

American Consortium for Small Ruminant Parasite Control

Best Management Practices for Internal Parasite Control in Small Ruminants

COPPER OXIDE WIRE PARTICLES

INTRODUCTION

Internal parasites pose a difficult challenge for many small ruminant producers. Parasites are numerous and adaptable. Some traditional control methods may fail due to parasites having developed resistance to the anthelmintics (dewormers). Organic producers usually face even greater difficulties because they are more limited in their control options.

A multi-pronged approach to managing internal parasites is now recommended. This approach includes attention to nutrition, good pasture management, animal selection, and good sanitation. But even with these important measures, some animals may still need treatment.

One treatment that may be effective is copper oxide wire particles (COWP). These tiny metal particles are a slow release form of copper that can be administered in a gel cap. Research indicates that COWP are effective against adult barber pole worms (*Haemonchus contortus*).

GETTING STARTED

- A good way to screen for *H. contortus* levels is to use the FAMACHA© method for assessing anemia.
- As with dewormers, COWP should only be given to animals that require treatment based on FAMACHA© and/or the Five Point Check©. The whole flock or herd should not be treated with COWP.
- Organic certifying agencies may accept COWP as part of an integrated parasite management program. However, organic producers should check with their certifier prior to use.



Gel cap containing COWP

HOW TO USE

- Copper oxide wire particles are sold as copper supplements for cattle (12.5 and 25 g boluses) and goats (2 and 4 g boluses; g = gram).
- Purchasing cattle boluses and repackaging them into smaller gelatin capsules is usually the most economical way to give COWP, especially if you have larger numbers of animals. You can weigh the wire particles to determine how much to put into the capsules.
- Gel caps can be purchased online or from pharmacies. If you will be using a calf balling gun, a #12 capsule fits, though it is much bigger than needed for the dose. A small bolus will work with pet balling/pilling guns.



DOSAGE

- To prevent possible copper toxicity, especially in sheep, the lowest effective dose of COWP should be used.
- Doses that have proven to be effective are 0.5 to 1.0 g for lambs and kids and 1 to 2 g for mature animals. Dosage is based on age not weight.
- The 2 g goat boluses are okay for deworming adults, but are too much for young animals. The 4 g boluses are too much for deworming purposes.
- Research indicates that the low dosages of COWP are probably safe to repeat at 6 week intervals over a 6-month grazing season. However, multiple repeated dosing may be ineffective.



damage plastic guns and pill poppers after multiple uses, so it is important to have extras on hand if dosing many animals.

- Remember to be gentle and patient. Too much force may injure the animal. Your first efforts with COWP boluses may be awkward and frustrating but will improve with practice.
- Keep the animal's nose level to its eyes while placing the end of the balling gun or pill popper over the back of the tongue. When you feel the end of the gun go over the "bump" at the back of the tongue, eject the bolus.

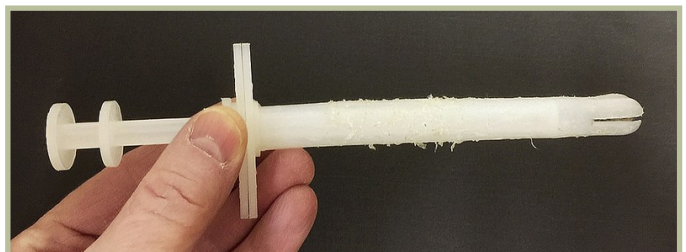


WHAT RESULTS CAN I EXPECT?

ADMINISTERING COWP

- Use a plastic or metal balling gun to administer COWP. Balling guns run the spectrum from disposable pet balling/pilling guns to durable metal calf balling guns, with soft plastic ends.
- Use an appropriately sized "gun" for the size of your boluses to avoid the bolus falling out before dosing. A bit of peanut butter can help keep it in place. An advantage of large capsules is that they are easy to spot if spit out.
- You should never put your fingers in the back of the animal's mouth. Molars are strong and can administer a very painful bite. They can also

- Similar to most dewormers, the deworming effect of COWP is immediate, but short-lived. Fecal egg counts might climb again after 3 to 4 weeks, even sooner if the animals are carrying a large load of immature larvae. FAMACHA® can be used to monitor animals for additional need for treatment or management change.



- Similar results can be expected from the different commercial sources of COWP.
- While there is scientific evidence that COWP reduce barber pole worm infections in small ruminants, effectiveness can be affected by several factors, including the ratio of barber pole worms to other parasite species and digestive function and gut pH. Diarrhea may reduce the effectiveness of COWP treatment.
- Because of variability in effectiveness, COWP should not be the only treatment for animals critically ill with *H. contortus* (e.g., FAMACHA® 4 or 5). One or more dewormers should be given at the same time. Supportive therapy may be necessary for some clinically parasitized animals.

PRECAUTIONS

- Copper may accumulate to unsafe levels in the liver, especially in sheep. Liver samples of animals that die or are harvested for meat can be analyzed for safe copper levels (20-100 mg/kg wet for sheep, 20-150 mg/kg wet for goats. This information can be used to see if COWP can be used safely in the flock or herd.
- Checking livers is the most definitive way to check the copper status of your animals. However, analyzing your feed (forages, concentrates, mineral supplements) for copper and copper antagonists such as molybdenum, sulfur, iron and zinc helps to evaluate risk of copper toxicity and identify problems earlier.
- Copper requirements recommended by the National Research Council range from 5 to 8 mg/kg of dry matter for sheep using factorial equations and 15 (lactating does) to 25 (growing kids) mg/kg DM for goats. Slightly higher concentrations may be cautiously warranted if concentrations of minerals antagonistic to copper in the diet are large enough to interfere with copper absorption. Conversely lower concentrations of antagonist minerals can result in toxicity at lower dietary levels of copper. The ratio of copper to molybdenum should not exceed 10:1 to prevent copper toxicity.



ABOUT COPPER TOXICITY

Excess copper is stored in the liver. Sheep are less efficient at getting rid of excess copper than other ruminants, making them less tolerant of excess copper and more susceptible to copper toxicity. In simplistic terms, when the liver is “full”, and/or if stress factors impair liver function, copper is dumped into the bloodstream, causing red blood cells to die, leading to anemia, weakness, and sudden death. The urine may appear red and the animal, jaundiced, as noted in mucus membranes and skin tone. Treatment is difficult and if one animal exhibits copper toxicity, other cases in the herd or flock are likely. However, compared to copper sulfate, COWP is less likely to cause copper toxicity.

Once you start using COWP for worm control, you should periodically check livers to see if copper levels are still at safe levels.



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