Prevalence and Risk Factor Analysis of Intestinal Parasites in Finnish Domestic Rabbits

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1. Introduction

Prevalence studies of gastrointestinal parasites among family-owned domestic rabbits are rare despite the questions often arising among rabbit owners and veterinarians regarding the need for regular deworming. This study aimed to estimate the prevalence of gastrointestinal parasites in domestic rabbits and to determine the risk factors for parasitic infections in order to make recommendations for parasite control. We hypothesized that the prevalence of intestinal parasites is low and that rabbits are infected by only a few parasitic species.

2. Materials and Methods

We analyzed 2-g faecal samples (n = 398) from family-owned domestic rabbits and internet-based questionnaires (n = 363) completed by their owners. Owners were advised to clean the litter box in the evening and collect on Monday, Tuesday or Wednesday morning at least 20 to 30 over-night faecal pellets per rabbit to a plastic bag and send the samples to the laboratory on the same day. Number of participating rabbits per household was limited to three. Samples were stored in the refrigerator and examined quantitatively within one week of collection in autumn 2012 and September 2015 using a modified McMaster method.

To study the risk factors for Eimeria infection, those not too much correlated with each other (Spearman r < 0.8) and with P ≤ 0.2 in the crude logistic regression analyses were included in the manual backwards multivariable logistic regression analysis, and factors with Wald's P < 0.05 into the final model. For

statistical analyses IBM SPSS Statistics version 23 was used (IBM Corp., Armonk, NY, USA).



Oocysts of Eimeria

3. Results

Eimeria oocysts represented the most common parasite found (27%, mean opg 4212). Nematode Passalurus ambiguus eggs were found in 3% of the samples (mean epg 65), while Trichuris leporis eggs and cestode eggs, respectively, were each found in 1 sample (0.25%). The risk factor analysis was limited only to Eimeria infection due to the low number of positive results for other parasites. We identified a young age (< 0.5 years), multi-rabbit households (with at least three rabbits) and living somewhere other than in a home-like environment as risk factors for Eimeria infection.



Final multivariable logistic regression model for Eimeria infections among Finnish domestic rabbits (Omnibus tests of model coefficients P = 0.000, Nagelkerke $R^2 = 31.7\%$, Hosmer and Lemeshow test P = 0.960, the area under the receiver-operating characteristic curve (AUROC) 0.787 (95% CI, 0.730–0.845)).

Risk factor	b ^a	Wald's P	OR ^b	95% CI ^c
Age <0.5 years vs older	1.864	0.000	6.5	2.9–14.3

Number of intestinal parasites in faecal samples (n = 398) from Finnish domestic rabbits.

Multi-rabbit household vs <3 rabbits	0.900	0.004	2.5	1.3-4.5
Living as a non-house rabbit vs living in a house	1.653	0.000	5.2	2.8-9.8
Constant	-2.166	0.000	NA ^d	
^a Regression coefficient ^b Odds ratio ^c 95% confidence interval for OR ^d Not applicable				



4. Conclusions

Prevalence of intestinal parasites among Finnish domestic rabbits was low.

Rabbits were infected by only a few parasite species.



Eggs of Passalurus ambiguus

Given the low helminth prevalence situation in Finland, there seems to be no need to routinely deworm pet rabbits.

We recommend examination to diagnose intestinal parasitic infections in rabbits prior to treatment, at least in low prevalence conditions similar to those in our study.



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