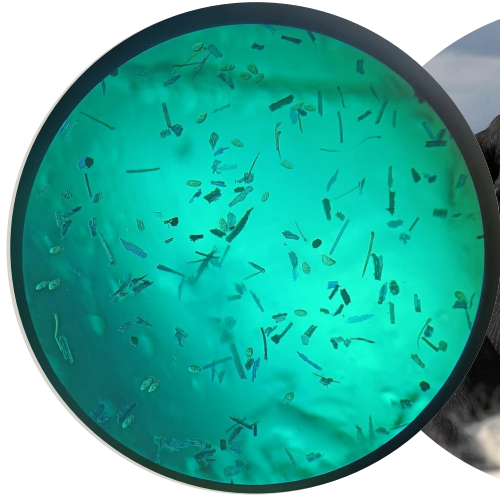


Alternative treatments for liver and rumen fluke infections in cattle in the Netherlands

September 4th, EAAP, Florence

I. van Dixhoorn, J. Verkaik, C. van Schoote, E. Graat, L. Le Roux-Pullen



Fasciolosis – costs for farmers €250/cow/year

Prevalence expands

Treatment (anthelmintics) is a dead-end solution

- Multi-resistance
- Threat to public health
- Soil pollution

Alternatives solutions are needed



Liver and rumen Fluke

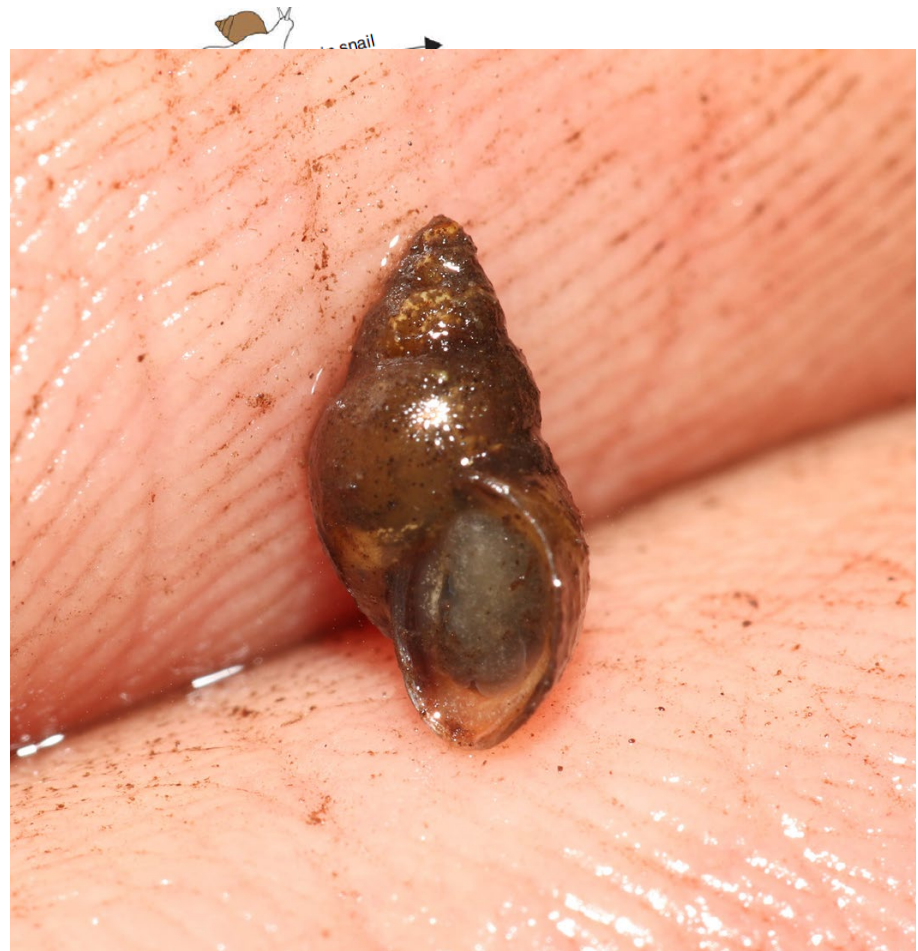
Trematodes

- *Fasciola hepatica*
- *Paramphistomum* spp.

Cycle 3 – 6 months

Intermediate host: snail

- *Galba truncatula*



Plant-derived compounds

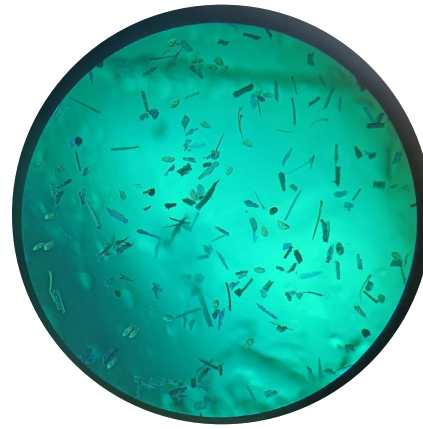
- Allicin¹
- *Ferula asafoetida*²
- In vitro experiments³

1: Borlinghaus et al. (2014);
2: Mahendra and Bisht (2012);
3: Sunita and Singh (2011)



Source: Bahrami G. et al. (2012)

Aim



The (curative) effect of two rumen boluses

- allicin
- *Ferula asafoetida* extract

on liver and rumen fluke **faecal egg counts** and liver fluke antibody level

Materials and methods

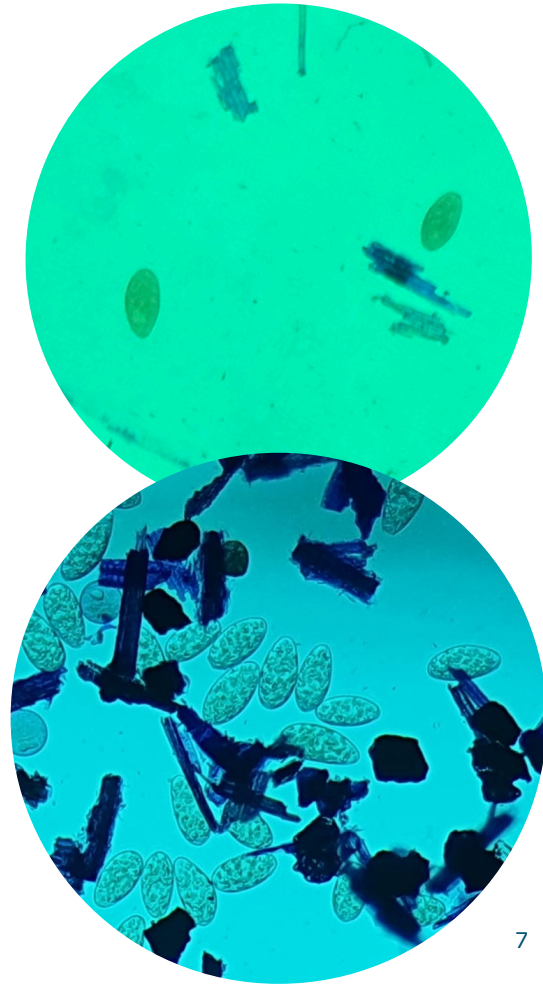
- December – April 2024
- 178 cows from 10 dairy farms
- Treatment groups
 - Allicin, n=50
 - *Ferula asafoetida*, n=44
 - Control (n=84)



Materials and methods

- Bulk tank milk ELISA
- Blood samples (ELISA)
 - Antibody level (30 S/P%)
- Faecal samples
 - Trematode egg filter¹
 - Liver and rumen fluke egg counts (LFEC and RFEC) in 8 g of faeces

1: Dorsman (1956)

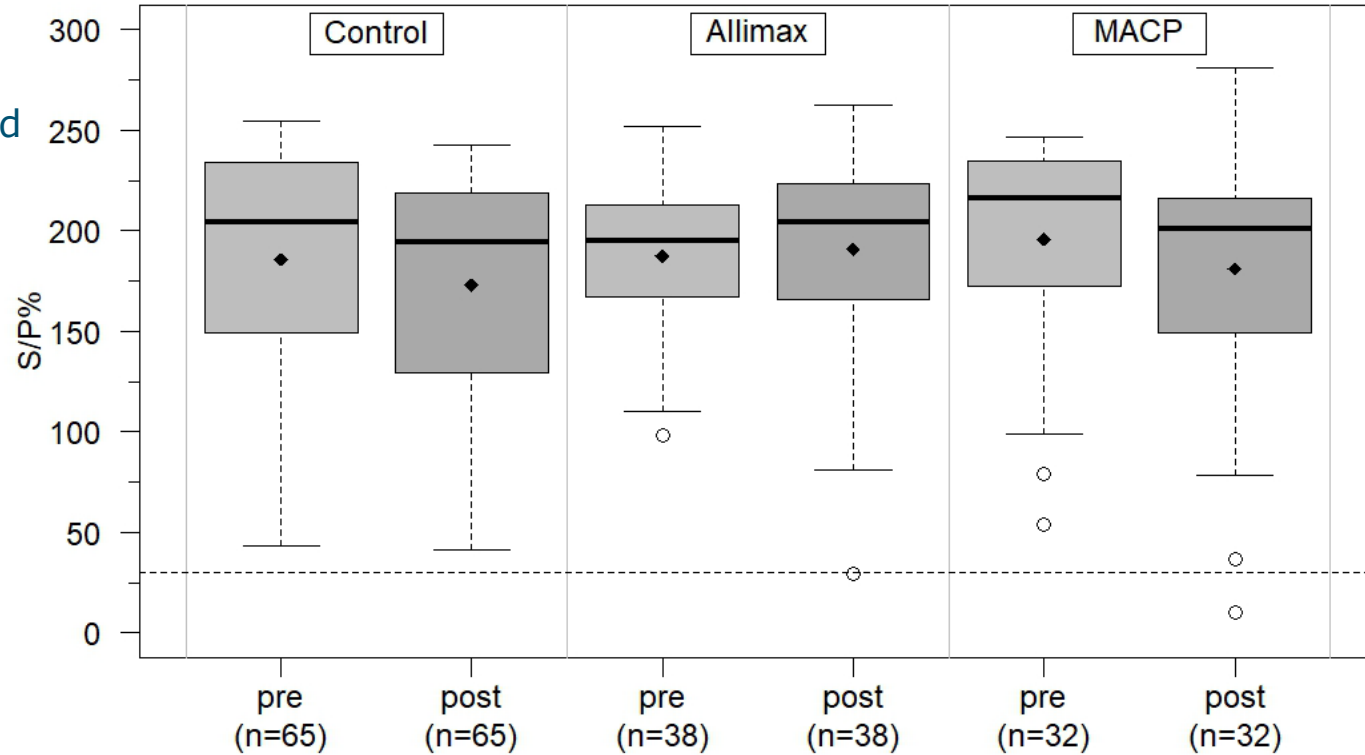


Fluke filter (Dorsman technique)



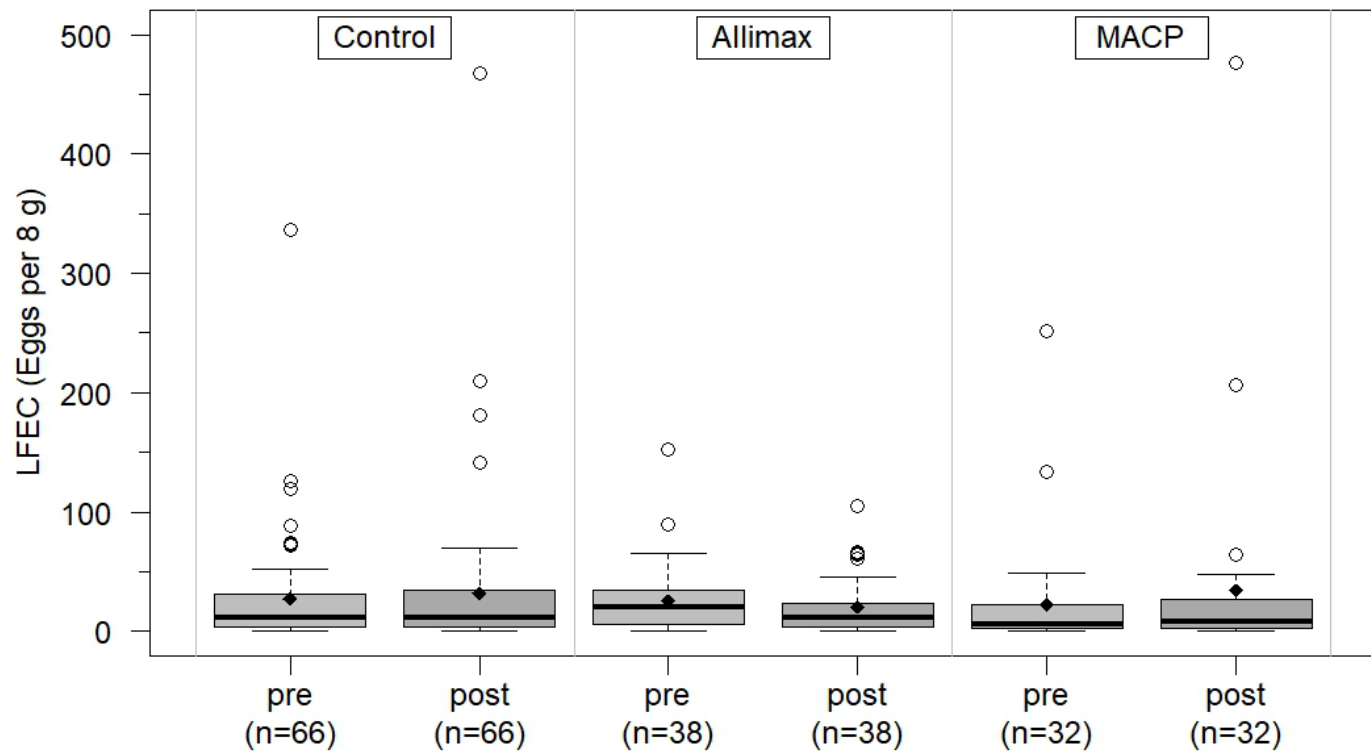
Results – liver fluke antibody level

- No differences in antibody level pre- and post-treatment
- Antibodies persist in blood (Castro et al., 2000)



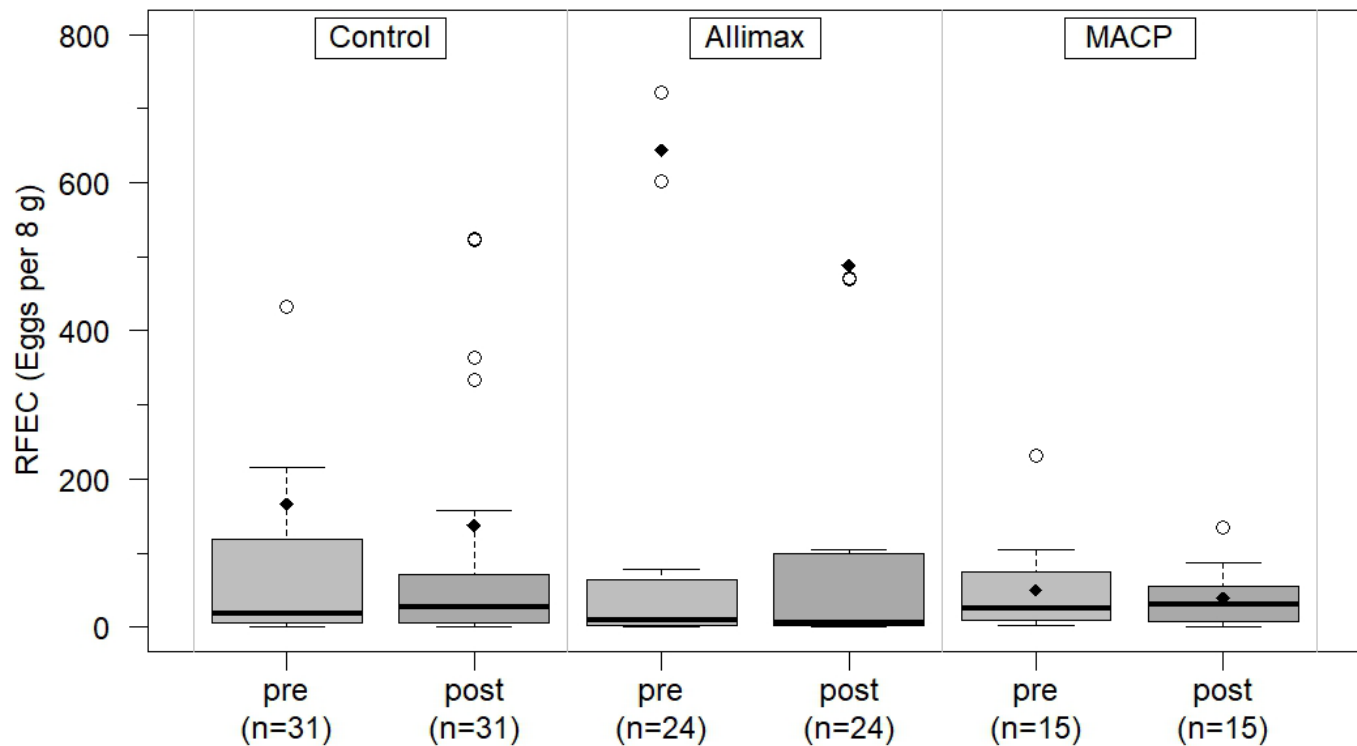
Results - liver fluke faecal egg counts

- Pre (1-337 eggs)
Post (0-468 eggs)
- $r_{s,272}=.81$
- Control (P=0.3)
- Allimax (P=0.002)
20 to 16 eggs
- MACP (P<0.0001)
14 to 22 eggs



Results – rumen fluke faecal egg counts

- Pre (1-6040)
Post (0-5310)
- $r_{s,140}=.87$
- Control (P=0.08)
- Allimax (P<0.0001)
788 to 593 eggs
- MACP (P<0.0001)
104 to 90 eggs



Discussion

- Allicin reduced LFEC and RFEC
- *Ferula asafoetida* reduced RFEC
- **Significant differences, but low egg counts, so relevant?**
 - Liver fluke economic threshold of 5 EPG¹
 - 17% of animals in pre

1: Malone and Craig (1990)

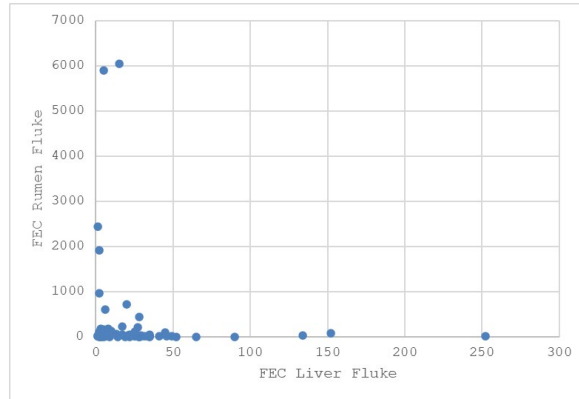
Discussion

- Rumen fluke threshold for “highly infected” of 200 EPG¹
→ 6% of animals in pre
- Low egg counts in pre samples
 - Cow selection based on antibody level
 - Coprological method, more frequent sampling

1: Malrait et al. (2015)

Rumen Fluke

- Pathogenicity?
- Competition with Liver fluke?



Thank you for your attention

Wageningen University and Research:

- Livestock Research
- Adaptation Physiology
- Food Safety Research

