Parasite Control Year Planner

Sheep

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KEY POINTS FOR EFFECTIVE PARASITE CONTROL

Anthelmintics (wormers):

Anthelmintics to treat PGE (gut worms) – there are currently 5 groups of wormers (please see tables at end):
- Group 1-BZ (Benzimidazoles)
- Group 2-LV (Levamisole)
- Group 3-ML (Macrocyclic Lactones)
- Group 4-AD (Amino-acetonitrile Derivatives)
- Group 5-SI (Spironidols - POM-V)

Resistance has been recorded in Groups 1-3, with some flocks showing resistance to more than 1 group (multiple resistance). Group 4 and 5 are new wormers and there is no known resistance to them in the UK (although some reports to 4-AD abroad) so they should be incorporated into control strategies on farms with multiple resistance.

Anthelmintics to treat fluke – There are 5 main compounds:
- Triclabendazole (treats all stages including immature flukes).
- Clopental (effective against immature fluke from around 7-28 days post infestation).
- Nitroxynil (effective against immature fluke from around 5-7 weeks post infestation).
- Albendazole (effective against adult fluke at increased dose rate during late winter/spring).
- Oxyclozanide (effective against adult fluke during late winter/spring).

Triclabendazole is highly effective against all stages of fluke, including the early immature fluke stages (> 2 days old) and so is the anthelmintic of choice for the autumn treatment of acute fluke. However, resistance is increasing so it should be used sparingly at other times of year.

Combination fluke and wormer products should only be used when necessary, as they can lead to off-target selection for resistance to broad-spectrum anthelmintics in nematodes.

Bio-security:

If you don’t have worm/fluke resistance in your flock it’s vital to keep it out. When buying in sheep or rams follow a quarantine strategy:

- PGE: On arrival isolate, yard and worm with 4-AD or 5-SI wormer and inject with moxidectin 1%.
- After 48 hours yarding, turn out onto contaminated pasture (pasture that has been previously grazed by sheep) and isolate for a further 3 weeks. Check for scab, CLA and CQDD.

Fluke:

- Treatments should be “risk based” depending on time of year and origin. If triclabendazole resistance is suspected then use an alternative flukicide taking into account product variations in activity against immature fluke.
- Keep sheep yarded, or on quarantine pastures (no fluke habitats) for at least 4 weeks. Monitor by FEC to determine the need for any subsequent treatment.

Resistance:

- PGE: gut worm resistance:
  - Have you had your flock tested for resistance to anthelmintics (wormer)?
    - YES □   NO □
  - If you have resistance on your farm – to which group(s) is there resistance?
    - YES □   NO □

- PG E – W omer if over 500 epg
  - Have you had your flock tested for resistance to a w omer?
    - YES □   NO □

- If you have not had your flock tested – you need to test for resistance – if worms on your farm are resistant to the wormers you are using, it will result in lower weight gains, clinical disease and possibly death – the cost to you is not only the cost of the wormer but the decreased weight gains.

- You can easily check for possible resistance:
  - Take faecal egg counts (FECs) from a group of 10 sheep.
  - Worm with your usual wormer and then repeat FECs post worming: time varies for different wormers i.e. 7 days post worming 2-LV, 14 days 1-BZ and 3-ML.
  - Resistance is suspected if mean FECs have reduced by less than 95% post treatment.

- Fluke resistance:
  - Have you had your flock tested for resistance to triclabendazole?
    - YES □   NO □
  - IF YES, do you have resistance to triclabendazole on your farm?
    - YES □   NO □
  - A coproantigen ELISA test or fluke egg reduction test can be used to detect triclabendazole resistance two to three weeks after dosing – ask your vet.

Strategic dosing:

The timing of strategic dosing is weather dependent as it affects parasites life cycles and the potential for disease outbreaks, particularly nematodiosis in the spring and acute fluke in the autumn. There are 2 strategic treatment times:

- Nematodiosis – Spring nematodiosis worming. Weather will affect the timing of the hatch of Nematodoid eggs. If the peak hatch coincides with lambs of the right age grazing contaminated pasture it will result in disease and possible death, so it’s vital your sheep vet advises on the timing of worming – generally Group 1-BZ wormers are used and in some years a second nematodiosis dose is required (see NADIS Parasite Forecast www.nadis.org.uk and SCOPS Nematodius forecast www.scops.org.uk).

- PG E - W omer if over 500 epg

Use the correct product:

Use the product(s) recommended by your sheep vet.

Accurate dosage:

Under dosing is a common contributory factor for anthelmintic resistance – so don’t guess:
- Split animals into different groups - lambs, ewes and rams.
- Whole groups vary considerably in size, subdivide.
- Weigh some of the heaviest animals in each group and dose to the heaviest.
- Dose according to manufacturer’s recommendations.
- Check accurate calibration of dosing equipment.

Targeted dosing - Faecal Egg Counts (FECs):

Apart from the strategic 4-weekly dosing times for the rest of the year is based on monitored weight gains or FECs. To carry out a FEC, collect dung samples from 10-20 sheep. The samples will be mixed in the lab, and eggs counted in the combined sample.

- PGE - W omer if over 500 epg
- Fluke - Treat 1 or more eggs present

Targeted worming is used to limit the build-up of resistance to wormers while improving growth rates.

Plan for health - ask your vet for a Veterinary Parasite Control plan

www.nadis.org.uk
Nematodirus can occur when lambs are 6–12 weeks old. Strategic worming — If dosing weaned lambs and moving onto safe grazing it is after weaning and a move to “safe grazing” lambs may not need Contaminated grazing — pastures grazed by sheep this season and therefore likely to have a high level of worm egg contamination. Resistant worms — a resistant worm survives treatment with the standard recommended dose of an anthelmintic. This is a heritable trait and can be passed on to the worm’s offspring. The term “in refugia” refers to the population of worms coming from untreated sheep and the free-living sub-population i.e. eggs and larval stages not exposed to anthelmintics. The bigger the in refugia population the slower resistance develops. After weaning and a move to “safe grazing” lambs may not need to be treated with an anthelmintic for up to 6–10 weeks, however this will depend upon the amount of infection carried over, stocking rate and weather conditions (large numbers of lambs left untreated, high stocking rates and wet weather increase challenge). If dosing weaned lambs and moving onto safe grazing it is important to delay the move, by up to 7 days following treatment, to further reduce the pressure on selection for resistance. Strategic worming - *Nematodirus battus* (N. battus): The spring hatch is weather dependent - so ask your vet and look out for the NADIS www.nadis.org.uk and SCOPS www.scops.org.uk Nematodirus forecasts. Nematodirosis can occur when lambs are 6-12 weeks old on contaminated pasture and may coincide with coincidirosis. Treatment is usually with a Group 1 BZ. Flocks with multiple resistance (to two or more groups) grazing safe pastures: Where multiple resistance has previously been confirmed on your farm, products containing group 4-AD and group 5-SI anthelmintics will be especially useful in weaned fattening lambs before moving to safe pasture. Around 10% of the strongest lambs should be left untreated to ensure that some susceptible worms are carried over onto the new pasture to reduce selection on these new groups of worms. Pre-tipping worming: Worming all breeding females pre-tipping is rarely necessary and dosing all ewes pre-tipping may select for wormer resistance, however, autumn infections (and fluke or Haemonchus infections) can be significant so carry out a FEC first. In general terms, anthelmintic treatment should be targeted at leaner ewes, gimmers, or those sheep with dags. Rams are often neglected at this time and a FEC will decide whether a pre-tipping anthelmintic treatment is necessary. Anthelmintic treatments of ewes at lambing: The timing of dosing and choice of wormer are both important. If ewes are still experiencing the post partum egg rise when the effect of the wormer ceases, they are likely to become re-infected quickly, particularly on heavily infected permanent pastures. With long-acting treatments there may be a prolonged period before ewes re-establish a nematode infection from the in refugia population, which can be highly selective for resistance. Recommendations are to either leave a proportion of ewes untreated, or treat early in the post-lambing phase to ensure that ewes become re-infected with unselected parasites before their immunity is fully restored. With long-acting formulations of moxidectin the recommendation is to use these products prior to lambing, or at turnout. Fluke Strategic treatment: Acute fluke is weather dependent and can occur from July onwards, more usually September and October, with wet summers increasing fluke activity, a second dose may be required - so ask your sheep vet for advice based on local farm conditions and NADIS fluke forecast. Triclabendazole is the only flukicide effective against very young immature flukes. In high risk years a repeat treatment will likely be necessary 4-6 weeks later. Sheep with acute fluke infestation may simply be found dead without prior signs of illness therefore it is important to have a sudden deaths investigated to allow immediate preventive measures. Post mortem examination is essential to establish a diagnosis of acute fluke. Less severe clinical signs include reduced grazing, rapid weight loss, abdominal pain, anaemia and low ESR. Chronic fluke in sheep peaks in the late winter/early spring. • Not all sheep with a significant fluke infestation show classical “bottle-jaw”. • Liver fluke may cause scanning figures to be up to 30% lower than normal, with a higher barren rate (2% considered to be a normal barren rate). • Efforts must be taken to reduce reliance on triclabendazole by husbandry measures and the use of other flukicide treatments when appropriate. • Closeant and nitroxynil are highly effective against immature flukes from around 7 weeks post infestation. • Albendazole and oxyclozanide can be used for the treatment of adult flukes during late winter/spring. • Where possible, sheep should be moved to safer pastures after treatment. • Supplementary feeding may be necessary to restore body condition before late pregnancy. • Flocks with no previous evidence of fluke disease must maintain their farm’s biosecurity especially with respect to purchased sheep, but also cattle.
Coccidiosis

Coccidiosis usually affects twin lambs from 3-4 weeks of age on heavily contaminated permanent pasture and may appear around the same time as Nematodirus, so infections can be confused with Nematodirus - diagnosis is based on clinical signs and previous history of disease. Faecal oocyst counts (FOC) are helpful but not always conclusive so consult your vet yet, as prompt diagnosis is essential.

- Clinical signs include unthriftiness and profuse watery diarrhoea, often containing streaks of blood.
- Avoid overcrowding and mixing different age groups of lambs. It also helps to provide plenty of clean bedding in birthing and rearing pens, and to keep young lambs off heavily contaminated pastures.
- Preventative treatment with anticoellics:
  - Decoquinate creep feed for 28 days, or
  - Udoxime (not anticoccidial)

Sheep scab is typically encountered from September through to April.

Clinical signs include unthriftiness and profuse watery diarrhoea, heavily contaminated permanent pasture and may appear around the same time as Nematodirus. Coccidiosis is a significant risk in April for February/March born lambs managed intensively indoors.

- Treatment is by either dipping in an approved acaricide (diazinon) or by injection with an ML. It is essential that all sheep in a flock are treated, regardless of whether showing signs.
- Use of plunge dipping for other reasons, such as control of sheep lice, is effective when applied soon after shearing.

For details on products see tables.

Tick control: dip, injection, pour-on, spot-on, spot-spray, spray, dust, fly control, ear tags, etoparasiticides, etc.

<table>
<thead>
<tr>
<th>Active</th>
<th>Dose Rate</th>
<th>Treatment</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ivermectin</td>
<td>0.5m l/kg (120mg/kg)</td>
<td>2 injections</td>
<td>-</td>
</tr>
<tr>
<td>Doramectin</td>
<td>1m l/kg (100mg/kg)</td>
<td>1 injection</td>
<td>-</td>
</tr>
<tr>
<td>Moxidectin</td>
<td>0.1m l/kg (200mg/kg)</td>
<td>2 injections</td>
<td>28 days after one injection</td>
</tr>
<tr>
<td>Moniezia</td>
<td>0.5m l/kg (1mg/kg)</td>
<td>1 injection</td>
<td>60 days after one injection</td>
</tr>
<tr>
<td>Ivermectin (Dysect)</td>
<td>0.5m l/kg (1mg/kg)</td>
<td>1 injection</td>
<td>Up to 28 days after one treatment</td>
</tr>
</tbody>
</table>

Sheep scab continues to cause serious welfare problems throughout the UK.

ECTOPARASITES

Scab

Sheep scab is typically encountered from September through to April.

- Sheep have distinctive grazing patterns and are observed kicking at their chest with their hind feet and/or rubbing themselves against fence posts. The fleece is wet, sticky, yellow and frequently contaminated with dirt from the head, feet. Typically after around eight weeks, the hair loss on the flanks may extend to 20 cm diameter surrounded by an area of inflammation and serum exudation. The skin is often thrown into thickened corrugations.

Keds

Keds are permanent ectoparasites and are most commonly seen during autumn and winter. As with lice, spread occurs by close contact.

- The treatments used for lice are also effective against keds.

Blowflyy

Check sheep daily for signs of blowfly. Adults flies are attracted to:

- Areas adjacent to faecal staining surrounding the anus.
- Heavily contaminated permanent pasture and may appear around the same time as Nematoth, so infections can be confused with Nematoth. Nematodirus - diagnosis is based on clinical signs and previous history of disease. Faecal oocyst counts (FOC) are helpful but not always conclusive so consult your vet yet, as prompt diagnosis is essential.

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- The treatments used for lice are also effective against keds.
### 1-BZ Sheep Products

<table>
<thead>
<tr>
<th>Active Product</th>
<th>Group</th>
<th>Gastrointestinal Worms</th>
<th>Lung Worms</th>
<th>Tape Worms</th>
<th>Fluke Nematodes</th>
<th>Combination Active</th>
<th>Route</th>
<th>Dose Rate (Fluke rate)</th>
<th>Product</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albendazole</td>
<td>1-BZ</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
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<td>Oral Drench</td>
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<tr>
<td>Fenbendazole</td>
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<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
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<td>Fenbendazole</td>
<td>NoBrand</td>
</tr>
<tr>
<td>Oxfendazole</td>
<td>1-BZ</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>Oral Drench</td>
<td>1ml/5kg (1.5ml/kg)</td>
<td>Oxfendazole</td>
<td>NoBrand</td>
</tr>
<tr>
<td>Triclabendazole</td>
<td>1-BZ</td>
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<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>Oral Drench</td>
<td>1ml/5kg (1.5ml/kg)</td>
<td>Triclabendazole</td>
<td>NoBrand</td>
</tr>
</tbody>
</table>

**Key:**
- ✓ = Active
- ± = Combination active
- ± = Variable activity

**Notes:**
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### 3-ML Sheep Products

<table>
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<th>Active Product</th>
<th>Group</th>
<th>Gastrointestinal Worms</th>
<th>Lung Worms</th>
<th>Tape Worms</th>
<th>Fluke Nematodes</th>
<th>Combination Active</th>
<th>Route</th>
<th>Dose Rate (Fluke rate)</th>
<th>Product</th>
<th>Company</th>
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<tbody>
<tr>
<td>Ivermectin</td>
<td>3-ML</td>
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<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>Oral Drench</td>
<td>1ml/5kg (1.5ml/kg)</td>
<td>Ivermectin</td>
<td>NoBrand</td>
</tr>
</tbody>
</table>

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### Group 5. Spiroindole (5-SI) Sheep Products POM-V

<table>
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<tr>
<th>Active</th>
<th>Gastroems</th>
<th>Lung Worms</th>
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<th>Fluke</th>
<th>Combination Active</th>
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<th>Dose Rate</th>
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### Combination Wormers and Flukicides

<table>
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<th>Active</th>
<th>Gastroems</th>
<th>Lung Worms</th>
<th>Tape Worms</th>
<th>Fluke</th>
<th>Combination Active</th>
<th>Route</th>
<th>Dose Rate</th>
<th>Product</th>
<th>Company</th>
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</thead>
<tbody>
<tr>
<td>Triclabendazole</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Oral Drench</td>
<td>1ml/5kg</td>
<td>Eimeria</td>
<td>✓</td>
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### Flukicides

<table>
<thead>
<tr>
<th>Active</th>
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<th>Lung Worms</th>
<th>Tape Worms</th>
<th>Fluke</th>
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<th>Route</th>
<th>Dose Rate</th>
<th>Product</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albendazole</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Oral Drench</td>
<td>1.5ml/5kg</td>
<td>Abamectin</td>
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<tr>
<td>Ivermectin</td>
<td>0.5-2ml</td>
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<td>1ml/5kg</td>
<td>Eimeria</td>
<td>✓</td>
<td>Zelitl</td>
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<td>Levamisole</td>
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<td>✓</td>
<td>Oral Drench</td>
<td>1ml/4kg</td>
<td>Endoxan 100</td>
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</tr>
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<td>Triclabendazole</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Oral Drench</td>
<td>1ml/5kg</td>
<td>Endoxan 100</td>
<td>Zelitl</td>
</tr>
</tbody>
</table>

**Notes**

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- ± = Combination active
- = Vestibular activity
- **Dose range 0.5ml 14-25kg, 1ml 25-50kg, 1.5ml 51-100kg, 1.5ml 41-55kg, 1ml 56-75kg**
Plan for health - ask your vet for a veterinary health plan