

Combating damaging parasites in **goats and sheep**



Integrated, simple, low-cost methods are helping resource-poor farmers to improve their earnings by reducing the damage caused by parasites.



Above: Many resource-poor farmers depend on goats and sheep for large parts of their incomes. New ways of keeping animals healthy can make a critical difference in their lives.

Stomach worms are among the most common and damaging gastrointestinal parasites affecting goats and sheep in the tropics and sub-tropics. Yet poor farmers in these areas often lack the resources they need to buy costly anti-parasitic (anthelmintic) drugs.

How can they overcome this problem? By using, in combination, simple techniques to assess their animals' health and inexpensive, homemade feed blocks to supplement their diets. This boosts overall productivity, thereby improving the livelihoods of livestock keepers.

Why parasites are a problem

Stomach (gastrointestinal) parasites cause diseases that greatly weaken livestock, including goats, sheep, cattle and wild ruminants. This reduces the amount of milk and meat produced per animal, lowers weight gains and makes breeding and weaning less efficient. As a result, these parasites are one of the major barriers preventing poor livestock keepers from climbing out of poverty.

The nematode (roundworm) *Haemonchus contortus*—also known as wireworm or Barber's pole worm—is particularly damaging and widespread in the tropics and sub-tropics. Animals infected by this worm eat less, and use what they do eat less efficiently. This, in turn, lowers their ability to fight off parasites, especially in the case of younger animals. The reproductive capacity of female animals is diminished, as is milk production. Some animals may even die as a result of parasite infection.

The most commonly used control method for these parasites are anthelmintic drugs. Nonetheless, the use of these drugs involves several problems:

- Many resource-poor farmers cannot afford anthelmintics.
- Stomach worms are becoming increasingly resistant to these drugs, which makes them less effective.
- Using these drugs may prevent young animals from building up resistance to parasites.
- Deworming is often done selectively, in the animals least able to suppress or resist the effects of parasite infection (young animals in particular). As a result, parasites flourish

among the untreated animals, re-infecting the fields where animals graze.

Integrated solutions—a practical approach to the problem

Healthy animals are more resistant to parasite infection, or at least more resilient when it occurs. Research has shown that the use of a combination of simple, low-cost detection and supplementation measures can significantly improve animal health, thereby reducing the damage caused by parasites among resource-poor farmers.

How do parasites make animals weak?

Parasites reduce the amount of protein that animals take in

- by siphoning it off, in the case of blood-leeching stomach worms,
- by decreasing the animal's appetite,
- by reducing the animal's ability to digest its food, and
- by reducing the efficiency with which animals use (metabolize) the food they manage to digest.

All of this results in anaemia, which weakens the host animal's ability to combat parasites and increases its susceptibility to other diseases.

What can be done?

Early detection

By measuring an antibody called IgA in the blood, scientists have found that they can identify whether an animal is healthy enough to resist parasites before it develops signs of disease. This test has a number of benefits: it indicates which

animals are not receiving a sufficiently nutritious diet and can also help to single out animals that are genetically susceptible to parasites. Farmers can then select and breed from stronger, more resistant animals.

Controlling stomach nematodes before animals get sick also allows farmers to help livestock to grow faster and bigger. This means that females can breed more efficiently, and that males can be sold sooner. It also makes animals simpler to manage, as it is generally easier to care for animals that are healthy.

Simple, cheap IgA tests are currently being developed for use by farmers—so look out for these in the future.

Recognising the signs of parasite-induced anaemia

Anaemia is a sign of parasitism. Scientists have developed a system known as FAMACHA® that helps livestock keepers to discover whether an animal is anaemic—and to what degree—by comparing the colour of the mucous membranes of its eyes with colours on a specially prepared set of cards. In this way, farmers can identify animals suffering from nematode infection and target them for treatment.



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Above & below left: The FAMACHA® system provides a simple, hands-on means of detecting parasite-induced anaemia in goats and sheep. It involves comparing the colour of the pink mucous membrane around the eye with a colour chart.
Photos: K. Campbell

Integrated solutions—a practical approach to the problem *cont.*

Seasonal supplementation

One of the most important strategies in combating parasite infections is dietary supplementation. Increasing the availability of nutrients in the animals' diets helps to compensate for the protein that parasites in the stomach steal. It also helps animals fight the parasites, by boosting their immune response.

Improving the nutrition of livestock through supplementation involves several considerations:

- the quality or types of food supplied
- the quantity of food
- the seasonal requirements of the animals.

Once these considerations have been analyzed and at-risk animals have been identified, their protein supply can be increased by using readily degradable sources of protein known as urea-molasses blocks (UMB). These bring the animal back to health, increasing its productivity.



Above: Gastrointestinal parasites cause diseases that greatly weaken livestock. **Photo:** W. Richards

Strategic use of drugs

In combination with detection and supplementation, drugs can be used selectively to combat serious cases of infection in very young or susceptible animals.

Use of high-tannin forage

Feeding animals forage with a high tannin content has also been found to help control internal parasites—particularly in sheep.

Important considerations

To use the FAMACHA® system properly, users must receive practical hands-on instruction from an authorized trainer. They must also obtain the official authorized card set which has accurate colour gradations. Photocopies should not be used.

When providing **UMB supplements**, care should be taken to ensure that too much urea is not consumed by the animals, as it can be toxic. So, it is very important to follow the simple guidelines given below. Farmers should ensure that:

- the supplement is not administered to non-ruminants, or to young animals (goats and sheep under six months old)
- not more than 100 g are consumed daily by goats and sheep
- the supplement is only supplied in hardened block form (never ground up, as powder or small lumps, and never dissolved in water)
- the animals receive, in addition to the supplement, their usual feed (straw, fresh grass, concentrates) and adequate amounts of clean drinking water. Remember, UMB are supplements (additions) to the diet, not replacements for any part of the diet.



How to make low-cost UMB

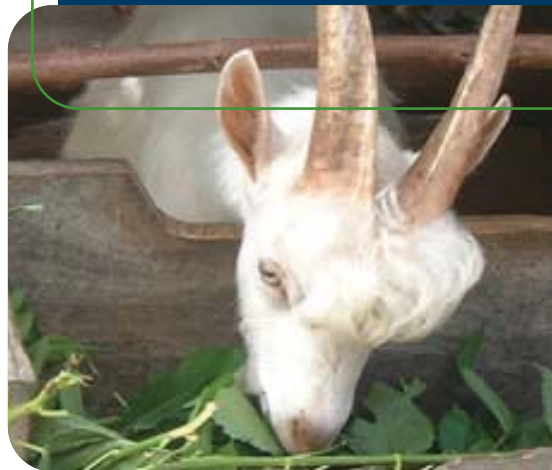
UMB can be made from a range of ingredients, depending on local availability, nutritive value and price. The blocks can also include additional components.

The following is a sample step-by-step guide for the preparation of UMB, based on the volumes of ingredients given in the table below.

Ingredients of UMB (for 10 kg of mixture)		
	Amount (kg)	Percentage (%)
Molasses	3.9	39
Urea	1	10
Wheat bran	2	20
Rice polishings (husks)	2	20
Lime	0.6	6
Salt	0.5	6

Urea-molasses

blocks can be made from a range of ingredients



Above: Urea-molasses blocks provide a readily degradable source of protein to supplement animals' diets. *Photos:* W. Richards

How to make low-cost UMB *cont.*

1. Weigh 3.9 kg of molasses and place it in a large bowl.
2. Add 500 g of common salt and 1 kg of urea and mix well by hand.
3. Store this mixture overnight or for at least 12 hours.
4. Thoroughly mix the contents of the bowl by hand once more.
5. Add the wheat bran, rice polishings (husks), and lime (which were previously kept in separate bowls) and mix well by hand.
6. Fill a 9-inch long, 5-inch wide and 5-inch high (or similar sized) container with the mixture and apply pressure to shape the block. (A block prepared in this way usually weighs 2.5 kg. The mixture can also be pressed in the bowl in which it was prepared. Remember to use a strong container.)
7. Remove the block from the container and let it harden for 15 hours, after which it will be ready for consumption by the animals.

Animals should consume the UMB by licking. Care should be taken to ensure that they cannot bite the blocks (for instance, the blocks can be placed in a metal "cage"). If necessary, the animals can be encouraged to lick the block by spreading salt or bran on it.



Above: Nutritious urea-molasses feedblocks are cheap and easy to make. Used as a supplement, they help animals fight parasites.

Photo: S. Khan/S. Siddiki

How UMB work

Molasses provides a fermentable substrate as well as minerals (calcium) and trace elements. Its pleasant taste and smell makes urea-molasses blocks attractive to animals. Molasses also helps to solidify the blocks.

Urea provides fermentable nitrogen, the most important component of the block. Nitrogen makes forage easier to digest and compensates for the loss of protein through parasitism. It does so by promoting microbial fermentation of the forage, which in turn leads to increased availability of protein after rumination.

Wheat or rice bran provides key nutrients (e.g. fat, protein, and phosphorus), soaks up moisture, and helps solidify the blocks. It may be replaced by other fibrous materials (e.g., dry and finely crushed sugar cane or groundnut hulls).

A gelling agent, or binder, is needed to solidify the blocks. Several products can be used, including magnesium oxide, bentonite, calcium oxide (lime), and calcium hydroxide.

Crop residues and by-products can be included to provide additional nutrients, according to their availability.

Minerals may be added if available. Salt, which is inexpensive, is generally added because animals often do not get enough in their diets.

Chemicals or drugs may be added to control parasites or to manipulate the fermentation of food in animals' rumens.

Benefits of UMB

UMB have been tested and successfully used among resource-poor, smallholder farmers in southern Africa, India and Bangladesh, where they have effectively reduced the damage caused by parasite infection.

In summary, their use:

- increases the amounts animals eat, resulting in weight gain and better body condition,
- improves the nutritive value of roughage by providing animals with easily metabolized protein and readily fermentable energy sources,
- provides additional nutrients that may be missing from the animals' diet and offers a vehicle for administration of drugs.

In doing so, urea-molasses blocks greatly improve the health of ruminants, increase their productivity and reduce death rates, especially when used in combination with the FAMACHA® test and other parasite-control steps outlined in this booklet.

Teaching livestock keepers the importance of the techniques outlined in this guide can make a major contribution to reducing poverty among resource-poor farmers in your region.



Photo: J. Maclean/M. Stear

Healthy animals are more resistant to parasite infection

For tools, guidelines and contact, please see the back page.

Tools, guidelines and contact

If you want to find out more, here are some tools and guidelines that may be helpful.

1. The FAMACHA® system
2. Goatkeepers' Animal Health Care Manual
3. Worms in your Goats, Sheep and Cattle
4. Smallstock Toolbox
5. Tannins and Worms

Contact

For more information on the tools and guidelines above, please contact Dr Wyn Richards (w.richards@nrint.co.uk), at the Research into Use Programme, NR International, Park House, Bradbourne Lane, Aylesford, Kent ME20 6SN, UK.

Also see the websites www.lpp.uk.com and www.dfid-ahp.org.uk

About this series

Research into Use *Pocket Guides* showcase new technologies that have been tried and tested, and have proven successful in the field. They were produced to demonstrate the importance of high-quality scientific communication.

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