THE ROLE OF PASTURE MANAGEMENT IN CONTROLLING INTESTINAL PARASITES

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This contribution should be read in conjunction with other papers elsewhere in these proceedings, in particular those relating to the use of *Sericea lespedeza* as a pasture and those dealing with integrated parasite management.

The lack of a well-planned, practical and properly implemented grazing programme will inevitably lead to serious difficulties in achieving the effective, long term control of internal parasites. Reliance on anthelmintics alone is no way to cover up the effects of poor pasture management. It simply leads to the rapid and inavoidable development of drug resistance in parasite populations.

Grazing management is a complex matter requiring expertise in optimising pasture growth and recovery, utilisation and maintenance. These requirements have to be balanced with the sometimes conflicting measures needed to ensure good parasite control, or at least minimising the buildup of parasites on pastures or natural grazing (veld).

In far too many farming operations, there is no real grazing management plan. Livestock are just moved about in seeming random fashion from paddock to paddock in a series of *ad hoc* decisions determined by the way the pasture appears. Too often there is no record of how long pastures were used by how many animals, or the weather conditions prevailing.

A parasite control programme that does not include a pasture management programme is doomed to achieve poor worm control at best, and to result in a parasite disaster at worst.

How can good farmers (and their advisors) draw up and implement a good programme for pasture management, given the problems listed above and in addition, the wide variety of climates, pastures and farming systems that are in use? The answer is not to use ready-made programmes, but rather to know and implement the principles that favour livestock and not parasites. What follows is a list of principles that should be implemented wherever possible, given the problems that may require modifications and compromise to ensure that usage of pasture is both unfavourable to worms and favourable to animal production and profitability.

1. Remember that the outcome of parasite infections is primarily a matter of numbers – the greater the number of viable infective L3 larvae that are ingested over time, the greater the risk of severe effects on livestock.

2. Always consider the number of sheep or goats grazing a given size of pasture (animals per hectare) each day. This is known as the grazing pressure. The greater this is, the more eggs are deposited daily and these after hatching can become infective larvae for grazing small ruminants.

3. The number of days that livestock graze a pasture also determines the contamination level. The more time they are on a pasture, the higher the contamination with eggs.

4. Parasite loads of grazing sheep should be determined, the higher the average faecal egg count in a flock or herd the quicker that contamination will build up.

5. The length of rest, when a pasture is not grazed at all, will determine how many viable infective larvae survive to infect sheep or goats when they return. We should not talk of “clean” or “worm free” pastures, only “worm safe” grazing. The time of rest that makes pastures relatively safe depends on the worm species and the climate. In

tropical (warm, humid) environments the great majority of wireworm larvae can be dead within a month. In sub-tropical environments a rest of 2 – 3 months can be sufficient to suppress numbers of most worms significantly but there are always exceptions. *Nematodrus* species (long-necked bankrupt worm) last for many months. In "temperate" climates (cool to cold in high latitude areas) many parasite eggs can last 6 months and more.

6. Climatic factors are important for the hatching and survival of worm eggs. Dry and cold spells prevent eggs hatching, but when moisture and warmth return, they can be very large numbers of larvae hatching simultaneously, resulting in massive and dangerous infestations in livestock. The grazing plan must be adapted to take account of these factors.

7. Pasture type is important for larval survival. Dense mats formed by pastures like kikuyu are very favourable for larval survival. Some pastures contain antiparasitic compounds, notably but not only tannins, and these may influence the parasite contamination level.

8. Pasture height is crucial, and while grazing short may be good for grass utilisation, it is bad for larval intake, since the overwhelming majority of infective larvae are found in the first few centimetres of plants.

9. Pasture cover also helps determine the intake of larvae. Poor cover means bare patches and low larval survival.

10. Sunlight tends to dry out the pasture. Southern slopes in the Southern Hemisphere are cooler and moister, so larvae tend to survive better and longer. The same is true in pastures with shade from trees and bushes.

11. Slope influences water retention and flat pastures dry out slower than freely draining slopes. Thus flat pastures are more favourable for larval survival.

12. Soil type will affect larval survival. Quick-draining sandy soils are less suitable than water-retaining clay soils for larval development and survival.

13. Alternating grazing between small ruminants (Sheep, goats, camelids) and other herbivores (cattle, horses, ostriches) will lower pasture contamination since for the most part, these groups are not significantly affected by the other group's parasites. This effectively can increase the rest period of the grazing from the parasite control point of view.

14. Use contaminated grazing by grazing less susceptible animals. Lambs and lactating or late pregnant ewes must get the least contaminated (safest) grazing available.

15. Worm "hotspots" need special attention to limit contamination and infections. These hotspots are marshy areas, areas around leaking water troughs, holding areas, grassed pens, frequently used pastures. Moisture plus heavy contamination means heavy infestation, and worm problems can often be traced to such worm hotspots.

16. Wherever possible at the peak of worm season, make use of alternative grazing like natural (indigenous) pastures or veld, or crop residues. This often helps to break the escalation of pasture contamination.

17. The nutritional value of the pasture is important, since well-fed animals mount a better immune response to worm infection.

18. Browse (bushes) is safer since worm larvae cannot ascend the stalk very far.

19. Always have a written plan to utilise pastures so that potential problems can be identified beforehand and appropriate action taken.

20. Ensure that there is a good record of stock movements, pasture usage, grazing pressures, type of livestock, rain, irrigation, temperature, pasture type, fertilisation and worm treatments. This is not so burdensome once it is implemented, and the benefits will be immense from a pasture utilisation as well as a parasite control viewpoint. It will also enable the identification of problems that need rectification.

21. By remembering that the overwhelming majority of parasites (>95%) are to be found on the pastures and not in the animals, the key role of pasture management can be used to ensure that parasites do not have a serious effect on either productivity or profitability.

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