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Wild Meat Raises Lead Exposure

Tests by the CDC show that eating venison and other game can raise the amounts of lead in human bodies by 50 percent

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By Scott Streater, Environmental Health News on September 28, 2009



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To Dr. William Cornatzer, it was an unforgettable image, one that troubled him deeply.

An avid hunter, Cornatzer was listening to a presentation on the lead poisoning of California condors when an x-ray of a mule deer flashed on an overhead screen. The deer had been shot in the chest with a high-powered rifle. Cornatzer was shocked that the deer's entire carcass was riddled with dozens of tiny lead-shot fragments.

“My first thought had nothing to do with California condors; it had to do with what I had been doing as a hunter myself, and what I had been feeding our kids,” said Cornatzer, a clinical professor of medicine at the University of North Dakota School of Medicine & Health Sciences.

“I knew good and well after seeing that image that I had been eating a lot of lead fragments over the years,” he said.

That realization led Cornatzer and a radiologist last year to X-ray 100 packages of venison that had been donated by a sportsmen group to a food bank. About 60 percent of the packages contained lead-shot fragments, even though it's common practice among hunters to remove meat around the wound.

The discovery prompted North Dakota to warn pregnant women and children 6 and under not to eat venison killed with ammunition containing lead.

It also sparked a flurry of new research that raises questions about the safety of eating wild game, as well as a renewed debate about eliminating lead ammunition.

Earlier this year, the National Park Service announced a controversial plan to ban lead ammunition and fishing tackle in the parks, which Acting Director Dan Wenk said “will benefit humans, wildlife, and ecosystems inside and outside park

boundaries.”

Cheap, durable and readily available, lead has been used in weapons and other products since the Romans first mined it more than 2,500 years ago. Bullets have contained lead, which upon impact mushrooms to create a larger wound, since the 14th century.

But lead is a dangerous neurotoxin, particularly for children and fetuses. Low levels can harm children’s developing brains, causing learning disabilities and reduced IQs. High levels can trigger severe neurological problems.

Sporting groups are opposed to any restrictions on lead-based ammunition, arguing that there’s no clear evidence that it is dangerous when used to hunt deer and other animals.

“The use of traditional ammunition does not pose a health risk to human beings,” said Ted Novin, director of public affairs for the National Shooting Sports Foundation, a trade association for the firearms, ammunition and hunting industries.

Novin added that “there has never been a documented case of lead poisoning among humans who have eaten game harvested with traditional ammunition.”

New research, however, has shown that eating venison and other game can substantially raise the amounts of lead in human bodies. The findings have prompted some experts to recommend bans on lead ammunition.

“We want to avoid having people exposed to lead to the extent that it’s feasible and practical, and it’s clear that one of the key ways to minimize exposure is to use alternatives to lead ammunition,” said Dr. Michael Kosnett, a medical toxicologist at the University of Colorado at Denver School of Medicine. “You’re putting food on the table to nourish your family. Why not nourish them with healthy food if that’s a possible alternative?”

The Centers for Disease Control and Prevention tested 736 people, mostly adults, in six North Dakota cities and found that those who ate wild game had 50 percent more lead in their blood than those who did not eat it. The lead exposure was highest among people who consumed not only venison, but also birds and other game,

according to the study published last month in the journal *Environmental Research*.

Those who ate wild game meat had average lead levels of 1.27 micrograms per deciliter, compared with 0.84 for those who ate no game. Most said they either hunted the animals themselves or obtained the meat from friends or family members.

“What was most troubling is that as wild game consumption increases, the blood-lead levels increase,” said study co-author Mary Jean Brown, chief of the CDC’s lead poisoning prevention branch. “The strong recommendation we would make is that pregnant women should not consume this meat.”

The CDC is planning a second round of testing this year involving hunters in Wisconsin, Brown said.

The National Shooting Sports Foundation argues that everyone in the North Dakota study had blood-lead levels below the CDC’s health guideline of 10 micrograms per deciliter.

However, recent research has reported that children’s mental abilities are reduced by lead at levels far below the CDC guideline. Brown and others say there is no threshold below which lead does not cause harm, particularly with children.

As a result, the CDC recommends that “all nonessential uses of lead should be eliminated,” according to a 2005 statement. Less than 2 percent of children in the United States have lead levels that exceed the amount that the CDC considers safe. Most exposure comes from old, deteriorating lead-based paint, which was banned in 1978.

Another study, published in April, showed that eating venison containing lead-shot fragments can quickly raise blood-lead levels.

Researchers at Washington State University and Boise State University fed lead-tainted venison to four pigs and lead-free venison to a separate control group of pigs. The pigs that ate the venison containing lead fragments reached a lead level of 3.8 micrograms per deciliter after only two days—more than three times higher than the highest level in the control group of pigs, according to the study, which was

sponsored by The Peregrine Fund, a group that advocates for the removal of lead shot to protect condors.

“At risk in the U.S. are some ten million hunters, their families, and low-income beneficiaries of venison donation,” the report says. One program, Sportsmen Against Hunger, donates the meat to low-income people.

The National Park Service posted the results of The Peregrine Fund study on its Web site, noting “that while the results are preliminary and much further study needs to be done to better assess risks to humans, it appears that if lead bullets are used, odds are high that you will ingest lead particles in ground meat.”

Mostly to protect wildlife, the park service plans to end the use of lead bullets and fishing gear in all parks. A public comment period will be held next year, said Jody Lyle, an agency spokeswoman.

“Our goal is to eliminate the use of lead ammunition and lead fishing tackle in parks by the end of 2010,” Wenk said when announcing the proposal in March. “We want to take a leadership role in removing lead from the environment.”

Although hunting is prohibited in most national parks, it is allowed on some park properties. Rangers also would have to stop using lead ammunition when culling herds or killing wounded or sick animals.

Hunting groups say any restriction on traditional ammunition will price many people out of hunting, because the alternatives--steel, copper or tungsten shells--can cost as much as six times more.

This is not the first time the federal government has considered restrictions on lead ammunition. The United States in 1991 phased out lead-shot for hunting waterfowl, mostly because bald eagles that prey on them were being poisoned.

Twenty-nine other countries have adopted voluntary or legislative restrictions. Some of the most aggressive regulations have been adopted in Europe, where lead-shot poisoning has killed white-tailed eagles and endangered Spanish Imperial eagles.

While there is no European Union standard for lead ammunition, Denmark was the first to ban lead shot for waterfowl in wetlands in 1985, followed throughout the 1990s by Norway, the Netherlands, Finland, England, Spain and Sweden. France did so in 2006. Denmark, followed by Norway and the Netherlands, extended the lead-shot ban to all hunted species in 2000.

California and Arizona also have taken action, implementing mandatory and voluntary bans, respectively, on lead bullets and shot in an effort to protect condors.

Pressure to ban lead-based ammunition in the U.S. intensified last year with the release of a report on threats to wildlife commissioned by The Wilderness Society and the American Fisheries Society.

The report said that lead fishing sinkers have poisoned brown pelicans, mute swans and Canada geese. Even more dangerous is lead shot in gut piles left behind by hunters and consumed by scavengers, including endangered condors, said Barnett Rattner, a wildlife toxicologist with the U.S. Geological Survey and a co-author of the review.

John H. Schulz, a resource scientist at the Missouri Department of Conservation, has calculated that as many as 15 million mourning doves are killed in North America each year from lead poisoning, mostly from eating spent lead shot that looks like the weed seed they depend on for food. That's almost as many as the estimated 20 million mourning doves legally shot and killed each year by hunters.

But it's the science pointing to possible human health impacts that has Schulz convinced that there's more than enough scientific evidence to begin a phase-out of lead ammunition.

"Let's not spend any more time studying whether the problem is significant. It is real. It is serious. It is significant," Schulz said. "Now, how are we going to address it in a thoughtful and sensitive manner so no affected stakeholders are disenfranchised?"

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