



Melton Sullivan has learned more about chronic wasting disease (CWD) in the last few months than he cares to remember. His ranch, located near a wide spot in the road called Pagoda, Colo., is just a few miles from ground zero, where an outbreak has led to an intensive effort to thin the local deer and elk populations. Wildlife officials linked the source of the problem to a local domesticated elk ranch.

“When it first broke, it caught us with our pants down,” Sullivan recalls.

Like most of his ranching neighbors, Sullivan’s economic livelihood depends a great deal on fee hunting. During the last 35 years, his family has built a reputable guiding and outfitting business. His ranch, which lies at the base of the Flat Top Mountains, is in the heart of some of the best elk hunting in the world. He takes in about 40 hunters every fall.

“As our business has evolved, we’ve become much more dependent on hunting,” Sullivan says. “We’re more dependent on hunting than ever. It’s very significant to our livelihood because we’ve really moved in that direction.”

Fortunately, despite all the bad press and public fears of the disease — which is in the same family as bovine spongiform encephalopathy (BSE) — it has yet to affect his business. “We called every one of our hunters when it first happened, and explained to them the situation,” Sullivan explains. “Every one of them said they were still coming to hunt this year.”



Becoming an issue

Unfortunately, it appears that CWD is becoming a major issue for property owners across the country, especially as it moves into other regions. (It has also been found in the heavily deer-populated state of Wisconsin.) And for cattle producers who depend on the land and its resources for their living, CWD will be a top-of-mind management concern in the coming years.

CWD is a debilitating, ultimately fatal disease in deer and elk. The disease has not been shown to spread to cattle or other livestock. Infected animals are listless, lose significant weight, and eventually die in a wasted state. They drink large amounts of water and urinate frequently. The brains of animals with CWD develop microscopic-sized holes, which give the brain a sponge-like appearance.

CWD belongs to a family of diseases known as transmissible spongiform encephalopathies (TSEs). Within this family of diseases, there are three predominant variants that affect animals: scrapie, which has been identified in sheep for more than 200 years; BSE in cattle; and CWD in deer and elk. CWD was first recognized as a clinical “wasting” syndrome in 1967 in mule deer in northern Colorado.

Within the TSE family, there are also two main variants that affect humans: Creutzfeldt-Jakob disease, which occurs naturally in about one out of every one million people; and new variant Creutzfeldt-Jakob disease (nvCJD), which has been linked to the large-scale outbreak of BSE in cattle herds in Great Britain. Although the British consumed nearly 750,000 infected cattle during a 10-year period, fewer than 135 humans

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► Above: CWD is a debilitating, ultimately fatal disease in deer and elk. The disease has not been shown to spread to cattle or other livestock.

have died after contracting nvCJD.

To date, the only cases of CWD in free-ranging deer and elk in the United States have occurred in Wyoming, Colorado, Nebraska, South Dakota, New Mexico and Wisconsin. CWD also occurs in a few captive herds, and appears to be more common in areas where deer and elk congregate at man-made feed and water stations.

Even in areas where the disease is endemic, the frequency of infection is low. In Colorado and Wyoming, for instance, after sampling more than 15,000 deer and elk for more than a decade, less than 1% of elk in endemic areas have been found to be infected. Historical infection rates in deer herds vary from less than 1% to a range of from 3% to 15%.

Near Sullivan's ranch, where wildlife officials depopulated more than 1,000 deer and elk, less than 1% of the deer were infected, and none of the elk had contracted the disease.

The cause

No one is certain what causes the disease, but most scientists believe it's caused by a prion, an abnormal form of a normal protein, known as cellular prion protein. These are most commonly found in the central nervous system. The abnormal prion protein "infects" the host animal by promoting conversion of normal cellular prion protein to the abnormal form.

"It's very important to understand that chronic wasting disease is not simply BSE in deer and elk, as some might have you believe," says Michael Miller, staff veterinarian for the Colorado Division of Wildlife. "Although these maladies are in the same disease family, we know that the strain of prion that appears to cause CWD is quite different from the strain that causes BSE, and also appears to be somewhat different from strains of scrapie that naturally infect domestic



► The latest outbreak of CWD in the United States has occurred in the free-ranging deer population in Wisconsin.

sheep and goats here in the U.S. and overseas."

The incubation period in exposed deer and elk averages somewhere in the range of 20-30 months with natural infections, but may be somewhat shorter or considerably longer (perhaps 60 months or more) in individual cases.

"Although we don't know precisely how CWD is transmitted among deer and elk, the agent is probably shed in feces, saliva and perhaps urine," Miller explains. "In addition, contaminated environments likely play a role in epidemics and the recurrence of disease in some situations. In some cases, the CWD agent apparently persisted in heavily contaminated environments for years after all infected deer or elk had been removed."

Scientists, however, are unsure how the disease seemingly leapt from one area to another, as it did recently into Wisconsin.

"It's possible that it moved on an animal that was imported into Wisconsin from another state," says Sarah Hurley, deputy administrator for Wisconsin Land Division, Department of Natural Resources. "It's possible that these deer are ranging in

part, over land on which sheep with scrapie disease were pastured at one time. It's possible that someone went hunting out west and brought back a mule deer and discarded the skeleton and hide somewhere out in that part of the world. You could just go on and on and speculate, but we don't really know."

Hurley speculates that CWD may arise naturally in areas where population densities have exceeded desirable carrying capacities. In other words, the disease may be nature's way of culling deer and elk populations.

"We do have a lot of indication that it's density dependent," she explains. "It doesn't matter if it's nose-to-nose contact or contaminated feed or spread by sexual contact, or by sneezing or urine and feces, or carried by fleas from one animal to another — whatever it might be. We don't need to know exactly how it happens if we understand at least some of the dynamics and we can reduce the density, regardless of what exactly is happening in the moment that the disease goes from one to another. We've been able to intervene there and reduce the risk of transmission. We don't have to understand everything about it to be able to begin to

manage it. We can fine-tune the management if we know more about how it's spread, but we aren't completely helpless or powerless in being able to begin to work on the disease, just because we don't know everything there is to know."

Managing the disease may be Wisconsin's biggest challenge in the coming months. A controversial effort is already underway to depopulate a 600-square-mile section of the state, in hopes of holding the disease in check, and to prevent it from spreading into other areas. As many as 100,000 deer could be harvested as a result.

Like Sullivan, Wisconsin cattle producers will soon see the effects of CWD first hand — and the picture isn't pretty.

"I don't know how it will ultimately affect us," Sullivan says. "But I do suspect that we may have had this disease for a long time — that it's not something that just happened more recently. I think that science has just finally spun up to where we are able to finally recognize it, and do something about it."

Hedging his bets, Sullivan is doing all he can to learn about the disease, how it spreads, and how he as a land manager can improve his ability to control it. He advises that all landowners in "hot spot" areas conduct monitoring on their places, and attend workshops if they're available. Recently, he learned how to extract brain stems from deer and elk carcasses and submit them to wildlife officials for evaluation. This way, he can assure his hunters that the meat they take home is safe to eat.

"Our biggest challenge is perception," he adds. "We don't need to scare the hell out of people about this disease. There's no evidence it spreads to people. There's no evidence it spreads to cows. We just need to use reason and sound science, and manage it the best way we can."

