

Use of diatomaceous earth as a dietary supplement in organic hens and its effects on parasite load, egg production and egg quality

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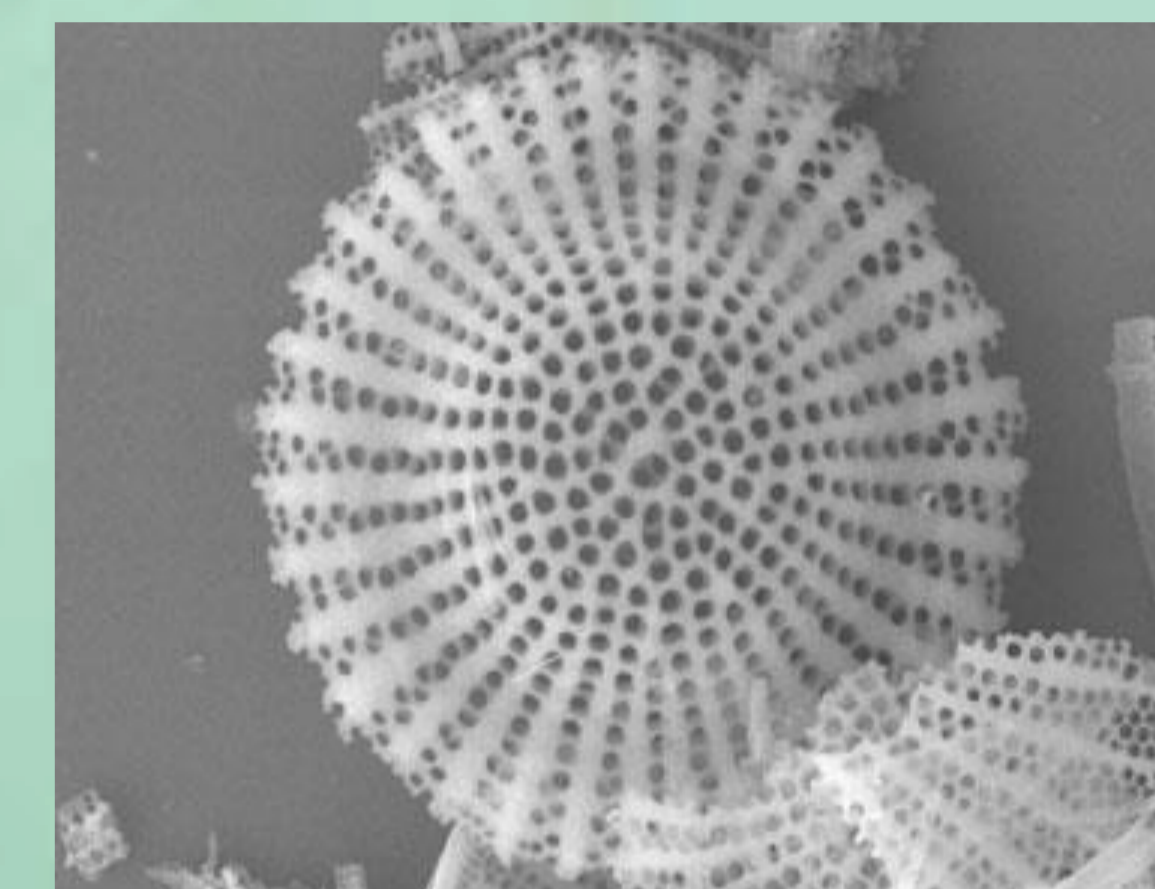
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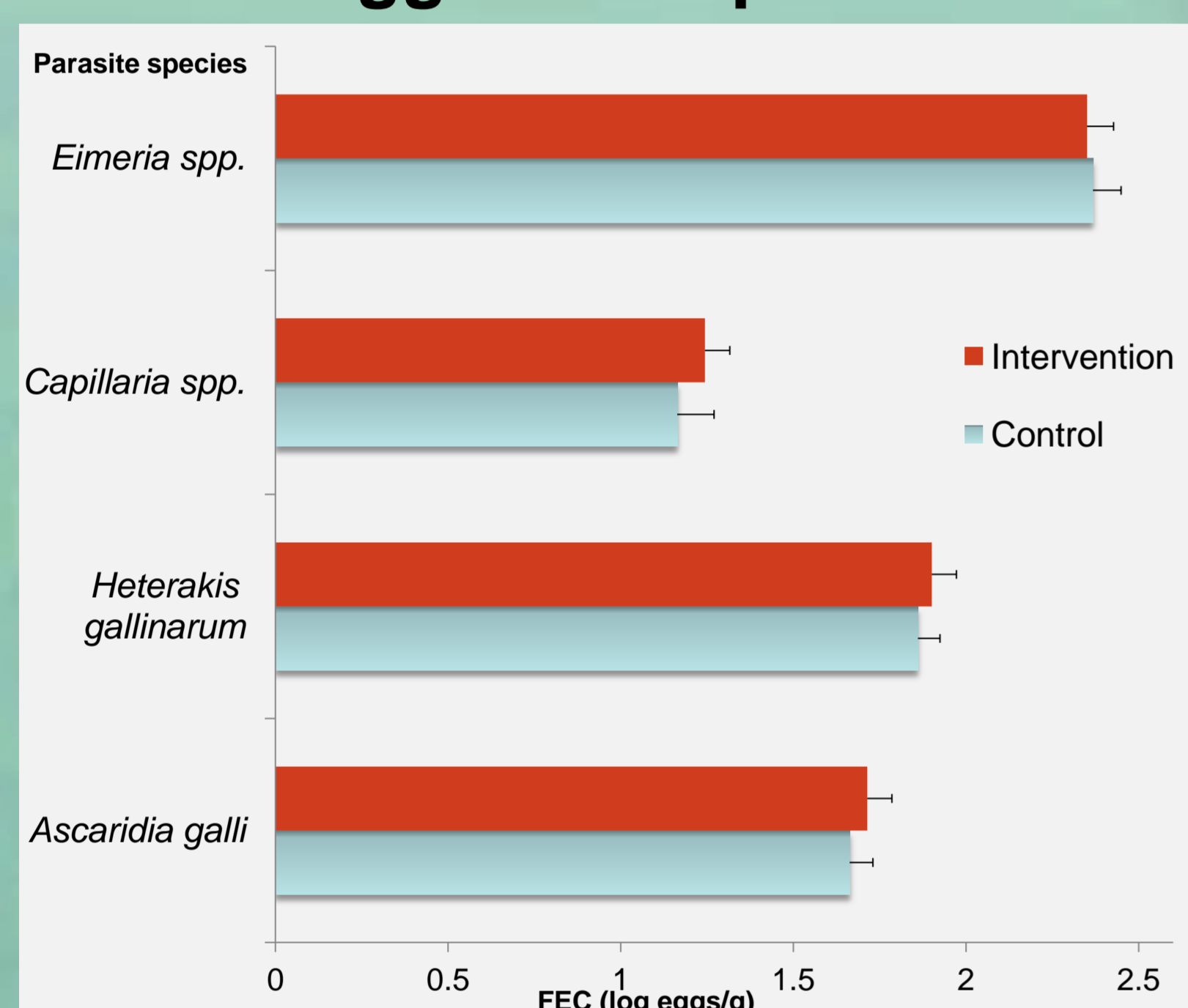
Introduction

Organic farming of poultry is an established practice in the UK, providing the market with a good quality and well-accepted product. Despite the robust nature of laying hens, parasitic infections can play a role affecting the flock performance and parasite prevalence is not well documented in free range farming systems. Egg size and quality vary as the laying period advances, resulting in a higher risk of breakage due to thinner and more fragile eggshells. Diet supplementation with diatomaceous earth (DE), a natural soft siliceous sedimentary rock consisting in fossilized remains of diatoms, is proposed in this study in order to evaluate its efficacy for parasitic control and improved egg production.

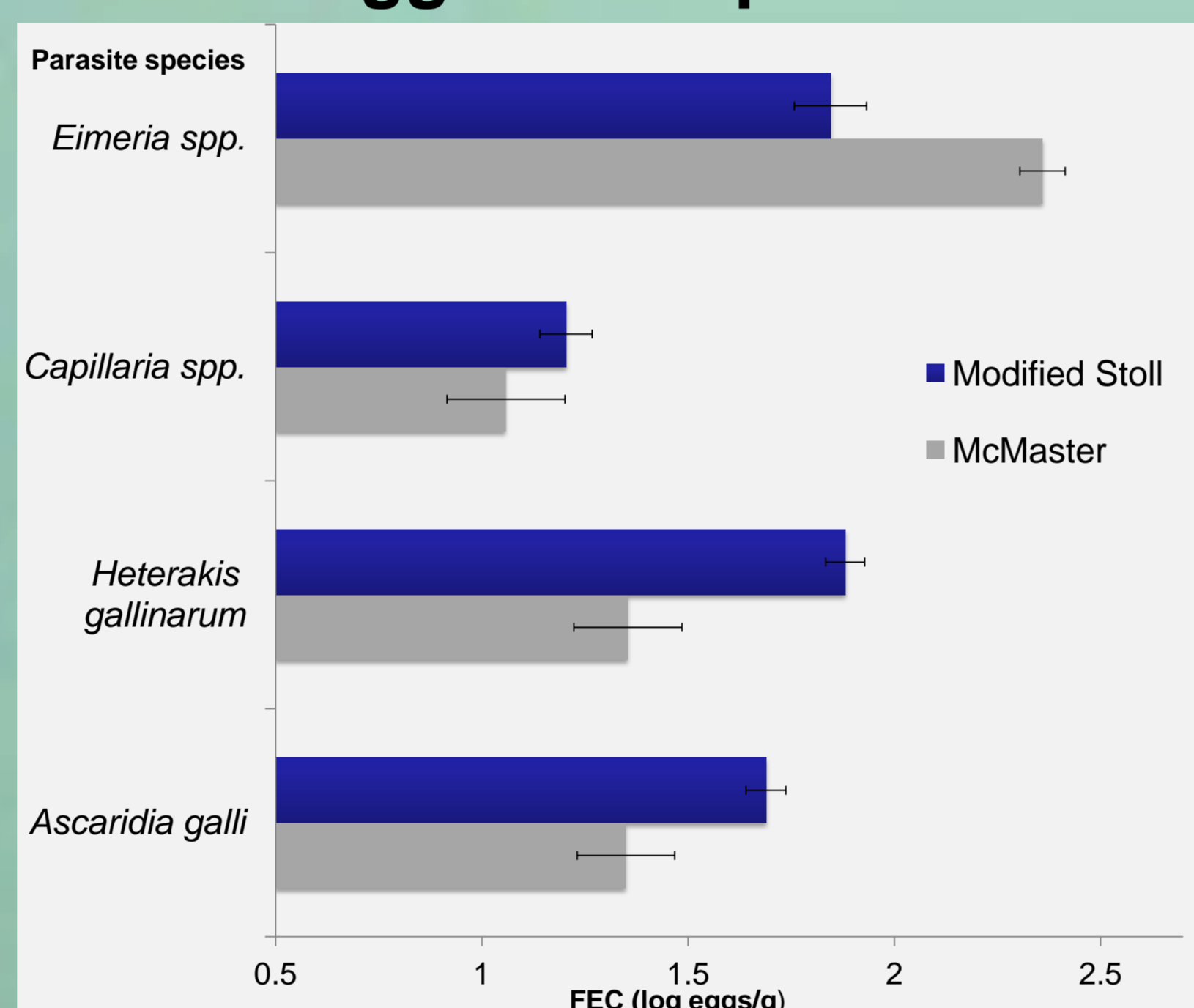


Results

Faecal egg counts per diet

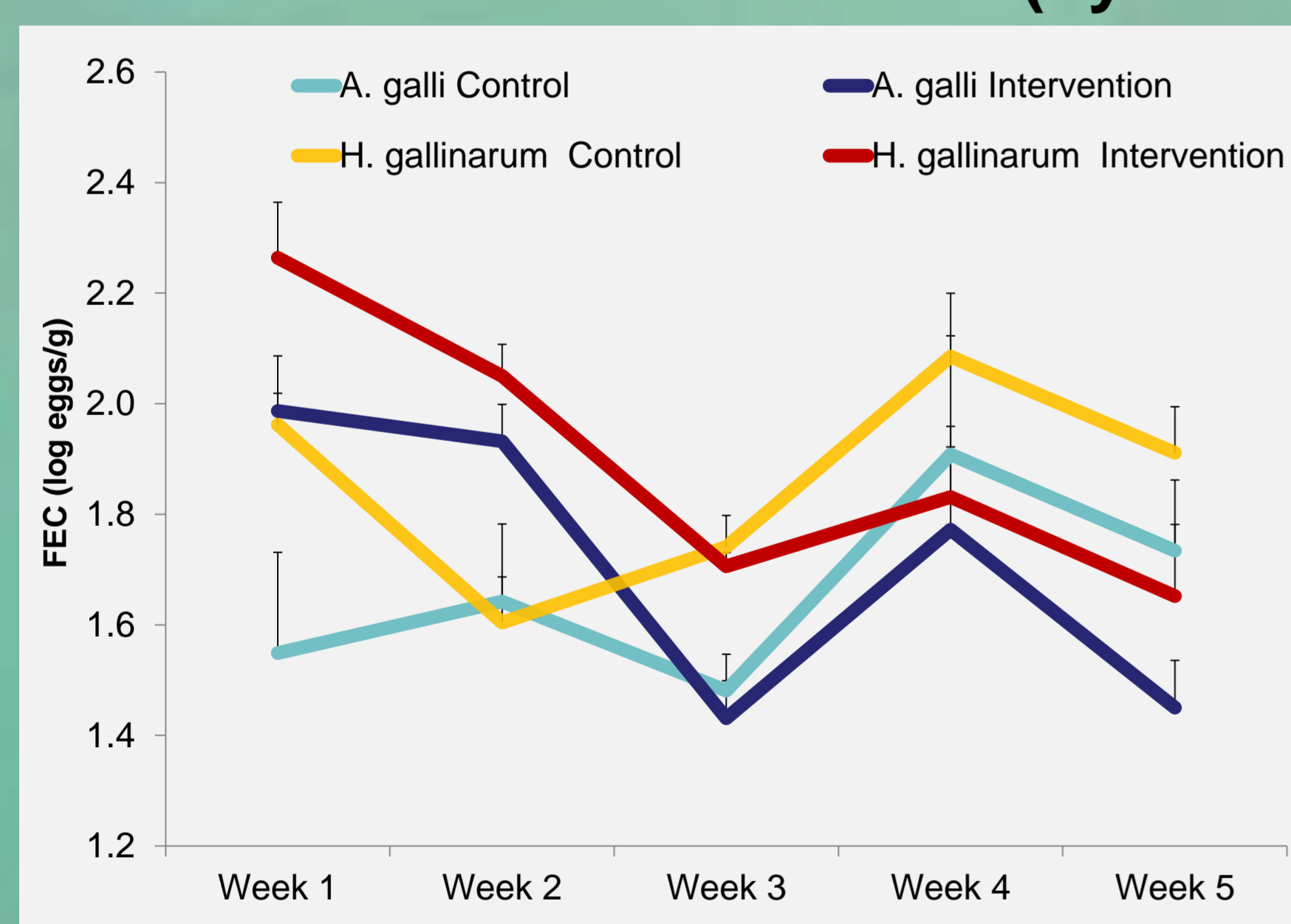


Faecal egg counts per method



All parasites tested by M. Stoll method except *Eimeria* spp. (by McMaster).

Evolution of Ascarids FEC (by M. Stoll)



- Interaction week*diet $p < 0.05$.
- Intervention reduced in 27% initial FEC for both *A. galli* and *H. gallinarum* and had lower FEC than control at week 5 (-16.4% *A. galli* and -13.6% *H. gallinarum*).

FEC method sensitivity

FEC method	Parasite species		
	<i>Eimeria</i> spp.	Ascarids (<i>A. galli</i> & <i>H. gallinarum</i>)	<i>Capillaria</i> spp.
McMaster	100%	81.6%	66.6%
Modified Stoll	100%	100%	96.6%



Detection of *E. acervulina* by PCR using SCARdb ID Ac-AD18-953 primers



Eimeria spp. oocysts

Discussion

Dietary treatment did not have a significant effect in parasite counts but FEC method was significant ($p < 0.05$). Some effectiveness was identified for Ascarids. Egg production was higher in the intervention group and that was consistent throughout the study; however, no additional benefits were found with regard to eggshell quality (weight, density, egg specific gravity) or % of broken eggs.

Materials and Methods

Animals

400 Novogen Brown hens of approx. 54 weeks of age from a commercial organic laying hen farm housed in two different sheds ($n = 200$) with a shared field to free range.

Diet

2 dietary treatments, applied biweekly for 5 weeks:

- ✦ Control: basal diet made of home grown naked oats, wheat/pea mix, whole wheat and oats, whole rapeseed, protein/mineral concentrate and limestone.
- ✦ Intervention: basal diet supplemented with DE (Diature™ DE) at 1.35%

Faecal sampling and faecal egg counts (FEC)

Weekly sampling of fresh faeces from the shed's floors to perform McMaster and Modified Stoll FEC tests. Parasite eggs were counted and recorded separately for each parasite species.

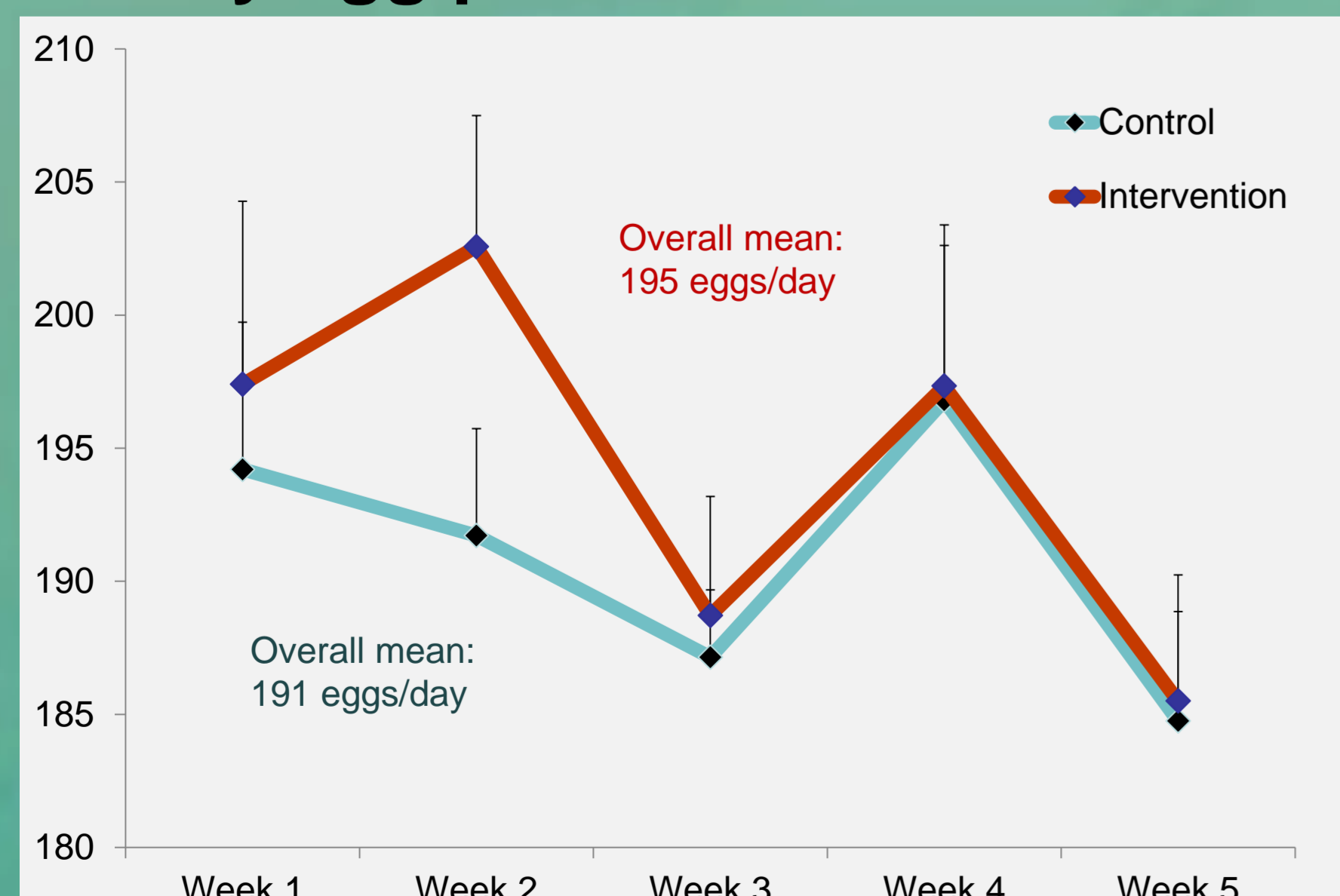
Egg sampling and production records

A sample of 45 eggs per treatment was taken at the beginning and end of study (15 eggs/day over 3 consecutive days). Egg production was recorded on a daily basis.

Egg quality tests

Eggs were assessed individually, evaluating: weight of whole egg, candling and external exam, specific gravity, height of albumen, weight and colour of yolk, presence of inclusions and weight of desiccated shell.

Daily egg production



Main parasites identified:



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