covers a period of seventeen years, beginning in March, 1891, when, as a boy of 16, I built a small inclosure of 1½ acres to confine a single doe that was captured as a fawn in the neighboring forest.

A buck and other does were secured from year to year, until in 1900, by purchase and natural increase, my herd numbered 25 head of all ages.

From 1891 to 1901 I lost every year from disease an average of 20 per cent. The climax came in the drought year of 1901, when my loss was 50 per cent from the disease known as "black tongue."

I am convinced that, like cholera in swine, individuals recovering from this disease are immune from further attack. Apparently all of my herd were afflicted. The survivors and their progeny constitute my present breeding stock. I have made no purchases since 1901, nor have I suffered any loss from disease.

For the last seven years my herd has averaged 70 per cent increase, all of which I have sold at satisfactory prices. I began selling at \$20 per pair of fawns at 4 months of age and \$30 per pair of adults. I now get \$40 and \$60, respectively. I sell almost exclusively for pets and for propagating purposes, although a few surplus bucks have been sold for venison, averaging me 15 cents per pound gross weight.

If we except the goat, I know of no domestic animal common to the farm that requires so little feed and attention as the deer. My herd has a range of only 15 acres, two-thirds of which are set to white clover, bluegrass, and orchard grass. I provide also a small plot of wheat or rye for winter pasture. With the above provision, in this latitude, no feed is required between April 15 and November 15. During the rest of the year a ration of corn, bran, or other mill feed somewhat smaller than that required for sheep, in connection with a stack of clover or pea hay to which they have free access, is sufficient to keep them in good condition. Deer eat with relish nearly all of the common coarse weeds, and for clearing land of brush they are, I think, second only to the common goat.

Probably the greatest expense connected with the business of raising deer is the fencing. Another item of trouble and expense, when the animals are raised for pets, requiring that they be handled and shipped alive, is the fact that the fawns must be taken from the does when 10 days old and raised by hand on cow's milk. They are quite easily raised in this way, with but slight percentage of loss, but require frequent and careful attention for the first month. When they are allowed to run with the does their natural wildness can not be overcome, no matter how gentle the does may be.

I have found the business profitable on the lines indicated. I believe they could be profitably bred for venison alone—certainly with less trouble and expense, since the fawns would be reared by the does and the trouble and expense of raising by hand would be eliminated.

My experience does not coincide with that of some other breeders^a in respect to the weakening of reproductive powers of deer by the confinement in parks. I have no barren does. Usually they produce a single fawn at two years of age; afterwards twins, and in rare cases triplets.

MANAGEMENT OF VIRGINIA DEER.

As to the management of deer little need be added to the statements from practical breeders already given. Virginia deer are polygamous, like cattle; the rutting season is in November; the period of gestation is about seven months, and the fawns are born in May or June. Young does usually breed when about 17 months old and have but one fawn the first time; afterwards they commonly produce twins. The fawns are spotted until the first shedding of the hair in the fall.

While deer are chiefly browsing animals, in captivity they eat nearly every kind of vegetation, including most kinds of garden stuff. They are fond of acorns, beechnuts, chestnuts, and other mast. Lily pads, leaves, lichens, and mosses are freely eaten. With plenty of range and an abundant variety of plants there need be, therefore, no apprehension concerning the deer's food. A good supply of running water must be provided, and the animals should have access to rock salt. If the browse and pasturage are scant, a small ration of grain should be fed. Of the grains, corn is generally recommended as a food; there is no waste, as the deer pick up every grain. Coarse hay full of weeds is preferable to timothy or other tame hays, except alfalfa. Of clover hay, deer usually eat the blossom heads greedily, but waste the other parts. In winter feeding is necessary everywhere, and in the northern half of the United States shelter of some kind should be provided.

The remarks about castrating elk apply as well to the common deer. A number of vigorous bucks, however, must be kept with any considerable herd of does, for a single huck can not serve an unlimited number. Frequent changes of blood by introducing new bucks should be practiced to avoid inbreeding.

WILD DEER IN PRIVATE GAME PRESERVES.

Individual owners, as well as associations, have established large private preserves in many parts of the country and stocked them with deer and other big game. The objects have been to preserve the animals and to provide sport for the owners. In the free life under the protected conditions generally provided, deer do remarkably well, the increase being even more rapid than in small parks. There can

^a See Antelope and Deer of North America, by J. D. Caton, p. 304. 1877.

be no doubt of the success of ventures in propagating the Virginia deer under natural conditions as wild game, as is proved by the experience of a large number of hunting clubs and private owners.

Deer in Buckwood Park, a New Jersey preserve of 4,000 acres, belonging to Charles S. Worthington, increased in the ten years between 1892 and 1903 from 19 to about 400 head, and the number was then lessened because it was thought too large for the permanent sustaining capacity of the park. The St. Louis Park and Agricultural Company have about 1,000 deer and 400 elk in their 5,000-acre preserve in Taney County, Mo. The Otzinachson Rod and Gun Club six years ago placed about 90 deer, mostly does, in their 4,000 acre park in Clinton County, Pa. These have multiplied to nearly 2,000 head, and a further increase of about a thousand fawns is expected during the present season (1908). Doubtless these experiences are not exceptional.

The good effect of such preserves on the supply of game in the State should not be overlooked. While they may temporarily restrict the hunting privileges of a few citizens, they ultimately become a source of game supply secondary in importance only to State preserves or game refuges. Already a number of private reserves have become overstocked, and game has escaped or been turned over to the State to become the property of the people. The success of private enterprise in propagating large game in inclosures has thus become an object lesson for State game commissioners and others, and suggests the feasibility of the State's undertaking a similar work for the people.

GAME LAWS IN RELATION TO DEER FARMING.

The chief obstacle to profitable propagation of deer in the United States is the restrictive character of State laws governing the killing, sale, and transportation of game. Many of the States, following precedent, lay down the broad rule that all the game animals in the State, whether resident or migratory, are the property of the State. A few States except game animals that are "under private ownership legally acquired." A few others encourage private ownership by providing a way in which wild animals—deer and the like—may be captured for domestication. Generally, when private ownership of game is recognized by law, the right to kill such game is granted, but the owner is hampered by the same regulations as to season, sale, and shipment that apply to wild game. One by one, however, State legislatures are coming to recognize the interests of game propagators, and game laws are gradually being modified in accordance with the change of view.

The chief source from which deer and elk may be obtained for stocking preserves is from animals already in captivity. These must

be transported from place to place or there can be no commerce in them, yet the laws of many States absolutely forbid their shipment. The laws as to possession and transportation of deer carcasses make the shipping of venison also illegal. General export of venison is legal from only six of the States, and three of these have no wild deer left to protect.

The laws concerning the season for killing and the sale of deer are often equally embarrassing to those who would produce venison for profit. The owner of domesticated deer can not legally kill his animals except in open season. Owners of private preserves are similarly restricted and are limited to the killing of one or two animals in a season. More than half the States and Territories absolutely forbid the sale of venison. A few forbid the sale of venison produced within the State, but permit the sale of that imported from other States, a most unjust discrimination against home industry.

The following States have recently modified their laws so as to provide, under regulations, for the sale of deer from private preserves. Transportation and even export are included in some of them.

Arkansas.—Possession, sale, and shipment of deer or fawns is permitted when they have been raised in captivity for domestic purposes and are accompanied by an affidavit from the raiser.

Colorado.—Owners of private preserves under a license are permitted to sell and ship deer or other quadrupeds that are accompanied by an invoice. A fee is required for each animal sold.

Illinois.—Any person who raises deer for market may kill and sell them at any time in the same manner as other domestic animals.

Indiana.—The provisions of the law as to possession and sale do not apply to persons who have under ownership or control any deer raised in a deer park.

Massachusetts.—The owner may sell his own tame deer kept on his own grounds.

Minnesota.—Persons who desire to domesticate deer, moose, elk, or caribou may secure a permit to do so from the State board of game and fish commissioners by paying a fee of 50 cents for each animal in captivity and a like fee for each animal added later by natural increase or otherwise. The animals kept in captivity may be sold or shipped within or without the State, by permission of the commissioners.

Missouri.—Deer or elk, alive or dead, may be shipped from any private preserve and sold in the markets of the State when accompanied by a tag furnished by the game warden of the county, showing whose property it is, where killed, and to whom shipped.

New Hampshire.—The Blue Mountain Forest Association may kill elk, deer, or moose in their preserve for one month after the open season, and at any time may transport them outside the State.

New York.—Deer may be sold during the open season; and moose, elk, caribou, and antelope from private parks may be sold during the same period. Common carriers may transport animals into the State for breeding purposes, but may not transport venison unless it is accompanied by the owner.

North Carolina.—Seventeen counties permit the owner and keeper of an inclosed game reserve, who raises deer for use or sale, to kill, sell, or use those raised or kept in said inclosure.

Pennsylvania.—Owners of game preserves who hold a game-propagating certificate may sell and transport deer or fawn alive for propagating purposes only, after securing the written consent of the president of the board of game commissioners.

In three or four other States game "under private ownership, legally acquired," is supposed to be exempt from the general provisions of the game law; but in a test case as to its sale or export it is doubtful whether the courts would so hold without more specific provision legalizing such commerce.

SUMMARY.

The domestication of deer and elk offers an interesting field for experiment, as well as remunerative returns for the investment of capital.

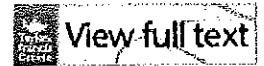
The wapiti and the Virginia deer can be raised successfully and cheaply under many different conditions of food and climate. The production of venison and the rearing of both species for stocking parks may be made profitable industries in the United States.

Instead of hampering breeders by restrictions, as at present, State laws should be so modified as to encourage the raising of deer, elk, and other animals as a source of profit to the individual and to the State.

Safeguards against the destruction and sale of wild deer in place of domesticated deer are not difficult to enforce. For this purpose a system of licensing private parks, and of tagging deer or carcasses sold or shipped, so that they may be easily identified, is recommended.

It is believed that with favorable legislation much otherwise waste land in the United States may be utilized for the production of venison so as to yield profitable returns, and also that this excellent and nutritious meat, instead of being denied to 99 per cent of the population of the country, may become as common and as cheap in our markets as mutton.

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The role of genetics in chronic wasting disease of North American cervids.

Robinson SJ¹, Samuel MD, O'Rourke KI, Johnson CJ.

Author information

Abstract

Chronic wasting disease (CWD) is a major concern for the management of North American cervid populations. This fatal prion disease has led to declines in populations which have high CWD prevalence and areas with both high and low infection rates have experienced economic losses in wildlife recreation and fears of potential spill-over into livestock or humans. Research from human and veterinary medicine has established that the prion protein gene (Prnp) encodes the protein responsible for transmissible spongiform encephalopathies (TSEs). Polymorphisms in the Prnp gene can lead to different prion forms that moderate individual susceptibility to and progression of TSE infection. Prnp genes have been sequenced in a number of cervid species including those currently infected by CWD (elk, mule deer, white-tailed deer, moose) and those for which susceptibility is not yet determined (caribou, fallow deer, sika deer). Over thousands of sequences examined, the Prnp gene is remarkably conserved within the family Cervidae; only 16 amino acid polymorphisms have been reported within the 256 amino acid open reading frame in the third exon of the Prnp gene. Some of these polymorphisms have been associated with lower rates of CWD infection and slower progression of clinical CWD. Here we review the body of research on Prnp genetics of North American cervids. Specifically, we focus on known polymorphisms in the Prnp gene, observed genotypic differences in CWD infection rates and clinical progression, mechanisms for genetic TSE resistance related to both the cervid host and the prion agent and potential for natural selection for CWD-resistance. We also identify gaps in our knowledge that require future research.

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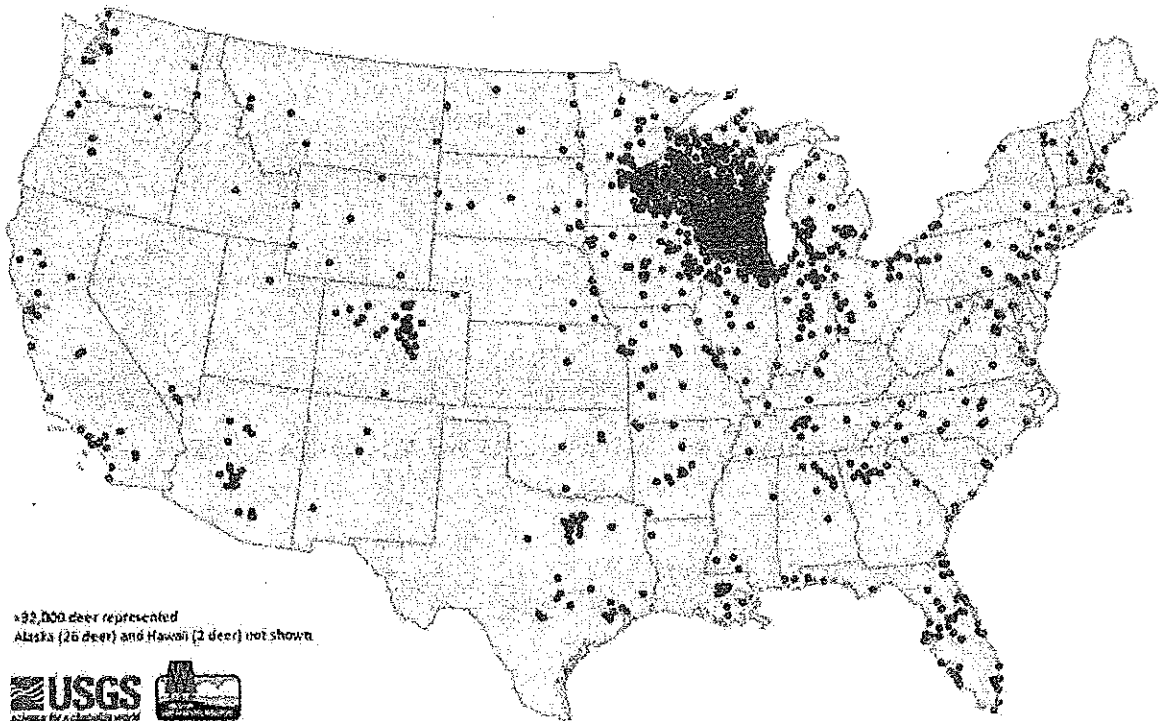
Map Spells Trouble for the Future of Deer Hunting

(/)

April 25, 2018

| By Lindsay Thomas Jr. (<https://www.qdma.com/author/lindsay-thomas-jr/>)

Home Zip Codes of hunters harvesting deer in Dane, Iowa, Richland and Sauk Counties, Wisconsin, 2016-2017
Data: Wisconsin Department of Natural Resources



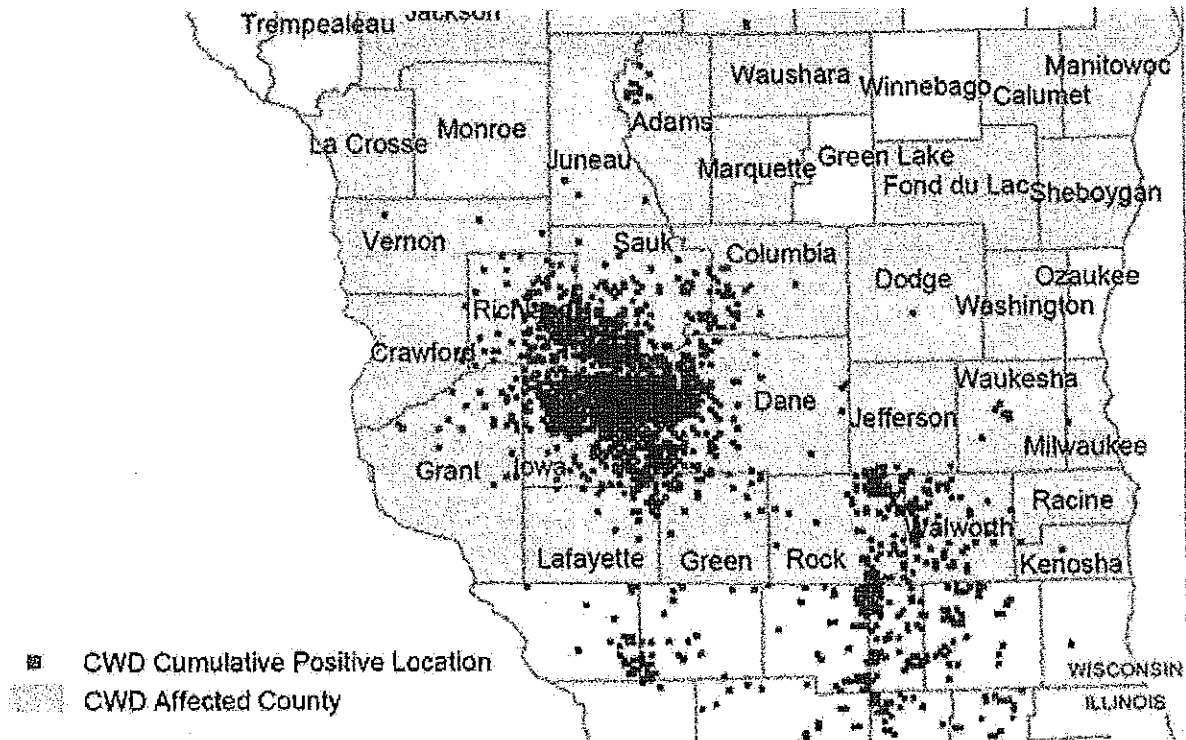
This map scares the hell out of me. Once you understand what it shows us about deer hunters and chronic wasting disease (CWD), it should alarm you, too. It's a map of one of the ways we will lose the war against CWD unless we take action, and I hope it shocks us awake.

In the 2016-2017 hunting season, more than 32,000 whitetails were killed by hunters in the four Wisconsin counties with the highest incidence of CWD in the state - Dane, Iowa, Richland and Sauk counties. The red dots on the map above are the home zip codes for every hunter who harvested at least one of those deer. Yes, hunters from 49 states killed deer in Wisconsin's CWD hotbed in 2016-17. Only Delaware was not represented in reported harvests. Even hunters from Alaska (26 deer) and Hawaii (two deer) traveled to Wisconsin to hunt in those four counties that year.

Why is this alarming? Consider all of the following.

CWD HOT ZONE

These four counties, which adjoin each other and form a block in southwest Wisconsin near the borders with Illinois and Iowa, are the hottest CWD infection zone in Wisconsin. If you were patterning your turkey shotgun, and each pellet was one record of a CWD-positive wild deer on a target shaped like the state of Wisconsin, you'd want these four counties to be the gobbler's head. And you'd have a very dead gobbler (see below).



<https://dnr.wi.gov/topic/wildlifehabitat/documents/wiill.pdf>

Click map to see more detail.

As of 2016, prevalence rates of CWD among adult bucks - meaning the percentage of tested adult bucks that were positive for CWD - included 15 percent in Dane, 42 percent in Richland, 45 percent in Sauk, and as high as 51 percent in north central Iowa County. Today more than half of all adult bucks in large portions of Iowa County probably carry CWD. Prevalence rates are lower for yearling bucks and does, and, as with bucks, the prevalence rates vary for these other deer across the map.

MOST OF THESE DEER WERE NOT TESTED FOR CWD

I've learned from Wisconsin DNR that they tested 2,291 deer from the four counties in the 2016-17 season, or 7 percent of the harvest. (There are private services available for CWD testing, but the number of deer tested annually that way is in the single digits statewide.) So, that year more than 29,000 deer harvested in those four counties were *not* tested for CWD. How many of those untested deer probably had CWD? Well, of the 2,291 that were tested, 17 percent were positive. This suggests approximately 5,000 of those untested deer were also positive.

MOST DEER WITH CWD APPEAR HEALTHY

CWD incubates in a whitetail for an estimated minimum of 16 months and an average of two years before the deer becomes "clinical" and begins to show symptoms or act sick, at which point it won't last much longer. Therefore, the majority of CWD-positive deer killed by hunters will appear to be healthy. You cannot look at a deer you killed and determine whether it should be tested for CWD. If you shot it in a CWD zone, you should get it tested.

WHERE THIS GETS SCARY

Given all these facts, here's what we can assume with near certainty: Some number of these hunters killed CWD-positive deer, did not get them tested, and returned home taking parts of those deer with them. The two primary routes for CWD to be introduced into new areas are:

1. In live, captive whitetails trucked legally or illegally by people.
2. In contaminated deer carcasses or high-risk parts.

How many hunters left the CWD zone or even the state of Wisconsin with an entire deer carcass, field-dressed or not? No doubt some of them did, especially those who lived close enough to drive rather than fly to Wisconsin. We can't know how many, but it's not zero. We can't know how many of those CWD-positive carcasses were transported into areas or states that don't yet have CWD in whitetails, but it's not zero. And it's happening every hunting season.

Regulations are being broken in many of these cases, because most states now ban the importation of certain deer carcass parts to prevent CWD entering their state. In fact, a review of regulations shows there's no land route out of Wisconsin for a hunter hauling a carcass with an intact spinal column and skull. Every bordering state bans the importation of these parts, though Illinois allows it if you are taking the carcass directly to a licensed meat processor in Illinois. But just because there are rules doesn't mean hunters know about them. Most of these laws are relatively new, and surveys have shown that few hunters are aware of them (The low testing rate alone suggests that few hunters realize the precautions they should take with deer harvested in these counties). Nevertheless, many states are starting to make cases for violations. Last season, Tennessee

<https://www.tn.gov/twra/news/2017/11/22/four-charged-with-illegal-importation-of-deer-carcasses-from-a-cwd-positive-state.html>) and [Mississippi \(https://www.mdwfp.com/media/news/wildlife-hunting/citation-issued-for-violating-deer-carcass-transportation-regulations/\)](https://www.mdwfp.com/media/news/wildlife-hunting/citation-issued-for-violating-deer-carcass-transportation-regulations/), among other states, charged hunters for illegally importing banned deer carcass parts into their home states.

The infectious prions that cause CWD are concentrated in a deer's nervous system, especially the brain, spinal cord, eyes, spleen, tonsils and lymph nodes. If these parts are discarded outdoors, prions will remain in the environment after the carcass has decomposed or been scattered by scavengers. Prions are extremely tough and do not decompose for many years. No one knows for sure how long they last, and they can infect new deer that come in contact with them.

Of those non-zero number of hunters who left Wisconsin in 2016-17 with intact carcasses of CWD-positive deer in the backs of pickups, we can't know how many of them butchered those deer at home or delivered them to processors or taxidermists. From there, we can't know how many of those infectious parts like brains and spleens ended up discarded in the woods where they could potentially introduce CWD to healthy deer in a new area. But it's probably not zero.



QDMA member Bob Weiland of Wisconsin (right) and his friend Sid Courtney killed these bucks in 2013. Both deer then tested positive for CWD. Most deer with CWD that are killed by hunters appear to be healthy.

"Clearly there is an opportunity for the inadvertent movement of infectious material within and across jurisdictions," said Bryan Richards of the USGS, who helped produce the map. "And this opportunity is not unique to Wisconsin."

The map shows 15 zip code markers in my home state of Georgia, which does not have CWD to our knowledge. A road trip from here to southwest Wisconsin would take about 14 hours – not easy but not impossible with a hunting buddy to share the wheel. Did any of those Georgians make a road trip and haul home a deer carcass? If not in 2016-17, what about other seasons? And as Bryan pointed out, Georgia hunters travel to other CWD zones besides the ones in Wisconsin to hunt each year. The USGS map only deals with one of them.

What About Your Health?

So far, I've been concerned with all these hunters from all over the country potentially exposing healthy deer in their home states to CWD. I've said nothing of the human health concerns.

There is still no clear evidence that CWD can affect people, but it hasn't been ruled out, so the Centers for Disease Control and the World Health Organization recommend that you play it safe by protecting yourself if you hunt a deer population known to be affected by CWD. Primarily, you should submit for testing every deer you harvest from that area and wait for an "all clear" before you eat the venison. If the deer tests positive, you should safely discard the venison, preferably by bagging it and sending it to a landfill.

So, go back to those 29,000 deer harvested in those four counties in 2016-17 that were never tested for CWD. How many of the hunters represented by zip code dots on the map above unknowingly ate venison from a CWD-positive deer they killed?

We don't know. But it's not zero.

What Hunters Should Do

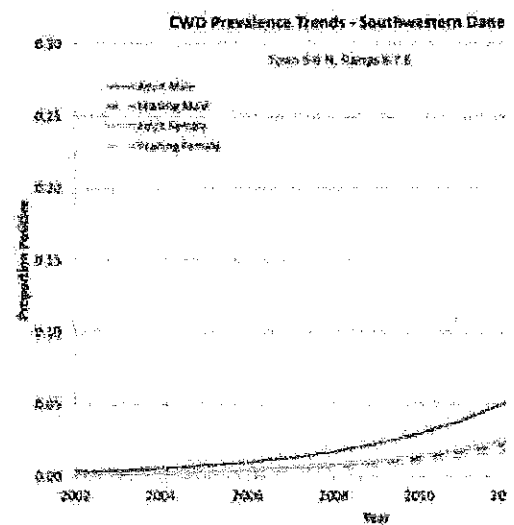
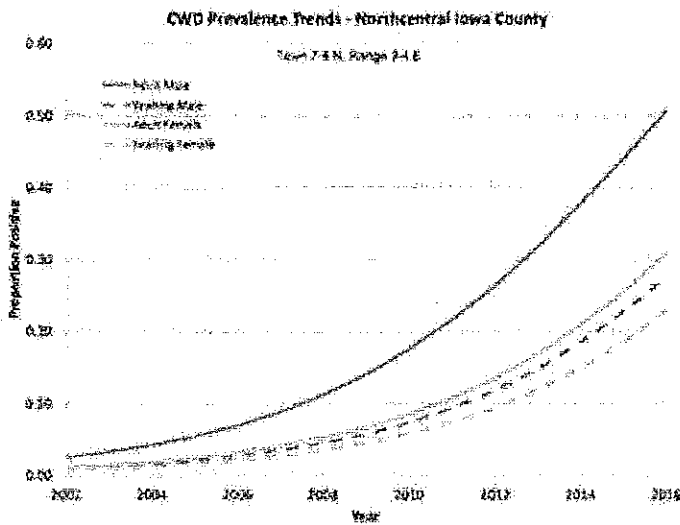
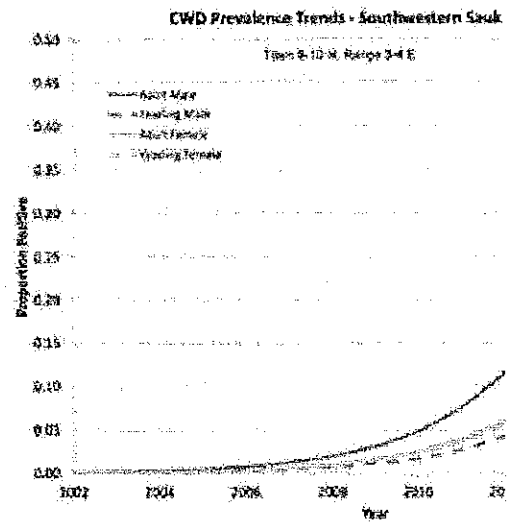
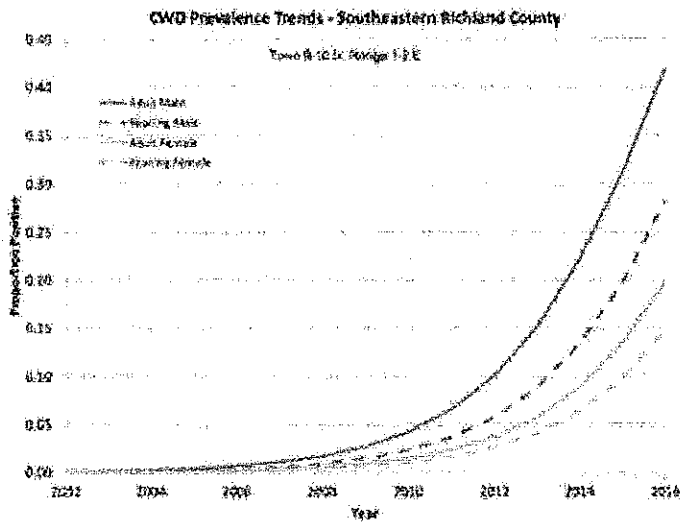
This map gives us a glimpse of one of the ways we will gradually lose the war against CWD, watching it spread to every corner of the whitetail's range, unless we take action. Answer the alarm by educating yourself and informing others. If you or people you know hunt deer out of state or even out of your home county, do your homework and learn whether you will be hunting in a CWD zone. If you will be, learn the local rules for tagging, testing and transportation of carcasses. Submit any deer you harvest for local testing, and wait for results before you eat the venison.

Even if you are hunting a non-CWD zone out of state, know your state's deer-carcass importation rules, which tell you the parts of deer you can legally bring home. This goes for states you will drive through on the way home: Their import regulations apply to you even if you are just passing through. To be safe, never leave any state with more than boned-out venison and a thoroughly cleaned skull plate attached to antlers. Many states ban the importation of hides unless they are tanned or part of finished taxidermy.

This very helpful website (<http://ncwildlife.org/Hunting/Cervid-Carcass-Regulations>) compiles all state carcass import regulations in one place. It is hosted by the North Carolina Wildlife Resources Commission.

To stop the spread of CWD and fight this threat to the future of deer hunting, we've got to work to inform ourselves, our hunting partners, and even folks we don't know. QDMA is stepping up our game in this area, too, with efforts like our #KnowCWD (<https://twitter.com/search?src=typd&q=%23KnowCWD>) campaign. Help us by becoming a member (<https://www.qdma.com/get-involved/join/>), sharing information like this article on your social media network, and talking to hunters you know. It's clear that ignorance of this disease and how it spreads is one of the ways hunters are losing the battle already, but we can turn that tide.

To stop the spread of CWD, we need a lot more zeros.



The CWD infection rates among deer in these four Wisconsin counties are trend upwards at a faster rate each year. Unless we do more to stop the spread of CV every corner of the whitetail's range will be facing trend lines like these.

Follow Lindsay on [Twitter \(http://twitter.com/lindsaythomasjr\)](http://twitter.com/lindsaythomasjr) and [Instagram \(http://instagram.com/lindsay_thomas_jr\)](http://instagram.com/lindsay_thomas_jr)

The Genetics of Scrapie Susceptibility

Scrapie is an infectious disease; a susceptible animal must come in contact with the disease agent to become infected. Scrapie does not occur in any sheep of any genotype that has not been exposed to the infectious agent. However, once exposed to the agent, the genotype of the animal has a profound effect on which sheep may become infected and eventually die. The interaction between the scrapie agent and host genetics is not fully understood. The following is a summary of the current knowledge. It is possible that additional genes or sites on the prion gene will be identified that will also impact susceptibility.

General Background

To understand the genetic component of scrapie, it is necessary to review some of the basics of molecular genetics. In the 1950's Watson and Crick discovered that the genetic code was contained in the double helix molecule of deoxyribonucleic acid (DNA). The basic unit of DNA consists of three chemical elements (a nitrogenous base, a phosphate group, and a deoxyribose sugar molecule). This unit is known as a nucleotide. DNA is present in all nucleated cells of the body and is passed to subsequent generations in the eggs and sperm of mammalian species. Subsequently, it was discovered that DNA encodes proteins. Proteins are composed of amino acid chains. Scientists have determined that DNA codes the amino acid sequence of proteins through sets of three nucleotide bases. Each set of three nucleotide bases is called a codon; each codon codes for one amino acid. Chromosomes are made up of DNA strands. Chromosomes always occur in pairs one from the sire and one from the dam. The two chromosomes that make up a chromosome pair code for the same proteins.

The amino acid sequence that makes up a specific protein usually remains constant from generation to generation and from animal to animal within a species. Rarely, a change occurs at a codon site resulting in a different amino acid sequence, this variability in amino acid sequence is known as polymorphism. In most instances, polymorphism is thought to have little effect on the resulting protein produced. However, in the case of the normal prion protein (PrP cellular), polymorphism can have a profound effect on scrapie susceptibility.

All animals that have been studied have a gene that codes for the normal prion protein. The function of normally occurring cellular prion protein is unknown.

Understanding the Scrapie Agent's Interaction with the Host Genotype

The current state of knowledge about what causes scrapie must be examined to understand how different codons influence susceptibility to scrapie. Various causes of scrapie have been theorized; however, a majority of scientists believe that the causative agent is an abnormal form of a normally occurring cellular prion protein known as PrP scrapie. PrP cellular, the normally occurring cellular prion protein, is found in all tissues that have been examined. Stanley Prusiner received the Nobel Prize in 1998 for his work supporting this theory. The basis of this theory is that an abnormally conformed prion protein, PrP scrapie, serves as a template to influence a geometrical conformation change

in the normal PrP cellular produced by the exposed animal. This abnormal protein (PrP scrapie) accumulates. After a period of months and more often years, it causes nervous system dysfunction and, eventually, the death of the animal. The abnormal prion proteins (PrP scrapie) may be found in the nervous system, the spleen, lymph nodes, placenta, intestine, blood, pancreas, ovary, and liver of infected sheep.

The gene that encodes the normal prion protein has polymorphisms at codons 136, 154, and 171 that influence the ability of the prion cellular protein structure to be geometrically altered by the PrP scrapie template when the animal is exposed to it.

At this time, no such polymorphisms have been identified for goats. All goats, therefore, must be assumed to be susceptible.

Genetic Susceptibility to Scrapie

- Codon 136 codes for either the amino acid valine (V) or alanine (A);
- Codon 154 codes for either histidine (H) or arginine (R); and
 - Codon 154 plays a minor role in scrapie susceptibility and is not often used in the United States. Codon 154 is not a consideration in the US Scrapie Eradication Program at this time.
- Codon 171 codes for glutamine (Q), arginine (R), lysine (K), or histidine (H).
 - The presence of H at 171 is presently thought to be equivalent to Q for scrapie resistance. K at 171 has recently been found in a few Barbados sheep, its effect on scrapie resistance has not been studied.

US sheep have 3 major forms (alleles) of the scrapie susceptibility gene: AQ, AR, and VQ and 2 minor forms AH and AK. The VQ allele occurs at a significantly lower frequency than AQ or AR. For the purpose of this discussion H or K at 171 will be considered equivalent to Q. Each sheep inherits two copies of each gene and thus two alleles (one from each parent). Codons 136 and 171 are close together on the same chromosome so the offspring will always receive one of the alleles of each parent and not a mixture of the two. In the United States, codon 171 appears to be the major determinant of relative scrapie susceptibility. In some flocks, codon 136 may also play a role.

Each gene has a pair of alleles, one on each chromosome of a chromosome pair. Alleles reside in the same site on each chromosome. When only codons 171 and 136 are considered and H or K at 171 is treated as a Q at 171, there are only four combinations that need to be considered in order to eliminate scrapie from a flock AARR, AAQR, AVQR, and QQ.

1. AA RR sheep are nearly completely resistance to scrapie. Only one case (in Japan) has ever been reported. These sheep are highly unlikely to carry or transmit scrapie;
2. AA QR sheep are rarely susceptible. In rare cases, AA QR sheep in Europe have become infected. Most but not all cases have been in flocks with high scrapie prevalence. It is unknown whether infected AA QR sheep can transmit the

- disease. The risk from exposed AA QR sheep is probably minor, since infected AA QR sheep are rare and it is unusual for PrP scrapie to be found outside the brain of these sheep;
3. AV QR sheep are somewhat susceptible to some scrapie strains. Two cases have been identified in the US. The risk from exposed AV QR sheep is probably minor, since infected AV QR sheep are rare and it is unusual for PrP scrapie to be found outside the brain of these sheep. AV QR sheep are significantly less susceptible to the scrapie strains that affect them than are the QQ sheep that are affected by these strains
 4. QQ Sheep (AA QQ, AV QQ, and VV QQ) are susceptible to scrapie and can transmit the disease to susceptible flock mates.

Genetics as a Tool for Eradicating Scrapie

Genetic selection is being used as the primary means of scrapie control in the Netherlands and the United Kingdom. In the United States, the U.S. Department of Agriculture's (USDA) Animal Plant Health Inspection Service (APHIS) is using genetic testing to determine which exposed animals must be removed or restricted in affected flocks and which are free to move unrestricted. APHIS policy recognizes the importance of codon 171 and the potential importance of codon 136 in the transmission of scrapie in the United States.

The National Genetics Based Flock Clean-up Plan allows affected producers to retain or move RR sheep, AA QR sheep, and most AV QR sheep without restriction. It also calls for the removal or restriction of all exposed QQ ewes, exposed female goats, and the female offspring of scrapie positive female animals. In a minority of flocks where positive AV QR sheep are identified, exposed AV QR ewes will be removed or restricted. In other flocks when requested by the owner APHIS will remove exposed AV QR ewes for study. All scrapie positive and suspect animals must be removed. In the unlikely event that scrapie is found in a sheep that is neither QQ nor AV QR, additional animals may be required to be removed or restricted.

In a small percentage of flocks that are either heavily infected, that have cleaned up and then had a recurrence of scrapie in animals born on the premises, or where the epidemiology is different from that seen in most flocks additional animals may be purchased for study and/or additional restrictions may be placed on the flock.

Owners of affected flocks that comply with the requirements of the National Genetics Based Flock Clean-up Plan are eligible for indemnification of any animals that are removed as part of the flock plan in accordance with Title 9 Code of Federal Regulations, part 54. Flocks whose owners do not retain restricted female animals will not be considered exposed flocks once they have completed the flock cleanup plan. If an owner elects to retain restricted female animals, additional restrictions will be placed on the flock. These flocks will be considered exposed flocks until all such animals are removed or a five-year monitoring plan is completed.

Other Tools for Eradicating Scrapie

In addition to a genetics based flock clean up plan, USDA is using several tools to eradicate scrapie. These include (1) finding infected and source flocks through the testing of exposed animals traced out of known infected flocks and, beginning in April 2003, through slaughter surveillance, (2) identification of sheep and goats in commerce to allow for effective tracing of scrapie positive and exposed animals, (3) restricting the movement of genetically susceptible exposed animals, and (4) educating producers, veterinarians, and others about clinical signs of scrapie.



Scrapie Disease Information

Scrapie is a fatal, degenerative disease affecting the central nervous system of sheep and goats. It is among a number of diseases classified as transmissible spongiform encephalopathies (TSE). Infected flocks can experience significant production losses.

Scrapie is the oldest known TSE, and under natural conditions only sheep and goats are known to be affected by scrapie. Once infected, the animal remains infected for life. Transmission of the classical scrapie agent is not completely understood, and apparently healthy sheep infected with the agent can transmit disease. Sheep and goats are typically infected as young lambs or kids, though adult sheep and goats can become infected.

Clinical signs of classical scrapie typically appear between 2 to 5 years after infection; therefore, infected animals rarely show clinical signs of infection before the age of 2 years, with the average age of clinical onset being 3-4 years. The prolonged incubation period, the subclinical nature of the infection during its early stages, and the fact that the only diagnostic tests currently available require brain or lymphoid tissue make detection of scrapie difficult. Sheep typically live 1 to 6 months after the onset of clinical signs, but some will die earlier or later. Duration of clinical signs may depend on the observational abilities of the producer. Some sheep may simply be found dead.

Due to damage to the nervous system, affected animals often show behavior changes, such as nervousness or aggression, intense rubbing, and locomotor incoordination that progresses to recumbency and death. Other clinical signs may include tremors (especially of head and neck), head pressing or "star gazing," significant weight loss with no decrease in appetite, wool pulling, and hyperesthesia. Additional signs in affected goats may include difficulty milking, premature kidding, and pica (eating or licking substances not normally eaten). **See videos below.**

Over a period of several years the number of infected animals increases while the age at onset of clinical

Related Links

[Sheep & Goat Health](#)

[Sheep and Goat Identification](#)

[National Scrapie Eradication Program](#)

[Scrapie Free Flock Certification Program](#)

[Scrapie Sample Submission](#)

Animals increase in the age at onset of clinical signs decreases, making these flocks economically unviable. Animals sold from infected flocks spread scrapie to other flocks.

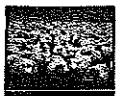
Once an infected animal is detected, eradication of the disease from the flock or herd may consist of either selective depopulation of certain higher-risk exposed animals (e.g., only those that are genetically susceptible, heavily exposed, test positive or inconclusive, and/or showing clinical signs) or, less commonly, complete flock depopulation, as well as cleaning and disinfection of the premises. Approximately 30 percent of US sheep are genetically susceptible to scrapie. Susceptibility varies between flocks based on breed and whether genetic selection for resistance has been used. Owners of infected flocks are encouraged to restock with rams that are resistant (RR) and ewes of resistant or less susceptible genotypes (RR or QR). Researchers are still investigating the possibility of genetic resistance in goats, but have not yet identified a resistant genotype. Therefore, currently all goats are considered genetically susceptible.

See Scrapie Factsheet for more detail.

Remember: Educate, Report and Submit

Educate yourself on the clinical signs of scrapie.

(All videos are Windows Media Player format)



Narrated Video
The Clinical Signs of

Scrapie



Hopping Gait Video



Video of Infected Sheep



Gait Problems
Difficulty Eating
Nibbling

Report. Contact your State Veterinarian or the USDA Veterinary Services Area Office for your state if your sheep or goat, older than 12 months, exhibits clinical signs of scrapie. Testing clinical suspects is the most cost effective way to find scrapie infected animals.

Fence-Line Contact Between Wild and Farmed White-Tailed Deer in Michigan: Potential for Disease Transmission

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Abstract

Interactions between wild and farmed white-tailed deer (*Odocoileus virginianus*) along perimeter fences may play a role in the transmission of diseases like bovine tuberculosis and chronic wasting disease. However, no study has evaluated direct contact between wild and farmed deer through fences. We used animal-activated cameras to estimate rates of interaction between wild and farmed deer at 6 high-fenced commercial white-tailed deer farms in Michigan, USA, during October 2003 to January 2005. We recorded only 2 direct, naso-oral contacts between wild and farmed deer during >77,000 hours of camera monitoring. We documented little direct contact between wild and captive deer through fences and, therefore, believe there is limited potential for direct transmission of diseases. However, we suspect our results are conservative and do not rule out the risks of direct or indirect disease transmission into or out of deer farms. Our findings will be of use to federal and state agencies responsible for regulating deer farms as well as managers of such facilities.

Experimental Bluetongue Disease in White-Tailed Deer*

by R. A. Vosdingh**, ***, D. O. Trainer*** and B. C. Easterday***

ABSTRACT

Nine white-tailed deer and six sheep were experimentally exposed to the California BTV-8 strain of bluetongue virus. The infections were fatal for seven of the nine deer. An additional deer died from exposure to an isolate of bluetongue virus from bighorn sheep. Clinical signs and lesions of bluetongue in deer were described. The incubation period, signs and lesions of bluetongue and epizootic hemorrhagic disease of deer appear to be similar. Virus isolations were made from the blood and a variety of tissues of exposed deer and identified as bluetongue virus. Neutralizing antibodies were detected in all of the convalescent sera.

Introduction

Among domestic species, bluetongue is primarily a disease of sheep, although cattle and goats are susceptible (1).

Except for the blesbok (*Damaliscus albifrons*) and bighorn sheep (*Ovis canadensis*), the susceptibility and role of wild ruminants in this disease is unknown. Neitz (2) has shown that under experimental conditions the blesbok can develop an inapparent infection of bluetongue. A natural case of bluetongue in a bighorn ram in western Texas was documented by Robinson, *et al* (3). Bluetongue virus (BTV) has been detected in two species of wild rodents (*Rhodomys pumila* and *Otomys irroratus*) (1). Suckling mice (4) and suckling hamsters (5) are the only laboratory animals

susceptible to BTV. Information available on the host range of this virus in domestic and wild species appears to be limited to these reports.

The aim of this study was to determine the susceptibility of the white-tailed deer (*Odocoileus virginianus*) to BTV, and to study the experimental disease produced.

Materials and Methods

Virus. — The California BTV-8 strain of bluetongue virus, obtained as infective sheep blood from the Bluetongue Research Laboratory, USDA-ARS, Denver, Colorado was used in all but one of these experiments. The virus was preserved in oxalate-carbolic acid-glycerin solution (O. C. G.)¹ at 4°C. In this laboratory, the BTV-8 was passed serially in three sheep. Blood taken one day prior to the peak in temperature rise of either the second or third sheep passage was used as inoculum.

Bluetongue virus isolated from a bighorn sheep (3) and passaged two times in domestic sheep was obtained from R. M. Robinson, Texas A & M University². This was used as the inoculum in one deer.

Experimental Animals. — White-tailed deer used in this study were obtained from the wild as fawns less than two weeks of age, were bottle fed and raised under penned conditions at the University of Wisconsin Charnany Research Center. Seven fawns, 7 to 8 months of age, (D35, D36, D2, D3, D4, D6 and D8) and three adults more than one year of age (D1, D5 and D7) were used in the experiments (Table I). All experimental studies were conducted during

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**Sponsored by the United States Army Veterinary Corps.

***Present address: Virus and Rickettsia Division, Fort Detrick, Frederick, Maryland.

¹O. C. G.: 500 ml. glycerin, 500 ml. distilled H₂O, 5 gm. potassium oxalate, 5 gm. phenol.

²The bluetongue viruses were obtained by permission of the ADE Division of the USDA under permit #174-T (Denver) and #2031 (Robinson).

the fall or winter months in a Rockefeller type isolation building (6). Deer were placed in isolation one week prior to exposure to obtain reference temperature and hematologic values.

The sheep (S695, S63, S1, S2 and S3) were mixed breeds approximately one year of age and obtained from central Wisconsin. Suckling mice, 2 to 3 days old, were obtained from the mouse colony maintained by the Department of Veterinary Science, University of Wisconsin. One day old embryonated chicken eggs were purchased from local hatcheries and incubated to the desired age for inoculation.

Experimental Design. — The protocol of the experimental inoculations is summarized in Figure I. For all inoculations, 2.5 ml. of the inoculum was injected intravenously and 2.5 ml. intramuscularly (Table I). Three deer (D36, D1 and D2) received blood from sheep (S63), the third passage of BTV-8 in domestic sheep in our laboratory. D35 was not inoculated, but shared an isolation room with D36 and died eight days after the death of D36. From D35 a 10% suspension of spleen in phosphate-buffered-saline (PBS) was prepared and filtered through a 0.2 μ membrane filter. D3 and S1 received this filtered spleen suspension. D4 and S2 were inoculated with a similar 10% suspension of spleen from D35 that had not been filtered.

One deer (D5) was inoculated with blood from sheep (S695), the second passage of

BTV-8 in domestic sheep in our laboratory. Two deer (D6 and D7) were inoculated with a 10% suspension of spleen from D2 which had succumbed to previous experimental exposure. The suspension of spleen contained 1,000 units of penicillin and 1 mg. of streptomycin per ml. of diluent. S3 was inoculated with blood taken from D2 one day prior to the peak of the temperature rise. D8 was inoculated with blood from the second sheep passage of the BTV isolated from the bighorn sheep.

All animals were examined for signs of disease and rectal temperatures were recorded daily. Five ml. of blood were taken either daily or every other day, preserved in an equal volume of O. C. G. and stored at 4°C until tested for the presence of BTV. Additional blood was collected for hematologic and serologic studies.

The extent and nature of gross lesions were recorded at necropsy and representative tissues were collected, fixed in formalin, and stained with hematoxylin and eosin. Duplicated tissue sections were frozen at -60°C until they could be tested for the presence of virus.

Virus Isolation Studies. — Deer and sheep blood collected during the study was diluted 10⁻¹ and 10⁻² in PBS, containing 0.15% lipase (7). Tissue specimens were ground in Ten Broeck tissue homogenizers to a 10% suspension in PBS containing 1,000 units of penicillin and 1 mg. of streptomycin per ml. The suspension was clari-

TABLE I. — Summary of Experimental Exposures of Deer and Sheep to Bluetongue (BTV-8)

Number	EXPERIMENTAL ANIMALS*			EXPERIMENTAL RESULTS** (days post inoculation)		
	Age	Sex	Inoculum	Onset signs	Death	Temperature peak
S63.....	A	M	S695 Blood	0	.	
S1.....	A	M	D35 Spleen (filtered)	7	.	7 (106.8)
S2.....	A	M	D35 Spleen (unfiltered)	6	.	6 (106.0)
S3.....	A	M	D2 Blood	6	.	6 (106.8)
D36.....	F	M	S63 Blood	4	5	4 (104.7)
D35.....	F	M	Contact	5	7	U (103.6)
D2.....	F	M	S63 Blood	7	8	5 (106.0)
D3.....	F	M	D35 Spleen (filtered)	6	8	6 (104.8)
D4.....	F	M	D35 Spleen (unfiltered)	4	5	2 (104.8)
D6.....	F	M	D2 Spleen	7	8	5 (103.6)
D8.....	F	M	BS	8	8	7 (103.5)
D1.....	A	M	S63 Blood	0	.	5 (105.2)
D5.....	A	M	S695 Blood	0	.	6 (103.6)
D7.....	A	Fe	D2 Spleen	8	8	U

*S = Sheep, D = Deer, A = Adult (1 yr. or older), F = Fawn (less than 1 yr.), M = Male, Fe = Female, Inoculum delivered by both I V and I M routes (except D35 — see text for details), DBS = Second sheep passage of bighorn sheep isolate.

** Dot . = Did not die, U = Undetermined, Parenthesis () indicates degrees of peak temperature rise in F.

TABLE II. — Summary of virus isolation results from blood of deer experimentally exposed to BTV*

Virus Isolations**									
Deer									
Days P.I.	D1	D5	D7	D9	D2	D3	D4	D6	D8
0	.	.	.	—	.	—	—	—	—
1	.	.	—
2	.	.	—	+	.
3	+	—	—	.	+	+	+	+	.
4	+	+	+	+	+	+	+	+	.
5	+	+	+	.	+	+	+	+	.
6	+	+	+	.	+	+	X	+	.
7	+	+	.	—	+	+	.	+	+
8	+	+	.	X	+	+	.	+	—
9	+	.	X	.	X	X	.	X	X
10	+
16	—

*All deer exposed to BT-8, except D8 which was exposed to the Sonora 100 strain of BTV

**Dot . = Not tested, + = recovered, — = Virus not recovered, X = Death occurred previous day

fied by centrifuging at 2,000 r.p.m. for 10 minutes. Using the method of Alexander (8), 0.3 ml. from each blood and tissue specimens was inoculated into the yolk-sac of each of six 7 day old embryonating chicken eggs. Inoculated eggs were incubated at 35°C the first 18-24 hours, and at 33.5°C the remainder of the incubation period.

The eggs were candled daily and the dead embryos were harvested. Blood samples were considered positive for BTV if by the third serial passage in eggs, the death rate had increased to at least five out of six and the embryos were hemorrhagic. All materials were routinely tested for bacterial contamination on blood agar and in thioglycollate broth. Selected samples of the embryo-lethal-agent were identified as BTV by virus-neutralization tests performed in suckling mice.

Adaptation to Mice. — Chicken-embryo-lethal-agents from D2 and D3 were adapted to suckling mice one to three days old following the method of Van den Ende, *et al* (4). Each of six to eight mice, constituting a group, received 0.02 ml. of a 10% chick embryo suspension by intracerebral inoculation. Each mouse received a second inoculation 2-5 hours after the first. Seven to eight days after exposure, or within 24 hours of the onset of illness, brains were harvested by group and a 10% suspension of brain was suspended in PBS. Two to

three serial mouse passages of this material were required before death occurred regularly 7 to 10 days post inoculation. The mouse adapted isolates were identified by serum neutralization tests using pre-inoculation and convalescent serum samples of sheep (S63).

Virus neutralization tests in mice were performed on all of the deer and sheep serum samples collected. The constant serum-varying virus procedure was employed. The sera were heat inactivated at 56°C for 30 minutes. The serum-virus mixtures, containing antibiotics, were incubated for 30 minutes at room temperature and 30 minutes at 4°C as recommended by Kipps (9). Groups of six to eight suckling mice were individually inoculated intracerebrally with appropriate serum-virus mixtures. With each set of sera tested, a control litter was inoculated with BTV and either normal deer or normal lamb serum. The LD₅₀ was calculated by the method of Reed and Muench (10).

Selected epizootic hemorrhagic disease (EHD) immune deer sera were also tested by this system.

Results

Signs and Lesions. — Experimental exposure to BTV resulted in clinical disease in all the deer and sheep (Table I). The infections were fatal for all of the fawns (D2, D3, D4, D6, D8, D35 and D36) and the adult female deer (D7), with death occurring from the fifth to eighth day post-inoculation. The sheep and the two male adult deer did not succumb.

Clinical signs observed in all fatal fawn cases, included a rise in temperature (Table I) that went as high as 106°F. A typical

TABLE III. — Summary of virus isolation results from tissues and body fluids of deer experimentally exposed to BT-8

Tissue	Virus Isolations*				
	Deer				
	D3	D4	D2	D36	D35
Spleen.....	+	+	+	+	+
Tongue.....	+	+	E	.	.
Liver.....	+	+	.	.	.
Kidney.....	+	+	.	.	.
Prescapular lymph node	.	+	.	.	.
Post mortem blood.....	+	+	.	.	.
Thoracic fluid.....	E	+	.	.	.
Urine.....	E	+	.	.	.

* + = Virus recovered, E = Equivocal results, Dot . = Not tested.

TABLE IV. Results of Mouse Neutralization Tests of Experimental Deer and Sheep Exposed to Bluetongue (BTV-8)

LOG ₁₀ NEUTRALIZING INDEX*		
Serum source	Pre-inoc. Sera	Conv. Sera**
Control Sheep	0	
S63	0	3.0
S1	0.23	3.0
S2	0	2.5
S3	0	3.0
Control Deer	0	
D1	0	3.0
D5	0.6	3.5
D2	0	
D3	0	1.35 (8)
D4	0.2	0.43 (4)
D6	0	2.5 (8)
D7	0	0.1 (6)

*Log₁₀ neutralizing index calculated by subtracting the MLD₅₀ titer of the virus in the presence of the test serum from that of the virus in the presence of the normal serum.

**Convalescent sera collected approximately 2 mos. p. i. unless indicated by days p. i. in parenthesis () for animals that died. A dot, indicates serum not tested.

temperature response of deer is illustrated in Figure II. Anorexia usually began on the day of the peak in temperature and excessive salivation commonly occurred the day preceding death. All fawns became weak, lost their fear of man, and were recumbent one to two days prior to death. There was a clear, mucopurulent nasal discharge of varying degrees in all animals that succumbed. Crusts were formed in the nares of D2, D3, D4 and D8. A severe bloody diarrhea occurred in D6. Except for D7, all of the animals that died had swollen and cyanotic tongues. The only appreciable hematological change detected was a leucopenia. This was especially evident in deer that survived (Table IV).

The only sign of disease in the two adult male deer was a temperature rise of 4.6 and 2.2 degrees that occurred on the fifth and sixth day post inoculation and returned to normal in two to three days (Table I). Because of daily fluctuations it was not possible to evaluate the temperature response of the female deer (D7). On the day it succumbed, D7 was recumbent but attempted to rise. Her hind legs appeared paralyzed.

The clinical signs observed in the exposed sheep were a temperature rise on the sixth or seventh day post inoculation (Table I), anorexia at about the same time, a slight weight loss and some salivation.

Gross lesions in all deer that died in-

cluded subendocardial hemorrhages, enteritis of the small and large intestine, and hemorrhages in the tongue. There were no tongue lesions in D7. The extent and severity of hemorrhaging varied between individuals, but was always present. The most severe hemorrhagic lesions occurred in D8. D36 had subcutaneous hemorrhages, an ulcer in the rumen approximately 1 cm. in diameter and peritonitis. There was a small hyperemic area of the buccal mucosa in D6 and extensive hyperemia of the buccal mucosa in D8. D7 had a necrotic fetus that was macerated to the stage of partial liquification.

Microscopically, either hyperemia, congestion or hemorrhages were usually seen in the heart, lungs, liver, spleen, kidneys, stomachs, intestines, adrenals, lymph nodes, thymus and tongue. A detailed description of the histopathology of experimental bluetongue in white-tailed deer was presented by Karstad and Trainer (11).

Virus Isolations. — Virus was detected in the blood of all the deer exposed to BTV (Table II). The viremia and temperature of D2 appeared to parallel one another and were considered typical of the temperature response and viremia (Figure II). Of the limited isolation attempts made from deer

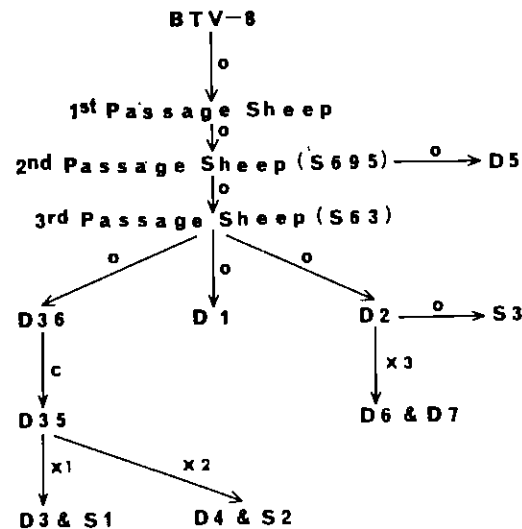


Fig. 1. Protocol of Experimental Exposure of Deer and Sheep to Bluetongue (BTV-8).*

- * D = Deer, S = Sheep
- o = Blood in O.C.G.
- c = Contact (D35 not inoculated)
- x1 = 10% spleen suspension (filtered)
- x2 = 10% spleen suspension (not filtered & containing no antibiotics)
- x3 = 10% spleen suspension (not filtered & containing antibiotics)

TABLE V. — Summary of Hematology Results of two BTV-8 Infected Deer, one which survived and one which succumbed.

HEMATOLOGICAL VALUES*								
Day of Inoculation	RBC (10^6)		WBC (10^3)		PCV		Sed. Rate (1 hr.)	
	D1	D2	D1	D2	D1	D2	D1	D2
- 5	8.9	8.5	6.2	2.8	40	54	3.2	0.0
- 4	7.9	14.6	6.2	4.7	43	61	4.4	0.1
- 3	8.8	12.6	6.0	4.1	41	54	1.9	0.0
- 2	9.3	13.7	3.7	4.2	44	53	0.9	0.2
0	9.4	12.5	3.7	2.5	43	45	0.5	0.2
1	9.4	13.5	3.5	4.0	46	36	0.8	0.1
2	9.4	13.3	3.9	3.1	44	37	0.6	0.1
3	8.5	12.7	1.4	2.8	40	58	—	—
4	9.0	12.4	1.3	2.3	41	56	4.6	0.0
5	.	.	1.7	2.0	47	58	2.3	0.1
6	.	.	2.1	1.9	60	60.5	0.0	0.0
7	11.4	13.4	2.6	2.8	58	59.5	0.0	0.2
8	10.3	12.9	2.6	7.5	53	55.5	0.15	0.1
9	10.5	D	2.5	D	46	D	1.6	D
10	8.5	.	3.0	.	42	.	3.4	.
11	—	.	.	.
12	9.6	.	2.8	.	47	.	0.4	.

*RBC = Red blood cells, WBC = White blood cells, PCV = Packed cell volume, Sed. = Sedimentation, Dot . = Not tested, D = Animal died.

tissues and fluids, BTV was detected in the spleen, tongue, liver kidney, lymph node, post mortem blood, thoracic fluid and urine (Table III).

Because of the requirement for adopting BTV to embryonating eggs by serial passage it was possible to quantitate BTV in the blood during the course of the infection or in the tissues and fluids at necropsy.

Neutralization Tests. — The convalescent serum of the third passage sheep (S63) was used as a standard and had a \log_{10} neutralizing index of 3.0.

Convalescent sera from all of the animals neutralized the BTV from D2, and the results are summarized in Table IV. Con-

valescent sera from both surviving deer (D1 and D5) neutralized the virus, and of the deer that succumbed, the amount of neutralizing antibody appeared to depend on the length of survival time.

Convalescent serum from each of the experimental sheep (S1, S2 and S3) had a \log_{10} neutralizing index of 2.5 or 3.0.

To test for a possible serologic relationship between bluetongue and epizootic hemorrhagic disease of deer, three EHD immune deer sera were incorporated into the same test system used for the BTV deer sera. No significant neutralization was shown by the EHD sera.

Discussion

These limited studies show that experimental bluetongue can produce both fatal and non-fatal infections in deer. It appears that deer less than a year of age may be more susceptible to fatal infections since all seven exposed fawns succumbed. The results of the exposure of the fawn D8 to the bighorn sheep BTV isolate were similar to those observed in the fawns exposed to BTV-8. The results with the adult pregnant doe (D7) are difficult to interpret. This deer was extremely wild and it was necessary to immobilize her with succinylcholine chloride to collect specimens. It is possible that mechanical injury contributed to her recumbency and death. Also, at necropsy



Fig. 2. A typical temperature and viremia response of deer to experimental bluetongue, as observed in D2.

a necrotic fetus was found, and its role in her death was not determined. It was evident from the degree of maceration that the death of the fetus occurred prior to BTV exposure.

The two adult male deer which survived BTV challenge were immune to EHD. It is not known what effect this may have had on the BTV responses in these deer. As a result, the specific effect of age on susceptibility was not fully established. It was noted that the incubation period, signs and gross lesions observed for bluetongue in deer were similar to those described for EHD (11, 12). Further studies are necessary to elucidate the possible decreased virulence for adults as well as any relationship between EHD and the various antigenic types of bluetongue.

Many of the signs and lesions observed for bluetongue of deer were typical of those described for sheep, however, some of the classical lesions described for this disease in sheep were not seen. These included the hoof lesions and the excoriations of the nasal and oral mucosa. Perhaps an explanation for the lack of these lesions in the fawns was the peracute to acute course of the disease.

The apparent contact transmission of bluetongue from D36 to D35 was unexpected and unexplained. By necessity, the autopsy of D36 was performed in the isolation unit occupied by D35 (a contact control). Since the animals were housed on concrete and could have incurred abrasions on the legs, or other areas, the exposure of D35 could have occurred by contamination of skin abrasions.

A viremia occurred in experimental bluetongue of deer and virus was detected in the blood for as long as ten days after exposure. BTV was also detected in a variety of deer tissues and urine. Of the tissues studied, the spleen appeared to be the best source of virus.

These preliminary studies indicate that deer are susceptible to BTV and might play a role in its epizootiology. Recently a "semi-natural" outbreak of bluetongue occurred in a herd of captive deer in Texas (13), illustrating that BTV in deer is probably not confined to experimental exposures. Although the status of bluetongue in deer is still unknown, it might, as with cattle, serve as a source of virus for the insect vector during epizootics of the disease. Deer may serve as a reservoir during interepizootic periods. The need for further investigations to clarify the significance and role of deer in the natural history of bluetongue is apparent.

REFERENCES

1. HOWELL, P. G. Emerging disease of animals. *F. A. O.* 61: 11-153. 1963.
2. NEITZ, W. O. The bleabuck (*Damaliscus Albifrons*) as a carrier of heartwater and bluetongue. *J. S. Afr. Vet. Med. Assoc.* 4: 24-26. 1933.
3. ROBINSON, R. M., HAILEY, T. L., LIVINGSTON, C. W., and THOMAS, J. W. Bluetongue in the desert bighorn sheep. *J. Wildl. Mgmt.* 31: 165-168. 1967.
4. VAN DEN ENDE, M., LINDER, A., and KASCHULS, V. R. Experiments with the Cyprus strain of bluetongue virus; multiplication in the central nervous system of mice and complement fixation. *J. Hyg.* 52: 154-164. 1964.
5. CABASSO, V. J., ROBERTS, G. I., DOUGLAS, J. M., ZORZI, R., STEBBINS, M. R., and COX, H. R. Bluetongue. 1. Propagation of bluetongue virus of sheep in suckling hamsters. *Proc. Soc. Exp. Biol.* 88: 678-681. 1955.
6. SHOPE, R. E., GRIFFITHS, H. J., and JENKINS, D. L. Rinderpest. I. The cultivation of rinderpest virus in the developing hen's egg. *Amer. J. Vet. Res.* 7 (23): 135-141. 1946.
7. LUEDKE, A. J. Personal communication. 1966.
8. ALEXANDER, R. A. The propagation of bluetongue virus in the developing chick embryo with particular reference to the temperature of incubation. *Onderstepoort J. Vet. Sci.* 22: 7-26. 1947.
9. KIPPS, A. Complement fixation with antigens prepared from bluetongue virus — infected mouse brains. *J. Hyg.* 54: 79-88. 1956.
10. REED, L. J., and MUENCH, H. A simple method of estimating fifty per cent endpoints. *Am. J. Hyg.* 27: 493-497. 1938.
11. KARSTAD, L. and TRAINER, D. O. Histopathology of experimental bluetongue disease of white-tailed deer. *Can. Vet. Jour.* 8 (11) 247-264. 1967.
12. KARSTAD, L., WINTER, A., and TRAINER, D. O. Pathology of epizootic hemorrhagic disease of deer. *Amer. J. Vet. Res.* 22: 222-235. 1961.
13. ROBINSON, R. M. Personal communication, 1966.

CWD Best Management Practices

Enrollment in the CWD Herd Status Program is mandatory if you wish to move live farm-raised deer (FRD) within or outside of Wisconsin. You must be enrolled in the CWD Herd Status (HS) Program for at least 5 years before movement is allowed.

Identification requirements

FRD in your herd that are 12 months of age or older must have 2 individual identifications (IDs) -- One official and the second either official or unique to the herd. Live FRD of any age leaving your farm must have these 2 individual IDs.

To enroll in the CWD HS program, you must submit to DATCP:

- An application to register your herd of FRD and pay applicable fees
- An application to enroll your registered herd in the CWD HS program, free of charge, including a completed herd census of all the deer and the 2 individual IDs of each deer in the herd. The census must be performed within 30 days of application. Include a copy of any movement papers to show where the animals originated from
- A physical inventory of all deer conducted by your herd veterinarian verifying the herd census information
- A veterinarian's statement that (s)he has established a client-patient relationship and no deer show signs of CWD

To remain in the CWD HS program, you must:

- Identify all FRD in the herd before they are 12 months old with 2 individual IDs described above
- Perform CWD testing on FRD 12 months or older
- Call the herd veterinarian within 24 hours if you see any signs of CWD
- Complete and send to DATCP an annual census that identifies all FRD added to or removed (including by escape) from the herd since the last census.
- Complete a physical inventory with your herd veterinarian every 3 years.
- Submit a veterinarian's statement that (s)he has maintained a valid client-patient relationship and that there have been no CWD signs or positive results in the past year
- Report all escapes and returns to DATCP (608-224-4886 or 608-224-4896) and to your local DNR warden within 24 hours.
- Create and maintain complete herd records for each FRD

Herd additions

To add FRD to your enrolled herd, you must comply with applicable movement regulations for in-state movement; or imported deer. If you add deer from a herd that is not enrolled in the CWD HS program, your herd will lose all CWD status.

Moving Farm Raised Deer in Wisconsin

A certificate of veterinary inspection is required and must accompany every farm-raised deer that is moved from a herd in this state with the exception of FRD going to slaughter or animals moved between 2 locations under the same license. Animals moved to slaughter need a completed federal bureau form VS 1-27 or AH-CD-101.

The herd must also be adequately separated from any wild deer herd known to be infected with chronic wasting disease. If 2 or more wild deer found or killed within 5 miles of the FRD herd have tested positive for chronic wasting disease, the herd must be enclosed by a double protective barrier.

Record keeping

Owners of a herd enrolled in the CWD HS program must keep all records for at least 5 years and must make them available to DATCP for inspection and copying upon request.

Recommendations for reducing escapes:

- Check exterior fencing on a regular basis.
- Check exterior fencing after a storm.
- Any trees along the fence line that are deemed a risk such as dead trees, leaning towards the exterior fence, or trees with a weak root system such as Poplar, should be removed.
- All exterior gates should have secure latches or chains.
- Gate hinges should be securely attached and maintained with a recommended 3" in height to keep the gate from coming off the hinge.
- Loading and unloading areas must be secured. When feasible, loading and unloading should be done inside of the 8 foot fence.

What to do if an escape does occur:

The DATCP has strict rules in place for escaped animals. All escapes must be reported within 24 hours. If the herd resides in a non-CWD affected area, the herd owner has 120 hours to return the escaped animal to the herd without the loss of herd status. If a FRD escapes into a wild disease control area, the herd owner only has 24 hours to return that animal to the herd without the loss of herd status.

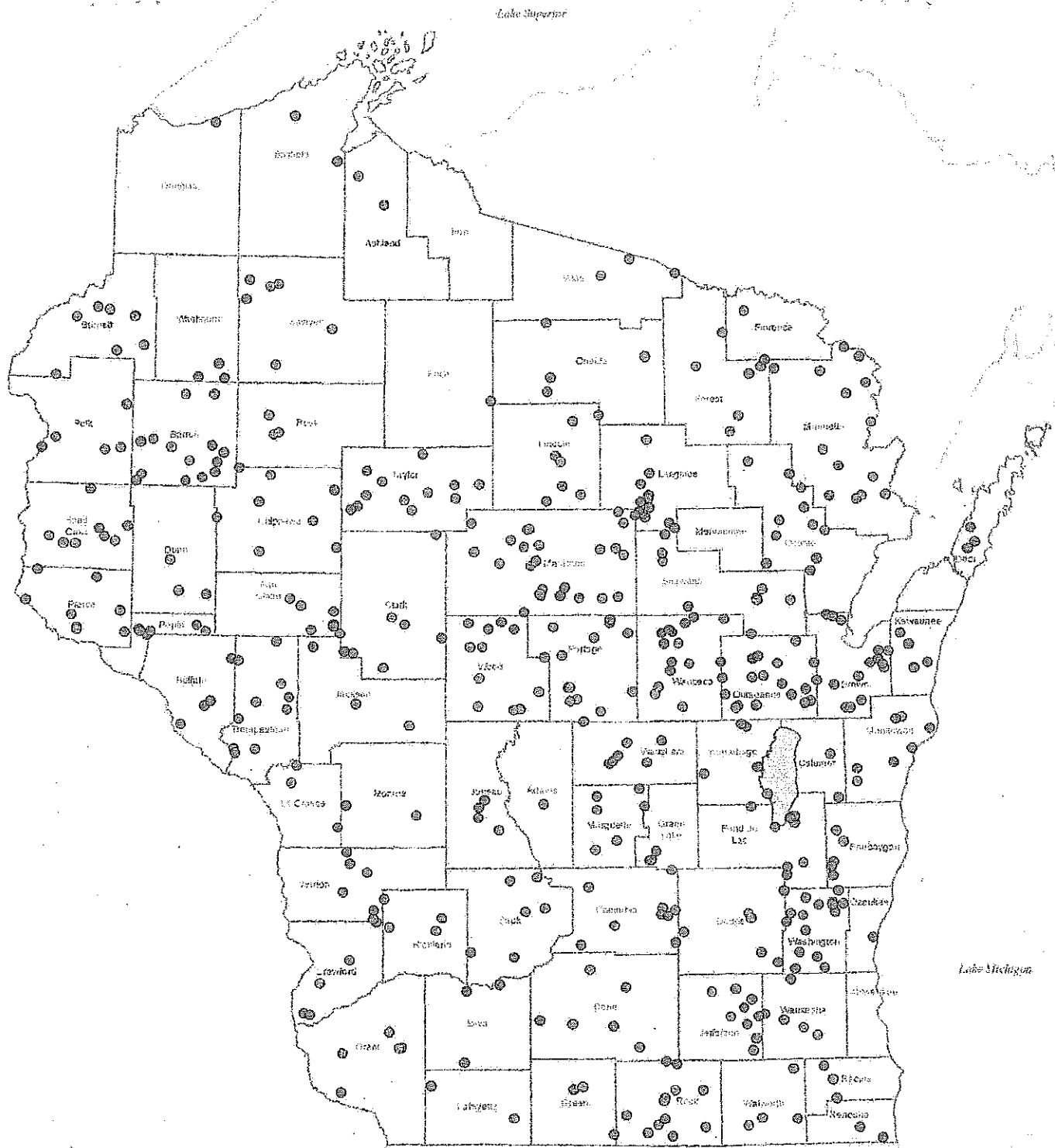
Escaped deer are very easy to get back into their pens; it is the only home they know and they are dependent on their food source.

The majority of the time they will wonder around for a short time, but will be back trying to get back in with their pen mates.

Almost always they will follow the fence line making it fairly easy to come from the OPPOSITE direction and SLOWLY move them in the direction they just came from.

It is highly important to have a pen or alleyway that can be opened up for them to return to.

The majority of the time they will be back into the enclosure within 6 hours looking for their food source and their pen mates.

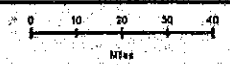


● 458 Farms

USER6&OURIRL&M&P&S&W&C&Reg_Deer_Farms_072614.pdf

Data shown on this map were obtained from various sources and are of varying age and resolution. This map is not intended to be used for navigation, and is not an authoritative source of information about legal land ownership or public access. The Department of Agriculture, Trade and Consumer Protection does not guarantee the accuracy, applicability for a particular use, completeness, or legality of data provided by other sources. No warranty, expressed or implied, is made regarding the accuracy or utility of information depicted on this map. Created by alison.mynsberge@wi.gov on 7/25/2014.

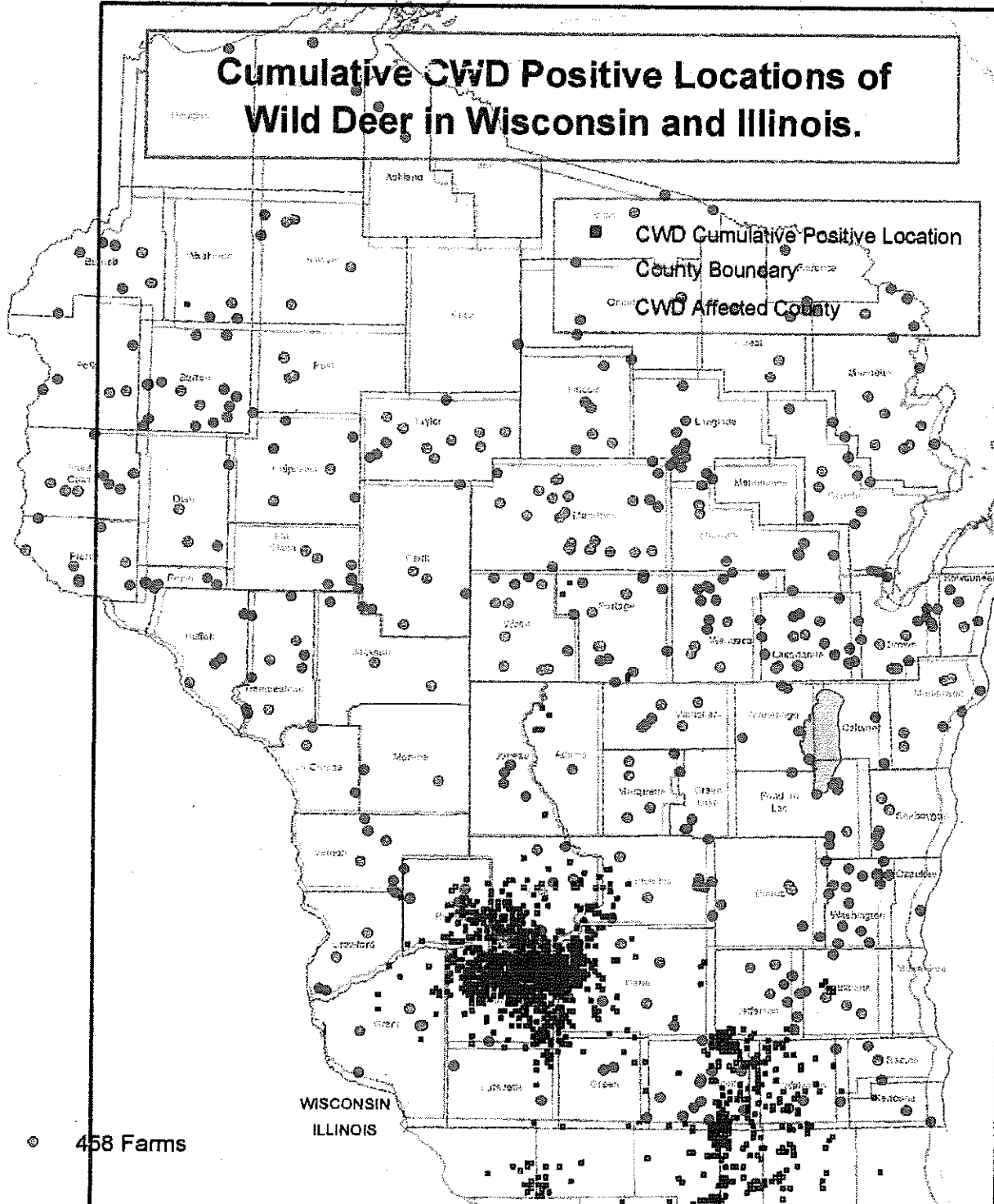
Registered Deer Farms



Division of Animal Health



Cumulative CWD Positive Locations of Wild Deer in Wisconsin and Illinois.



458 Farms

Map printed 3/30/16

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Locations as of 3/30/16.
Registered Deer Farms as of 5/26/15

Division of Animal Health



Posthunt deer population estimates for counties/new management areas, 2002-2017

Population estimates for 2014-2017 were based on county-specific Sex-Age-Kill calculations. Estimates from prior years were generated at the DMU level and converted to counties using county/DMU-specific estimates of the area of deer hal

Management Area	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ADAMS-Farm	2,272	3,123	2,494	2,337	3,496	2,940	2,917	3,149	3,848	4,721	4,816	4,163	4,923	5,039	5,441	5,309
ADAMS-Forest	12,173	14,025	11,043	15,065	23,567	19,858	16,141	10,532	13,720	12,797	14,185	13,029	15,303	16,694	19,315	16,296
ASHLAND	13,385	18,768	15,981	15,832	16,248	17,924	13,079	11,287	14,717	14,287	13,742	9,750	7,506	7,369	11,275	14,753
BARRON	11,032	16,472	13,421	16,700	16,633	16,050	12,502	14,588	17,295	13,422	18,346	14,051	13,663	14,352	19,787	21,495
BAYFIELD	28,519	39,500	34,900	35,616	39,154	37,952	24,838	24,907	26,657	27,262	28,804	21,205	18,033	18,340	29,314	33,012
BROWN	4,157	4,518	5,854	4,096	5,124	4,625	3,400	3,983	4,650	6,263	7,691	8,175	8,563	9,144	10,296	10,721
BUFFALO	13,374	21,164	18,389	16,673	17,919	22,316	18,860	22,843	24,466	27,451	31,401	23,229	27,627	25,981	27,682	21,608
BURNETT	16,591	21,554	17,919	21,931	24,881	22,129	19,625	21,028	27,425	20,606	27,089	19,818	18,071	20,192	24,124	23,498
CALUMET	2,380	2,277	2,628	2,195	3,372	3,103	2,701	2,816	3,082	3,675	4,677	4,637	4,214	4,162	4,435	5,246
CHIPPewa	14,486	19,164	17,689	20,279	22,134	20,018	16,400	17,590	19,900	18,330	21,456	18,234	13,326	13,931	19,935	22,314
CLARK-Farm	6,481	10,136	8,325	8,232	8,645	8,571	7,408	8,193	10,579	10,930	12,682	12,024	10,874	14,769	13,271	14,965
CLARK-Forest	14,192	14,006	13,826	15,973	20,881	16,641	16,516	13,322	15,019	13,178	15,371	13,750	12,381	10,854	18,395	18,808
COLUMBIA	13,634	16,919	15,556	17,760	16,327	16,864	18,150	14,245	15,059	16,109	16,347	16,046	20,421	22,663	25,370	28,439
CRAWFORD	8,373	11,317	10,978	16,159	15,725	19,772	17,448	16,086	14,786	16,096	18,319	15,952	16,601	20,019	16,127	16,790
DANE	9,483	16,910	16,234	21,936	23,751	23,879	17,524	16,834	18,928	15,355	17,059	18,854	17,427	17,667	18,529	16,740
DODGE	7,241	10,434	12,963	16,623	11,504	12,219	10,480	10,878	11,530	12,141	13,021	10,974	13,353	13,713	14,103	16,467
DOOR	8,479	10,491	9,603	8,918	9,526	10,338	9,620	8,502	9,016	11,802	16,139	15,343	14,610	18,318	18,105	16,991
DOUGLAS	23,827	34,948	27,185	32,324	36,463	36,711	24,765	25,881	32,100	26,404	32,023	23,143	21,119	22,780	32,688	33,591
DUNN	10,874	15,790	15,334	15,764	14,748	13,662	12,498	14,131	19,234	18,925	21,621	17,506	19,121	20,146	25,141	20,812
EAU CLAIRE-Farm	5,401	7,697	6,479	7,566	7,607	7,319	5,992	7,164	8,414	8,107	9,400	7,693	7,791	6,818	8,568	8,701
EAU CLAIRE-Forest	6,190	5,190	5,190	6,083	8,594	6,353	5,883	5,278	6,366	5,380	6,072	5,830	3,285	4,225	4,547	5,879
FLORENCE	8,278	9,815	6,992	8,235	10,423	8,720	8,460	7,849	10,022	9,635	8,456	7,628	7,463	7,276	9,659	17,711
FOND DU LAC	8,000	9,635	8,797	7,504	10,652	12,109	10,614	9,781	10,503	11,538	12,793	11,863	13,747	14,859	14,576	16,005
FOREST	17,527	17,519	15,452	15,476	17,644	16,699	10,543	10,036	14,606	17,073	14,732	14,172	8,372	7,323	9,980	16,057
GRANT	12,162	13,629	13,968	17,012	16,416	26,634	23,023	21,200	21,551	18,661	20,780	20,368	20,702	22,978	26,254	23,823
GREEN	4,691	6,132	7,169	9,763	12,224	11,195	7,873	8,507	8,195	7,723	8,310	9,213	8,382	9,500	10,141	8,279
GREEN LAKE	10,073	12,638	11,280	10,249	9,432	9,043	8,197	8,725	9,845	11,720	13,034	11,020	13,142	16,145	14,640	14,682
ICWA	11,973	13,989	12,214	15,774	20,050	25,757	18,582	18,105	20,874	16,866	17,342	18,595	20,367	21,702	24,508	20,433
IRON	8,816	14,958	12,622	12,381	11,478	13,127	10,483	7,828	10,565	11,090	9,916	6,480	2,366	2,571	3,816	7,355
JACKSON-Farm	11,388	14,004	18,926	18,756	14,860	20,313	18,787	16,943	16,791	18,173	20,102	15,285	16,732	16,388	19,935	18,834
JACKSON-Forest	13,724	13,508	12,476	14,467	16,412	15,154	14,304	11,183	11,221	10,833	13,499	10,471	8,042	8,766	10,854	10,576
JEFFERSON	5,492	8,036	11,389	9,629	9,697	11,803	9,226	8,815	9,205	9,125	9,619	10,126	8,548	7,865	6,968	10,110
JUNEAU-Farm	6,018	6,835	9,191	9,089	11,350	9,607	8,991	9,327	9,902	10,783	11,180	10,710	9,867	9,766	10,277	10,678
JUNEAU-Forest	12,253	12,870	10,428	13,175	19,601	18,362	13,029	8,780	11,052	10,285	11,509	10,029	7,355	8,642	9,137	11,626
KENOSHA	1,522	1,903	2,195	2,859	3,025	3,664	4,044	4,003	3,208	2,602	2,797	2,984	2,195	2,083	1,924	1,214
Kewaunee	4,018	4,802	3,920	4,204	3,737	3,898	3,739	4,046	4,449	6,889	9,506	8,610	9,699	13,338	12,532	11,405
LA CROSSE	8,790	11,776	10,382	9,290	13,517	12,039	11,324	10,257	10,544	11,360	14,504	11,511	10,804	10,925	10,760	12,651
LAFAYETTE	3,777	6,348	6,306	8,892	13,498	15,203	12,710	12,423	11,413	9,357	9,291	8,997	8,658	9,903	10,267	8,303
LANGLADE	16,036	16,641	13,691	14,028	17,260	16,916	10,747	10,434	13,836	15,461	13,808	11,733	12,188	12,501	17,729	23,728
LINCOLN	18,700	18,045	17,430	18,810	23,944	24,877	13,490	14,057	17,959	17,721	16,978	19,082	16,109	16,571	22,237	23,431
MANITOWOC	6,222	5,871	6,836	5,739	8,871	8,111	7,098	7,414	8,026	9,597	12,252	12,217	12,568	13,767	12,557	15,361
MARATHON	28,738	34,752	34,655	36,982	33,500	33,000	24,059	27,355	36,161	36,791	39,928	38,782	31,668	36,294	40,822	45,349
MARINETTE-Farm	12,486	14,532	15,192	12,695	11,963	11,564	11,865	12,909	16,160	17,620	18,450	14,865	14,827	12,021	17,695	17,145
MARINETTE-Forest	20,917	17,708	20,111	18,955	21,166	20,145	15,350	14,198	21,153	20,885	19,128	21,678	20,004	20,032	23,896	37,662
MARQUETTE	15,133	20,317	16,920	18,190	18,217	16,101	14,204	13,480	15,089	18,434	18,549	16,328	19,788	22,269	22,436	22,903
MILWAUKEE	690	1,058	920	819	977	919	879	883	915	1,127	1,306	1,403	597	965	662	833
MONROE-Farm	12,827	18,650	15,953	13,887	10,557	19,294	16,393	14,807	17,288	19,668	23,892	20,628	22,160	21,134	21,507	23,235
MONROE-Forest	3,783	3,679	3,111	3,660	4,964	4,155	3,305	2,378	2,766	2,569	2,989	2,409	3,379	4,005	3,652	4,007
OCONTO-Farm	14,363	18,438	16,722	14,954	14,289	13,987	14,763	17,205	20,906	24,631	27,454	22,844	19,169	17,321	24,883	25,293
OCONTO-Forest	6,609	6,548	8,031	5,824	6,573	6,908	4,348	3,721	5,810	5,078	5,624	5,051	5,432	7,607	6,816	9,296
ONEIDA	26,631	26,340	22,835	24,779	29,388	28,912	18,830	17,448	24,386	21,943	22,450	19,686	18,525	19,400	22,442	23,268
OUTAGAMIE	9,167	10,495	9,052	7,888	7,707	7,740	7,063	7,610	10,677	12,834	14,680	12,789	14,451	17,646	16,403	16,196
OZAUKEE	1,256	1,860	1,681	1,440	1,795	1,718	1,573	1,657	1,694	2,047	2,388	2,800	3,391	3,990	4,034	3,731
PEPIN	3,477	5,373	4,893	4,555	4,699	5,318	4,561	5,491	6,388	6,899	7,850	5,949	6,023	7,267	8,449	6,768
PIERCE	4,973	6,562	7,170	6,195	7,351	7,008	7,128	6,847	8,540	8,472	10,398	8,928	10,419	10,847	13,836	11,650
POLK	14,689	16,952	18,026	22,020	21,696	22,433	16,234	20,419	21,959	20,341	26,248	18,590	22,938	21,452	27,948	23,614
PORTAGE	15,288	20,410	19,840	19,814	21,512	19,823	14,544	16,355	20,517	20,453	22,700	19,974	17,682	19,055	21,111	22,307
PRICE	24,627	31,922	27,204	29,885	33,654	33,627	22,684	20,020	27,534	22,187	23,768	19,410	16,498	18,738	25,804	27,970
RACINE	1,692	2,072	2,380	3,087	4,234	3,953	4,357	4,314	3,454	2,822	3,038	3,240	2,779	3,166	2,960	1,989
RICHLAND	11,634	10,114	10,445	14,842	14,243	16,819	22,055	20,182	20,273	18,571	16,586	17,859	22,262	30,379	29,647	28,190
ROCK	3,844	5,945	7,514	7,914	10,797	12,089	9,223	8,560	8,812	8,798	8,853	9,968	7,375	6,840	6,008	7,007
RUSK	22,019	24,264	22,978	26,320	29,937	28,979	19,540	18,876	23,819	19,089	23,419	19,373	16,804	19,326	26,254	25,687
SAUK	14,414	19,196	15,482	13,914	24,593	21,740	20,222	17,873	21,194	18,167	18,696	20,480	25,189	29,556	29,476	29,001
SAWYER	27,488	28,648	25,021	28,435	31,718	29,119	21,248	19,208	26,383	22,082	25,265	19,376	13,295	15,347	21,489	22,046
SHAWANO	24,538	28,720	23,631	21,840	23,679	23,856	23,922	26,263	34,395	39,907	42,324	39,332	39,667	44,391	43,591	41,070
SHEBOYGAN	4,123	5,313	5,551	4,123	5,894	6,113										

