

Avoid too frequent deworming in goats and sheep. Drug treatments will always be required, but minimise their frequency:

- Avoid routine treatments
- Monitor your goats and sheep or individuals within them: using worm egg counts in faeces, intestines, and observe the signs of worm infestation.
- Individual-animal treatment strategies by reducing the frequency of treating the whole herd
- Young lambs and kids, and milking females, require more drug support than other animals
- Grazing management - rotational grazing to minimise intake of worms and excessive pasture contamination. Do not treat animals and then release them directly to clean pastures (clear of worms). Goats can graze with cattle
- Animals in good nutrition (good pastures and supplementation) resist or tolerate infection with worms
- Breed selection for animals in the **flock/herd that are genetically resistant** or tolerant to worm infection
- Vaccination

How to determine when to treat the goats against worms;

Color	Treatment recommendation
Red	No
Red-pink	No
Pink	?
Pink-white	Yes
white	yes

The table above will help you make a decision for targeted selective treatment of animals against worms. This minimises excessive use of dewormers in a flock/herd, and thus slows down the development of anthelmintic resistance.

- Reduce proportion of resistant worms
 - Use targeted selective treatment - some animals are left untreated when treatments are given. This is based on assessments of anaemia.
- Proper drug choice
 - Minimise the survival of resistant worms. Use effective drugs
- Prevent introduction of resistant worms
 - Provide 'quarantine' treatments to new animals

Managing Worm Resistance to Dewormers in Goats and Sheep



NARO



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Round worms;

Round worms in the stomach and intestines of goats and sheep are one of the biggest problems in the production of goats and sheep. Some of these worms such as *red stomach worms* are highly blood-feeding and cause high death in goats and sheep.



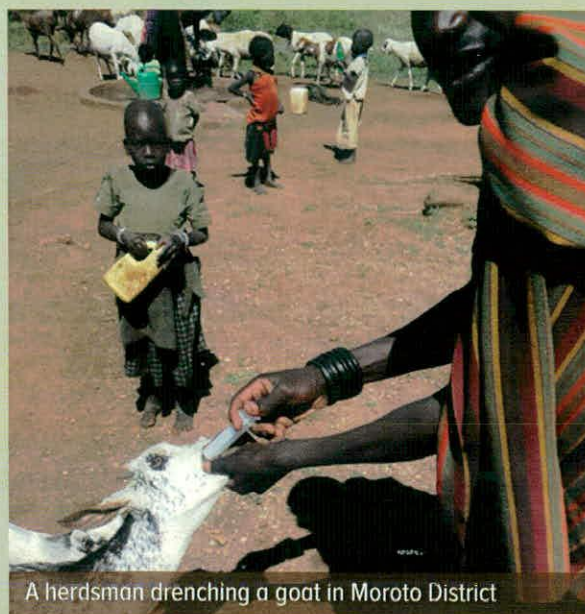
Signs of worms infection in goats and sheep:

- Diarrhoea
- weight loss
- worms in the stomach
- bottle jaw
- depression
- rough haircoat
- weakness, anaemia (pale mucous membranes)

Commonly used dewormers in Uganda include:

- Albendazole
- Ivermectin
- Levamisole
- Trodax

Dewormer resistance (DR), simply means resistance of worms to de-wormers. Clinically, DR occurs when the normal treatment dose is no longer fully effective (although many worms may still be killed) to treat the goat or sheep. Or, the ability of worms to survive drug treatments that are generally effective against the same species and stage of infection at the same dose rate. DR results in animal deaths if not managed.



A herdsman drenching a goat in Moroto District

Current status of Dewormer Resistance in Uganda

Resistance was reported at a goat herd in Serere (Byaruhanga and Okwee-Acai, 2013); in Nakapiripirit (Byaruhanga and others, 2014); in Soroti, Gulu, Mpigi, Mbarara and Ssembabule (Nabukanya and others, 2014); in Kabala, Kisoro, Kanungu and Rikungiri (Benda and others, 2015).

Development of Dewormer Resistance

Resistant worms exist in the population even before the drugs are administered. Treatment eliminates the worms that are susceptible, while those that are resistant survive and pass on their genes.

How to manage Dewormer Resistance

Dewormer Resistance is unavoidable because it is a natural occurrence, however to reduce it:

- Avoid under dosing
 - Ensure the correct dose rates are used based on proper weight estimation.
 - Oral administration of the dewormers is over the back of the tongue, and not into the mouth to ensure that the drug does not bypass the rumen.
 - Avoid substandard drugs on the market, whereby low doses can be unintentionally administered
 - Goats require higher doses than sheep

