For more information contact:

Ministry of Agriculture and Rural Development (MoARD)
P. O. Box 62347, Addis Ababa, Ethiopia
www.moard.gov.et

National Agricultural Advisory Services (NAADS)
P. O. Box 25235, Kampala, Uganda
Tel: +256-41-345440/345065/345066, Fax: +256-41-347843
Email: info@naads.or.ug, www.naads.or.ug

Animal Diseases Research Institute
P. O. Box 9254, Dar es Salaam
Tel: (255-22) 2863104/864369
e-mail: adri@raha.com; virology@raha.com; lutkagaruki@hotmail.com

Kenya Agricultural Research Institute (KARI)
PO Box 57811, Nairobi, Kenya
Tel: +254-(0)20-418 3301/3720
Fax: +254-(0)20-418 3344
Email: Resource.center@kari.org, www.kari.org

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The ACP-EU Technical Centre for Agricultural and Rural Cooperation (CTA)
PO Box 380, 6700 AJ Wageningen, The Netherlands
Tel: +31 (0) 317-467100, Fax: +31(0)317-460067
Email: cta@cta.int, Website: www.cta.int

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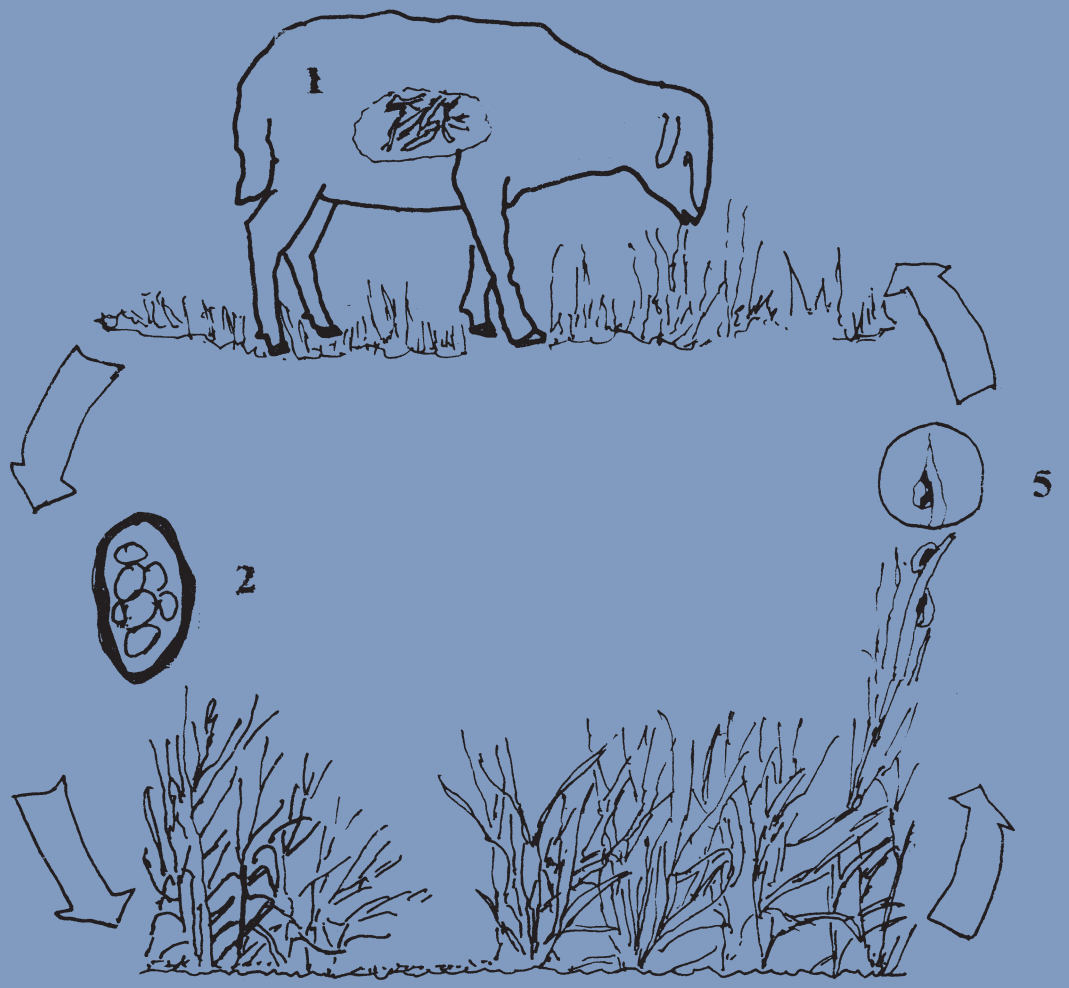
Worm control in sheep



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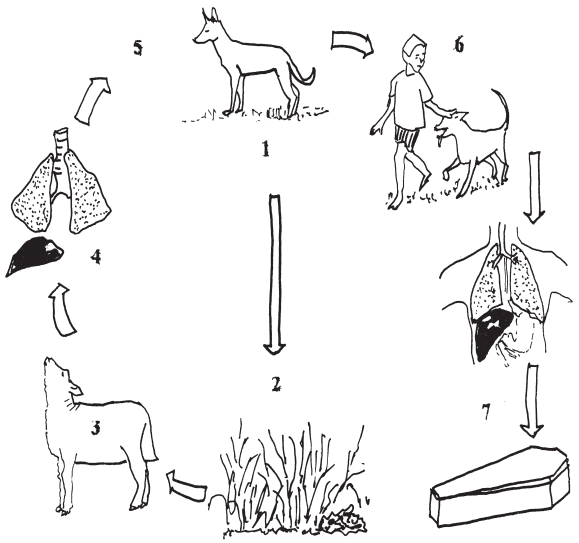
Worm control in sheep

How important are worms in sheep?

Every sheep grazing on pasture is infested with one type of worm or the other. The effect of these in the animal depends on:

- The type of worm
- The number of worms in the animal
- The breed of sheep
- The level of nutrition available
- The age of the animal and the level of previous exposure of the animal to the specific worms.



Failure to control clinical worm infestation in sheep can result in blood loss, thin animals and death. In case of hydatid disease (a disease related to infestation with tapeworm), failure to control the life cycle can result in a public health problem and deaths in infected humans.

How can I tell my sheep have clinical worm infestation?

Different worm infestation levels in sheep exhibit different clinical signs. In general, the following signs may be indicative of clinical worm infestation:

- Dullness
- Loss of appetite
- Scruffy hair coat
- Membranes inside the eyelids are pale – not the usual pink
- A pendulous swelling may develop under the lower jaw – 'bottle jaw'
- Loss of body condition
- Diarrhoea (*may or may not be present depending on the parasite*)
- Death in severe cases.

How do I know which worms are affecting my sheep?

There are many types of worms that can infest sheep. However, some important ones in the Eastern Africa region are mentioned in Table 1 against their symptoms.

Table 1: *Main symptoms and possible clinical worm infestation*

Main symptoms	Possible worm infestation
Pendulous swelling under the lower jaw (bottle jaw), very pale membranes inside the eyelids and mouth, emaciation and death	Roundworm Liver fluke (*Fasciola*) infestation is a consideration if the animals are known to graze along the banks of streams, marshy or swampy pasture, near ponds or in areas prone to flooding. Young rumen flukes (*Paramphistome* and *Calicophoron*) are a consideration too, especially in cases of very pale membranes and increased thirst.
Distinctive dark-coloured diarrhoea	Roundworm
Nodules in the intestines of slaughtered animals, otherwise little or no other signs in live animals	Roundworm, mainly due to pimply gut worm (*Oesophagostomum*)
White tape-like segments in faecal droppings	Tapeworm
Presence of cysts in liver, lungs or heart of slaughtered animals	Hydatid cysts

The level of worm infestation is related to climate and the seasons. It is therefore possible to treat animals at particular times of the year or in response to weather patterns and break the life cycle of the parasites.

General principles of effective worm treatment

- Treat sheep with an appropriate dewormer
- Use correct dose based either on individual weight or on weight of the heaviest animal in the flock
- Deposit dewormer over the tongue (a drug deposited at the front of the tongue may go directly into the glandular stomach and this reduces drug availability in the body)
- Drench animals in the morning before feeding
- Drench all adults before mating
- Drench all females two weeks before lambing
- Drench lambs at weaning (three months of age)
- Drench all animals before the start of the rainy season or at times of peak infection
- In cases of resistance to dewormer give two full doses at a 12-hour interval
- Drench with two different dewormers at the same time to dramatically delay resistance to either drug (*seek veterinary advice before doing this*)

Points to note:

- *Stocking rate:* If you have too many animals per unit area, pasture contamination is enhanced and frequent re-infections occur.

- *No effective rotation:* Pasture rotation is a very effective strategy for worm control as it avoids frequent re-infections. Tethering and moving animals to new sites every 3 to 4 days is a form of rotation.
- *Communal watering sites and roadside grazing* are constant sources of infective larvae.

What other management practices can I use to minimise worm infestation?

- If animals are fed indoors, use a slatted floor
- Construct feed troughs on the wall to avoid contamination with droppings
- Feed animals adequate quantities of quality feed available within your environment
- Use animals that are known to be resistant to worms.

Roundworm control in sheep

Roundworm control in high-temperature and humid conditions

- Treat all animals just before the rainy season
- At other times treat sick animals only
- Follow the general principles of treatment described above.

Roundworm control in sub-humid, warm, grain-growing regions

- Turn animals onto grain fields after harvest
- In areas with large enough fields to allow rotational grazing, return animals onto the paddock after 2 months.
- Treat any clinical cases
- Grazing paddocks with sheep first, followed by cattle, reduces pasture larval contamination for sheep.
- Alternating a food crop with grass will result in pasture with less larval contamination.

Roundworm control in sub-humid, cool, highland regions

Because these areas are relatively cool, larvae can survive on pasture and be infective for long periods.

- Treat clinical cases as soon as you notice the symptoms
- Graze adult cattle after sheep, goats and calves
- Cut-and-carry systems can prevent animals grazing and contaminating pasture if one starts with clean pastures and clean animals
- Where land size allows, rotation of pasture will be effective but a pasture needs to be rested for at least 3 months.

Roundworm control in arid and semi-arid regions

In these areas during the dry seasons, ingested worm larvae may assume delayed development. Once the rains come, the larvae resume development and thus may cause acute worm infestation. Transmission is seasonal and some periods of the year are too dry for larvae to survive on pasture. However, watering points and *bomas* (open-air enclosures within homesteads) are often areas of high contamination.

- Treat all animals one week after the onset of the rainy season
- Treat clinical cases as soon as you notice the symptoms
- Treat animals when the grass has browned in the dry season to prevent chronic syndromes which can be caused by relatively few worms and are difficult to diagnose
- *Smallholders in semi-arid zones*: Small farms in such areas cannot support many animals. Animals quite often have nutritional stress leading to a chronic worm problem. Feed supplementation is useful.
- *Semi-arid pastoral areas and semi-arid large-scale ranches:* Although stocking rates may be low, which should reduce the risk of infection, poor feed may lead to chronic infestation, so supplementation with feed blocks is desirable. Ranches may have facilities to allow management of lambing and of grazing. For example, "dose and move procedures" in which animals are treated and moved to clean grounds is useful to control worm infestation. Also move *bomas* frequently.
- *Arid- zone pastoral areas:* Rainfall is unevenly distributed annually and hence there are times of nutritional stress. Although stocking rates may be low, heavy contamination around watering points and *bomas* is common.

Minimising roundworm resistance to dewormer treatment

Dosing

- Do not under-dose animals. Dose on the basis of the heaviest animal in the flock
- Treat animals in the morning before feeding
- Change class of drug yearly (*seek veterinary advice*)
- Drench dewormer over the tongue.

Timing of treatment

Epidemiological information (information on the causes, distribution, and control of disease in populations) is important in deciding on the time for treatment.

- Administer the dewormer when the parasite population is concentrated in the host and the rate of transmission (i.e by egg production) is low. For example, in arid and semi-arid areas, treat at the middle of the dry season when the parasites are likely to be in the hosts in an arrested (hypobiotic) state.
- Treat again a week into the rainy season to kill worms before they mature and start contaminating the pastures.
- When moving animals from a contaminated to a clean pasture, treat 48 hours before. To avoid rapid re-infection, the treated animals should preferably be housed for the 48 hours to ensure that all worm eggs are voided prior to moving the animals.
- A pasture can be considered free of parasites if it was cropped or if it had been rested for at least 3 months (at least 4 months in the highlands).

Using integrated control measures

- By using a combination of control measures (rotational grazing, 'dose-and-move', zero-grazing etc), the use of dewormers will be minimised which will in turn minimise the number of generations of worms exposed to the dewormers, thus slowing the development of resistance to drugs.

Avoidance of importation of resistance

- Do not purchase animals to rear from a farm with a history of drug resistance (*seek veterinary advice prior to purchase*).

Management of roundworms with confirmed resistance to dewormer treatment

- Total withdrawal of selected family/families of dewormers
- Combine selected benzimidazoles and narrow-spectrum compounds and use them strategically
- Manipulate drug usage by using a combination of two full doses of different drugs or split dose and apply at an interval (consult a veterinarian before attempting this).
- Use slow-release devices.

Control of liver and rumen flukes in sheep

- Effective fluke control is based on correct diagnosis, use of effective dewormers and a reduction in the exposure of sheep to the intermediate hosts - snails.
- The choice of a dewormer drug depends on price and availability.

***Table 2**: Dewormers effective against liver and rumen flukes*

Drug	Effective against:
Closantel	Mature liver flukes and immature rumen flukes
Niclosamide	Immature rumen flukes
Nitroxynil, Rafoxanide	Mature liver flukes
Oxyclozanide, Resorantel	Immature and mature rumen flukes
Triclabendazole	Immature and mature liver flukes

- For prophylactic treatment, give dewormer at the end of the season when the snails - the intermediate hosts - are becoming less active.
- For curative treatment, give dewormer 2 to 3 months after the expected peak period of infection in the sheep.
- Additional treatment may be carried out in situations where sheep are grazed in wet areas during the dry season or in areas with high snail populations.
- Use of chemicals (molluscides) such as Niclosamide (bayluscide, WP 70) recommended by the World Health Organization (WHO) to control snails, or biological methods such as keeping ducks that feed on the snails, reduces the snail population and breaks the life cycle of flukes.
- Draining of low-lying wet areas and fencing off the wet and poorly drained areas reduces infection rates in sheep.
- Supplementation with highly nutritious feeds helps to reduce the effects of flukes on sheep.

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Control of tapeworm in sheep

- Most tapeworm infections in sheep are considered non-pathogenic and therefore specific treatment for infection with these parasites is not necessary.
- To treat severe infection in lambs however, use a dewormer such as Praziquantel that will target both tapeworms and roundworms.

Control of hydatid disease in sheep

- Control of hydatid disease in sheep is based on the control of infection in dogs.
- Prevent dog entry to slaughter houses.
- All offal containing cysts (the larval stages of the worm) should be destroyed by incineration or burying
- Treat dogs regularly with Praziquantel. Confine treated dogs for 1 to 2 days and burn and bury their faeces.
- Initiate a public health campaign on the dangers posed by dogs infected with the adult worm of the hydatid disease and the importance of thorough cooking of offal before offering them to dogs.

Case study

Mr James Mwangi hails from Mathira Division of Nyeri District located in a sub-humid highland region of Central Kenya. He has 2.5 acres of land and is among the farmers in his community who took part in a trial carried out by the Kenya Agricultural Research Institute (KARI) and the National Veterinary Research Centre (NVRC) between 1993 and 1996, to assess the causes, distribution and control of parasitic worms and to test intervention strategies. Prior to the trails, Mr Mwangi had 7 indigenous sheep crossed with Dorper sheep raised under the roadside tethering grazing system. He had no specific strategy on worm control and had high mortalities among his lambs. Mr Mwangi dewormed only adult sheep with whatever dewormer he had at hand, but left the young ones out, because he thought lambs did not have worms until they reached six months of age.

Following the advice of scientists from the NVRC, Mr Mwangi started implementing a regime of treating adult sheep before mating, ewes before lambing, and lambs at weaning. He also treated all sheep before the beginning of the rainy season. Being in an area with liver fluke infestation, he adopted prophylactic and curative treatment regimes and feed supplementation.

Ten years after implementing a successful worm-control strategy, Mr Mwangi is a successful farmer keeping over 50 sheep under a semi-zero grazing system. He has upgraded his sheep farming from indigenous crosses to pure Dorpers and is also keeping dairy goats as well. He sells lambs and kids to farmer groups in his area and to far-off districts in central Kenya. A kid aged 6 months fetches him at least US$65. A breeding male sheep or goat fetches him about US$230.