

# Eimeria vison on Dutch mink farms

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## Introduction

Clinical coccidiosis is rarely if ever reported on Dutch mink farms. In other species low-grade non-lethal infections with coccidia are known to have a large impact on production<sup>[1]</sup>, and in minks these infections have previously been implicated as a cause or contributing factor to overall poor performance and intestinal problems in June and July, called 'June blues'. To determine if, despite the absence of clinical outbreaks, coccidia are common in Dutch minks, and which species are involved, a small screening of six farms was organized.

## Materials and methods

### Sampling in the first week of June 2015

6 mink farms (A-F), each 20 fecal samples:  
34/120 diarrhea, 86/120 normal feces

### Additional samples end of June

Farm A (6 of healthy pups)

Farm C (3 of healthy pups and 3 of pups in sick bay)

For each sample the number of oocysts per gram (OPG) of feces was determined using a modified McMaster method utilizing solutions of zinc sulfate (ZnSO<sub>4</sub>). Additionally a pooled sample was created for each farm. Oocysts from each pool were sporulated according to a modified version of the method from Ryley et al<sup>[2]</sup>. Length and width of sporulated oocysts were measured using Cellsense software (Olympus, Japan) in accordance with Long's method<sup>[3]</sup>.

## Results oocyst detection

61% of the 120 samples contained oocysts (Table 1). Incidence of coccidia in diarrheic samples was not significantly different from normal samples.

**Table 1. Average number of oocysts (Av. OPG) as well as oocyst incidence from the first 120 samples, listed by farm and subdivided into diarrhea and normal samples**

Farm	Diarrheic samples		Normal samples		Total	
	Av. OPG	Positive/total	Av. OPG	Positive/total	Av. OPG	Positive/total
A	396	4/5 (80%)	660	10/15 (67%)	594	14/20 (70%)
B	165	6/8 (75%)	220	7/12 (58%)	198	13/20 (65%)
C	693	8/10 (80%)	561	10/10 (100%)	627	18/20 (90%)
D	-	0/0	2,005 <sup>1</sup>	12/20 (60%)	2,005 <sup>1</sup>	12/20 (60%)
E	66	1/5 (20%)	154	7/15 (47%)	132	8/20 (40%)
F	55	2/6 (33%)	130	6/14 (43%)	107	8/20 (40%)

<sup>1</sup> The average OPG at farm D is strongly affected by a single high measurement. Without this outlier the average OPG at farm D is 165.

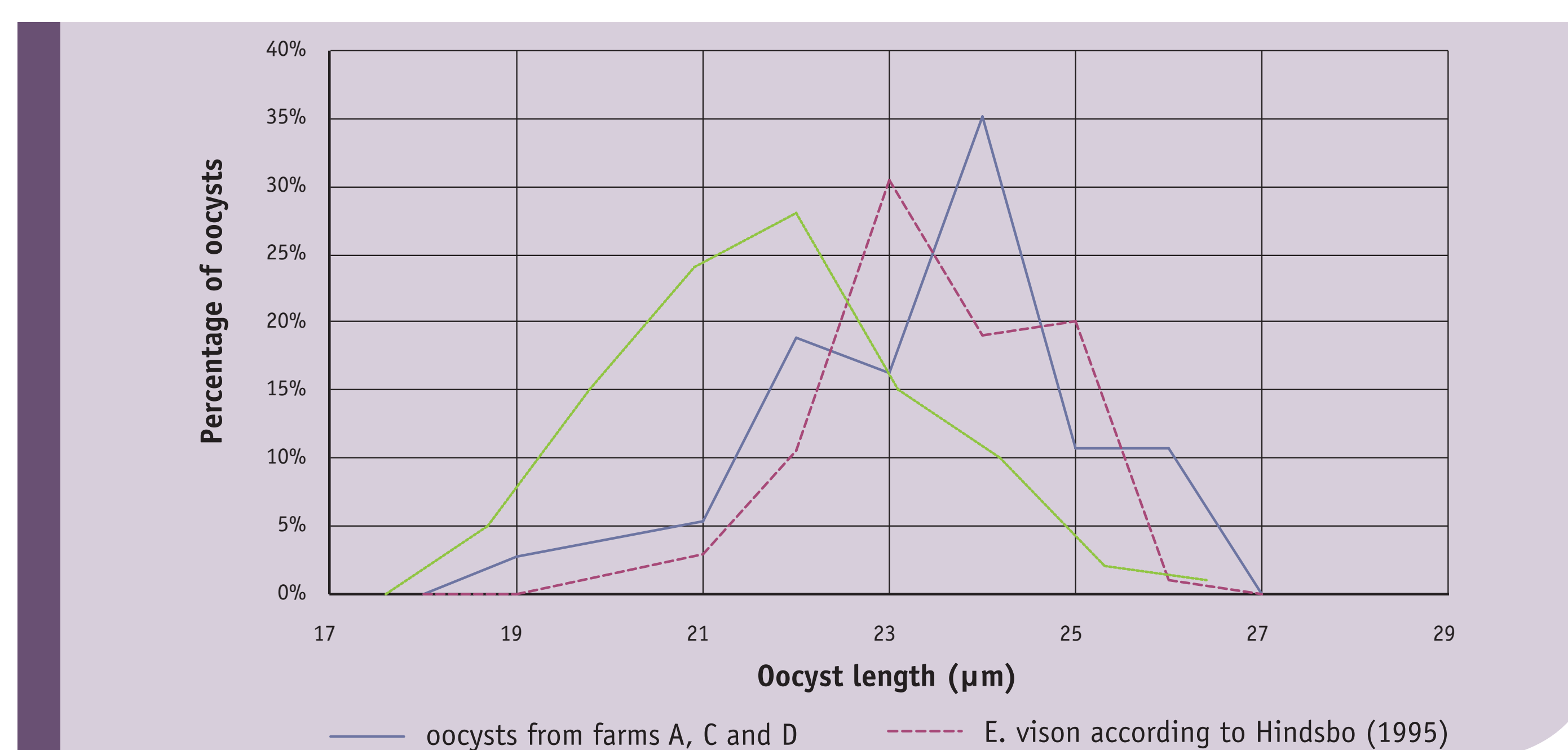
11 of the 12 additional samples contained oocysts (Table 2). The average OPG was significantly higher than the OPGs in the first 120 samples.

**Table 2. Average number of oocysts (Av. OPG) as well as oocyst incidence in 12 pup feces samples from farms A and C**

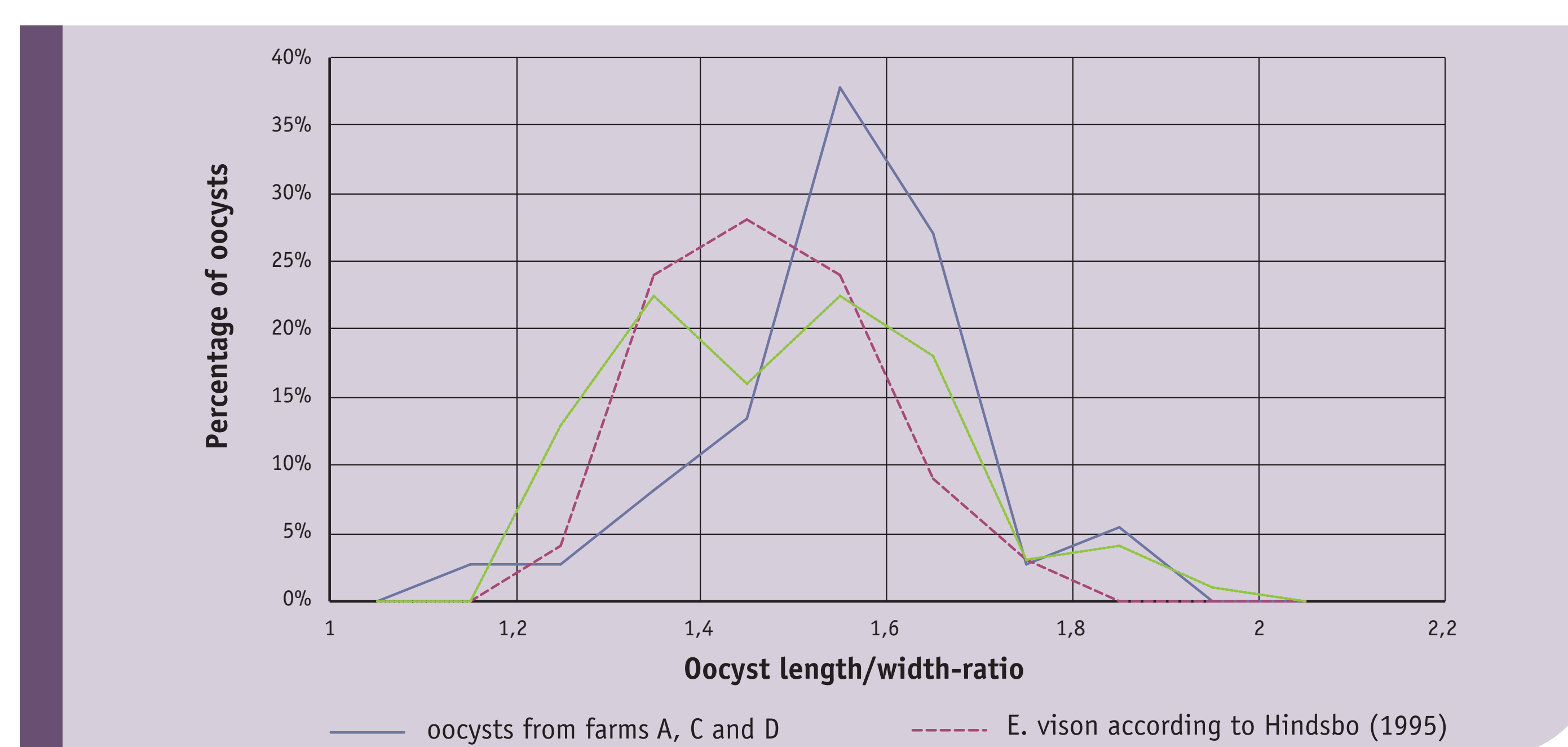
Farm	Sick bay		Healthy population		Total	
	Av. OPG	Positive/total	Av. OPG	Positive/total	Av. OPG	Positive/total
A	-	0/0	18,343	6/6 (100%)	18,343	6/6 (100%)
C	1,540	2/3 (67%)	8,030	3/3 (100%)	4,785	5/6 (83%)

## Results oocyst identification

Intact sporulated oocysts were only found in pooled samples from farms A, C and D. Length, width and length/width-ratio was determined for 37 of these oocysts. Average length was 23.6 μm and average width was 15.3 μm, which is comparable to values reported by Hindsbo and McTaggart for *Eimeria vison*<sup>[4]</sup> (Figure 1 and 2).



**Figure 1. Frequency of length of sporulated oocysts (μm), compared with data from Hindsbo and McTaggart**



**Figure 2. Frequency of length/width ratio of sporulated oocysts compared with data from Hindsbo and McTaggart**

## Morphology

Additional morphologic characteristics of these oocysts were also consistent with descriptions of *E. vison*<sup>[5]</sup> (see figure 3). No other *Eimeria* or *Isospora* species were recognized.



**Figure 3. Sporulated oocysts. Oo = oocyst, Sc = sporocyst, Sz = sporozoite**

## Conclusions

Coccidia were found in samples from each farm, but generally at low levels. Fecal samples from pups were almost all positive and often contained well above 10,000 OPG.

The high prevalence on farms and the high OPG in pup feces indicate coccidiosis is a possible health problem for Dutch mink pups in June and July, and a potential complicating factor in other intestinal diseases.

## References

<sup>[1]</sup> Dauschies and Najdrowski, 2005; Gauly et al., 2004; Voeten et al., 1988 <sup>[2]</sup> Ryley et al., 1976 <sup>[3]</sup> Long et al., 1976 <sup>[4]</sup> Hindsbo, 1995; McTaggart, 1960 <sup>[5]</sup> Levine, 1948; McTaggart, 1960