Cattle parasites and their control
Aim

COWS aims to provide the best available, evidence-based information and advice to the cattle industry in relation to the sustainable control of parasites in cattle.

We are an independent industry led group

www.cattleparasites.org.uk
Twitter: @COWSworms
Who?

COWS also has input from farmers and independent consultants
Why?

- Currently, anthelmintic resistance is common in sheep, less so in cattle.
- However, suspect resistance has been reported in the liver fluke (to triclabendazole) and the intestinal worm, *Cooperia* (to macrocyclic lactones).
- COWS is following the lead of SCOPS in the provision of up-to-date, evidence-based advice on parasite control and the management of resistance to the cattle industry.
Introduction & Scope

- Gut worms
- Lungworms
- Liver fluke & Rumen fluke
- External parasites
- Parasite control
  - Administration of anthelmintics
  - Management options
  - Anthelmintic resistance
Gut worms – Parasitic gastroenteritis (PGE)

• Known as Nematodes or roundworms
• Two main species of gut worms
  • *Ostertagia ostertagi* (Abomasum)
  • *Cooperia oncophora* (Small intestine)
• Greatest threat to young stock (*1*st season grazing calves)
  • Scour, weight loss, failure to thrive
• BUT adult productivity can be affected
  • Reduced food intake, growth rates, milk yield
Epidemiology – gut worms

• All these species have direct life cycles
• Eggs shed on pasture in dung
• Develop to L1----L2----L3 within dung pat
• Development is dependent on temperature (it proceeds faster when it is warmes).
• L3 is infective stage, which migrates from the dung to the pasture
• L3 can survive over winter on pasture
• Control based on preventing build up of L3 on pasture
• Ingestion of large numbers of L3 can cause disease
• Disease typically seen from July onwards
OSTERTAGIA AND COOPERIA
GUT WORM LIFE CYCLES

FEMALE WORMS mate and lay eggs

ADULT WORMS develop within 3 weeks

INGESTED LARVAE pass into abomasum* or small intestine

EGGS passed in dung

LARVAE develop in 3 days to 21 days LARVAE move from dung to pasture in moist conditions

LARVAE can remain viable on pasture for one year

* Ostertagia  ** Cooperia  † Development can be inhibited in autumn and resume in late winter or early spring
Seasonality of gut worms: Weaned calves

Turnout April; Housing November; No treatment or moves

- Over-wintered larvae
- Pasture larvae

Main risk of disease
Abomasal pathology

O. ostertagi nodules
Lungworm

• One species (*Dictyocaulus viviparus*)
• Highly pathogenic
• Very unpredictable epidemiology
• L1----L2----L3 develop in the dung
• Temperature dependent development
• L3 infective stage, spread by *Pilobolus* fungus, can reach fields where no cattle have previously grazed
• Cattle develop strong immunity, but can be short lasting (≤6 months) in the absence of exposure
• A vaccine is available to protect cattle
Larval development and dispersion
Liver and Rumen fluke

• Highly pathogenic in sheep, the same parasite infects cattle
• Major cause of production losses in cattle
• Indirect life cycle – transmitted through a mud snail
• Life cycle dependent on temperature AND rainfall
• Cattle most at risk from infection in the Autumn

• Rumen fluke is relatively new and becoming quite common
  • The juvenile fluke can cause clinical disease, but the adults do little damage.
  • Transmitted by the same mud snail vector as liver fluke
Liver fluke life cycle

- **FLUKE** (migrate through the liver and mature)
- **EGGS** (shed 10-12 weeks after infection)
- **METACERCARIAE** (viable on grass for several months)
- **CERCARIA** (shed from snail after about 6 weeks)
- **MUD SNAIL**
- **MIRACIDIUM** (hatches after 2-4 weeks)
Liver fluke
Main ectoparasite groups

- Lice
- Flies
- Mange Mites
- Ticks
External parasites

• Lice
  • Long winter coats, close contact, warmth and dark conditions means lice are mainly a winter problem

• Mites
  • Most common type is Chorioptic mange, hair loss and irritation around base of the tail and the heels

• Flies
  • A summer problem
  • Biting flies (horse flies and stable flies)
  • Nuisance flies (head and horn flies)
  • Can transmit infections and bother cattle, reducing feeding time

• Ticks
  • Transmit disease such as Red Water Fever
  • Damage hides
Impact of ectoparasites

Clinical Disease

Behavioural Changes

Production Losses

Hide Damage
Current tools for parasite control

- **Anthelmintics**
  - Strategic
  - Therapeutic

- **Grazing management**
  - Evasive grazing
  - Mixed grazing

- **Nutrition**
  - Grassland management
  - Supplementation

- **Vaccination**
  - Lungworm (Huskvac)
Control measures – Identify risk

• What parasites are on the farm?
• Assess pasture & cattle risk
• Key time points - turnout, mid-summer, housing

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Time to acquire immunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ostertagia</td>
<td>2 grazing seasons</td>
</tr>
<tr>
<td>Cooperia</td>
<td>1 grazing season (3-6 months)</td>
</tr>
<tr>
<td>Lungworm</td>
<td>1-2 months, but repeat exposure is required to maintain immunity</td>
</tr>
<tr>
<td>Liver fluke</td>
<td>None</td>
</tr>
</tbody>
</table>
Matrix for nematode risk assessment

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (grazing seasons, GS)</td>
<td>&lt;1 year (1st GS)</td>
<td>1-2 yrs (2nd GS)</td>
<td>&gt;2 years (adult)*</td>
</tr>
<tr>
<td>Weight gain (&lt;2 yrs old)</td>
<td>&lt;0.7 kg/day</td>
<td>0.7-0.8 kg/day</td>
<td>&gt;0.8 kg/day</td>
</tr>
<tr>
<td>2 months after turnout</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faecal worm egg count (FGS)</td>
<td>&gt;200</td>
<td>50-200</td>
<td>&lt;50</td>
</tr>
<tr>
<td>2 months after TO (epg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field type</td>
<td>Permanent pasture</td>
<td>Silage/hay aftermath</td>
<td>Newly sown fields</td>
</tr>
<tr>
<td>Grazing history</td>
<td>Grazed by cattle</td>
<td>Grazed by cattle</td>
<td>Grazed by adult cows, sheep**</td>
</tr>
<tr>
<td></td>
<td>&lt;1 year old within</td>
<td>1-2 years old</td>
<td>or other species within last</td>
</tr>
<tr>
<td></td>
<td>last year</td>
<td>within last year</td>
<td>year</td>
</tr>
</tbody>
</table>

Incomplete table - see Integrated control chapter of technical manual p13
Control measures – Treat/manage appropriately

• Strategic or therapeutic policy?
• If wait and see is choice then monitor regularly
• Determine which products work well on your farm

COWS strongly advises that farmers discuss product choice with their vet or suitably qualified person (SQP) as part of their herd health plan
Control measures – minimize the risk of resistance

• Dose properly
  • Weigh animals
  • Calibrate dosing equipment regularly

• Aim for good parasite control at housing

• Implement an appropriate quarantine programme
The 5 R’s for the effective use of wormers

The right product for the right type of worm

The right animal

The right time

The right dose rate

Administered in the right way
Incorrect parasiticide administration

• **Under-dosing**
  • Poor efficacy when treating clinical cases
  • Reduced persistency & duration of protection
  • Increased risk of resistance

• **Over-dosing**
  • Risk of toxicity
  • Withdrawal periods for meat and milk are determined using the recommended dosage; higher dosages mean that withdrawal periods should be increased
Product choice

The BRP Cattle and Sheep Parasite Control Product Guide
A comprehensive list of products for the control of internal and external parasites in cattle and sheep

Cattle Endoparasiticides and Ectoparasiticides

Group 3: Macroyclic Lactones (ML) (Clear)

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>COMPANY NAME</th>
<th>CHEMICAL NAME</th>
<th>Roundworm</th>
<th>Lungworm</th>
<th>Tapeworm</th>
<th>Liver Fluke</th>
<th>Milks</th>
<th>Wartsles</th>
<th>Lice</th>
<th>Humans</th>
<th>Eyeworm</th>
<th>USE</th>
<th>WITHDRAWAL PERIOD (MAX)</th>
<th>MILK withhold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aminex 1% Injection</td>
<td>ChamberlAH</td>
<td>Invermectin</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Injection S/C</td>
<td>40 days</td>
<td>X</td>
</tr>
<tr>
<td>Aminex Pour-On 0.5%</td>
<td>ChamberlAH</td>
<td>Invermectin</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Pour-On</td>
<td>28 days</td>
<td>X</td>
</tr>
<tr>
<td>Ivermectin Injection</td>
<td>Ivermectin</td>
<td>Ivermectin</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Injection S/C</td>
<td>40 days</td>
<td>X</td>
</tr>
<tr>
<td>Ivermectin Pour-On for Cattle</td>
<td>Ivermectin</td>
<td>Ivermectin</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Pour-On</td>
<td>31 days</td>
<td>X</td>
</tr>
<tr>
<td>Cydectin 0.5% Pour-On for Cattle</td>
<td>Zoetis</td>
<td>Zoetis</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Pour-On</td>
<td>14 days</td>
<td>8 days</td>
</tr>
<tr>
<td>Cydectin 1% Injectable Solution for Cattle</td>
<td>Zoetis</td>
<td>Zoetis</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Injectable S/C</td>
<td>65 days</td>
<td>60 days</td>
</tr>
<tr>
<td>Cydectin 10% LA for Cattle</td>
<td>Zoetis</td>
<td>Zoetis</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Oral injection</td>
<td>108 days</td>
<td>80 days</td>
</tr>
<tr>
<td>Dewormer: Yong/Hog Solution for Injection for Cattle and Sheep</td>
<td>BancomAH</td>
<td>Doramectin</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Injection S/C</td>
<td>70 days</td>
<td>60 days</td>
</tr>
</tbody>
</table>
## Current resistance / Poor efficacy status

<table>
<thead>
<tr>
<th>Parasite: parasiticide</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cooperia</em> spp to macrocyclic lactones (Intestinal worms)</td>
<td>In FGS calves, treat with LEV or BZD or administer concurrently with ML</td>
</tr>
<tr>
<td><em>F. hepatica</em> to triclabendazole (TCBZ) (Liver fluke)</td>
<td>Use an alternative flukicide</td>
</tr>
<tr>
<td><em>P. ovis</em> to macrocyclic lactones (Psoroptic mange)</td>
<td>Isolate infested animals and repeat treatment until cured</td>
</tr>
</tbody>
</table>
Key messages

• Know the critical danger time - peak exposure to infective stages
• Think about life cycles and intervention points
  • Block transmission
  • Avoid high risk pasture at key times of year
• Know what is in veterinary medicines
• Talk to your vet or SQP
• Use drugs correctly
• Combine management strategies with drug control
• Think about quarantine measures
More information

- www.cattleparasites.org.uk
- @COWSworms
- Each chapter of the technical manual has a top tips page