

Worms in Goats

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INTRODUCTION

Worms can cause serious problems in goats, leading to poor productivity and even death, especially in the tropics. A high number of worms in the intestines can certainly kill goats. In the Top End of the Northern Territory (NT), most goats carry worms. However, the extent of their effect on goats in terms of deaths, loss in productivity and the cost of control will depend on their numbers and types.

TYPES OF INTESTINAL WORMS

In the Top End, two types of worms are the cause of most persistent problems: Barber's pole worm (*Haemonchus contortus*) and black scour worm (*Trichostrongylus colubriformis*).



Figure 1. Barber's pole worms (10-30 mm)
(*Haemonchus contortus*)



Figure 2. Black scour worm (4-8 mm)
(*Trichostrongylus colubriformis*)

Barber's pole worms

Barber's pole worms suck blood and are the most likely to cause serious losses in goats. High worm numbers in goats cause severe anaemia, literally bleeding them to death. Initially, goats become weak and the skin and gums become pale. An examination of the gums or eyelids will readily reveal anaemia. Bottle jaw (swelling under the jaw) may develop in severe cases of Barber's pole worm infestation.



Figure 3. Checking gums – they should be healthy pink, as in this picture

Black scour worms

Black scour worms cause scouring (diarrhoea) and ill-thrift (poor performance).

Other types of worms

A couple of other types of worms may also be present in the Top End, but are not as common. Tapeworms can occur in goats but they are not considered harmful, except in kids. Liver fluke is not found in the NT, unless it is present in imported goats.

Although not covered in this Agnote, another type of intestinal parasite, called Coccidia, can be a significant problem in young goats. Coccidia are commonly detected in goats in the NT. Worm drenches are not effective against coccidia, so if diarrhoea or deaths continue in goats after drenching, then coccidiosis should be considered.

WHY DO WORMS BECOME SUCH A PROBLEM IN GOATS IN THE TOP END?

- Goats appear to be more susceptible to worms and are less able to develop natural immunity than other livestock.
- The warm wet weather in the wet season encourages a rapid build-up of free-living stages of parasites on pasture.
- High stocking rates on pasture rapidly magnify the problem in goats.
- In other livestock, animals become more resistant to worms as they grow older, but such an age resistance mechanism is less effective in goats.
- A reduced natural immunity occurs in female goats during lactation, making them even more susceptible to worms.
- Worm drenches tend not to work as well in goats as in sheep.

LIFE CYCLES

Most common worms have two stages of development. The first is the parasitic stage, which occurs in the goat and the second is a free-living larval stage, which occurs on pasture. Adult worms live in the goat's intestine and lay eggs that come out in the faeces. The eggs hatch and develop into larvae on pasture. The larvae are eaten with pasture by other goats and develop into adults and start laying more eggs. Knowing the two stages helps in the management of parasite problems.

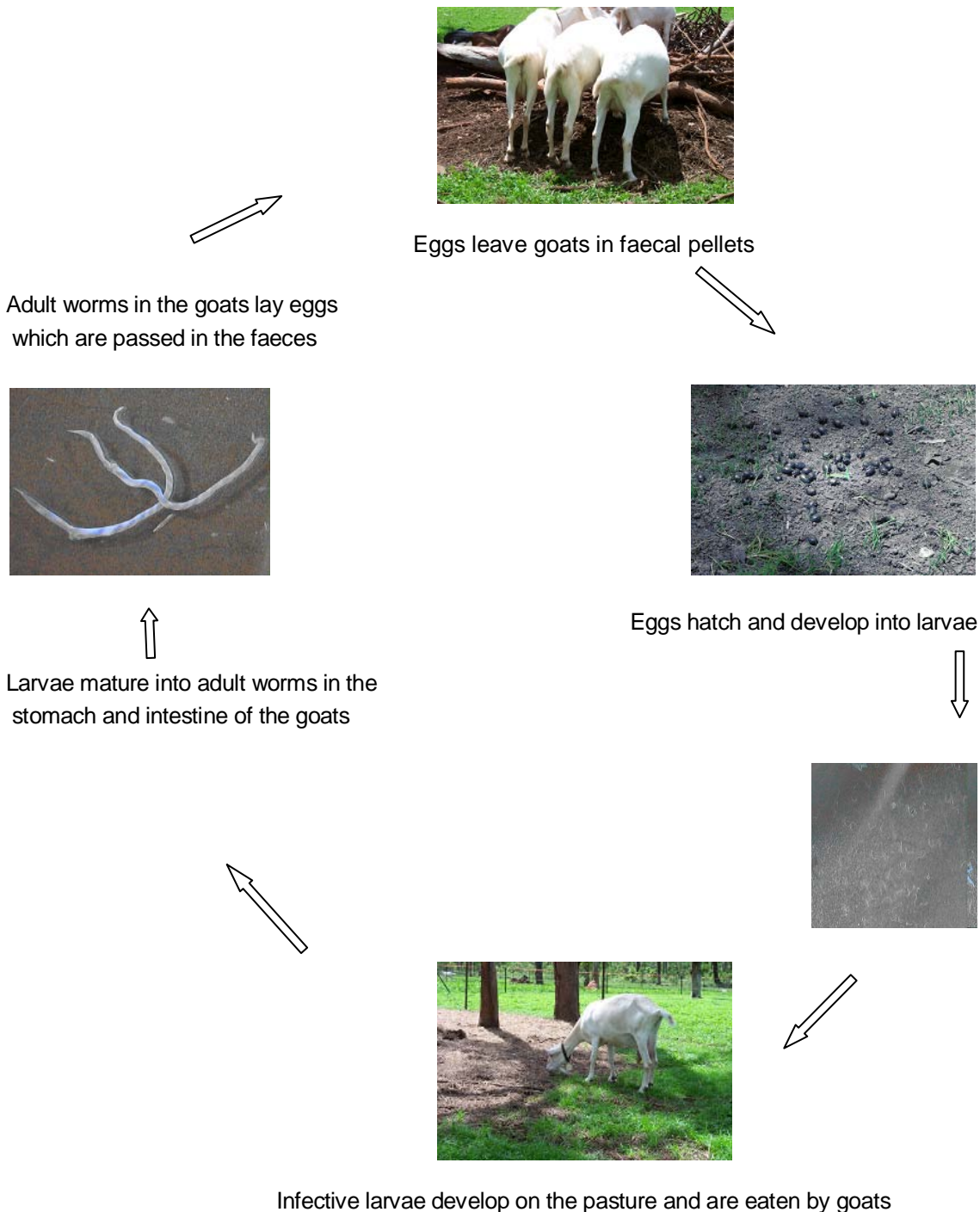


Figure 4. The life cycle of the Barber's pole worm

The life cycle of the worms may take as little as three to four weeks to complete. The Barber's pole worm is a prolific egg-layer as one female can lay up to 10 000 eggs daily.

Goats share parasitic worm species with sheep (so can cross-infect) and are also suitable hosts for some cattle parasites.

HOW TO CONTROL WORMS IN GOATS

Drenches are an important method for the control of worms. However, they only target a part of the life cycle of the worms. Also, goat worms rapidly become resistant to chemical drenches. To control worms effectively in the long term, you need a multi-pronged strategy, which also controls the worms in the environment.

1. CONTROL WITH ANTHELMINTICS

Anthelmintics, or worm drenches, are used to help control worm infestations. Many goat farmers rely on frequent drenching at set intervals, sometimes fortnightly. However, drenching will have little effect if the worms develop resistance to the drench you use. Worms can become resistant to worm drenches within two to three seasons. Increasing resistance in Australia to the latest anthelmintic groups, such as ivermectin and moxidectin, means that the options for drug use are limited and need to be wisely applied.

The following general points should be kept in mind to obtain effective results from drenching and to delay the emergence of resistance. For detailed information on the types of drenches and their use, see *Agnote* No. K52 'Effective Drenching Programs for Goats in the Top End'.

- Note that not all drenches are registered for use in goats. Always read and follow the manufacturer's instructions on the label.
- Using a drench that is not registered for goats is considered an "off-label" use and because goats are a food-producing species there are special regulations regarding the use of drugs. Under the Agriculture and Veterinary Chemicals (Control of Use) Act, off-label use of a drench in goats is not allowed unless authorised by an Australian Pesticides and Veterinary Medicines Authority permit or according to written instructions from a veterinarian. Correct precautions regarding withholding periods of meat and milk must be followed. Consult your local veterinarian.
- Drench at the recommended dose. Drenching doses will not be the same for sheep and goats. When calculating dose rates, it is important to weigh a few goats. Check drenching guns for accuracy.
- Girth measurements of goats can be correlated with weight. Place the tape snugly around the chest behind the front legs (see Figure 5), then use this length to estimate the weight from Table 1. However, remember these are only estimates. Weighing is more accurate.
- There are four different groups of anthelmintics available for use in goats (see *Agnote* K52). It used to be recommended to alternate the anthelmintic group annually. However, due to the emergence of multiple resistances in parasites over recent years, there are limitations on the efficacy of most anthelmintics. It is therefore highly recommended that drench resistance on each farm is assessed and then a range of anthelmintic groups is used within a season.
- Most anthelmintics registered for use in goats are known as benzimidazoles. There is widespread resistance to benzimidazoles. A faecal egg count reduction test (FECRT) (described below) would be highly recommended if you are using these anthelmintics. If you do have a resistance problem in your goats, macrocyclic lactones may be the only alternative efficient treatment available.
- The effectiveness of an anthelmintic can be increased if animals are fasted prior to drenching. So it is recommended to hold the goats off feed (in a yard) for 24 hours before drenching. This may not be advisable for does with kids.
- The effective action of a drench can be monitored by using an FECRT, which can be performed at the Berrimah Veterinary Laboratories (BVL). Samples for the FECRT need to be submitted before drenching and again 10 to 14 days after drenching.

Remember, drenching alone will not solve a parasite problem and is an unsatisfactory approach to the control of intestinal worms.



Figure 5. Girth measurements of goats can be correlated with weight

2. OTHER CONTROL STRATEGIES

The long-term control of worms depends on knowledge of their life cycles so as to manage drenching most effectively. Effective drenching strategies aim to minimise contamination of the pasture with worm larvae. The following guidelines are suggested:

Timing of drenches

The development of free-living stages of worms (i.e. worm larvae) is very rapid during moist summer months. Infection pressure can be reduced by preventing worm eggs from contaminating the pasture in the early wet season. In other words, drench early in the wet season so as to prevent the build-up of large numbers of adults. Strategic drenches in the dry season will also limit the number of larvae that could potentially contaminate pastures. Lactating does, kids and debilitated animals are most susceptible. Drenching these groups at weaning and prior to kidding and lactation, should be considered.

Paddock rotation

In the tropics, worms such as *Haemonchus*, undergo a rapid larval development in the wet season and die quickly when all of their energy supplies are utilised. If pastures are left un-grazed for three weeks, most of the larvae will die out. In the dry season, conditions are less conducive to larval survival. Studies in Fiji have shown that rapid rotation every three to four days through 10 paddocks minimises the need for drenching.

Low stocking rates

If stocking rates are low, contamination of pastures will be minimised. This also aids in maintaining a high plane of nutrition.

Browsing

If goats have an opportunity to browse rather than graze, they are less likely to become infected. Once grass becomes short and goats graze close to the ground, they will pick up lots of larvae.

Prevent grazing altogether

Housing goats on slatted floors or deep litter will eliminate faecal contamination. Although effective, this method may not be practical.

Nutrition

A high plane of nutrition reduces the effects of parasites.

MONITORING PARASITE BURDENS

This is really important. Control strategies should always include surveillance using faecal egg counts (FEC). This is a laboratory test that counts the number of worm eggs per gram of faeces (epg). Samples taken at drenching will give some indication of the level of infection acquired since the previous drenching (provided the previous drench given was effective). Testing again 10 to 14 days after drenching will show if the current drench has been effective. This is the FECRT. It must be remembered that FECs will give no indication of the numbers of immature parasites present. It only gives you an indication of the number of adult female worms in the goat that are laying eggs at the time.

LABORATORY TESTING

Collect fresh faeces for FECs from a range of animals to determine parasite burdens. Samples taken from individual animals should be placed in labelled bottles. Refrigerate the samples after collecting and organise for testing as soon as possible. Talk to your local veterinarian or stock inspector or contact BVL on 8999 2249. For a herd analysis, about 10% of animals should be sampled. If the majority of goats have over 500 epg, drenching is recommended. If you are planning to drench, collect faeces prior to drenching. For an FECRT, samples must be collected again about 10 days after drenching.

CONCLUSION

Worms in goats may cause serious disease, which can be difficult and costly to control, requiring a combination of management strategies and effective drenching. No strategy will entirely eliminate all parasites, but their damage can be minimised. As no new groups of anthelmintics are being developed, available anthelmintics should be used wisely to prolong their effectiveness.

IN GENERAL

Strategy:	Minimise drenching Reduce parasite burdens in goats Reduce contamination of pasture Minimise resistance
Requirements:	Effective drench Clean paddock
Main drenching period:	October - April
Number of drenches:	Four (will vary with the result of FECRT)

1. Hold goats for 24 hours without food (only overnight for females with kids) before drenching.
2. Collect faecal samples and send to BVL for testing.
3. Weigh or measure largest goats and calculate the drench rate.
4. Drench goats.
5. Hold for recommended holding period.
6. Release goats into a clean paddock.
7. Collect faeces for a FECRT after 10-14 days to determine efficacy of the drench.
8. Discuss the results with a veterinarian or an NT Government officer and repeat drenching as required, along with paddock rotation.

Table 1. Estimating goat weights from girth measurements

Girth (cm)	Weight (kg)	Girth (cm)	Weight (kg)
30	2.75	70	30
35	4	72.5	34
40	6	75	36
45	9	77.5	40
50	12	80	43
52.5	14	82.5	47
55	16	85	51
57.5	18	90	60
60	21	95	69
62.5	23	100	78
65	25	105	88
67.5	28		

Note: The figures in this table were calculated for female dairy goats. Figures will vary for other breeds of goats. These values should be used only as a rough guide and goats should be weighed where possible before drenching.

ACKNOWLEDGEMENT

The figures in Table 1 are from *Diseases of the Goat*, Second Edition, by John Matthews, published by Blackwell Science, 1999.

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