

Dewormer classes for small ruminants

An anthelmintic or "dewormer" (or drench) is a substance that expels or destroys parasitic worms. Dewormers are usually separated into classes on the basis of their chemical structure and mode of action. Although dewormers are sold under many different tradenames, there are only three classes of dewormers available for small ruminants in the US. Resistance has been reported in all three classes, and there can be cross-resistance to drugs in the same class.



1

Benzimidazoles (or white dewormers; BZ's) are the oldest class of (modern) dewormers. They kill worms by disrupting cellular energy metabolism; starving them. For small ruminants, BZ's include fenbendazole (Safeguard® suspension) and albendazole (Valbazen® drench). BZ's have a wide margin of safety and broad spectrum of activity. Albendazole is the most potent drug and the only dewormer labeled for control of tapeworms and (adult) liver flukes (in small ruminants). However, it should not be used in the first 45 days of pregnancy. Fenbendazole is FDA-approved for goats. Albendazole is approved for sheep and liver fluke control in goats. No drugs in this class are approved for camelids. Resistance to drugs in the BZ class is usually high.

2

Macrocyclic lactones (or clear dewormers; ML's) are the "newest" anthelmintic class. They kill worms by paralyzing them. Because they are fat-soluble, they have persistent activity, meaning they prevent reinfection for a longer period of time. ML's also have efficacy against external parasites, including nasal bots. ML's consist of two closely-related chemical classes: avermectins and milbemycins. Avermectins are more effective against external parasites whereas milbemycins are more effective against internal parasites. Ivermectin is an avermectin. It (Ivomec® drench) is approved for sheep. Moxidectin is a milbemycin. It is the most potent drug in the class (for parasitic worms). It (Cydectin® drench) is approved for sheep. No drugs in this class are approved for goats or camelids. Resistance to ivermectin tends to be high, while it is usually more moderate for moxidectin.

3

The third group is imidazothiazoles/tetrahydropyrimidines (membrane depolarizing class). Drugs include levamisole (Prohibit®, Leva-Med®) and morantel tartrate (Rumatel®, Positive Pellet® Goat Dewormer). These drugs affect the nervous system of the worms and kill them by paralyzing them. Levamisole (drench) is FDA-approved for sheep. Morantel (feed grade) is approved for goats. Levamisole has the lowest margin of safety of any dewormer. Resistance to levamisole is usually low to moderate. It is the most potent drug in the class and often the most effective of all dewormers, although this can vary geographically. Morantel only kills adult worms. It has a zero withdrawal for milk (in goats).

It is recommended that all dewormers be administered orally to small ruminants and that they be drench formulations (no injectables or pour-ons). Due to widespread resistance issues, it is now recommended that clinically-parasitized small ruminants be given combination treatments: dewormers from different classes, sequentially with appropriate doses (no splitting, halving, doubling, or mixing).



By Susan Schoenian (2023)
Sheep & Goat Specialist Emeritus
University of Maryland Extension
Reviewed by Michael Pesato, DVM
Visit wormx.info to learn more.