



Copper Oxide Wire Particles: Keeping It Safe

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Recent studies have shown that copper oxide wire particles exert an anthelmintic effect in the abomasum and that *Haemonchus contortus* is particularly susceptible to this treatment. Copasure® Bolus For Sheep and Goats is now commercially available in 2 and 4 gram bolus sizes.

The main goal of this month's Timely Topic entry is to remind the reader that copper treatment can be beneficial, but accidental over-supplementation of copper from any source is potentially dangerous. Controversy exists regarding how much dietary copper small ruminants need, and this determination is made even more complicated by the interaction of dietary copper with other minerals in the gut, such as molybdenum, sulfur and iron. Under optimal circumstances, a balance exists between copper accumulation and copper excretion in the liver. Sheep are much less efficient than goats at excreting excess copper from their liver, so they are less tolerant of excessive copper intake.

Copper oxide wire particles (COWP) can be successfully integrated into *Haemonchus contortus* (barberpole worm) management strategies on sheep and goat farms, particularly when producers are armed with knowledge on how to use it safely

Toxicity can occur when the liver becomes heavily saturated with copper. A stress factor such as shearing, handling, transport, bad weather, disease, or transport causes unbound (free) copper to be suddenly released from the liver into circulation. Once in the bloodstream, copper damages the red blood cells. Consequences include anemia, yellow discoloration of the eyes, and red colored urine.



COWPS resized for sheep & goats Image by S. Schoenian

Further, free copper in circulation damages the kidneys and the liver. It is difficult to remedy a herd or flock wide copper toxicity problem once it starts. Losses can continue for months even after copper supplementation stops. I have great respect for the devastating consequences that copper toxicity can cause on sheep and goat farms. None of the cases I have seen have stemmed specifically from copper oxide wire particle use to date, thankfully.

So, how can the benefit of copper oxide wire particle administration be obtained, while at the same time, minimizing potential negative consequences?

- 1) Work with your veterinarian to periodically assess the copper status of your herd or flock. Blood copper levels can be misleading, as they can be "normal" despite having dangerously high or low tissue copper levels. The best way to



Images by S. Schoenian

assess copper status is to measure copper and other minerals in liver and kidney samples. Collect liver and kidney samples from healthy animals that die suddenly or from animals while they are being processed for meat.

Frozen or chilled samples can be sent Michigan State University Diagnostic Center for Population and Animal Health (DCPAH). Request the trace nutrient (mineral) panel. If tissue copper levels are reported as above the normal reference range, then treatment with copper oxide wire particles is not recommended. However, if copper levels are in the normal or low range, especially if molybdenum levels are in the normal to high range, then use of copper oxide wire particles is a viable option.

- 2) Use the Copasure® product rather than other brands of copper oxide wire particles. The 2 gram Copasure® bolus can be split into two, 1 gram treatments, or into four, 0.5 gram treatments.
- 3) Do not use copper sulfate for worm control. Copper sulfate is much less effective as an anthelmintic compared to Copasure®. Also, copper in this readily available form is much more likely to result in toxicity.
- 4) Use the smallest dose of Copasure® needed to achieve the desired effect. More is definitely not better! Oral doses of 0.5 to 1 gram per head can be used in youngsters, and 2 to 4 grams per head can be used in adults. To err on the side of safety, use the lower doses in sheep and small breed goats. Minimize the number of treatments given to the same sheep or goat within a grazing season. If the higher doses are used, no more than 2 treatments should be given in any one grazing season, and at least 6 weeks should elapse between treatments.

Selective use of Copasure® will help minimize complications. Reserve copper oxide wire particle treatment for sheep and goats that are showing signs of disease related to haemonchosis, such as suboptimal body condition and high (anemic) FAMACHA© scores.



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