

Wild & Woolly



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Understanding Extra Label Drug Use

By Susan Schoenian

Sheep and goats are minor species. As a result, few drugs are approved by the Food & Drug Administration (FDA) for their use, especially in goats. Extra-label drug use is required to treat many disease conditions in sheep and goats.

Extra-label drug use (ELDU) is use of any drug in any manner that is not specified on the label. This includes using a drug for a different species or class, treating for a different disease, giving a different dosage, using a different route of administration, varying the interval and duration of treatment, and observing a different withdrawal period.



Only licensed veterinarians have the legal right to use or prescribe extra-label drugs.

Extra-label is the proper term. Off-label is not a legal term. Producers do not have the same legal right, even if the drug can be purchased over-the-counter or via the internet.

In order for a veterinarian to use or prescribe a drug extra-label, there must be a valid veterinarian-client-patient relationship (VCPR). A VCPR is one in which the veterinarian has assumed responsibility for the health and treatment of the animal(s), has sufficient knowledge of the animal(s) being treated, and is available for follow-up. "Timely" visits to the farm are part of a valid VCPR.

In addition to a VCPR, there are other conditions that must be met in order for a veterinarian to use or prescribe a drug extra-label:

1. There must be no animal drug approved for the intended use;
2. The approved animal drug for the intended use does not contain the necessary active ingredient;
3. There is an approved animal drug for the intended use, but it is not available in the appropriate form;
4. There is an approved animal drug for the intended use, but it is not available in the required concentration;
5. The approved drug is clinically ineffective.

Copper Oxide Wire Particles As A Deworming Agent

By Susan Schoenian



Copper oxide wire particles (COWPs) are tiny rods of copper oxide. Copper oxide is a slow release form of copper. It is not as readily absorbed as copper sulfate, so it is less likely to reach toxic levels in the liver. Copper sulfate is an old-time dewormer that has caused copper toxicity in sheep.

When animals ingest copper oxide, it passes through the rumen and lodges in the abomasum or true stomach, where adult barber pole (*Haemonchus contortus*) worms reside. Copper oxide appears to cause damage (likely death) to the adult worms. It does not affect immature worms, also blood feeders, or other species of worms.

Sheep and goats have a dietary requirement for copper. Copper metabolism is complicated, with several antagonists, especially molybdenum. Because of the risk of copper toxicity, especially to sheep, it is important to know the copper status of animals before using COWPs as a deworming agent. The best way to do this is to measure copper and other minerals in kidney or liver samples.

Samples can be collected from healthy animals that die suddenly or from animals that are being harvested for meat. Be sure to request the trace mineral (nutrient) panel from your veterinarian or diagnostic lab. Blood copper levels can be misleading. Nor do copper levels in feeds and forage tell the whole story.

If tissue copper levels are above normal ranges, it is not recommended that COWPs be used for deworming. If copper levels are in the normal to low range (and molybdenum levels are in the normal to high

range), it should be safe to use COWPs for deworming. However, always use the lowest dose possible to achieve a deworming effect. More is not better!

Dosage is based on age not weight. Doses that have proven effective are 0.5 to 1 g for lambs/kids and 1 to 2 g for ewes/does. You should selectively treat, only giving COWPs to animals with FAMACHA© scores of 3, 4, or 5. You should minimize the number of treatments given to the same animal. Remember, excess copper can accumulate in the liver until it reaches a toxic level.

Copper oxide wire particles are available as a copper supplement for cattle (12.5 and 25 g) and goats (2 and 4 g). Most of the research has been done with the Copasure® brand. The boluses can be repackaged into smaller doses for deworming sheep and goats. Gel caps can be purchased from pharmacies and even from Amazon.

It can be challenging to administer the gel caps containing COWPs to sheep and goats. Use a bolus or balling gun. It helps to use something sticky to hold the gel cap in the gun.

Members of the American Consortium for Small Ruminant Parasite Control (ACSRPC) have done considerable research evaluating COWPs as a dewormer for sheep and goats. In a recent study by USDA-ARS, a synergistic effect was achieved when COWPs were combined with a commercial dewormer, (Valbazen ©) with a high level of resistance.

To learn more about copper oxide wire particles as a treatment for barber pole worms, go to <https://www.wormx.info/copper-oxide-wire-particles>. Be sure to consult your veterinarian on all matters pertaining to internal parasite control.

This article was originally published in the *Delmarva Farmer and Lancaster Farming*.



Research Gleanings

- Researchers at the Gluck Equine Research Center at the University of Kentucky have developed smartphone technology for doing fecal egg counts. Zoetis has licensed the technology and is focusing on small animals, while UK researchers continue to develop the technology for equine. According to one of the UK researchers, the technology should work for ruminant roundworms.
- After two production cycles, Argentine researchers were able to improve the clinical efficacy of ivermectin by replacing resistant worms (*Cooperia spp.*) with susceptible worms, without causing clinical signs in parasite-free beef heifers.
- Greek researchers concluded that gastrointestinal parasitism, and particularly *Teladorsagia* infection might lead to clinical mastitis in lactating ewes.
- Researchers are hoping to use sheep as a genetically-modified large animal model to study Alzheimer's disease. There are physiological similarities between human and sheep brains, especially the aged sheep brain.
- Calm ewes wean 10 to 19 percent more lambs than nervous ewes, according to a Western Australian experiment in which ewes were divergently selected for calm and nervous temperament.
- Previous research showed that goats do not "self-medicate" by selecting tanniferous forages when they are naturally infected with internal parasites. Nor did a higher infection of *Haemonchus contortus* cause goats to consume more tannin-rich forages. However, the goats did show "nutritional wisdom" with their diet selection, which may help to mitigate the effects of parasitism.
- Colombian researchers determined that moxidectin given at ~135 day of pregnancy or 48 hours after lambing prevented the periparturient egg rise in ewes. Lambs of the treated ewes also had lower fecal egg counts compared to lambs whose names were not treated.
- A New Zealand study showed that pre-lambing drenching with a long-acting dewormer (macrocylic lactone) could select for resistance in the lambs, as some dewormers pass through to the lamb in the milk.

2018 Maryland Shearing School

The 2018 Maryland Shearing School will be held Friday and Saturday, April 20-21, 2018, 9:30 a.m. to 3:30 p.m., at Ridgely Thompson's farm, 1942 Uniontown Road, Westminster, MD 21157.

The school is open to anyone who wants to learn to shear sheep. Ownership of a sheep or a desire to become a commercial sheep shearer is preferred. Minimum age is 15. Participation is limited to 16.

The New Zealand method of shearing will be taught. Instructors include Aaron Geiman, Agriscience teacher in Carroll County, and Emily Chamelin, Professional shearer. Blade shearing will not be taught.

Pre-registration is required by April 1. The registration fee is \$100. It includes an ASI shearing notebook and instructional DVD.

Mail registration to Aaron Geiman at 429 Hook Road, Westminster, MD 21167. Checks should be made payable to Maryland Sheep Breeders Association, Inc.

For more information, send an email to mdshearingschool@gmail.com.



No More Free Plastic Scrapie Tags

As part of efforts to eradicate scrapie, US sheep and goat producers are required to follow federal and state regulations for officially identifying their sheep and goats. Prior to October 1, 2017, the National Scrapie Eradication Program provided free plastic ear tags and applicators. As of October 1, the program is only providing free metal tags.



Producers who already have premise IDs can call 1-888- USDA -TAG to get metal tags free of charge. Producers who don't have a premise ID need to request one before ordering tags. Producers who don't want to use the metal tags will need to purchase their own identification tags/devices from approved companies.

According to federal regulations, sheep under 18 months of age that move directly into slaughter channels do not need to be identified. Wethers under 18 months of age do not need to be identified. Low risk commercial goats, slaughter goats, and castrated goats do not need to be identified, according to the federal regulations. State regulations may be stricter than federal requirements and require additional animals to be identified.

While the incidence of scrapie has been significantly reduced, the goal remains: to have the US eventually declared scrapie-free by international animal health organizations. Producers can help with goal by complying with the mandatory ID requirements.

https://www.aphis.usda.gov/publications/animal_health/content/printable_version/fs_scrapie_recordkeeping.pdf

Testing for Scrapie Resistance In Goats Now Available

For a long time, sheep producers have been able to determine if their sheep were resistant to scrapie, by submitting blood samples. This enabled sheep producers to breed for scrapie resistance. Goat producers now have the same option.

After 10 years of study, researchers have identified genetic markers that confer scrapie resistance in goats. They are S-146 and K-222. The University of California-Davis is now offering testing for scrapie resistance in goats. Twenty to 30 hairs, with roots, are submitted for testing. The cost of the test is \$30 per animal.

Scrapie is a fatal, infectious neurodegenerative disease that affects sheep and goats. It is not caused by genetics, but an animal's genotype will determine if it gets the disease if it is exposed to the infective agent, a misshapen protein called a prion. Scrapie is spread primarily through placental fluids.

<http://www.vgl.ucdavis.edu/services/GoatScrapie.php>



(Image by UC Davis)

More Information On Sheep & Goats Can Be Accessed

<http://www.sheepandgoat.com>

<http://www.acsrpc.org> or wormx.info

<http://mdgoatatest.blogspot.com>

<http://www.sheep101.info>

<https://www.facebook.com/MDSsmall>

<http://issuu.com/mdsheepgoat>

<http://mdsheepgoat.blogspot.com>

<https://www.youtube.com/c/MarylandExtensionSmallRuminantProgram>

Sheep In Florida

For sheep to survive in Florida's humid, sub-tropical climate, they have to have some degree of parasite resistance. Otherwise, they'll constantly struggle with parasites (worms) and/or need to be raised in confinement. Several of the breeds raised in Florida strive to meet this requirement

Bred for Florida

The St. Augustine is an improved breed of hair sheep. It is a cross between the St. Croix (5/8) and Dorper (3/8). The St. Croix was selected because of its mothering ability, parasite resistance, and hardiness. The Dorper was valued for its size and muscling. Ron & Ruth Taber (Calovine Farm) began developing the St. Augustine breed in 1991.

According to the breed association, the primary characteristic of the St. Augustine is productivity. St. Augustine ewes are early maturing, have multiple births, have excellent maternal ability, and can perform well in an accelerated lambing program. Being bred and managed in Florida, the breed is well-adapted to hot, humid climates and should have good parasite resistance.

To learn more, visit the breed registry at <http://www.staugustinehairsheep.com/>.

A Part of Florida History

Over the years, numerous studies have documented the parasite resistance of the "Native" sheep of the Southeast (Florida and Gulf Coast Natives), including the lack of a periparturient egg rise. These breeds represent a valuable genetic resource to the US sheep industry, as it grapples with ways to combat widespread anthelmintic resistance.



(Florida Cracker Image by Florida Cracker Sheep Assoc.)

The Florida Cracker is a heritage breed and one of the oldest breeds of sheep in the United States. It believed to have descended from sheep (Churro) brought to Florida during the 1500's by Spanish explorers. After being abandoned by the settlers, the sheep roamed free for centuries, gradually and naturally adapting to the hot, humid conditions of Florida. Other breeds were introduced to "improve" the breed, but

most succumbed to the harsh conditions.

In the early 1900's, the Florida Cracker came close to becoming extinct. A flock was established at the University of Florida. A breed association was established in 2007 to save the breed. Despite recovery, the Livestock Conservancy still lists the breed's status as "critical," meaning there are fewer than 200 animals registered in the US and less than 2000 animals worldwide.

The name Florida Cracker was chosen to better reflect the breed's heritage and to differentiate it from other breeds using the term Native. Florida Cracker refers to colonial-era English and American pioneer settlers and their descendants in what is now the U.S. state of Florida (Wikipedia).

Though frequently clustered with Gulf Coast Native sheep, the Florida Cracker is a genetically distinct breed. Because they are a landrace (unimproved) breed, Florida Crackers vary in size and appearance. Their bodies are covered in wool, but their face and legs are clean. They are naturally polled, but scurs are possible. Many sheep show red markings, common to the Tunis.

According to the breed's web site, breed characteristics include: moderate size, high fertility, year-round breeding, good maternal instincts, and good milking ability. Though no studies specifically document parasite resistance in the Florida Cracker, their common heritage with other Gulf Coast breed would suggest that this would be a trait of the breed.

Source: Florida Cracker Sheep Association.

To learn more, go to <http://floridacrackersheep.com/>



(Image by St. Augustine Image by Florida Cracker Sheep Assoc)

Southern Maryland Meats Program

An opportunity for sheep and goat producers

In 2011, the Southern Maryland Agricultural Development Commission (SMADC), together with meat producers in the five Southern Maryland counties, created the Southern Maryland Meats Program in answer to the growing demand by consumers for meats that are produced locally in conditions that are safe, humane and environmentally responsible.

To participate in the Southern Maryland Meats marketing program, producers must be located in the 5-county area of Southern Maryland (Anne Arundel, Calvert, Charles, Prince Georges, and St. Mary's) and must meet stringent standards concerning raising, finishing and labeling of their meat products. All livestock meats are eligible to be included in the program (beef, pork, lamb, goat, rabbit, poultry, and bison)

Each farm raises, feeds and finishes its animals according to its own style and preference, however, to use the SMM brand/logo, the farm must pledge to uphold strict standards of quality and humane care and to use clearly



defined terms when marketing its product. An extensive explanation of terms and standards and the SMM application form can be found at www.southernmarylandmeats.com.

Participating producers receive a free website listing on the Southern Maryland Meats website, SMM promotional point of sale materials, and are also eligible to sell their meats at 5 regional partner stores that host dedicated SMM display cases. Workshops and other educational opportunities are offered to support the SMM livestock community year round.

Text provided by Susan McQuilkin, SMADC Marketing Specialist.

Editor's note: last fall, the University of Maryland Small Ruminant Extension Program began collaborating with Southern Maryland Meats to provide educational opportunities for sheep and goat producers in the five southern Maryland counties. You do not need to reside in the five Southern Maryland counties to participate in educational programs. Follow us on Facebook to learn about upcoming programs: <https://www.facebook.com/MDSmallRuminant/>

Effect of Anti-Coccidial Drugs In Goats

Researchers at Texas A&M University compared the efficacy of two anti-coccidia drugs in goats. One hundred and fifty young goats, housed on concrete lots, were randomized to receive either amprolium (50 mg/kg once a day for 5 days by mouth) or ponazuril (10 mg/kg by mouth once) if they had fecal oocyst counts >5,000 per gram.

Both treatments resulted in decreased oocyst counts post-treatment compared to before treatment. There was no significant difference between fecal coccidian oocyst counts between goats in each group. There was no significant difference in body weight between goats in each group. This study showed that both amprolium and ponazuril were effective in decreasing fecal coccidia oocyst counts in this group of goats.



Use of both drugs is currently extra-label in the USA. Amprolium (Corid®) is labeled for treatment of coccidiosis in calves while ponazuril (Marquis®), a metabolite of toltrazuril, is labeled for treatment of equine protozoal myeloencephalitis.

Coccidiosis is an important disease of young goats (and lambs) leading to weight loss, diarrhea, and death. In the USA, both ionophores and decoquinate are labeled for prevention

of coccidia in goats (and sheep). However, there are no drugs approved for treatment of clinical cases of coccidiosis in either species.

Prolonged use of Corid® can predispose animals to polio, as Corid® mimics thiamine (vitamin B1).

Source: Veterinary Parasitology, March 2016

Western Maryland Research & Education Center: Research Update

Small ruminant research has been conducted at the University of Maryland's Western Maryland Research & Education Center since 2004. For eleven years, the research center hosted the Western Maryland Pasture-Based Meat Goat Performance Test, which not only identify bucks that were resistant to internal parasites, but provided a wealth of knowledge about internal parasitism in small ruminants.

Last year (2017), no small ruminant research was conducted at the facility, as infrastructure needed to be re-established. The small ruminant program received approval and funding to build a 40 ft. x 40 ft. x 12 ft. roofed structure. The structure will house the handling system and provide shelter for the animals. Construction of the structure is expected to begin soon (January). Pastures will be re-established in the spring. A mixture of annuals and perennials will be planted.

After many years of working with goats, the research program will transition to sheep in 2018. Tentative plans are to use dairy sheep lambs (East Friesian x Lacaune) to compare the performance and carcass characteristics of ram, wether, and short-scrotum males. Future projects will probably pertain to internal parasite control, but it may take a year or two to build parasite infection levels.

Previous research has shown that short-scrotum males grow as well as intact males, without the risk of causing pregnancy in ewe lambs. It is also more humane to make a short-scrotum ram as compared to a wether. To make a short-scrotum ram, the testes are pushed up inside the body cavity and the empty scrotum is banded. Fertility is impaired because the testicles are at body temperature, not the few degrees cooler to allow fertility. But because the lambs retain their testicles, testosterone is still produced; thus, enabling the superior gain of the intact male.

The lambs will be pastured beginning in early May. While on pasture, they will have free choice access to soy hull pellets. Soy hulls are the outer part of the soybean. Since they are a roughage feed, they are the ideal supplement for animals consuming forage diets. Body weights, condition scores, FAMACHA© scores, and other pertinent data will be recorded. All of the lambs will be ear-tagged with RFID tags. Some of the lambs will be harvested to collect carcass data. The sexual behavior and fertility of the lambs may also be evaluated by a collaborator.

Plans are to hold a summer open house at the research center to showcase the project and use of precision farming technology.



Lambs were last grazed at WMREC in 2005

The Fungus That Hates Parasites

Duddingtonia flagrans (abbreviated to *D. flagrans*) is a natural strain of fungus isolated from the environment and found around the world. It is a nematophagous fungus. Nematophagous is a Greek word meaning "worm-eating".

D. flagrans is found on pasture (rarely soil) or in manure where it builds a microscopic net that traps, paralyzes, and consumes the juvenile stages (larvae) of parasitic worms. It is highly host specific, only targeting parasitic nematodes.

When fed to grazing animals, *D. flagrans* spores pass through the digestive system and into the manure, where they are activated when parasitic worm larvae become active. The spores have no effect on the host animal.

There are several published studies which document the efficacy of *D. flagrans* as a parasite control agent.

Duddingtonia.com is a new web site dedicated to disseminating facts and information concerning the efficacy of *Duddingtonia flagrans* in the successful treatment of parasite infestations in grazing animals around the world.

The web site gives visitors the option of signing up for the Duddingtonia newsletter. To do so, click the Stay Informed button.

"I have been told that the product should be available in the US sometime early 2018. Stay tuned." Dr. Jim Miller, Louisiana State University (retired).

Learn more at Duddingtonia.com



(image by dudingtonia.com)

2018 Junior Sheep & Wool Skillathon

The 2018 Junior Sheep & Goat Skillathon will be held Sunday, May 6, 8 a.m. to 12 noon, at the Maryland Sheep & Wool Festival, at the Howard County Fairgrounds in West Friendship, Maryland.

The contest is open to individuals and teams of youth, ages 8-18, from any county, state, or program. Youth compete according to their age as of January 1: junior, 8-10; intermediate, 11-13; and senior, 14-18. Teams consist of 3-4 youth from the same county, state, or program.

All skillathon stations will pertain to sheep, goats, and/or fiber. Study resources are available at www.sheepandgoat.com/skillathon. Premiums, ribbons, and t-shirts are provided by the Maryland Sheep Breeders Association.

Pre-registration is required by April 30. Youth can register online at <https://go.umd.edu/skillathon>. Alternatively, they can contact Susan Schoenian at sschoen@umd.edu or (301) 432-2767 x343.

The Maryland Sheep & Wool festival is always held the first full weekend in May. Parking is free, but there is a small admission fee. To learn more about the festival, go to www.sheepandwool.org.



Understanding Extra Label Drug Use (continued from page 1)



Extra label drugs can only be used if the health of the animal is threatened. They cannot be used to enhance performance. This includes drugs that are used to manipulate the reproductive cycle. For example, while CIDRs can be used to induce estrus in ewes, PG-600 does not meet the conditions for ELDU and cannot be used legally. In food-producing animals, human drugs cannot be used, if an animal drug is available.

It is recommended that extended withdrawal periods be followed when drugs are used extra-label. Withdrawal periods for extra-label drugs are available from the scientific literature, academia, and/or the Food Animal Residue Avoidance Database (FARAD; www.farad.org). You can find withdrawal periods for extra-label dewormers at www.wormx.info (select dewormers from the Topics drop-down menu.)

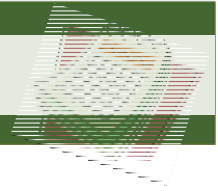
More government oversight of drugs, especially antibiotics, is expected in the future. It is anticipated that injectable antibiotics will eventually become prescription-only. This is already happening in California. It is important that all sheep and goat producers understand extra-label drugs and make efforts to ensure they are in compliance with the laws governing their use.

This article was originally published in the *Delmarva Farmer* and *Lancaster Farming*.



The 2018 Junior Sheep & Goat Skillathon will be held Sunday, May 6, 8 a.m. to 12 noon, at the Maryland Sheep & Wool Festival, at the Howard County Fairgrounds in West Friendship, Maryland.

Upcoming Events



January 30

American Goat Federation Annual Business Meeting
Marriott San Antonio River Center, San Antonio, Texas
Info: <https://www.americangoatafederation.org>

January 31-Feb 3

American Sheep Industry Association
Annual Convention
Marriott San Antonio River Center, San Antonio, Texas
Info: https://www.sheepusa.org/Events_2018Convention

April 7-8

Wool Handling School
Blue Ridge Community College, Weyers Cave, VA
Info: John Benner at benner89@vt.edu or (540) 245-5750 x2

April 20-21

Maryland Shearing School
Ridgely Thompson Farm, Westminster, Maryland
Info: mdshearingschool@gmail.com

May 5-6

Maryland Sheep & Wool Festival
Howard County Fairgrounds, West Friendship, Maryland
Info: www.sheepandwool.org

May 6

Junior Sheep & Goat Skillathon
Maryland Sheep & Wool Festival
Info: <https://www.sheepandgoat.com/skillathon>

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University of Maryland
Western Maryland Research and Education Center
18330 Keedysville Rd
Keedysville MD 21756