

# Prevalence of intestinal parasites in pet rabbits s1009684



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Analyzing the prevalence of intestinal parasites in pet rabbits *s1009684*

### ABSTRACT

Domestic rabbits are becoming increasingly popular as household pets. There is conflicting advice currently given to pet owners with regards to the prevalence of intestinal parasites. 36 rescue rabbits were faecal sampled and assessed for intestinal parasites using a McMasters counting chamber method whereby oocysts per gram (OPG) were calculated. Of the 36 rabbits sampled, 30 were shown to have intestinal parasites, coccidia being the most prevalent at 83%. Age of the rabbit sampled showed to be a significant indicator for prevalence of infection with rabbits 3 months to 1 year old having the highest prevalence of coccidia. Breed or number in housing environment had no effect on prevalence. Nematodes and cestodes were found in some of the rabbit faecal samples but were not considered significant. No rabbit sampled showed signs of disease or ill health, therefore concluding that OPG was not an indicator for prophylactic intestinal parasite treatment.

### INTRODUCTION

Rabbits are currently rated the third most popular pet in the UK with PDSA estimating the pet population to be around 1.7 million (PDSA Animal Wellbeing Report 2012). As pet rabbits are available in a multitude of varying breeds, sizes, body shapes and personalities it is no wonder they have increased significantly in popularity as pets over the years. Typically domestic rabbits have a life span of 8-12 years with many living longer if cared for in the most appropriate manner. Cat and Dog owners today are

very aware of the importance of routine intestinal parasite prevention however, the same cannot be said for rabbit owners. Currently there is a lack in continuity of advice from breeders, pet shop owners and vets as to whether or not it is appropriate to routinely prevent against intestinal parasites. Common intestinal parasites of pet rabbits are Coccidia, Nematodes and Cestodes all of which show little to no zoonotic threat.

Coccidiosis is the most common intestinal parasite in rabbits and is a highly contagious protozoal sporozoon infection (Bhat et al 1996). It is caused by the protozoal parasite *Eimeria* sp. There have been as many as 25 species of coccidia identified, each with varying degrees of pathogenicity and organ specificity (AL-Naimi et al 2012). Healthy rabbits can be asymptomatic carriers of the protozoa. All *Eimeria* species undergo complex life cycle having both intracellular and extracellular stages and asexual and sexual reproduction (AL-Naimi et al 2012). Coccidiosis is initiated by oral ingestion of the sporulated oocyst by a susceptible host (AL-Naimi et al 2012) and the “infection will develop into disease in young rabbits primarily whereas adults are mostly carriers” (Coudert P., 1989). There are two main forms of the disease, hepatic and intestinal with the latter being more common (Coudert et al. 1995). The majority of the intestinal species develop in the small intestines. Symptoms of the disease include failure of young animals to gain weight, diarrhoea, anaemia and growth retardation (Hobbs and Twigg 1998). There are non pathogenic to slightly pathogenic *Eimeria* sp (*E. media*, *E. exigua*, *E. perforans*, *E. coecicola*), moderately pathogenic (*E. irresidua*, *E. magna*, *E. piriformis*) and extremely pathogenic (*E. intestinalis*, *E.*

*flavescens*) (Licois and Coudert, 1980; Coudert et al., 1993). In all the intestinal types the prepatent phase lasts from 5-35 days.

The nematode or pinworm *Passalurus ambiguus* is a very common parasite of the domestic rabbit (Boag 1988). They are long thin worms which are often first noted by owners on the surface of freshly passed faeces (Boag et al 2001). The adult worms are inactive with the immature larvae being mildly pathogenic causing weight loss (Cattadori, Albert and Boag, 2007). Infection is spread through faecal oral route from contaminated animals (Cattadori, Albert and Boag, 2007). Less common nematodes found in domestic rabbits are the *Obeliscoides cuniculi* and the *Trichostrongylus spp* (Cattadori, Albert and Boag, 2007).

The most common cestode or tapeworm to be found in the domestic rabbit is the *Taenia pisiformis*, however in general cestodes are not commonly isolated from pet rabbits (Cattadori, Boag and Hudson, 2008). The larval forms of the tapeworm develop in the liver and abdominal cavity, compared to the adult form which can be found in the intestines of the rabbit (Cattadori, Boag and Hudson, 2008). The larval forms are more common in hutched rabbits. The life cycle of the *T. pisiformis* is dependent on the dog. Rabbits acquire tapeworms by ingesting contaminated feed and water containing tapeworm segments and eggs from the faeces of dogs (Poderson and Fenton, 2006). The young larvae are then released from the egg, penetrate the digestive tract and migrate to the liver (Poderson and Fenton, 2006). They migrate within the liver, entering into the abdominal cavity.

Here they will form fluid filled cysts (cysticerci) which can exit the abdominal cavity with faeces which can then be ingested by dogs (Dolibes-Matcos et al., <https://assignbuster.com/prevalence-of-intestinal-parasites-in-pet-rabbits-s1009684/>

2009), where it is able to develop into a mature tapeworm (Poderson and Fenton, 2006). Therefore parasite prevention within multi pet households plays a pivotal role in cestode population within domestic rabbits (Poderson and Fenton, 2006).

There has been considerable research done on intestinal parasites of rabbits used for farming purposes, whether it be for meat or fur production as they have the potential to be a production loosing expense. However the same cannot be said for the domestic household pet rabbit. For this reason there is inconsistent advice given to rabbit owners with regards to the prevalence, prevention and treatment of intestinal parasites. In an attempt to correct this short coming, this study aims to analyse the prevalence of intestinal parasites in a random population of domestic rabbits, to ascertain if prophylactic intestinal parasite treatment is warranted.

#### METHODS AND MATERIALS

Faecal samples were collected from 36 randomly selected domestic rabbits. The rabbits were all rescued or surrendered rabbits with unknown previous parasite treatment history. The rabbits were all of varying ages and breeds. The rabbits when sampled were all housed outdoors either in multi rabbit accommodation or single hutches. It was unknown if the rabbits had previously been housed indoors or outdoors. Fresh faecal pellets were collected from each rabbit individually. The faeces was stored in plastic sealed bags and stored at 4°C until analysis. The McMasters technique was used to assess the faecal samples. 4 grams of faeces was placed into a container and 56ml of saturated salt solution was added (400grams of

sodium chloride in 1000ml of water with a specific gravity of 1.18-1.20) (Carvalho et al. 2011; Mundt et al. 2005; Velkers, et al. 2010). The contents of the container were thoroughly mixed and then filtered through a tea strainer (Cattadori, Albert and Boag, 2007). The remaining suspension was then transferred into the McMasters counting chamber using a pipette and rested for 5 minutes (Coudert et al. 1995). The number of oocysts, nematodes and cestodes were calculated within each chamber and then multiplied by 50 to give the oocyst, nematodes or cestode per gram of faeces (OPG) (Cattadori, Albert and Boag, 2007).

Analysing the McMasters chamber allowed for the identification of different nematode and cestode eggs however only the *Eimeria sp* was able to be identified. Further analysis into what subspecies was present was not completed as this required sporulation of the oocysts which was not feasible in this study.

This statistical package Minitab was used for data analysis and a value of  $P < 0.05$  was considered significant.

## RESULTS

Of the 36 rabbit faecal samples tested, 30 rabbits showed to have intestinal parasites. Table 1 shows the most common parasite found on faecal analysis was coccidia, *Eimeria sp* with a prevalence of 83% followed by *Passalurus ambiguous* 22%. With 83% of the population sampled infected with *Eimeria sp* further analysis was done with regards to possible influences on the intensity of invasion. Table 2 shows the effect of age of the rabbits with regards to prevalence of *Eimeria sp*. There was a significant difference ( $P$  <https://assignbuster.com/prevalence-of-intestinal-parasites-in-pet-rabbits-s1009684/>

value  $<0.05$ ) between the age of the rabbits and the presence of *Eimeria* sp. There was a higher prevalence noted with rabbits who were aged 3 months to 1 year compared to less than 3 months or over one year old. This is consistent with results recorded by Fa Jing et al. 2011. Table 3 shows the effect of breed with regards to the prevalence of *Eimeria* sp. The Lionhead rabbits were most effected with *Eimeria* sp, with a prevalence of 28% however there was no significant difference (P value  $> 0.05$ ) in varying breeds with prevalence of the parasite. Table 3 reports that there was a slightly higher prevalence of *Eimeria* sp in rabbits housed in a multiple rabbit hutch compared to rabbits who were housed signally, prevalence being 44% and 39% respectively. However, there was no significant difference seen between the two groups (P value  $> 0.05$ ).

Parasite	Parasite	No: Infected	Prevelence (%)	Intensity of invasion (OPG/number nematodes or cestodes)
Coccidia	Eimeria sp	30	83	10231
Nematodes	Obeliscoides cuniculi	1	2.8	1
	Trichostrongylus spp	3	8	3
	Passalurus ambiguus	8	22	8
Cestoda	Cysticercus	1	2.8	1

## pisiformis

Table 1: Prevalence of intestinal parasites of 36 sampled domestic rabbits

Age	No: Infected	Prevelence (%)	OPG
0-3 months	0	0	0
3 months -1 year	26	72	8364
1 year – 5 years	4	11	1867

Table 2: Prevalence and intensity of coccidia infection in rabbits sampled dependent on age groups

Breed	No: Infected	Prevalence (%)	OPG
Mix	4	11	2465
Flop	9	25	1632
Angora	6	17	5123
Lionhea d	10	28	1423



Table 3: Prevalence and intensity of coccidia infection in rabbits sampled dependent on breed

Number in Housing	No: Infected	Prevalence (%)	OPG
Multiple	16	44	5213
Single	14	39	5412

Table 4: Prevalence and intensity of coccidia infection in rabbits sampled dependent number in housing

## DISCUSSION

Rai et al. (1985) reported that coccidiosis was the most common protozoan disease encountered by rabbits causing acute and chronic disease in all age groups. Be it that the subject group Rai et al 1985 reported on were farmed rabbits destined for the meat trade, this study focussing on domestic pet rabbits has revealed comparable results, with *Eimeria sp* being the most prevalent internal parasite recorded. Coudert, (1989) suggested that there was no correlation between OPG and the severity of the disease seen in the rabbits. This suggestion correlates to the results reported in this study as even the rabbits with the highest OPG's, Lionhead breeds and rabbits of 3 months to 1 year of age were not showing any signs of clinical disease (Licois and Coudert, 1980; Coudert et al., 1993). Previous studies by Pakandl et al. (2008) and Papeschi et al. (2013) showed that adult rabbits have the ability to be asymptomatic carriers of the protozoa which stands to reason why non

of the rabbits sampled for this study who showed to have a coccidia infestation were not showing any clinical signs of illness. Bhat et al. (1996) described rabbit coccidia as “very immunogenic” with the ability for hosts to develop natural resistance especially with regards to *E. intestinalis*. Possibly this may be the reason for 6 rabbits of the 36 sampled to be free from coccidia. A “crowding phenomenon” was described by Brackett and Bliznick, (1952) which discusses the importance of housing population numbers with respects to OPG’s recorded. Although the prevalence of coccidia in rabbits housed in multiple numbers was higher compared to rabbits housed as individuals, there was no significant difference to be found between the two in this study.

Subclinical coccidiosis disease is a possible explanation for 30 of the 36 rabbits sampled who showed to have OPG but not showing clinical signs of disease. As there was no previous history on the rabbits, it is not possible to determine if the rabbits have been slowly decreasing on body weight over time. Even though body weight is a simple recording to be made it is the most accurate when determining if subclinical protozoan disease is present or not (Boag et al 2001; Licois and Coudert, 1980).

Multiple studies have shown that there is a relationship between myxoma virus and internal nematode infections within rabbit populations (Boag, 1988; Boag et al., 200; Lello et al., 2005). It has been concluded by Cattadori et al., (2007), (2008) that rabbits which are infected with myxoma virus and or rabbit haemorrhagic disease virus (RHDV) are more susceptible to intestinal nematode and cestode infections (Licois and Coudert, 1980). Given that the vast majority of domestic rabbits are commonly vaccinated against both <https://assignbuster.com/prevalence-of-intestinal-parasites-in-pet-rabbits-s1009684/>

myxoma virus and RHDV, it stands to reason that this is a contributing factor for the low nematode and cestode prevalence recorded in this study.

The aim of this study was to determine if the prevalence of intestinal parasites in pet rabbits warrants routine worming. Given that no rabbit in the sample population was showing signs of clinical intestinal parasitic disease and there were low prevalence percentages for nematodes and cestodes, it can be concluded that routine worming of pet rabbits is not warranted. The high prevalence of coccidia within the population could be contributed to asymptomatic carriers, whereby until clinical signs of disease develop namely weight loss and diarrhoea it would then be appropriate to consider treatment for the disease.

This topic should not be considered exhausted by any means. There is great room for scope in this field with only limited research published on this subject to date. Further studies would benefit from greater background knowledge on the sample population, especially with regards to previous medical history and treatment. Given that the domestic rabbits as household pets is continuing to increase in popularity further research into preventable disease is paramount.