



Nematode infections in
sheep: as resistance
increases prevention
becomes key

Eva Van Mael – 19 april 2022

Nematode infections in sheep: as resistance increases prevention becomes key

- Introduction
- Gastrointestinal Nematodes in sheep
- Anthelmintic resistance
- Strategies for parasite control

Introduction: the sheep industry in Flanders

Year	Number of herds	Number of animals
2018	17.659	110.630
2019	17.537	112.359
2020	17.438	112.792
2021	17.411	116.258

Province	% active herds
Antwerpen	11,3
Vlaams-Brabant	15,4
West-Vlaanderen	28,1
Oost-Vlaanderen	34,9
Limburg	9,8

Introduction: the importance of gastrointestinal nematode infections in sheep

- Worldwide, all grazing sheep are exposed to gastrointestinal nematode infections

- Four key species:

- Nematodirus spp. → small intestine

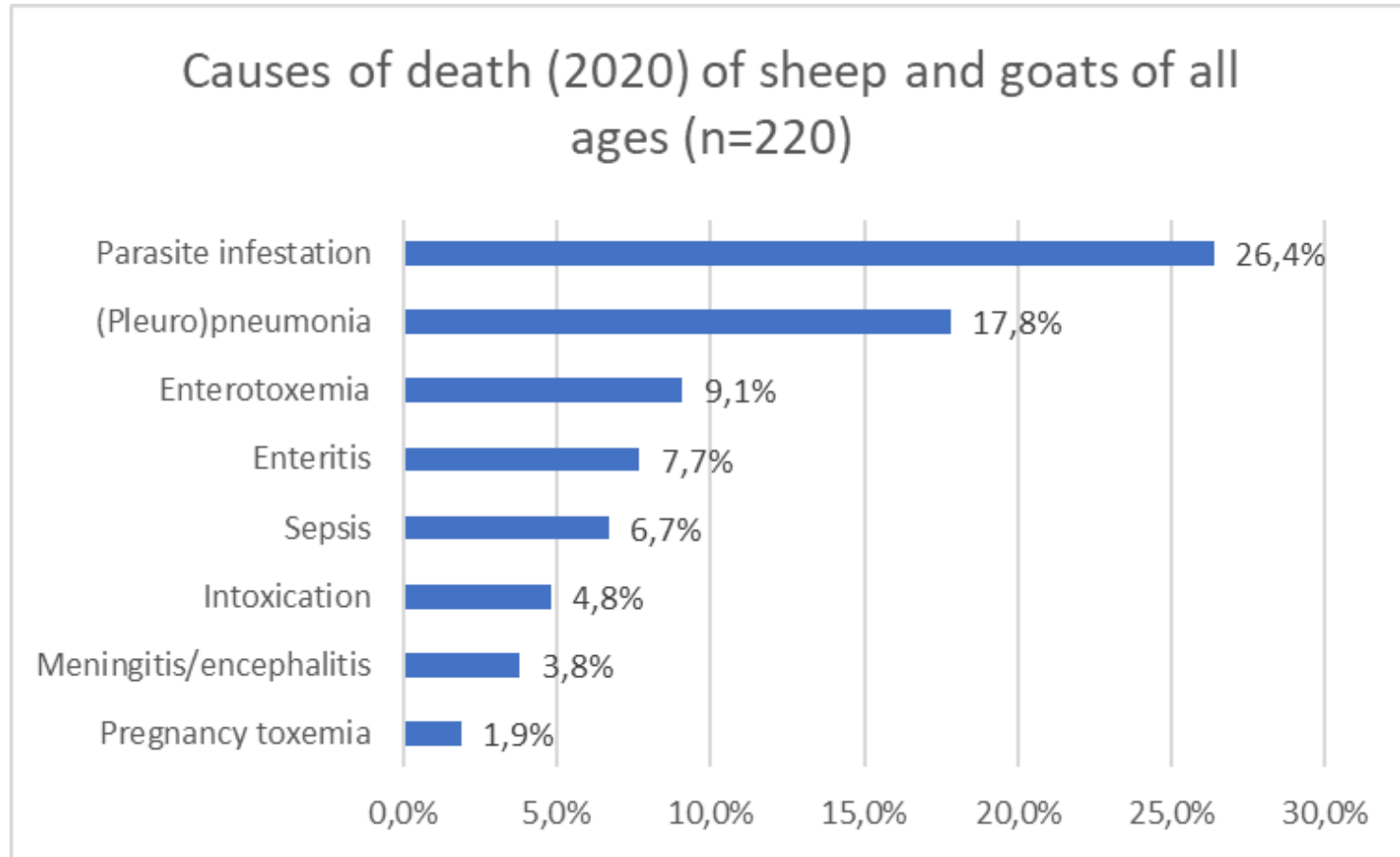
- Teladorsagia circumcincta → abomasum

- Trichostrongylus spp. → small intestine

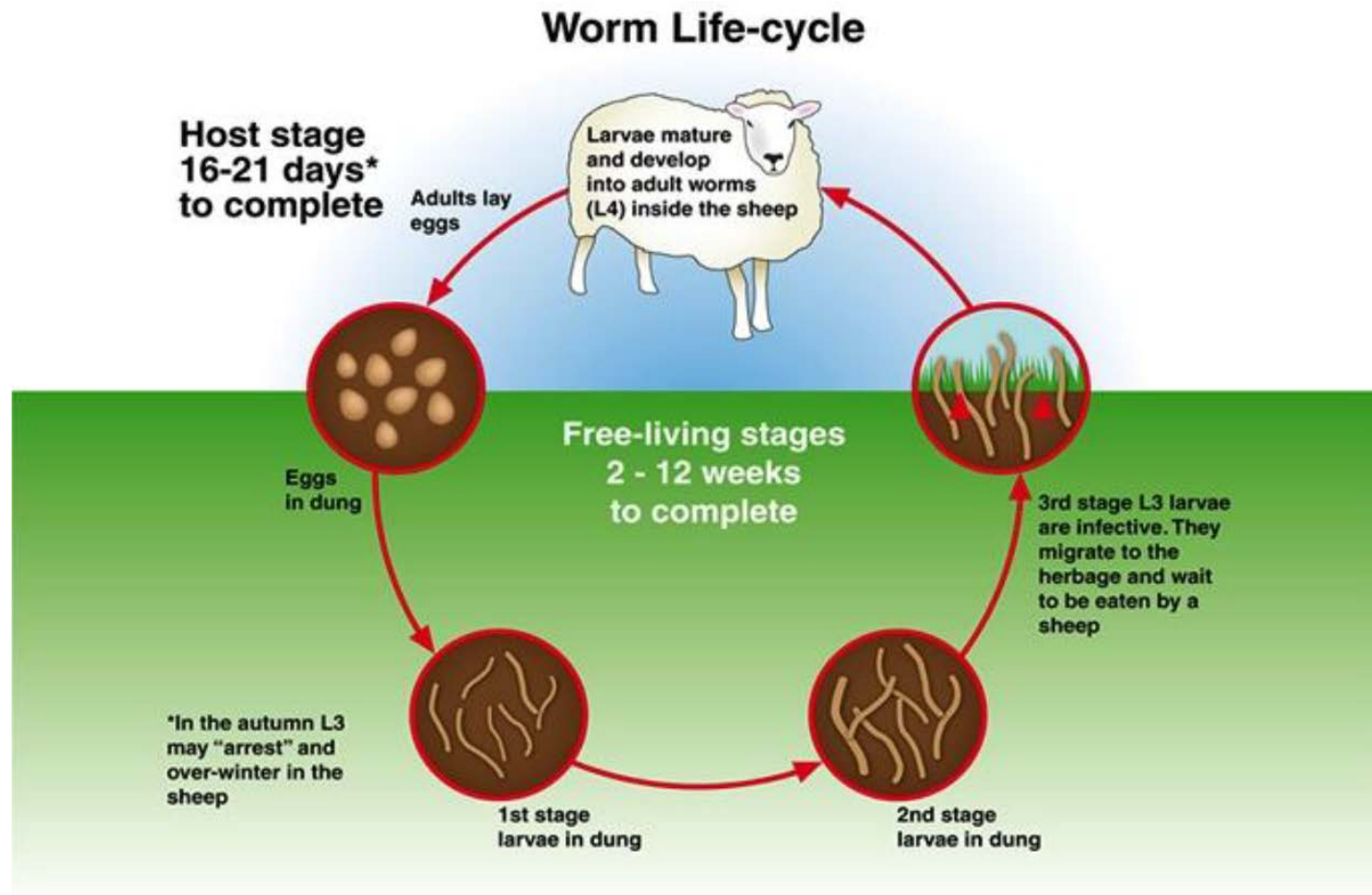
- Haemonchus contortus → abomasum

→ Strongylides

Introduction: the importance of gastrointestinal nematode infections in sheep

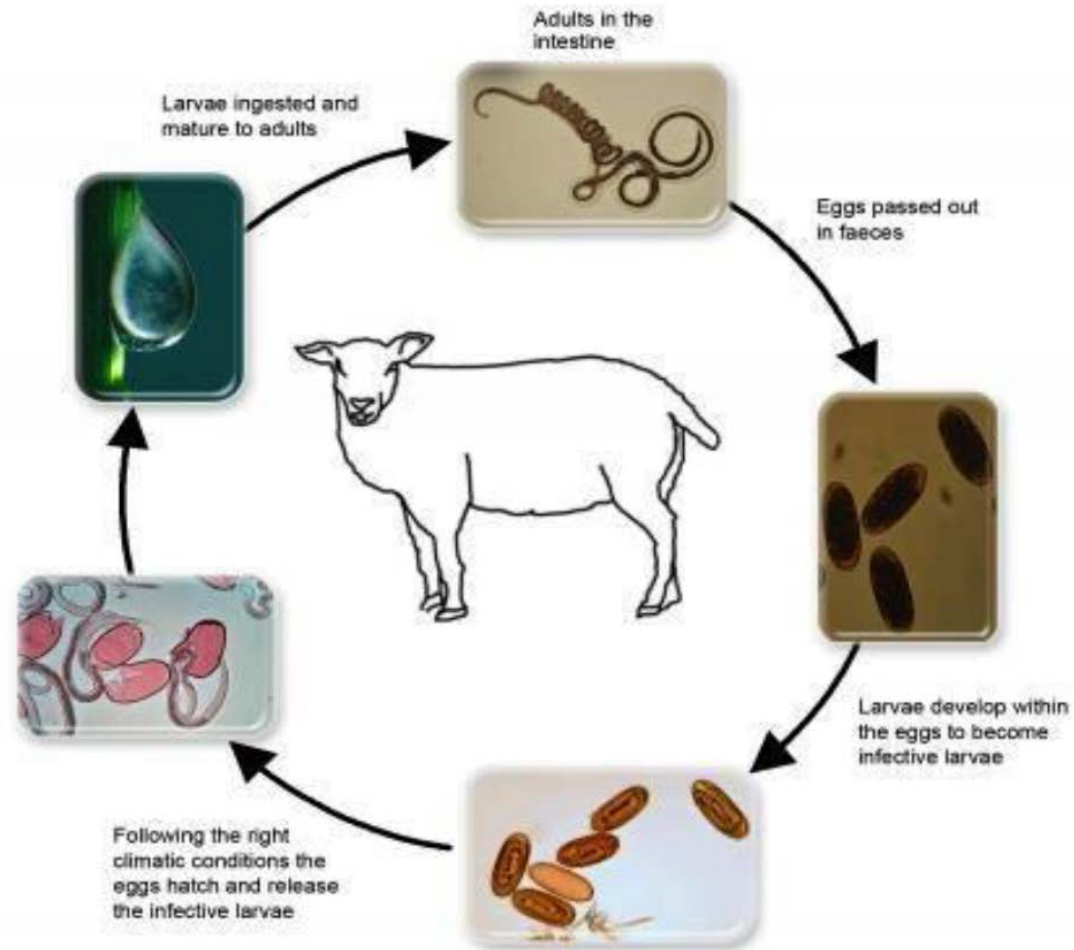


Gastrointestinal nematodes in sheep: Strongylides



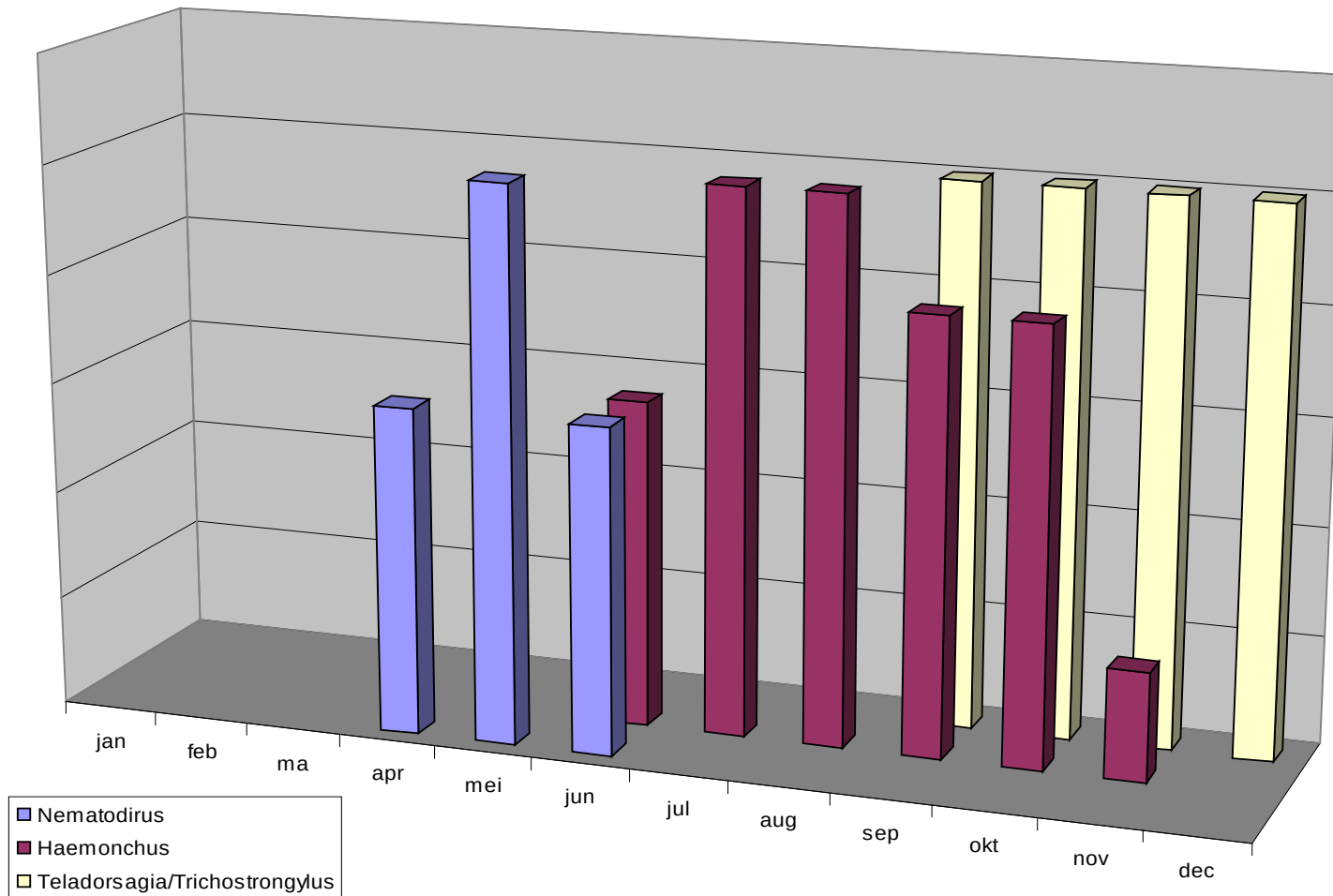
- L3 larvae are the infective larvae that are ingested by grazing sheep
- Infected ewes spread eggs on the pasture via dung
- Lambs get infected and start shedding eggs as well
- The level of contamination on the pasture is at its highest in summer and early autumn
- Adult worms that are not killed by anthelmintics or the immune system can remain viable for months

Gastrointestinal nematodes in sheep: *Nematodirus* spp.



- Worm eggs survive on the pasture during winter
- Development in ovo to the L3 stage
- They hatch when temperature starts rising (spring)
- Ewes are resistant

Gastrointestinal nematodes in sheep



Gastrointestinal nematode infections in sheep: symptoms

- Diarrhoea
 - Very severe and watery in case of *Nematodirus* spp.
 - Not present in case of *Haemonchus contortus*
- Weight loss
- Anaemia
- Edema
- (Acute) mortality

- Decrease in wool production
- Decrease in milk production

- Economic losses versus animal welfare

Gastrointestinal nematode infections in sheep: Haemonchus infection

Type of infection	Duration of the disease	EPG	Number of worms	Blood loss per day (ml)
Hyperacute	Acute death	> 100.000	10.000 – 35.000	200 to 600
Acute	1 to 6 weeks	1.000 – 100.000	1.000 – 10.000	50 to 200
Chronical	3 to 6 months	200 – 1.000	100 – 1.000	5 to 50

Anthelmintic resistance

The increase of anthelmintic resistance is a threat to profitable sheep farming!

Product group	Active component
Benzimidazoles	Albendazole
	Fenbendazole
	Mebendazole/Closantel
	Fenbantel
Imidithiazoles	Levamisol
Macrocyclic lactones	Ivermectin
	Doramectin
	Moxidectin
Amino-acetonitrilderivate	Monepantel

Anthelmintic resistance in Flanders

- Faecal egg count reduction test in 26 sheep flocks in Flanders
- Benzimidazoles:
 - Widespread resistance
 - Treatment failure on all 8 farms investigated
 - Mainly Haemonchus and Teladorsagia
- Macrocyclic lactones:
 - Resistance recorded in 7 out of 20 flocks
 - Mainly Haemonchus en Teladorsagia
- Closantel and Monepantel:
 - Treatment failure on one farm each



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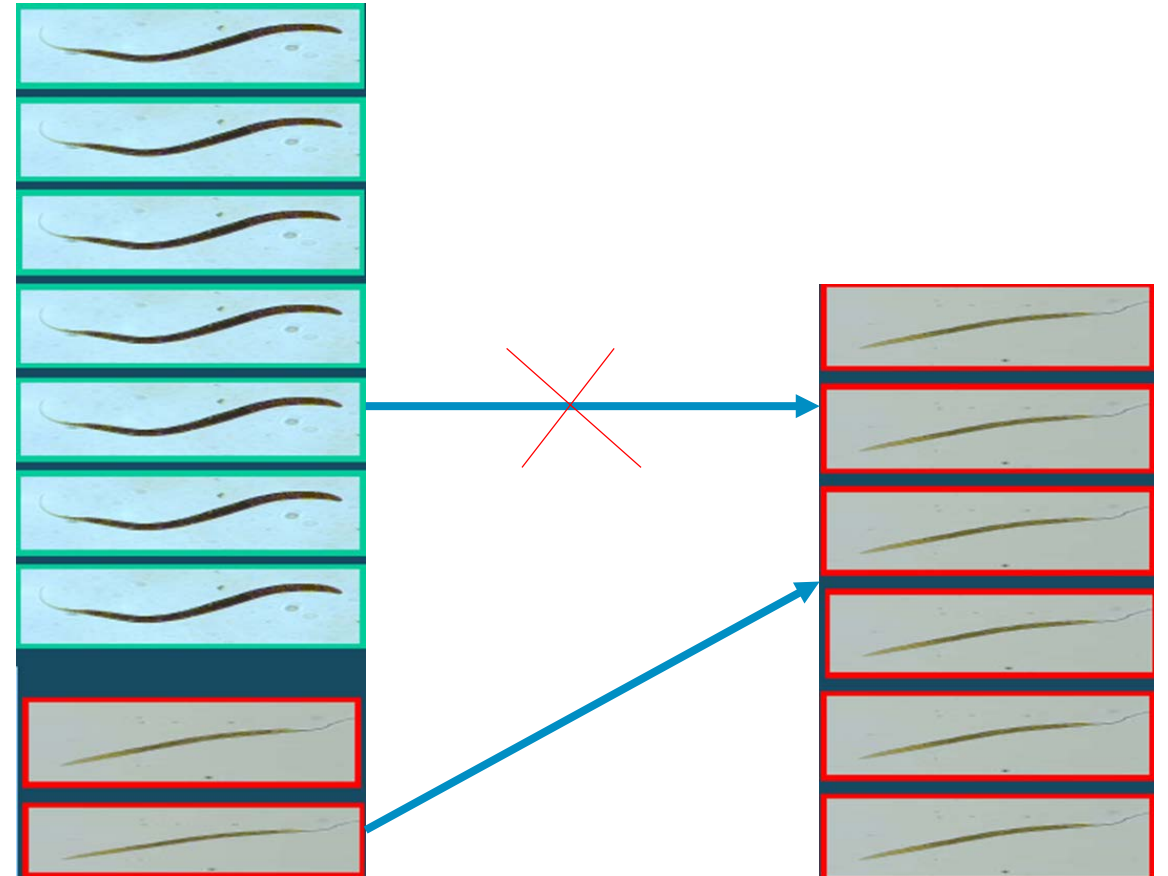
Anthelmintic resistance and common worm control practices in sheep farms in Flanders, Belgium

Edwin Claerebout ^{a,*, 1}, Nathalie De Wilde ^a, Eva Van Maele ^a, Stijn Casaert ^a, Fiona Vande Velde ^a, Florian Roeber ^c, Pamela Vinuesa Veloz ^a, Bruno Levecke ^a, Peter Geldhof ^a

Anthelmintic resistance

Causes of resistance:

1. Treatment frequency
2. Underdosing
3. Using the same product over and over again
4. Dose and move pasture management
5. Introduction of resistance via purchase of new sheep



Strategies for parasite control

- Prevention is key!
 - Need for evidence-based recommendations for parasite control that reduce the risk of further development of anthelmintic resistance
 - Classic deworming schedules:
 - Benzimidazoles: 1X/month
 - Levamisole: 1X/month
 - Macrocyclic lactones
 - Ivermectin s.c. 1X/month
 - Doramectin i.m. 1X/month
 - Moxidectin p.o. at the age of 4 and 12 weeks
- 
- Overconsumption of anthelmintics which leads to resistance

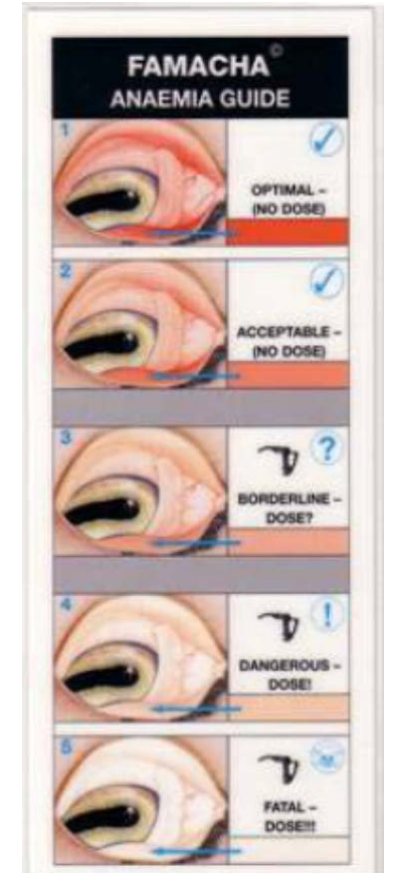
Strategies for parasite control

Monitoring of the animals during the grazing season

- Consistency of dung
- Body condition score
- Check for anemia
- Growth of the lambs

All combined with:

- Information on weather conditions, age of the animals, time of the year, pasture history
- Regular faecal egg count



Strategies for parasite control

When treatment is absolutely necessary...

- Avoid underdosing:
 - Weigh, don't guess!
 - Calibrate and maintain the drench gun
- Use products the right way
- Store products the right way
- Efficacy can be improved by fasting the animals 12h before treatment
- Regular faecal egg count reduction test!
 - At least 90% reduction for benzimidazoles and levamisole
 - At least 95% reduction for macrocyclic lactones
- Refugia:
 - 2 to 5% of the heaviest lambs
 - Ewes with only one lamb

Strategies for parasite control

Theoretically, it is possible to keep sheep without ever having to deworm them.

Pasture rotation:

- Every 3 weeks until half june
- Every 2 weeks from half june to half september

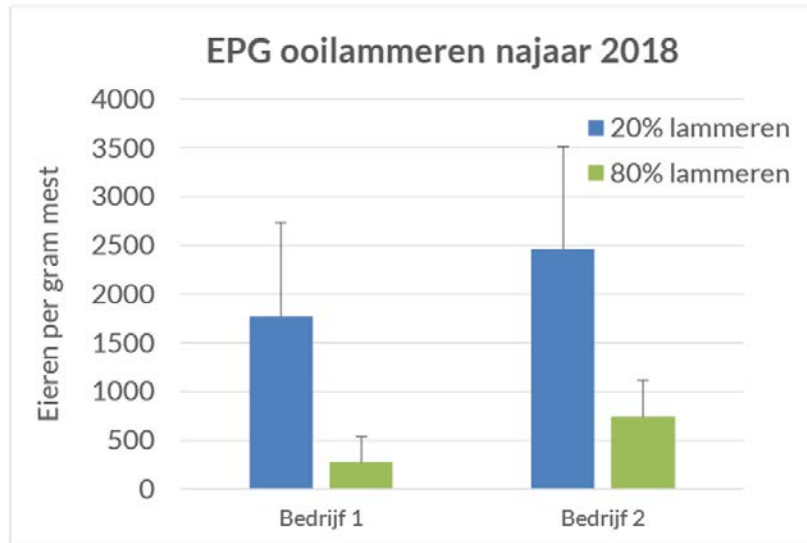
Safe pasture: no sheep for the last 3 months

Realistic scenario for Flemish sheep farmers?



Strategies for parasite control

- Quarantine of new animals
- Mixed grazing
- Alternative and bioactive crops?
 - Chicory
 - Clover species
- Genetic selection?



- 20% of the animals is responsible for 80% of the wormeggs
- Other 80% of the animals: deworming could be postponed...
- Breeding value NSFO: ewes with a higher breeding value have lower EPG

Results of a survey

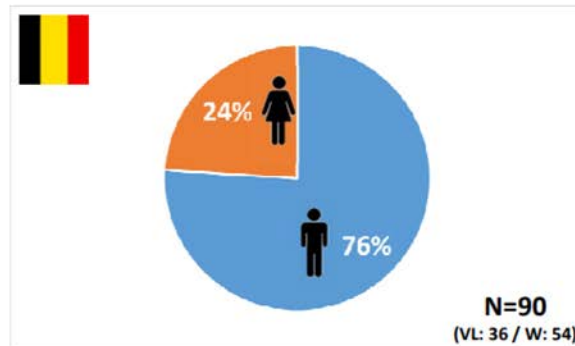
Project financed by Sanitary Fund

Objectives:

- Bring into focus the parasite control strategies
- Verify the efficacy of the most commonly used anthelmintics

Electronical survey was performed

Geslacht



Locatie



- Vlaams Brabant : 7
- Waals Brabant : 1

Results of a survey



What are the 3 most common causes of disease in the past 5 years? (ewes that have never lambed)

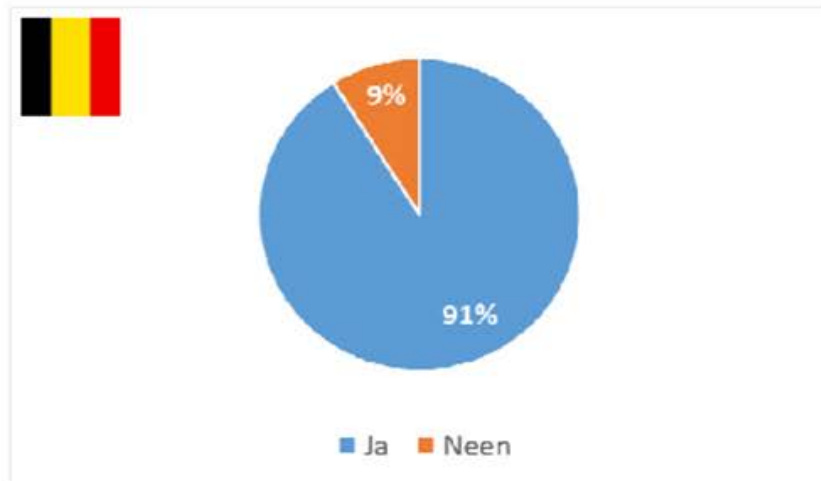
1. Internal parasites
2. Footrot
3. Others

What are the 3 most common causes of disease in the past 5 years? (ewes that have already lambed)

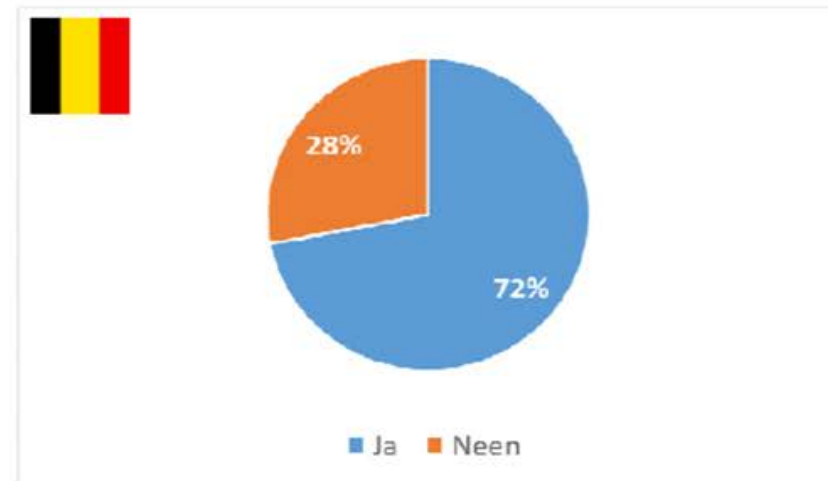
1. Mastitis
2. Internal parasites
3. Footrot

Results of a survey

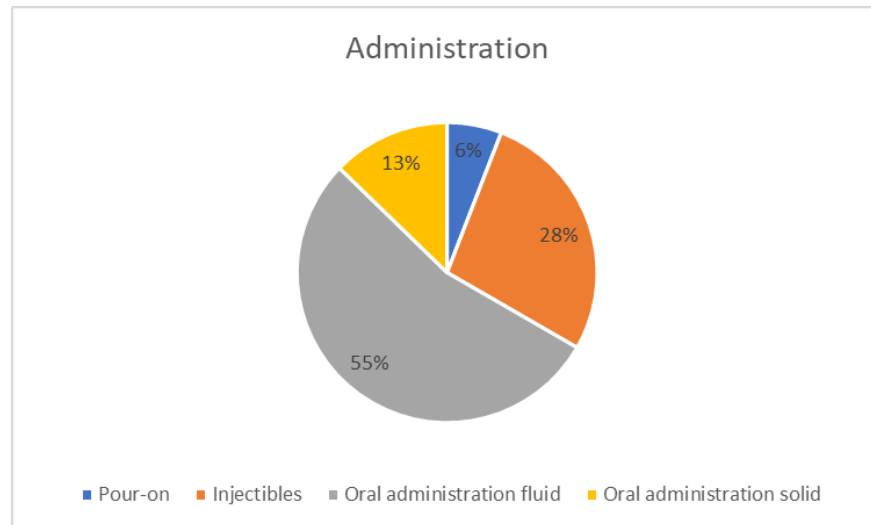
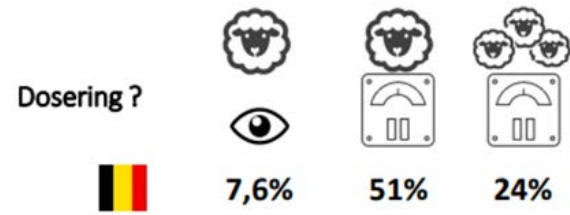
Are anthelmintics used to treat the animals against gastrointestinal nematodes?



Are all animals dewormed systematically?



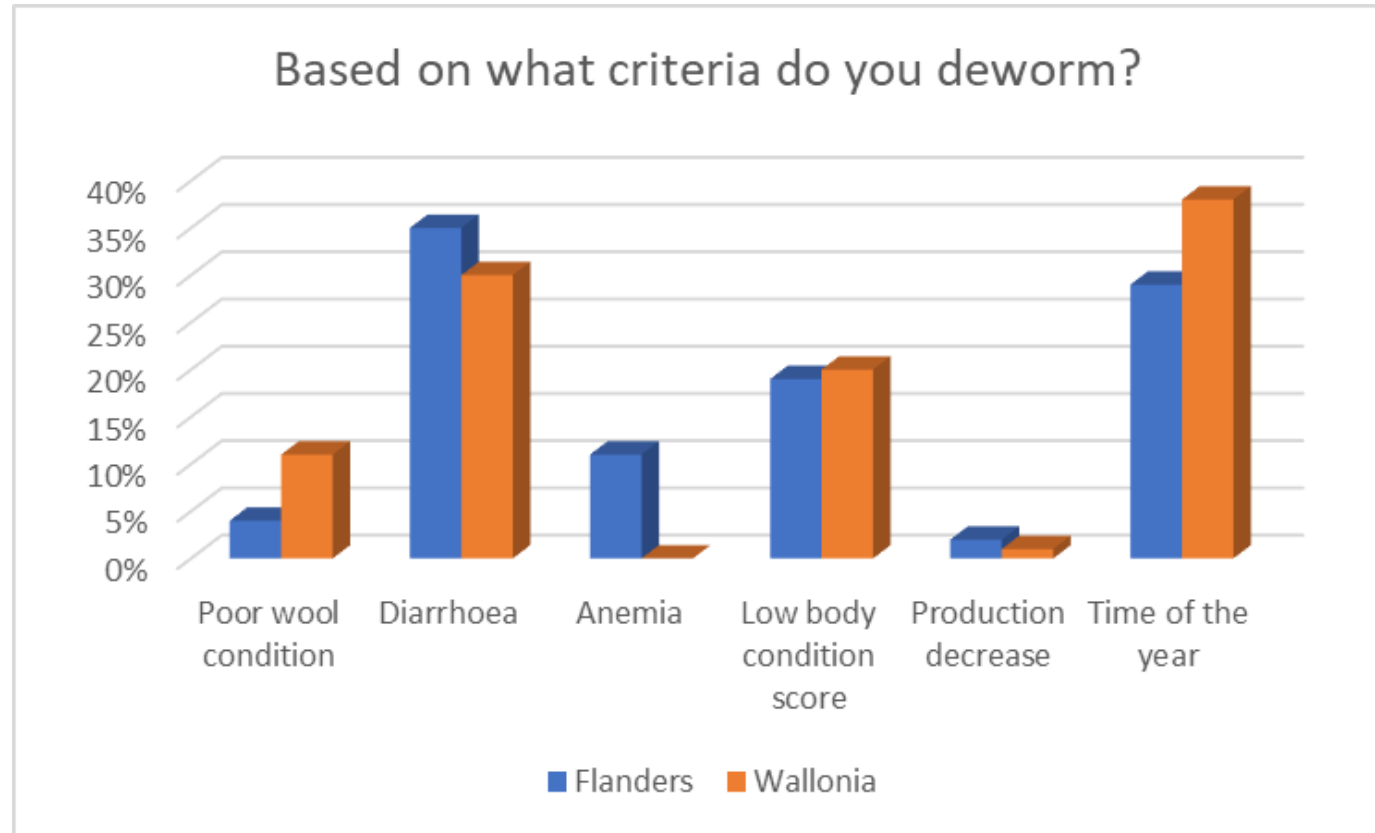
Results of a survey



Is there a product that you feel is not working?

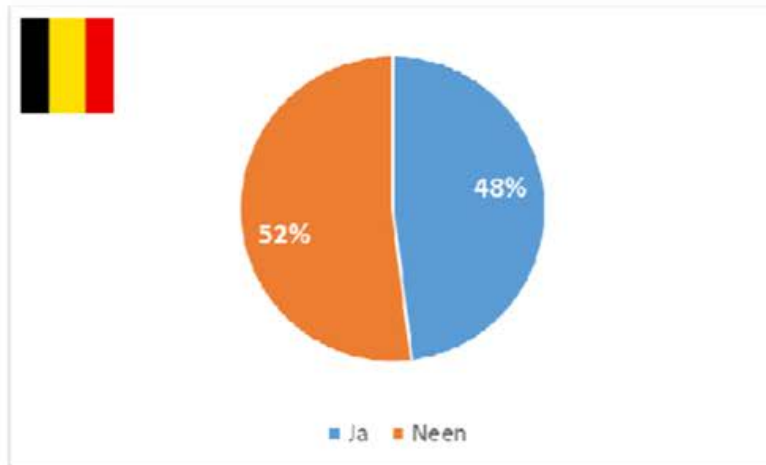
>50%: JA!

Results of a survey

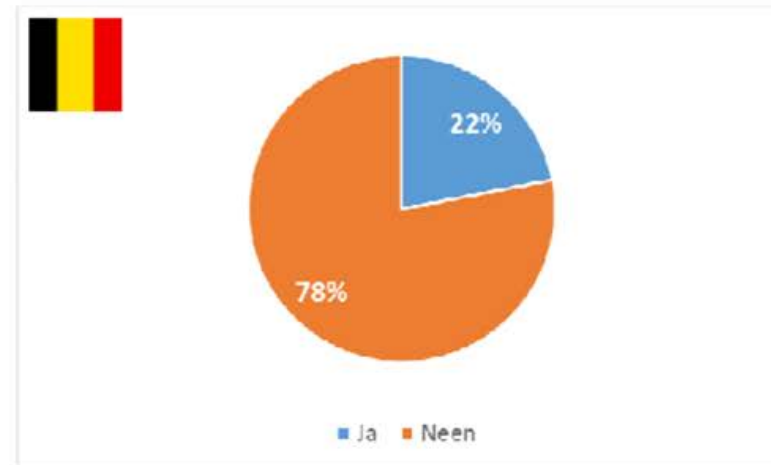


Results of a survey

Did you ever asked your vet or a lab to perform a faecal egg count?



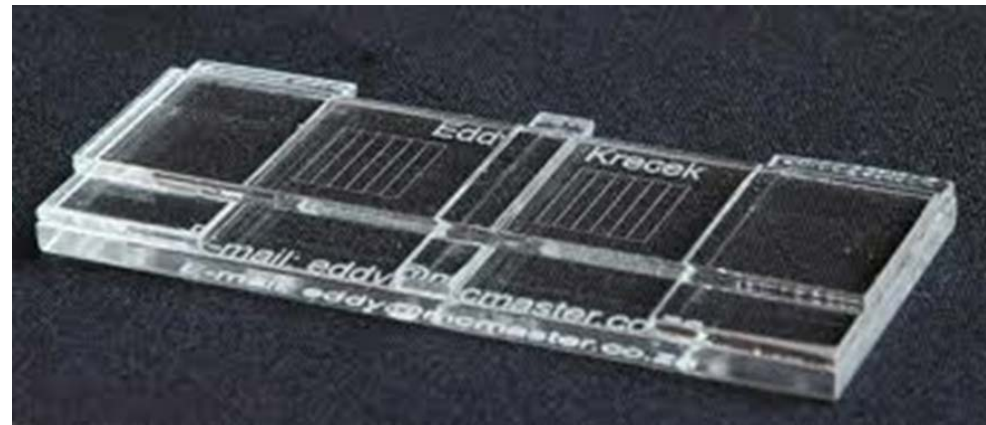
Did you ever perform a faecal egg count reduction test?



Strategies for parasite control

We need to create awareness!

Workshop Faecal egg count DGZ



VRAGEN?



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www.dgz.be