Drenching goats – trying to apply the Wormwise principles in real life

GINNY DODUNSKI
Totally Vets Ltd Taumarunui, 170 Hakiaha St, Taumarunui

Abstract

‘Wormwise for Goats’ is a best-practice resource aimed at educating goat producers about sustainable management of internal parasites.

Wormwise for goats strongly emphasises the management-related opportunities for decreasing the impact of worms on goats.

However the need for anthelmintic treatment is not going to go away. The widespread and severe nature of drench anthelmintic resistance in goat flocks, combined with the need to apply a default 91-day meat withholding period to most products, presents a challenge for goat producers and their advisors.

Introduction

‘Wormwise for Goats’ was funded by leftover goat levy money administered by Beef + Lamb NZ. It is a printed booklet and downloadable PDF which broadly follows the original Wormwise manual ‘A handbook of sustainable worm management for sheep and beef farmers’; distilling its salient points and expanding the information as it applies to goats and goat farming.

This paper describes some experiences attempting to apply the Wormwise principles in three very different goat farming scenarios:

1. A lifestyle block with a small number of goats and apparently severe multi-drug resistance
2. A goat ‘aggregator’ who has an almost continual stream of goats coming onto his property
3. A high performing intensive sheep and beef operation where goats are a minor component and able to be managed with very minimal drench inputs.
Brief summary of Wormwise principles for goats

Management

- Manage to minimise larval challenge. Goats are natural browsers and like variety in their diet. They will eat different weeds/shrubs/browse at different times of the year. The more they are forced to graze like sheep the more difficult worm management will be. ‘Let goats be goats!’
- Goats do best on pasture residuals (not pre-grazing mass) of 2500 kgDM/ha. This equates to about 11 cm long winter-grown pasture and 7 cm long summer-grown pasture
- For goats to be managed like this requires cattle to graze the pasture down from 2500 kgDM/ha to 1500 kgDM/ha (and sometimes less) to maintain quality.
- There is a lot to be gained through improved focus on body condition in adult goats, especially in the Angora breed, which may be underfed in the pursuit of lower micron fibre. This will improve the resilience of adults and enable them to be more effectively used as source of refugia.
- Worm management is much easier if goats are kept as a minority stock class.
- Lifestylers who run goats as a high proportion of their stock need to focus on lifting pasture residuals, feeding a lot more supplement to achieve this, and look at the feasibility of introducing browse species such as tree Lucerne and fodder willows.

Specific characteristics of worms in goats

- Goats develop a less robust immunity to worms than sheep do but adult goats do develop a level of immunity.
- As a general rule an adult goat will develop a level of immunity similar to that of a 2 tooth ewe. That said there is wide breed variation with the Boer and Angora breeds being recognised as less resilient.
- Worm epidemiology broadly follows the sheep pattern; most contamination comes from the kids in their first summer/autumn.
- That said, adults does over kidding have a more prolonged and severe breakdown of immunity and will be contributors to pasture contamination at this time.

Drench use

- From farmer survey work it appears that a ‘standard’ preventive programme in kids is underutilised on many properties. A proviso here is the need to first establish the product to be used in such a programme actually works.
- A routine drench should be a combination of highly effective actives. On many goat properties this will be very difficult to achieve and will potentially require the addition of one of the new actives (derquantel, monepantel)
- Products containing levamisole and/or abamectin have a toxicity risk, especially in young animals. In our practice we often recommend a double dose of moxidectin for goats under 6 months, especially for lifestylers who may have trouble estimating liveweights.
- Many adult goats maintain an oesophageal groove reflex which will divert drench straight into the abomasum rather than the rumen. The resulting rapid absorption
leads to inadequate plasma and tissue levels of drug; as effectiveness of anthelmintic is driven by the area under the plasma curve rather than height of the peak.

- Goats are also very good at spitting drench back.
- Techniques to ensure drench goes into the rumen include: use of a long thin drench nozzle, use of low volume drenches, and holding goats in a sitting position (dragging across the shearing board) rather than drenching in a race.
- Resistance to an abamectin-containing triple combination appears to be quite widespread in New Zealand goat flocks. In addition there are now several documented cases of monepantel (Zolvix™) resistance in NZ and Australian goat flocks, and it should not be assumed that the derquantel plus abamectin combination (Startect™) will be effective on its own either.
- An effective quarantine drench for goats in New Zealand should therefore probably be Zolvix plus Startect. This needs to be followed with a well thought-out quarantine protocol to prevent potential ‘super-worms’ from establishing on the property.

Withholding periods and default residue levels

**Withholding periods**

A major issue with all of the products described above is the need to apply a 91-day meat withholding period (WHP) when they are used in goats. This is the default withholding period for veterinary medicines in ruminants and deer.

Default WHPs were set based on existing data and designed to be used as a conservative ‘catch-all’ to avoid residues in animal products where there is no residue data to set a specific WHP.

A veterinarian can determine that a veterinary medicine can be used in an off label manner and advise an alternative withholding period, but the veterinarian is responsible for ensuring that such advice does not breach any maximum residue levels.

**Default residue levels**

Since goats tend to metabolise drugs faster than sheep, it is tempting to assume that the sheep WHP will be suitable for goats. A potential pitfall of this is the lower MRL (maximum residue level)/MPL (maximum permissible level) applied to off-label use.

Only the compounds registered for goats have specific MPLs (maximum permissible levels). Products which are registered in other species but not registered for goats have to comply with the default MPL of 0.01mg/kg. For example the MPL for moxidectin in sheep fat is 0.5mg/kg, but for goat fat is the default level of 0.01mg/kg – 50 times lower.

That said the level of non-compliance is very low. In 2015 there was a finding of a coccidiostat in an adult goat which was non-compliant because the level found exceeded the default level of 0.01 and because the product is registered for use in young animals only, of another species.

When a result exceeds a maximum permissible level the supplier will be placed on a national surveillance list and not removed until MPI is satisfied that the risk source has
been managed. Normally this is by testing a subsequent mob at slaughter.

Residue sampling

Figure 1. Shows the MPI national residue sampling plan for goats for 2016.

<table>
<thead>
<tr>
<th>Compound</th>
<th>Number of samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stilbenes, steroids and RALs</td>
<td>25</td>
</tr>
<tr>
<td>Thyreostats</td>
<td>25</td>
</tr>
<tr>
<td>Beta-agonists</td>
<td>25</td>
</tr>
<tr>
<td>Phenics</td>
<td>25</td>
</tr>
<tr>
<td>Nitrofurans</td>
<td>25</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>25</td>
</tr>
<tr>
<td>Anticoccidials</td>
<td>25</td>
</tr>
<tr>
<td>Anthelmintics</td>
<td>25</td>
</tr>
<tr>
<td>Pesticides &amp; environmental contaminants</td>
<td>25</td>
</tr>
<tr>
<td>1080</td>
<td>15</td>
</tr>
<tr>
<td>Elements</td>
<td>25</td>
</tr>
<tr>
<td>Anticoagulants</td>
<td>15</td>
</tr>
</tbody>
</table>

Figure 1. Monitoring sampling regime for goat slaughter premises

An annual sampling plan is drawn up to divide the above list among all premises that slaughter goats.

By comparison, in cattle 150 samples are undertaken for pesticides and environmental contaminants, and 125 for antibiotics.

For anthelmintics, 100 samples are required from both sheep and cattle. The full list is available at Website: foodsafety.govt.nz Link: bit.ly/1Xr1WSa

Sampling is randomised by week, day of week and vendor.

The substance groups above will include tests for multiple individual chemicals. For example each pesticide test is for more than 400 chemicals. The specific chemicals tested for are reviewed and modified annually based on known current use, and any national and international risk information.

Case studies

Waikato lifestyle block – the horse has bolted?

A lifestyle block near Te Awamutu has four goats, ranging in age from one to eight years.

Veterinary help was sought when oral ivermectin (for sheep and goats) did not seem to be providing adequate control of parasitism. One of the younger goats had had loose stools for some time, so a preliminary series of FECs (faecal egg counts) were performed on the goats 2.5 weeks after the last ivermectin drench. Counts were 350, 450, 800 and 3750 strongyle eggs per gram (EPG).
The possibility of resistance seemed high, but more information was required.

A ’mini’ faecal egg count reduction test (FECRT) was run; weighing the animals to ensure the correct dose was given, with care to ensure the animals swallowed properly. Oral moxidectin was used, with the intent of determining how badly the ’mectin family was failing.

A FEC at 10 days revealed two of the three of the goats had a zero egg count, and one had a count of 50 EPG. So it appeared that at least moxidectin was working reasonably well in these three animals.

The attending veterinarian had read ’Wormwise for Goats’ (hooray!) and sat down with the owners to talk through the Wormwise principles, and look at changes that could be made on the block. These owners really like their goats and were willing to do almost anything.

In the middle of the moxidectin check the goat with the highest initial FEC of 3750 was not clearing up (worrying the owners to no end) so the veterinarian decided to run an interim FEC. Four days after the drench this goat had a strongyle count of 5700 EPG. Whilst it is possible that there may still have been some egg clearance at four days, the egg count going up by 1950 was alarming.

The goat was drenched with a triple combination containing levamisole, albendazole and abamectin (Matrix). Split dosing was used with a 24 hour interval, and the goat held off pasture for 24 hours after the second dose. However five days after the Matrix was administered the egg count had risen to 10,050 EPG.

It came to light that this goat had been bought in from a goat breeder within the last few months. The attending veterinarian was rightly concerned about the highly resistant worms that this animal was likely contaminating the property with.

Where to from here?

- A larval culture of the faeces post-matrix to determine which species are involved
- If it were up to me I would drench the goat with both Zolvix™ and Startect™ at 1.5 times the sheep dose, and house it off pasture until it returns a zero egg count.
- Then what?
  - Presumably the ‘superworm’ that this goat has been populating the pasture with has not multiplied to any great extent or the other goats would not have returned such a good result with moxidectin
  - So aim to protect the status quo by improving the management of these goats to reduce reliance on drench – high pasture residuals, supplementary feed, look at feasibility of planting browse species
  - A small group of individual goats like these should be able to be managed as individuals and each only drenched when really necessary, FECs, FAMACHA scoring and ‘eyeometer’ are all useful tools.
  - Make a big call about what the routine drench combination should be – Matrix plus one new active? Two new actives? Split dosing?
  - Inform the goat breeder – they need to be aware of their situation and the responsibilities that should come with it.
Goat trader – a slippery slope?

This business buys goats from all over the North Island; many are mustered feral goats and an increasing percentage is cull dairy goats. 20,000 to 30,000 goats are traded throughout the year.

A percentage goes directly to slaughter, some are held until they can be booked for slaughter, and the smaller goats (under 26kg) are farmed on to grow out. Ferals and their crosses are preferred for this as they are more resilient. The owner has found Boers and Angoras difficult to manage under his system.

At any one time there are around 3000 goats on two hill country properties, with trading cattle (heifers and steers) to maintain pasture quality.

The big parasitological risks in this business are:

- Importing the ‘super-worm’ (probably several times a year!)
- Multiplying up the ‘super-worm’ to a point where the inability to control it results in failure of the farming system
- Inability to maintain health of goats as they approach slaughter weight due to 91 day default WHP

Quarantine protocol

At present the quarantine protocol on these farms is too loose. The small goats to be farmed on are drenched with Matrix at 1.5 times the sheep dose, and released onto well contaminated pasture. Undoubtedly there will be worms surviving this process (the first case study is a perfect example).

However before I blithely recommend changing to a ‘belts and braces’ quarantine protocol that could cost the client over $40,000 dollars a year in new drench actives, I would like to ascertain what the existing resistance status is. A FECRT will be a great investment that will determine whether in fact there is anything left to protect, or whether it is better to focus inside the farm gate at minimising the impact there.

On-farm worm control

Goats are essentially set stocked, at a light stocking rate, ranging over large blocks. Mobs of cattle come in and out as required for pasture control, sometimes rotating, and sometimes set stocked depending on the time of year.

A saving grace of this system is probably that there is a huge population of worms in refugia. The young goats are rarely drenched more frequently than every six weeks, though the owner does notice if he leaves them much beyond this in the autumn that they deteriorate.

Because such large numbers are farmed, some clinical parasitism is tolerated (slowness/dullness is often apparent prior to goats beginning to scour), as are occasional signs of drench toxicity in the name of treating with a triple combination at a high dose rate! He has noticed that this is much more likely to occur if goats have been off pasture for long periods before being drenched, so now makes an effort to muster smaller mobs and get them drenched quickly once in the yards.

The 91 day default withholding period is used, and as goats near slaughter size, they are given priority feeding to try to prevent the need to re-drench close to slaughter. Blocks with more browse and shrubs can be useful at this time to reduce larval challenge.
Small goat flock on a bigger property – something more sustainable?

A high performing, intensive sheep and beef operation in a summer safe area of Hawkes Bay runs a small breeding flock of 50 angora does, plus 20–30 wethers and replacement hoggets.

The goats are kept because their mohair makes it financially worthwhile, while their primary function is weed control, particularly of nodding thistles and Californian thistles, which they actively seek out. However the owner notes that they ‘eat whatever takes their fancy at the time’. The weed and pest category of his farm working expenses is a quarter of that of comparable sheep and beef farms.

Fifty does is quite a small mob, and when they don’t have young kids at foot they are mobbed up with cattle and rotated to improve the pasture control outcome.

The drench resistance status of the property is known; with a fairly standard pattern of minor resistance to the ‘original three’ drench actives in the sheep worm species.

The goats are drenched ‘as infrequently as possible’. Kids are drenched at marking in November, and again at weaning April. Does are treated pre-tup, though individuals may be drenched at other times if required. A triple combination is used at approximately 1.5 times the sheep dose.

Because of the way they are grazed (mostly consuming the weeds in a paddock while on frequent shifts) they presumably encounter very low larval challenge for much of the year which enables this very low level of drench input.

This type of enterprise is a great example of how even angora goats can be managed with very low drench inputs when farmed in a manner that suits them.

Thanks

To Jess Gordon, V.E Vets Te Awamutu for the lifestyle block case, and to Lynne Clay, Regional Technical Specialist and Residues Program Coordinator, Waikato Bay of Plenty team, MPI, for the information on residue sampling.