Louis Bolk Instituut

FreeBirds

Monique Bestman

# Role of range use in infections with parasites in laying hens


## Authors

**Monique Bestman**
Louis Bolk Institute (NL)

**Thea van Niekerk**
Wageningen Livestock Research (NL)

**Elske N de Haas**
Institute for Agricultural and Fisheries Research (BE)

**Valentina Ferrante**
University of Milano (IT)

**Stefan Gunnarsson**
Swedish University of Agricultural Sciences (SE)



## Funding

**ERA-net Core Organic Cofund FreeBirds**


## Introduction

In organic egg production a free-range area is provided for animal welfare. Both higher and lower worm burden (*Ascaridia* (Asc), *Heterakis* (Het) and *Capillaria* (Cap)) are reported for hens in free-range systems compared to other systems. Parasite infections can reduce health, welfare and productivity.

## Questions

1. Is infection of manure different for samples from 'outdoor hens', compared to 'indoor hens?
2. Is proportion of hens using the free-range correlated with parasite eggs in soil and manure?
3. Are parasite infections correlated with health and production parameters?

## Methods

- 20 Dutch flocks > 45 weeks old and > 3 weeks after a deworming.
- Farmers' estimate of range use (%HensOut) & health status
- Lay % at 60 weeks & mortality % till 60 weeks
- 6 soil samples/farm at 5, 20 and 50 m from pop-holes
- 70 individual droppings, pooled into 7 samples from outside > 50 m from the pop-holes (outdoor hens)
- 70 droppings, pooled into 7 samples from inside (indoor hens)
- All soil and manure samples analysed for parasite eggs/gram (EPG; McMaster method).
- *Ascaridia* and *Heterakis* counted as one category (Asc+Het) since they could not always be distinguished.

## Results

| | Asc+Het | | Cap | |
|---|---|---|---|---|
| | % of samples positive | Mean EPG* (SD) | % of samples positive | Mean EPG* (SD) |
| Soil (n=120) | 12 | 7 (7) | 0 | 0 (0) |
| Manure outside (n=140) | 94[a] | 405[c] (590) | 24 | 39 (56) |
| Manure inside (n=140) | 75[b] | 243[d] (335) | 19 | 26 (40) |

* Deworming is commonly advised when Asc+Het > 200 EPG or when Cap > 1

Proglottids of tapeworm (*Raillietina spp*) and adult roundworm (*Ascaridia galli*) in one dropping.

- # manure samples positive for Asc+Het collected outside was significantly higher, compared to # positive from inside (6.6 vs 5.3; p=0.004). Also, the mean EPG for Asc+Het was significantly higher in outside manure, compared to inside manure (405 vs 243; p=0.026).
- No correlations found between %HensOut and # soil or manure samples positive for Asc+Het, nor for Cap. No correlations found between %HensOut and mean EPG in soil or manure.
- Positive correlation found between # manure samples from 'indoor hens' positive for Asc+Het with mortality% till 60 weeks (Pearson correlation 0.495; p=0.026; n=20).
- No correlations found between # soil or manure samples from 'outdoor hens' positive for Asc+Het or Cap with the 'health according to the farmer', laying% at 60 weeks or mortality% till 60 weeks.

## Conclusions

- Manure from outside hens was more frequent infected with *Ascaridia* and *Heterakis* and had higher EPG, compared to manure from inside hens.
- Flock mortality was higher in case of a higher number of manure samples from 'indoor hens' being positive for roundworms. No other correlations were found between parasite infections and health or production parameters
- No association was found between %HensOut and parasite infections in soil or manure.