



Acorns, Small but Potentially Deadly

PHOTOS BY SHAUNA ROSE HERMEL

Cattle may start eating acorns due to limited forage, and that could lead to potentially deadly acorn poisoning.

by *Kasey Miller*

The weather has not been kind to ranchers and farmers this year, from record-setting droughts to intense flooding and hurricanes. Because of these weather changes, forage availability has been severely affected. With pastures low on forage, cattle may start eating acorns, which can lead to acorn poisoning.

What is acorn poisoning?

Acorn poisoning, or oak toxicity, occurs when too many acorns or buds are ingested, and the gallotannin in oak foliage creates gastrointestinal and kidney problems.

Tim Evans, a veterinary toxicologist at the University of Missouri–Columbia, says acorns do have nutritional value, but when cattle eat more than 50% of their diet in

immature leaves and buds in the spring and acorns in the fall because no other forage is available, that's when the problem starts. As the famous toxicologist Paracelsus said, "The dose makes the poison."

"Oaks have the potential to provide valuable nutrition, but animals shouldn't be left to forage entirely on oaks or noxious weeds like pigweed, which can cause a similar syndrome, and not have other forages and/or concentrate in their ration," he says.

Floron Faries, veterinarian at Texas AgriLife Extension Service, says the immature green acorns and immature oak leaves are the problem, as they contain the highest levels of toxins. He says that acorn poisoning occurs most often in September, when acorns are green, and in late winter

and early spring, when the leaves are immature and about a third of their normal size. The amount of toxins depends upon the species of oak tree.

Acorn poisoning is generally not a whole-herd problem, Faries says. A few cows like the taste of the green acorns and look for them up limbs. Low quantities of forage can also drive cattle to eat acorns. While it may not be a herd-wide problem, acorn poisoning can potentially be deadly.

What are the signs?

Gallotannin in the acorn is metabolized in the rumen into tannic acid and gallic acid, explains Sam Barringer, Extension veterinarian at West Virginia

University. The tannic acid causes ulceration in the mouth, esophagus and gastrointestinal tract, and is especially toxic to the renal tubules.

The first symptom of acorn poisoning is blood-tinged diarrhea, which producers often attribute to worms, Faries says. The gallotannins irritate the gastrointestinal tract, so cattle will show abdominal discomfort, appear humpbacked or take short uncomfortable strides while walking. The kidneys may also be inflamed.

If producers don't catch these signs, he warns, the cattle may progress to fast weight loss, though the cattle are generally thin to begin with if they are eating acorns, and difficulty in urination and defecation. The cattle will start looking gaunt; their flanks will pull up, their eyes will appear sunken, and because of dehydration the skin on their neck will stay folded after pinching it between a thumb and forefinger.

The subacute or chronic signs, Faries says, involve constipation; firm, black feces that look similar to that of a horse; and intense weakness.

Evans adds that ascites, or fluid in the abdomen, can also occur, along with subcutaneous edema or swelling.

Barringer notes that fast-growing calves on heavy-milking dams are usually the first to show signs because the tannins in oak concentrate in milk.

Acorn calf syndrome

Acorn calf syndrome is a different form of oak toxicity. According to John Maas, veterinarian at the University of California–Davis, "acorn calves" are malformed calves born to cows that have ingested large quantities of acorns during the second trimester of pregnancy, which is months 3-7. The cause is the combination of poor nutrition in addition to acorn exposure. The

calves have short legs, abnormal hooves, and misshapen heads. He reports that they look like dwarves most of the time.

Tam Garland, veterinarian at the Texas Veterinary Medical Diagnostic Laboratory (TVMDL), said that she has not seen acorn calf syndrome in Texas, because some cases of acorn poisoning in pregnant cows result in death.

What are possible treatments?

Unfortunately, there is no antidote for the oak toxin. If the early signs are noticed soon enough, Faries says, cattle supplemented with protein and good-quality hay should recover.

There are a few care options for cattle that show more progressed symptoms. Barringer suggests fluid and electrolyte replacement to keep kidneys operating. He says broad-spectrum antibiotics fight off secondary infections from the ulcers, but avoid gentamicin or other drugs that are metabolized by the kidney. He also suggests using mineral oil to act as a laxative, but little or no toxin is absorbed through it, so multiple doses are ineffective.

Robert Larson, veterinarian at Kansas State University (K-State) provides a recipe from Bob Miller, MU veterinarian, that Larson recommends producers use after the cattle are removed from the source of acorns:

- ▶ 1,040 pounds (lb.) of cottonseed meal (or available protein)
- ▶ 600 lb. of alfalfa meal
- ▶ 200 lb. of calcium hydroxide, make sure it is very fine because it is not palatable
- ▶ 160 lb. of molasses, to increase palatability

Feed 4 pounds a day to adult cattle.

The calcium hydroxide counteracts some of the tannin toxins, Larson says.

Garland adds that calcium hydroxide must be ingested in feed to work. It will not work as a drench.

There is an aggressive form of treatment called a rumenotomy, which empties the rumen, Larson says. However, the prognosis is still not very good for the procedure. The animal may survive, but its performance will suffer long-term consequences.

Faries notes there are “nutritional drugs” that can be administered intravenously by a veterinarian to treat the gastritis and the damage to kidneys and liver. But if there’s too much damage, he warns, the drugs won’t do much.

In all cases, Garland says, prevention is the best treatment.

Larson urges, “It is important for producers to be aware of the disease.” Look for signs of straining early on, and get more calories into the cattle so that they don’t eat the acorns.

Faries emphasizes that producers should provide protein supplements and good-quality hay for two reasons: 1) Well-fed cattle are more resistant to the toxins, and 2) they are less likely to eat the green acorns if they have enough forage. He recommends fencing off acorn thickets during immature growth periods so cattle can’t even access the risk.

The concern is nationwide; all oak trees produce tannins. Larson says that live oak and Mohr oak have been found with lower levels of tannins, but if cattle ingest enough, it is still a risk.

Garland says that in Texas, there is a

slimmer chance this year for acorn poisoning because the drought has caused the trees to produce less. However, climate also affects how much forage is available.

Because of the variability in oak trees nationwide, Evans suggests producers contact their local veterinarian or extension agents about their local oaks. However, he says, the best way to prevent acorn poisoning is to provide cattle with enough alternative forage and, if necessary, concentrate.

Awareness of the symptoms and quick action are keys to having cattle survive acorn poisoning.

