Anthelmintic resistance in beef cattle – what are the levels and what can be done to lessen its impact?

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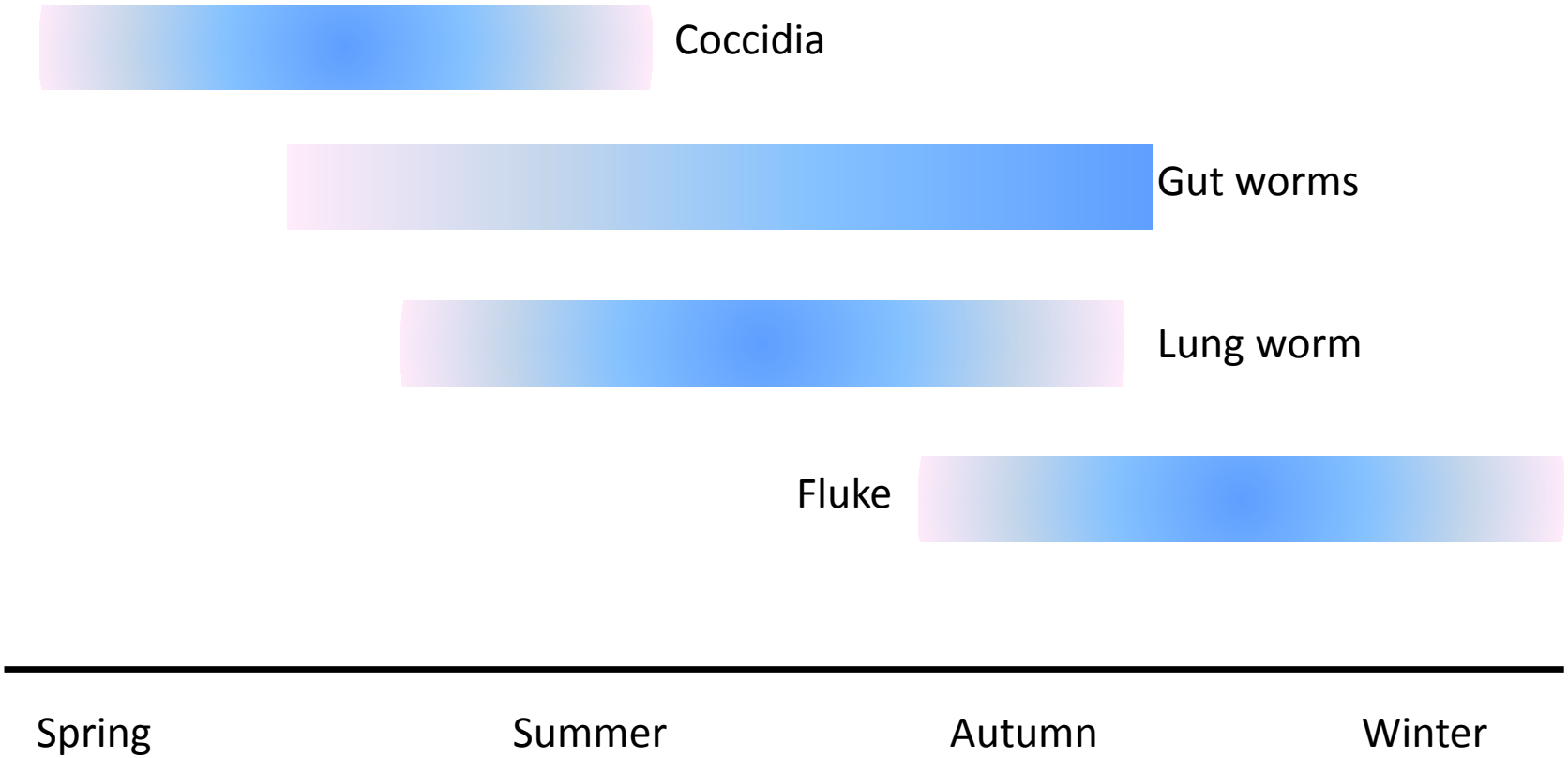
Teagasc Beef Conference 30th Oct 2018

Agriculture and Food Development Authority

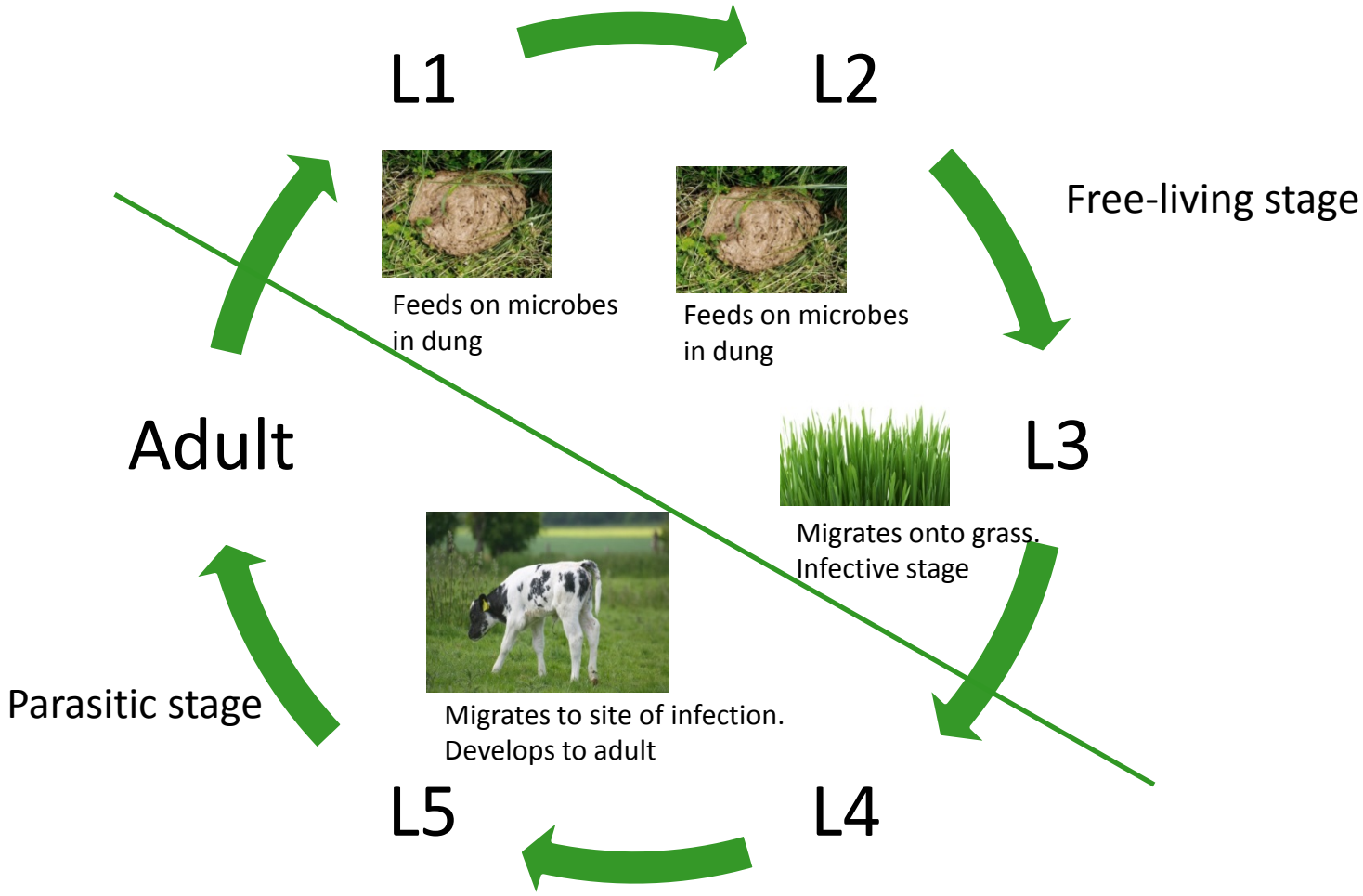
Overview

- Background
- Anthelmintic resistance in Ireland
- Sustainable worm control

Parasite Calendar



Worm lifecycle



Gastrointestinal nematodes of cattle

- Many different species
- *Cooperia oncophera*
- *Ostertagia ostertagi*

Cooperia oncophera	*Ostertagia ostertagi*
Small intestine	Abomasum
Main contributor to FEC in FGS	Type I or Type II disease
Immunity develops quickly	Immunity develops slowly

Anthelmintic drug classes currently available

Class	Common name	Chemicals	First released	First resistance reported
Benzimidazole	White (1-BZ)	Albendazole Fenbendazole Oxfendazole	1961	1964
Levamisole	Yellow (2-LV)	Levamisole	1970	1979
Macrocyclic lactone	Clear (3-ML)	Doramectin Eprinomectin Ivermectin Moxidectin	1981	1988

Anthelmintic Resistance

- Anthelmintic resistance is the ability of a worm to survive a dose that should kill it.

- It is a genetically inherited trait

- Anthelmintics from different classes (e.g. 1-BZ, 2-LV or 3-ML) have different modes of action but within a class products share the same mode of action - when resistance develops to one product within a class all the products in the same class are often be affected

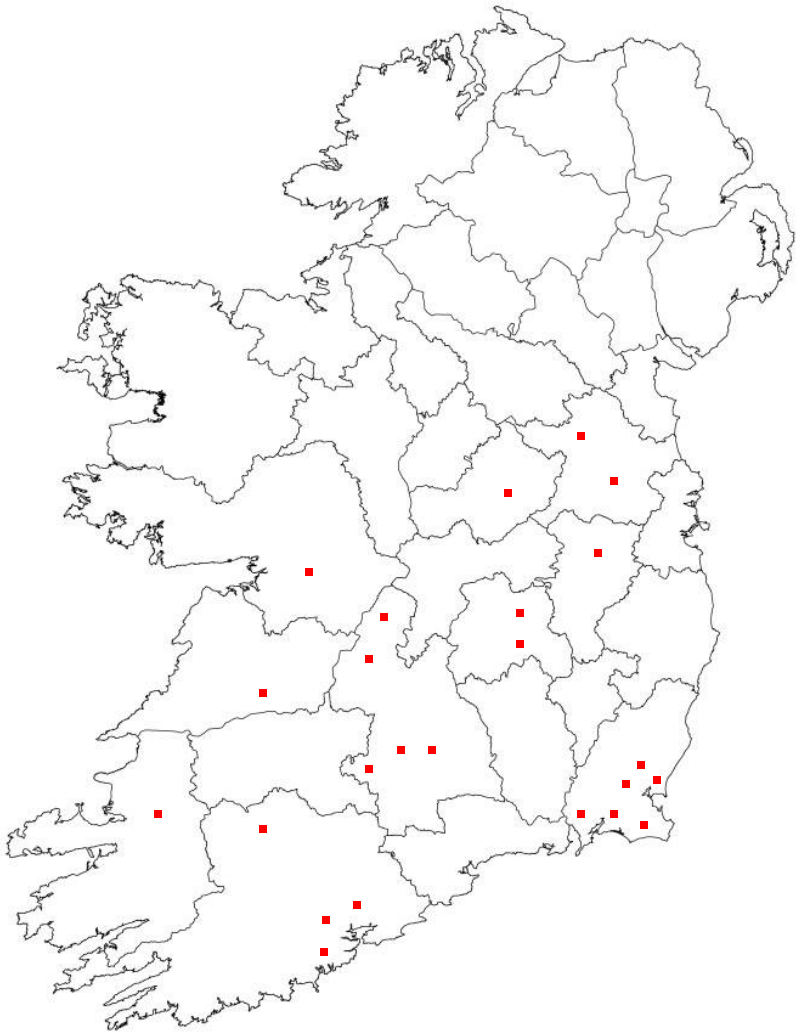
Anthelmintic Resistance in Ireland

Anthelmintics tested

24 farms tested in 2017 & 2018
All dairy calf to beef

Anthelmintic	Number of Farms
Benzimidazole (oral)	17
Levamisole (oral)	12
Ivermectin (injectable)	17
Moxidectin (injectable)	12

Farm location



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Faecal Egg Count Reduction Test

- Monitored herd level FEC
- Farmer submitted 10-15 calf faecal samples fortnightly – pooled
  - FEC (sensitivity 5 epg)
  - Baermann - lungworm
- When herd FEC > 100 epg we visited farm
- Per drug tested – selected 20 calves, weighed, marked
  - faecal sampled *per rectum*
  - Dose to weight of calf
- Determined FEC (sensitivity 5 epg)
- Revisited farm and re-sampled the marked calves
  - 7 days (2-LV)
  - 14 days (1-BZ, 3-ML (IV, 3-MOX))
- Determined FEC (sensitivity 5 epg)
- Faecal egg count reduction calculated
- Resistance when FECR < 95%

Resistance Results

Anthelmintic	Number of Farms	Number Resistant	Prevalence
Benzimidazole (oral)	17	12	71%
Levamisole (oral)	12	3	25%
Ivermectin (injectable)	17	17	100%
Moxidectin (injectable)	12	9	75%

1-BZ and 3-ML (IV) resistant *Cooperia* and *Ostertagia* were detected

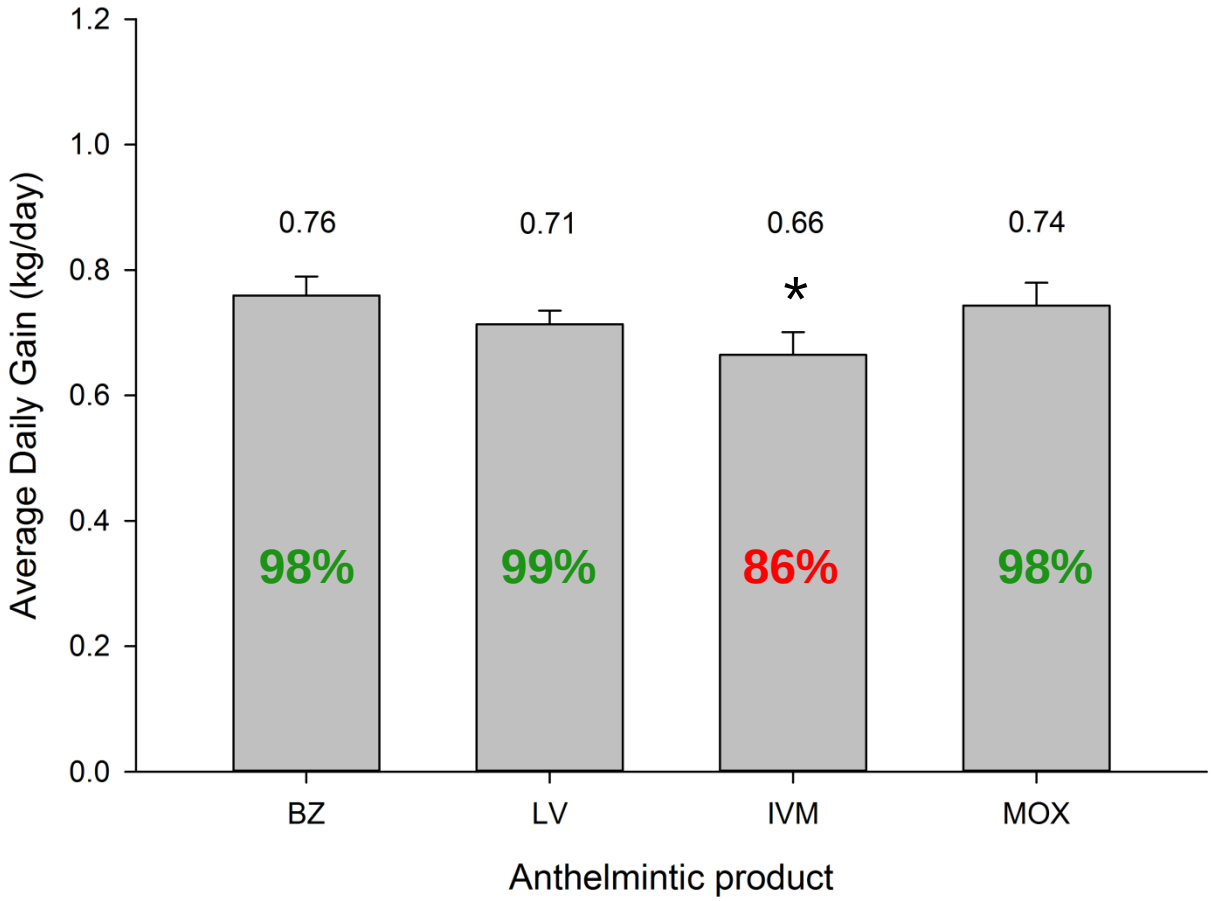
Reduction Results

Farm	Benzimidazole	Levamisole	Ivermectin	Moxidectin
2	69	80	-228	44
7	63	100	66	87
13	99	79	78	92
16	89	100	51	1
18	98	99	86	98

Red – resistant

Green – susceptible

Effect of Anthelmintic Resistance on Performance



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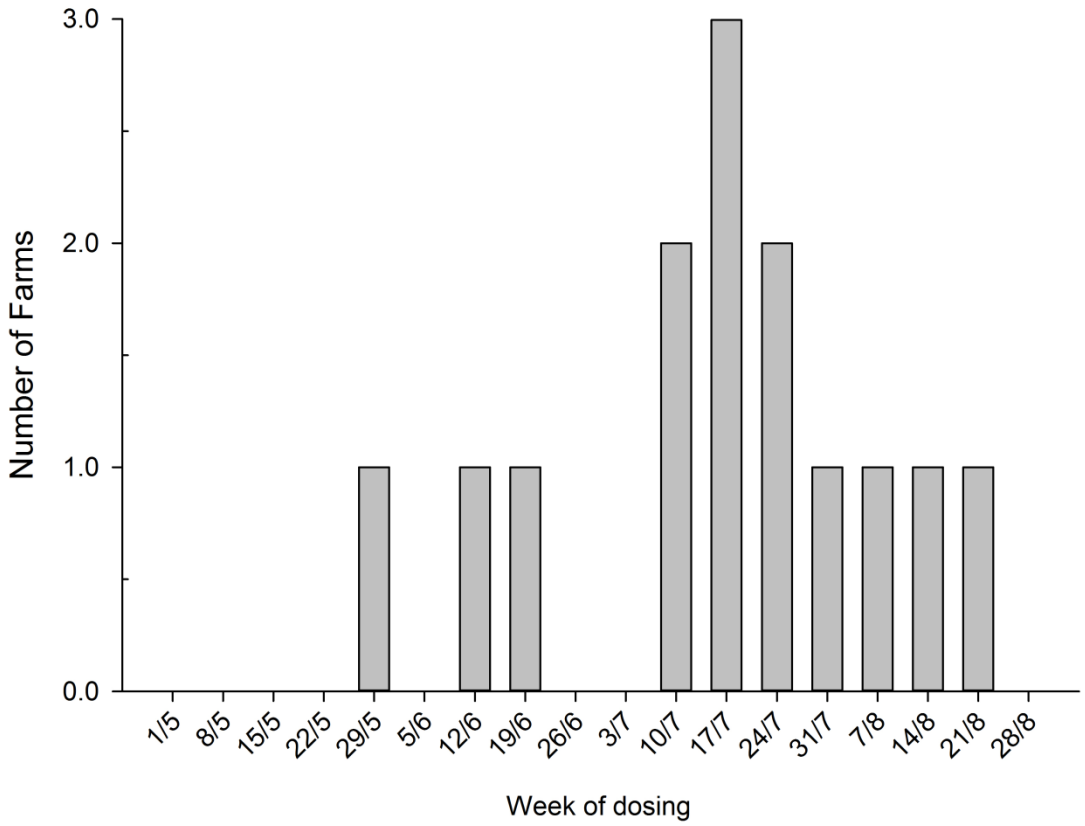
Dosing Date - 2017



Sustainable Worm Control

Managing gut worms

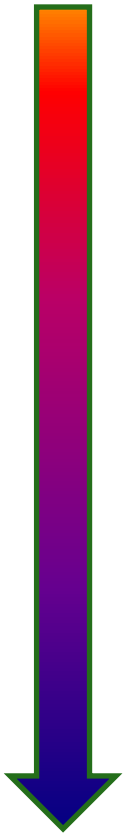
1. Grazing management

2. Good nutrition

3. Appropriate use of anthelmintics

Grazing management

Pasture Type	Recently grazed by	Season
Permanent	Calves	Autumn
Silage/hay aftergrass	Yearlings	Summer
Reseeded	Adult cows/sheep	Spring



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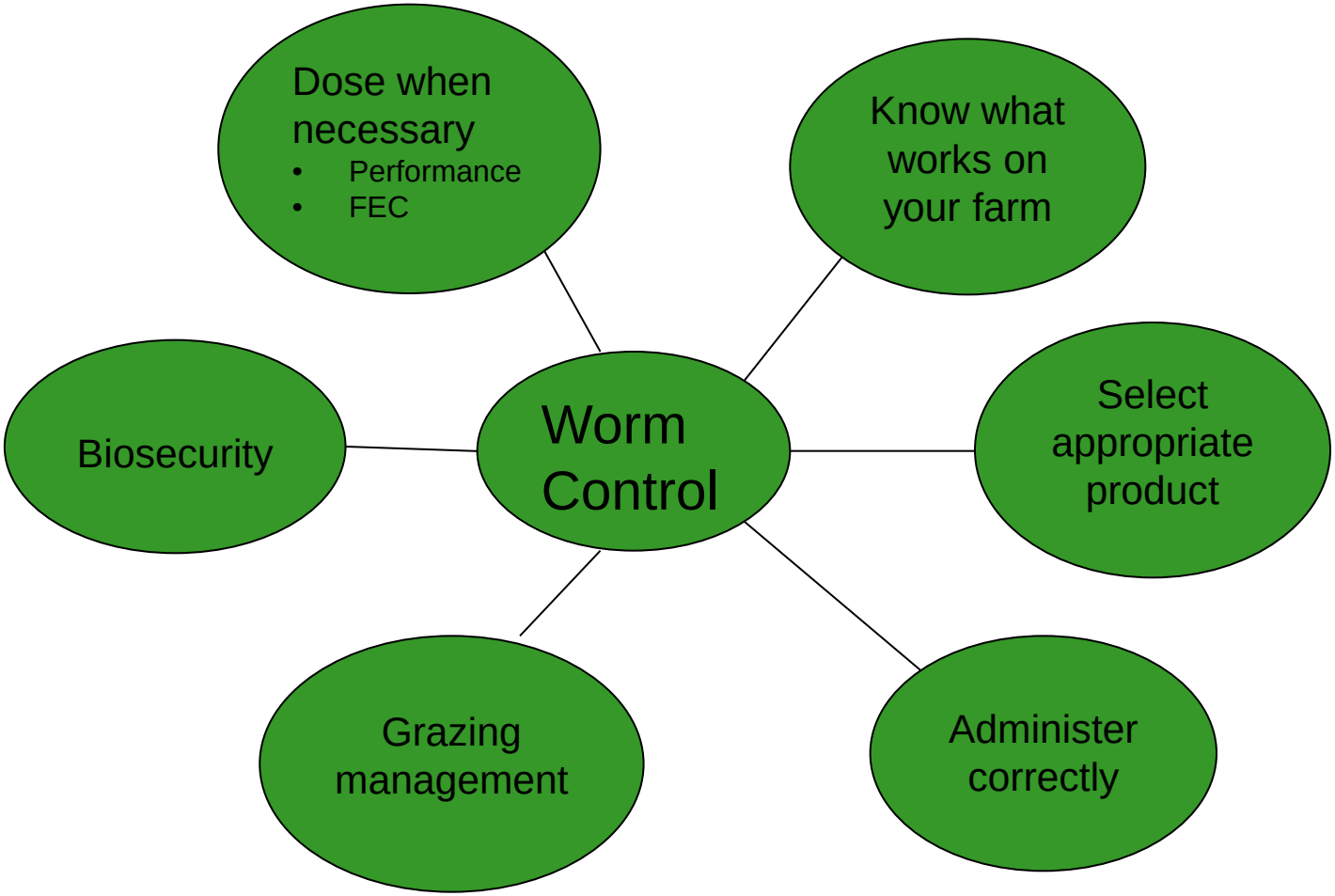
Good nutrition

- Worms suppress appetite
- Gut damage – reduce nutrient absorptive capacity
- Well fed calves are more resilient to worm challenge
  - sufficient feed
  - good quality

Appropriate use of anthelmintics

- Dose only when necessary
- Use an appropriate product
- Give the correct dose rate
- Administer the product in the right way

What to do?



Useful links

- Animal Health Ireland – Parasite Control Information Leaflets
- http://animalhealthireland.ie/?page_id=405

- Control of Worms Sustainably (COWS)
- http://www.cattleparasites.org.uk/

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Cost of Parasite Control

- Market for Animal Medicines in Ireland ~€150M per annum
- Products for Internal Parasite Control ~€40M per annum
- Accurately estimating the cost of worms or anthelmintic resistance is difficult
  - worm species present,
  - intensity of challenge,
  - status of the host (e.g. nutritional and immune status)
  - proportion of resistant worms