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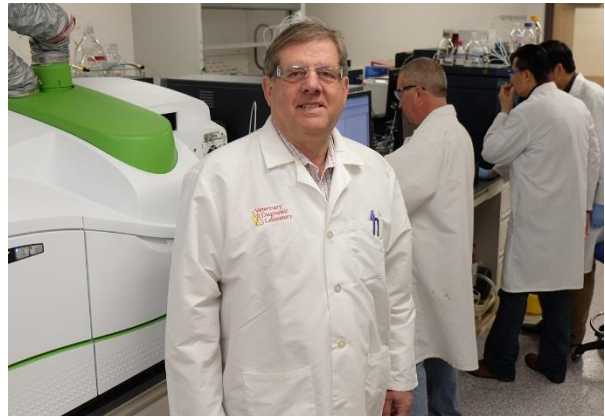
Source: Dr. Steve Ensley, sensley01@vet.k-state.edu, 785-532-4287

News release prepared by: Joe Montgomery, jmontgom@vet.k-state.edu, 785-532-4193

Kansas State University toxicologist warns not to forget about lead exposure

A recent case of a bald eagle found with symptoms of lead exposure has refocused the sites of Kansas State University animal health experts on an age-old problem.

Dr. Steve Ensley, a professor in the College of Veterinary Medicine, serves as a toxicologist for the Kansas State Veterinary Diagnostic Laboratory. He oversaw the diagnosis of blood samples from a locally found bald eagle earlier this year that was treated by Kansas State University veterinarians in the Veterinary Health Center and later released back into the wild in late March.



Dr. Steve Ensley

“We’ve got a piece of equipment we can do mineral analysis on allows us to analyze up to 26 minerals at a time,” Dr. Ensley said. “We can look at a whole blood sample and see where the lead would be and do that analysis within about an hour and be able to tell what the lead concentration is.”

He said in the case of the bald eagle, there were three different blood lead samples that were analyzed over a period of time.

“They were giving the eagle an antidote to trying to eliminate the lead from the body, and we were going to measure how fast it decreased,” Dr. Ensley said. “The analytical method is similar for all species – humans and animals – the instrument and instrumentation we have is fairly unique.”

Dr. Ensley said that eagles aren’t the only animals susceptible to lead poisoning.

“There was a significant exposure in Iowa in 2016,” Dr. Ensley said. “A [cattle] producer had a 75-pound tractor battery that got ground up and was inadvertently fed to 100 animals in a feedlot.”

He estimated approximately 100 head of cattle were exposed to lead and another 20 cow-calf pairs that were also exposed in the incident.

“That was a large death loss --- a large number of animals that were affected at one time,” Dr. Ensley noted somberly.

Dr. Ensley mentioned the problem with lead has notable been in the media due to exposure in humans.

“There have been a lot of problems in Flint, Michigan, with lead,” Dr. Ensley said. “Lead is a problem that’s not going to go away in the foreseeable future because we don’t have a good way to make sure it’s not in the environment.”

One of the issues with lead is from ingesting it orally.

“In the short term it goes into the liver, the kidneys and some in the tissue, but it’s very easily, quickly metabolized out of those organs,” Dr. Ensley said. “The place it goes to that makes it the biggest issue is in the bone, because calcium is a divalent cation like lead, so lead will be substituted for calcium in the bone. Once lead is in the bone, it can take a long time to be moved out of the bone to be excreted in the animal.”

Dr. Ensley said lead in body tissue normally takes about 30 days to be excreted, but when lead moves into the bone, it can take six months to a year, depending on the dose.

“We usually measure blood lead in parts per billion, and clinical signs in all species will usually start around 300 to 350 parts per billion,” Dr. Ensley said. “In the eagle, the highest concentration we had was around 1,000 parts per billion. In one of the last samples, we had --- when it was not showing clinical signs -- was right around 200 parts per billion, so that’s a significant decrease due to the treatment that was initiated. It demonstrates a good response to the therapy, and the reason why the animal wasn’t clinically affected anymore.”

Dr. Ensley teaches toxicology to the sophomore veterinary students, and said his class recently covered the subject of lead and other heavy metals.

“I always tell them that if you see an animal with any kind of nervous signs, lead should be one of the things you think about,” Dr. Ensley said. “If we can get one ml of whole blood -- it’s an inexpensive test we can do here at Kansas State and tell you whether it is or isn’t a problem. When I teach veterinary students about it, I say if you have a large animal ruminant, and they’re showing CMS signs, the potential for lead toxicity should be high on your differential list. Don’t forget about it because you don’t think it happens very often. It’s more common than you would believe.”

For information on blood lead testing, visit the [Kansas State Veterinary Diagnostic Laboratory website](#) at or contact KSVDL Client Care at 866-512-5650 or clientcare@vet.k-state.edu.

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Read more: [Bald eagle flies again in Kansas thanks to veterinary intervention after lead poisoning](#)