



Copper Toxicity in Livestock



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Copper toxicosis occurs following the ingestion and accumulation of excessive amounts of copper in the liver. All species are susceptible to developing copper toxicity, but sheep are most commonly affected. Most species absorb copper through the small intestine. Sheep, however, absorb copper through the small and large intestine. Sheep also store more copper in the liver than other species.

Sheep develop copper toxicity in a variety of ways. They not only develop copper toxicosis when copper levels are too high but also if molybdenum levels are too low. Molybdenum decreases the amount of copper that is absorbed in the intestine and stored in the liver by increasing copper excretion. Molybdenum is not added to commercial feeds because the U.S. Food and Drug Administration does not consider it safe as a livestock feed ingredient. Molybdenum is found in the soil and is taken up by plants, so when sheep consume molybdenum-containing plants at proper levels, they are less likely to develop copper toxicity. The ratio of copper to molybdenum in the total diet of sheep should be 6-to-1 and never more than 10-to-1.

Copper toxicity often occurs when sheep are fed rations intended for cattle, swine or poultry. Copper is added to cattle rations because cattle are more susceptible to copper deficiency than copper toxicity. Poultry and swine rations often include copper-containing growth enhancers. Other causes of copper toxicity include:

- Grazing on forages deficient in molybdenum.
- Consuming plants contaminated by copper-containing pesticides.
- Consuming copper products that are used for algae and snail control.
- Use of copper-containing anthelmintics (dewormers).
- Use of copper-containing foot baths to treat foot rot.
- Errors in feed formulations.
- Grazing on pastures fertilized with manure from poultry or swine facilities that contain copper-containing growth enhancers from the poultry or swine rations consumed by those animals.
- Copper consumption in animals with liver damage.

Clinical signs of copper toxicosis occur when the liver releases large amounts of copper into the blood, usually following a stressful event.

Common clinical signs include:

- Fever
- Dark red or brown urine
- Diarrhea
- Weakness
- Jaundice
- Difficulty breathing

A veterinarian should be contacted immediately if signs of copper toxicosis are observed. Un-

fortunately, treatment is rarely successful because the onset of clinical signs is preceded by severe damage to the liver, kidneys and intestines.

The best way to treat copper toxicosis is through prevention. Try to avoid stress or strenuous exercise in animals that may have accumulated copper. Molybdenum salts may be added to the diet to slowly decrease copper levels in the liver.

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July 2017

