

# THE EFFECT OF GARLIC (*ALLIUM SATIVUM*) AND BLACK CHOKEBERRY (*ARONIA MELANOCARPA*) ON WORM LOAD AND GUT HEALTH IN *ASCARIDIA GALLI* INFECTED LAYING HENS



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## We studied

- Whether feed additives with anti-parasitic effect can reduce the incidence and severity of worm infections in organic egg production
- The effect of plant derived compounds in *Ascaridia galli* (*A. galli*) infected layers

## Background

Parasite infections in layers have increased through the last decade due to the preferential use of floor-based production systems and access to outdoor areas with potentially contaminated litter and soil. Intestinal infections with nematodes, i.e., *A. galli*:

- impair bird welfare
- cause economic losses for the farmers

No vaccines are available and anthelmintic treatments -> withdrawal period during which eggs cannot be marketed as organic



## We found

- Garlic showed potential antiparasitic effect *in vivo*.
- Garlic moreover showed antibacterial effect and reduced the *E. coli* load in caeca and increased short chain fatty acid (SCFA) production.

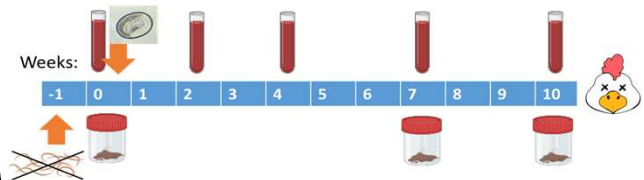
## Methods

### Animals:

- 96 Bovans Brown layers (18 weeks of age) from commercial supplier
- 4 treatment groups (4 replicate pens with 6 birds pr. group)

### Experimental setup:

- No supplementation (control)
- Freeze-dried garlic cloves (10 g/kg feed)
- Aronia pulp (10 g/kg feed)
- Garlic and Aronia (each 5 g/kg feed)



## Results

- No effect on egg production and general health (data not shown)
- Garlic supplementation numerically reduced the *A. galli* specific IgY titre in serum titre at 2 weeks post infection (p.i.) compared to the control group (p=0.082) (Fig. 1A). This is corresponding to the histotrophic phase of the *A. galli* life cycle
- Garlic supplementation numerically reduced the worm burden at 10 weeks p.i. (p=0.37) (Fig. 1B) but had no effect on *A. galli* eggs/gram faeces (data not shown)
- Garlic supplementation significantly reduced caecal content of *E. coli* (Fig. 2A)
- Garlic and/or aronia supplementation lowered the pH of caecal content (Fig. 2B) and increased caecal fermentation as indicated by an increase in short chain fatty acids, i.e., butyric acid and acetic acid (Fig. 2C and D)

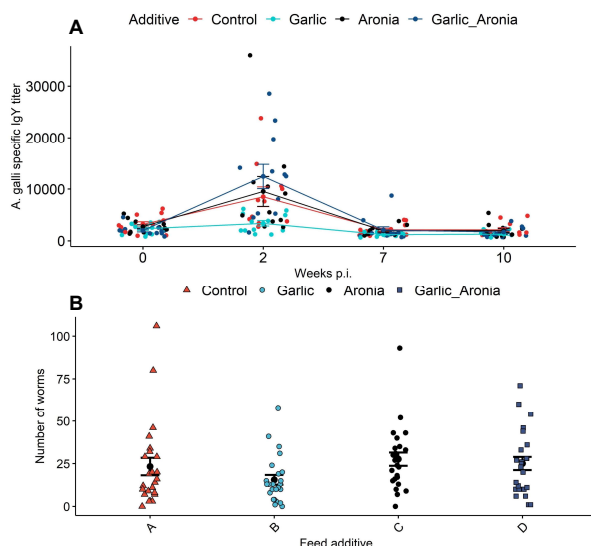


Figure 1. *A. galli* burden as measured by A) *A. galli* specific IgY titres in serum during the experiment (n=12 pr. treatment), or B) worm burden in the intestine at 10 weeks post infection (p.i.) (n=24 pr. treatment)

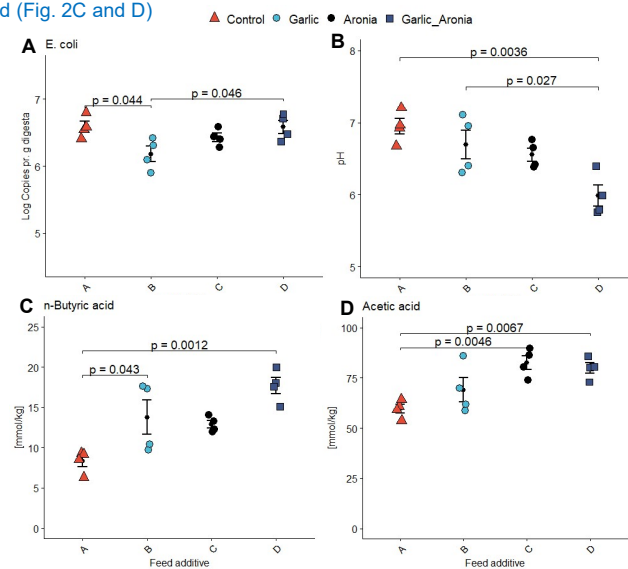


Figure 2. Characteristics of caecal content as measured by A) *E. coli* concentration, B) pH, C) concentration of n-butyric acid, and D) concentration of acetic acid at 10 weeks post infection. Caecal content from 6 chickens from same treatment was pooled giving a total of n=4 pr. treatment.



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