Sustainable Worm Control Strategies for Sheep
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Three Main Changes

• The Sheep Industry

• The Parasites

• The Anthelmintics and Resistance
Changes in the Sheep Industry

- 40% increase in sheep numbers since 1980
- 25% reduction in cattle numbers
- 25% reduction in temporary grass area
- 30% reduction in labour available
Implications For Worm Control

• Loss of opportunity for alternation and/or new leys
• More continuous sheep grazing at higher stocking rates
• More sheep/shepherd - ‘Blueprint’ control strategies
• Increasing reliance on anthelmintics
‘Blueprint’ Control Strategies

• Convenient
• Prophylactic
• Easily planned and recorded
• Effective historically
• Relatively cheap
• Rely on highly effective anthelmintics
Changes in Parasites - examples

1. Haemonchus contortus - more widespread
2. Trichostrongylus earlier
3. Nematodirus in the autumn
The Anthelmintics

- ML group added
- Persistency
- Resistance
- No new groups in foreseeable future
Three Broad Spectrum Groups

- **Group 1 (BZ)**
  - Benzimidazoles
  - White drenches

- **Group 2 (LM)**
  - Levamisoles
  - Yellow drenches

- **Group 3 (ML)**
  - Macrocyclic-lactones
  - Clear drenches
What is Resistance?

- Resistance is the heritable ability of the parasite to tolerate a normally effective dose of the anthelmintic.
- FECRT reduction less than 95%
- ......but you will probably not notice there is a problem until the reduction is much less than 95%
Moredun Survey - % BZ Resistance on Farms

- Lowland: Average 2000
- Upland: Average 1991
- Hill: Average 2000
The Rate AR Appears in a Flock

The graph shows the frequency of alleles and homozygous resistant worms over time. The x-axis represents time, and the y-axis represents frequency. The graph includes three points labeled A, B, and C, indicating specific time periods or frequency milestones.
The 8 New Recommendations

- Work out a control strategy with your veterinarian or advisor.
- Use effective quarantine strategies to prevent the importation of resistant worms in introduced sheep and goats.
- Test for AR on your farm.
- Administer anthelmintics effectively.
The 8 New Recommendations

- Use anthelmintics only when necessary
- Select the appropriate anthelmintic for the task
- Adopt strategies to preserve susceptible worms on the farm
- Reduce dependence on anthelmintics
1. Have a Strategy

- Work out a control strategy
- Develop a cost effective, reliable and sustainable plan.
2. Treat Sheep in Quarantine

- Treat with an ML and an LM sequentially
- Hold off pasture for 24-48 hours
- Turn out on to dirty pasture
3. Test for AR on Your Farm

- Post drench efficacy tests
- FECRTs
- Larval development tests
4. Administer Anthelmintics Effectively

- Dose for the heaviest in the group
- Check the dosing gun
- Restrict feed (BZ + ML)
- Use correct technique
Correct Dosing Technique

• Ensure the drench goes over the back of the tongue
5. Dose only when necessary

- Lambs
- The use of FECs
- Ewes at tupping
- Ewes around the time of lambing
Internal Parasitic Diseases in Lambs

Lambing

Coccidia
Nematodirus
Ostertagia
Haemonchus
Trichostrongylus
Fluke

Acute
Chronic
Spring
Summer
Autumn
Winter
Treatment of Lambs

• Treatment based on regional information, assessment of risk factors and FECs

• Routine treatment at set ages to be discouraged

• Consideration of the parasite species involved
Treatment of Lambs

- Monitoring
- Use of FECs
- Larval differentiation
- Investigation of ill-thrift
Faecal Egg Counts (FECs)

- Faecal egg counts (FECs) can give a useful guide to the level of parasitism in a flock of sheep
- At least 10 animals should be sampled
- A ‘group’ is a flock of sheep of the same sex, age, reproductive status and treatment history, running in the same field
- The faeces from 10 sheep may be pooled but only at the laboratory
FEC Monitoring

• Collection of faeces
  - Gather the group, hold quietly in one area, then gather faeces from the pasture
  - Place faeces in airtight container and cool
  - Deliver to laboratory within 48 hours
• Price and availability

- A FEC test is available from a number of laboratories and veterinary practices

- VLA labs offer a pooled test (10 samples) for £15.60 + VAT
Development of Immunity

- Sheep develop immunity to most worms by the time they are 4-5 months of age.

- Fit healthy ewes are not adversely affected by a worm burden (unless *haemonchus* is present).
Treatment of Ewes Pre-tupping

- No routine drenching of fit adult ewes pre-tupping

- Drench immature or lean ewes only

- For *Haemonchus contortus* - use closantel
Treatment of Ewes at Lambing

- Consider the need to dose ewes around lambing time
  - use highly efficacious treatments
  - leave some (10-20%) of ewes untreated
  - treat well before the end of PPRI
  - avoid exclusive use of moxidectin post-lambing
Treatment of Ewes at Lambing

- Fit ewes and/or those rearing singles do not have significantly raised egg outputs

- New research suggests that a high protein ration also reduces egg output in twin bearing ewes.
6. Select the Appropriate Anthelmintic

- Use narrow spectrum products where possible
- Avoid ‘off-target’ use
- Rotate where appropriate
- Use persistent action carefully (MOX; closantel)
7. Preserve a Susceptible Worm Population

- The ‘Dose and Move’ strategy is likely to select heavily for AR.
- The surviving worms are resistant and contaminate the pasture with their eggs.
- Without the dilution effect of contaminated pasture, the frequency of resistant genes in the free-living population can increase quickly.
- In theory, the cleaner the pasture, the faster the resistant-gene frequency increases.
Selection Pressure of Dose and Move

Treat

S

R

PS

R
Clean Grazing

RESISTANT
Preserving Susceptible Worms

• Two practical options:
  • Part-flock treatment (leave 10-20% untreated)
  OR.......  
  • Delay the move after treatment
Effect of Preserving Susceptible Worms
8. Reduce Dependence on Anthelmintics

- Use grazing management to reduce the challenge
- Rams bred for resistance / resilience
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