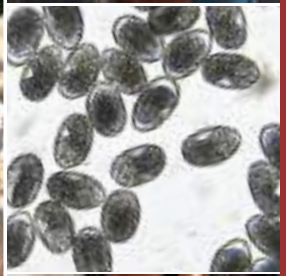
TARGETED SELECTIVE TREATMENT (TST)

OF INTERNAL PARASITES IN SMALL RUMINANTS



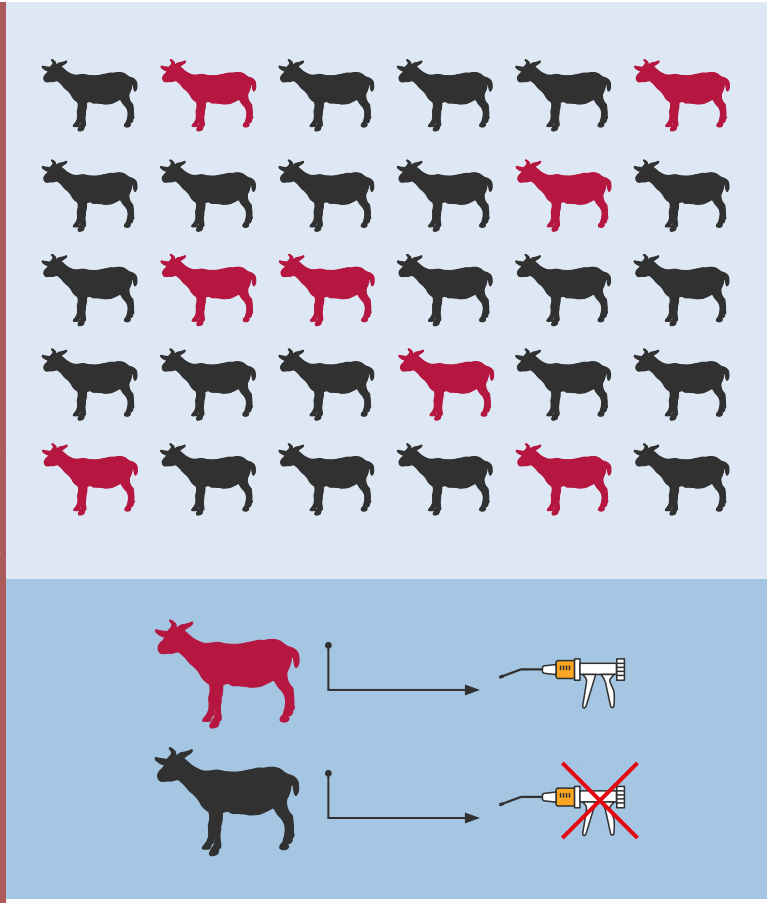






A VISUAL GUIDE

TARGETED SELECTIVE TREATMENT

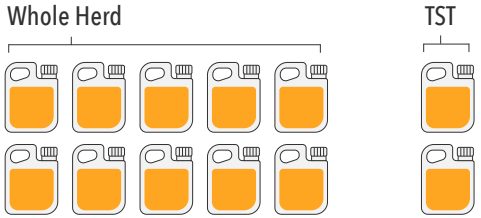


What is TST and why is it needed?

Worm infections in small ruminants are costly and can lead to disease, so their control is important and chemical dewormers (anthelmintics) are a vital tool.
Repeated whole-group anthelmintic treatments, however, encourage the development of anthelmintic resistance. One solution is to treat only those individuals that need it. This will protect them and reduce overall levels of infection in the herd, while also being efficient and leaving some worms unexposed to anthelmintics, so slowing the development of drug resistance.

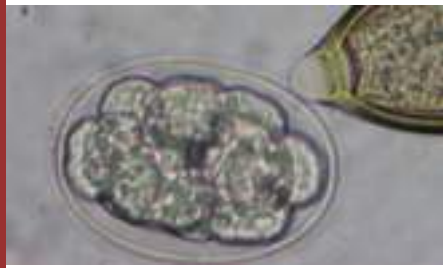
Did you know?

TST can support small ruminant health just as well as treating the whole herd and yet uses much less anthelmintic (around 83% less, Walker 2015).
This greatly reduces the cost of treatments, while helping the drug to stay effective.



How can animals in need of worming be recognised?

Appropriate indicators of treatment vary between farming systems, animal ages and types, and the equipment and time available.

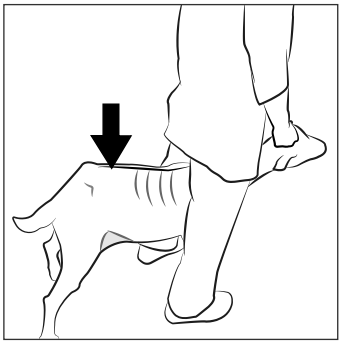


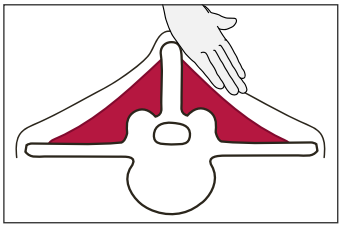


They measure effects of worms on health or production, rather than worm burden itself. Examples applicable to sheep and goats are given in the table. Monitoring production performance is an excellent way to target intervention at both group and individual animal levels (see further reading).
However, it is also possible to target treatment using very simple indicators – more information is provided in this pamphlet. Note that when treating goats, higher dose rates are generally required than for sheep.

Indicator	Age	Needs
Realised growth potential	Growing lambs	Weigh scales and herbage plate meter; calculation of target growth
Weight gain	Growing lambs / kids	Weigh scales or girth tape Weight recording
Milk yield	Adult ewes or does	Milk recording
Body condition	Mature sheep or goats	Body condition scoring system and experience
Anaemia	All ages	Colour chart for membrane colour
Dag (=diarrhoea)	All ages	Scoring system
General health	All ages	Experience







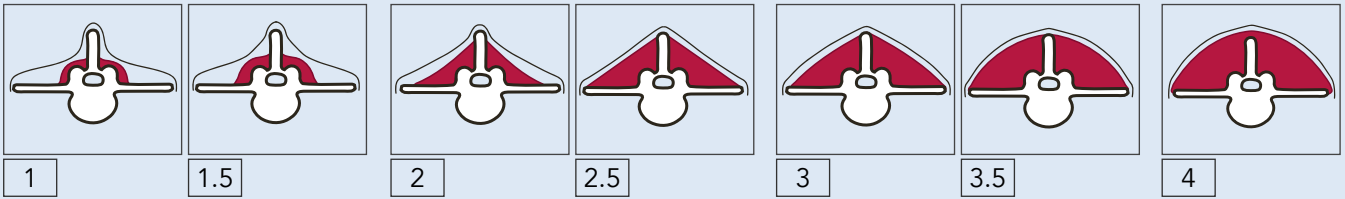
Body condition

Place the palm of your hand flat on the backbone between the pelvis and the ribs as shown by the arrow. Feel the shape and amount of muscle between the transverse bone at the side of the spine and spinous bone rising from the back. Feel both sides several times between the hip and ribs. Perform this test often to learn how different sheep or goats feel.

A scoring system should be used to record body condition and decide whether the animals are getting better or worse. An example body condition scoring system is shown here. Other systems can be used but operator consistency is important.

Note that goats typically score lower on body condition than sheep because less fat is stored under the skin. Declining body condition is often caused by worms, especially in untreated animals while grazing, but other causes including other diseases or poor nutrition are possible. Bear this in mind when deciding how to treat.

BODY CONDITION SCORECARD





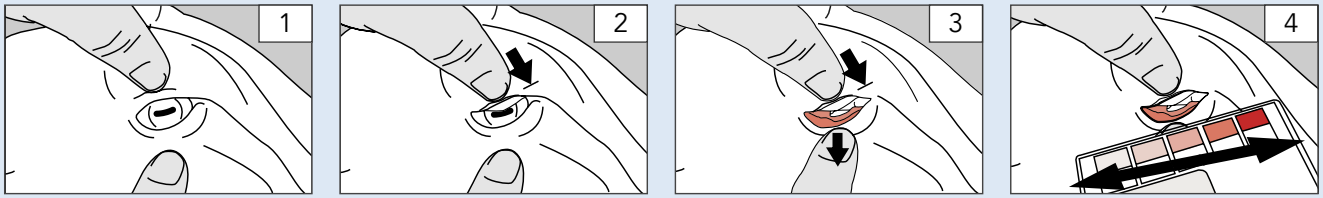


Anaemia

Some worm infections will cause anaemia, especially those that feed on blood, for example *Haemonchus contortus* roundworms or liver fluke. Anaemia can be detected by the colour of the mucous membranes surrounding the eye, which become pale with high or prolonged infection. It can be difficult to decide exactly how pale animals are, and a special card (a *FAMACHA©* card) is available to enable accurate and repeatable assessment (see further reading).

Note that anaemia is not typically a feature of the gastrointestinal nematodes most common in temperate areas, and this indicator is most useful in areas of high *Haemonchus* occurrence, including parts of central and southern Europe.

FAMACHA© CARD



Lightly press the eyelids together with one thumb and pull the skin below the eye just enough with the other thumb to expose the inside of the eyelid.

- *Do not open the eyes wide or be forceful as it might cause damage.*

Hold a FAMACHA© card close to the eye and move it back and forth to compare the colour.

- Avoid shade.
- Good light is needed for accuracy.
- *Check the whole area and record the darkest area using the FAMACHA© card*

Dag or diarrhoea

Most gut worms in small ruminants in Europe cause softening of the faeces, and eventually diarrhoea. This is often visible as faecal staining of the skin and coat around the rear end. The exact appearance depends on the level and duration of infection and other factors including diet and hair or fleece length. Nevertheless, choosing to treat those animals with evidence of loose stools (faeces) can be an effective way of implementing TST.
For example, in goats:

DAG EXAM SCORECARD



No faecal soiling
No treatment/action needed



Minor soiling on sides or edge of tail
No treatment/action needed



Slight soiling on sides or edge of tail
Usually no treatment/ action needed



Moderate soiling of tail and hair Dag formation
Consider treatment/action



Severe soiling extending down
Severe dag formation
Treatment recommended



Severe, watery diarrhea extending to legs
Treatment essential



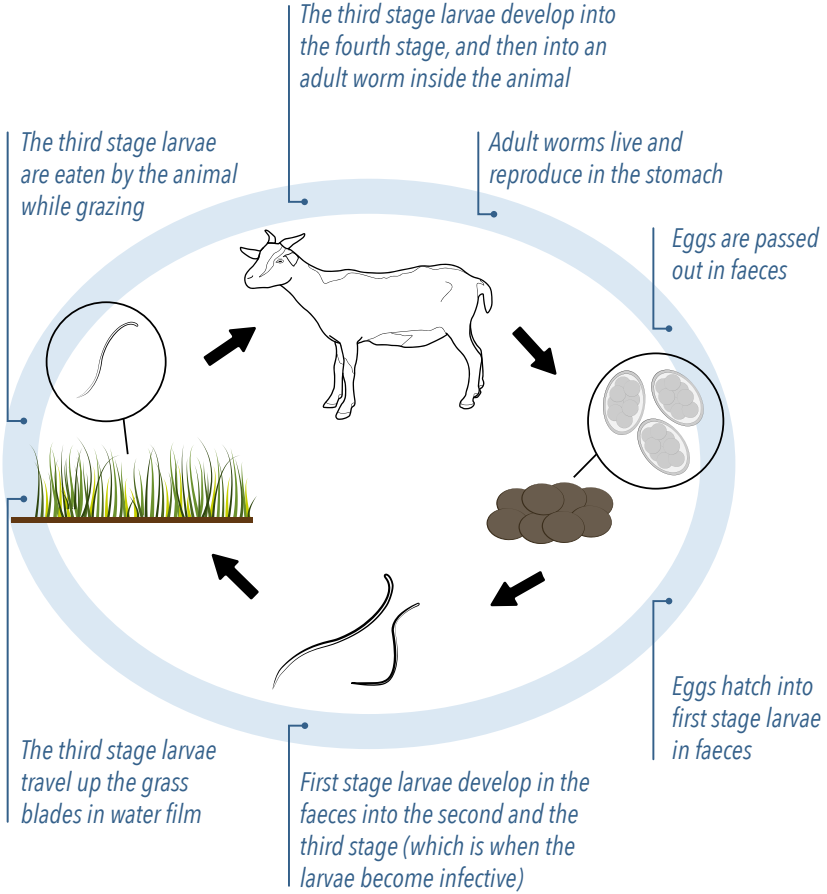
General health

When faced with a group needing treatment it is often possible to avoid treating animals that appear in the best health, and prioritise those less fit based on general appearance and farmer experience. This is preferable to treating the whole group. By using the specific indicators above, however, the choice is more accurate, and provides the opportunity for recording the performance of individual animals over time and their need for treatments. This information can be useful to decide on other health interventions and to select animals for breeding based on genetic merit.

Avoiding re-infection

Even if treatment is targeted effectively, grazing animals will likely become re-infected soon afterwards because the infective parasite larvae survive well on pasture.

Moving animals away from highly contaminated pasture, where possible, will reduce reinfection and the need to continue treating frequently. Also, by monitoring animal health from the start of the grazing season, using these methods, treatment can be considered before high levels of infection accumulate on the pasture.



FURTHER READING

Bath and Van Wyk 2009. *The Five Point Check© for targeted selective treatment of internal parasites in small ruminants. Small. Rum. Res. 86, 6–13.*

Charlier et al. 2014. *Practices to optimise gastrointestinal nematode control on sheep, goat and cattle farms in Europe using targeted (selective) treatments. Vet. Rec. 175, 250-255.*

Greer et al. 2020. *Refugia-based strategies for parasite control in livestock. Vet. Clin. N. Am. Food Anim. Pract. 36, 31-43.*

McBean et al. 2021. *The Happy Factor treatment threshold, used to determine Targeted Selective Treatment decisions for lambs, is transferable between farms. Animal 15, 100178.*

Van Wyk and Bath 2002. *The FAMACHA© system for managing haemonchosis in sheep and goats by clinically identifying individual animals for treatment. Vet. Res. 33, 509-529.*

Walker et al. 2015. *Mixed methods evaluation of targeted selective anthelmintic treatment by resource-poor smallholder goat farmers in Botswana. Vet. Parasitol. 214, 80-88.*

Gallidis et al. 2009. *The use of targeted selective treatments against gastrointestinal nematodes in milking sheep and goats in Greece based on parasitological and performance criteria. Vet. Parasitol. 164, 53-58.*

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