



Endoparasites in Dogs and Cats in Germany 1999–2002

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Abstract

Infections with endoparasites in dogs and cats have been determined by analysing the results of faecal examinations (Flotation, MIFC, sedimentation, Baermann, smear, ProSpecT *Giardia* Microplate Assay). Samples of 8438 dogs and 3167 cats from the years 1999 until 2002 have been included in the investigation. 2717 dogs (32.2%) and 771 cats (24.3%) have been infected with endoparasites. In the infected dogs the following parasites have been identified: Class Nematodea: *Toxocara canis*: 22.4%, *Toxascaris leonina*: 1.8%, Ancylostomatidae: 8.6%, *Trichuris vulpis*: 4.0%, *Capillaria* spp.: 2.3%, *Crenosoma vulpis*: 0.9%, *Angiostrongylus vasorum*: 0.3%; Class Cestodea: Taeniidae: 1.2%, *Dipylidium caninum*: 0.4%, *Diplopylidium/Joyeuxiella*: 0.1%, *Mesocostoides*: 0.2%, *Diphyllobothrium latum*: <0.1%; Class Sporozoa: *Sarcocystis* spp.: 9.0%, *Cystoisospora* spp.: 22.3%, *C. canis*: 8.0%, *C. ohioensis*: 17.0%, *Hammondia/Neospora*: 1.7%; Class Zoomastigophorea: *Giardia* spp.: 51.6%. In the 771 infected cats the following prevalences of parasites have been found: Class Nematodea: *Toxocara mystax*: 26.2%, *Ancylostoma tubaeforme*: 0.3%, *Capillaria* spp.: 7.0%, *Aelurostrongylus abstrusus*: 2.7%; Class Cestodea: Taeniidae: 2.6%, *Dipylidium caninum*: 0.1%; Class Sporozoa: *Sarcocystis* spp.: 2.2%, *Cystoisospora* spp.: 21.9%, *C. felis*: 15.3%, *C. rivolta*: 7.9%, *Toxoplasma/Hammondia*: 4.5%; Class Zoomastigophorea: *Giardia* spp.: 51.6%.

Introduction

Infections with endoparasites cause very different clinical symptoms depending on the parasite species and abundance. The development of safe broad spectrum anthelmintics has led to a more regular deworming of especially young animals, commonly without previous diagnosis. Whether or not this has led to a decrease in infection rates is not known. The target of this study was to gain actual data on endoparasite infections (helminths and protozoa) in dogs and cats in Germany by analysing faecal checks from a diagnostic laboratory.

Material and Methods

The results of parastiological examinations from the Veterinary Laboratory Freiburg from 8438 dogs and 3167 cats have been included in the analysis (Tab. 1).

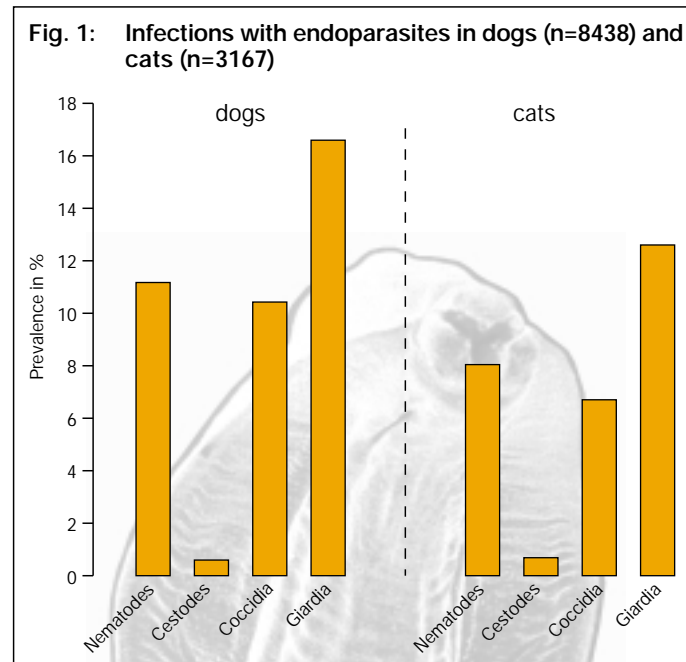
All samples have been investigated with following methods:
a) Flotation (spec. grav. 1.3),
b) MIFC (Merthiolate-Iodine-Formaldehyde-Concentration),
c) Sedimentation and Baerman (only if sufficient material),
d) Smear (in case of fluid faeces),
e) *Giardia* AG-ELISA (ProSpecT *Giardia* Microplate Assay) (most of the samples).

To examine the age dependence of the infection rates with endoparasites the data were statistically proved by the chi-square-test.

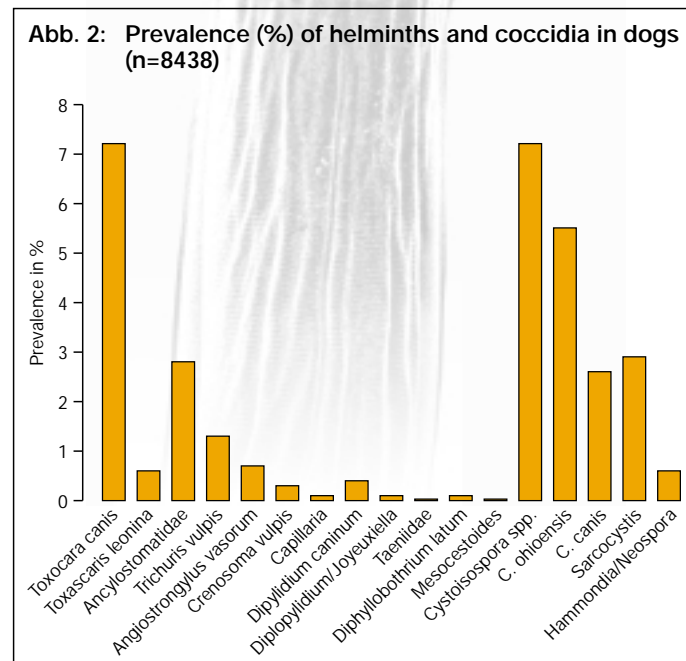
Year	Examined dogs n	Endoparasite positive dogs		Examined cats n	Endoparasite positive cats	
		n	%		n	%
1999	2129	649	30.5	764	152	19.9
2000	2014	702	34.9	758	197	26.0
2001	2063	663	32.1	819	218	26.6
2002	2232	703	31.5	826	204	24.7
1999–2002	8438	2717	32.2	3167	771	24.3

Results and Discussion

In dogs the most prevalent endoparasite (Fig. 1) was *Giardia* spp. (16.6% of 8438 dogs), followed by nematodes (11.2%), coccidia (10.4%) and cestodes (0.6%). Infections in cats showed a similar pattern (*Giardia* spp. in 12.6%, nematodes in 8.0%, coccidia in 6.7% and cestodes in 0.7% of 3167 cats).



In the 2717 endoparasite positive (32.2%) of 8438 examined dogs eggs from 12 different helminth species and oocysts from 5 different coccidia species have been identified (Fig. 2).



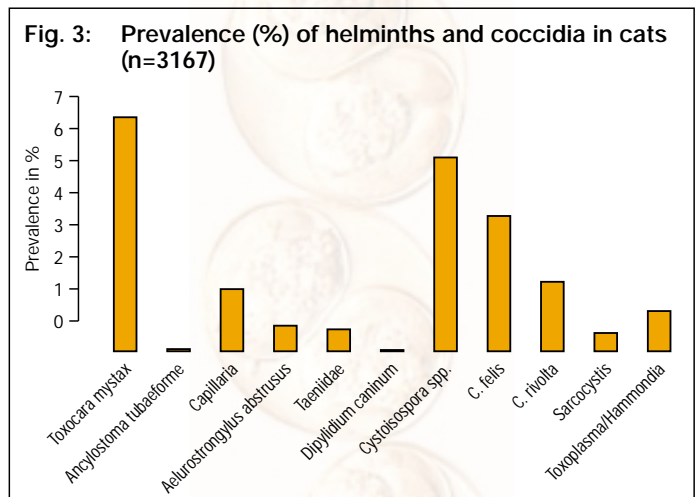
To analyse the age dependence of the determined infection rates, all dogs with known age (n=7113) have been grouped into four age groups (Tab. 2, 3). Dogs up to one year of age showed significantly higher infections rates with *Cystoisospora* spp. (p<0.0001), *Toxocara canis* (p<0.0001), *Trichuris vulpis* (p<0.001) and Ancylostomatidae (p<0.0001) compared to older dogs, whereas infections with *Sarcocystis* spp. and cestodes seemed to be equally distributed amongst all age groups.

Age (years)	Examined dogs with known age n	<i>Cystoisospora</i> positive dogs		<i>Sarcocystis</i> positive dogs	
		n	%	n	%
up to 1	2933	435	14.8	92	3.1
> 1–5	2286	43	1.9	68	3.0
> 5–10	1365	14	1.0	31	2.3
> 10	529	7	1.3	13	2.5
total	7113	499	7.0	204	2.9

Tab. 3: Prevalence of *Toxocara canis*, *Trichuris vulpis* and hookworms per age group of examined dogs

Age (years)	Examined dogs with known age n	<i>Toxocara</i> positive dogs		<i>Trichuris</i> positive dogs		Ancylostomatidae positive dogs	
		n	%	n	%	n	%
up to 1	2933	389	13.3	52	1.8	111	3.8
> 1–5	2286	81	3.5	26	1.1	55	2.4
> 5–10	1365	34	2.5	8	0.6	20	1.5
> 10	529	10	1.9	0	0	12	2.3
total	7113	514	7.2	86	1.2	198	2.8

In the 771 endoparasite positive (24.3%) of 3167 examined cats eggs from 6 different helminth species and oocysts from 5 different coccidia species have been identified (Fig. 3).



In order to analyse the age dependence of the infection rates, all cats with known age have been grouped into four age groups (Tab. 4). Cats up to one year old showed significantly higher infection rates with *Cystoisospora* spp. (p<0.0001) and *Toxocara mystax* (p<0.0001) compared to older cats, whereas infections with *Toxoplasma gondii/Hammondia hammondi* and *Sarcocystis* spp. seemed to be equally distributed in all age groups.

Tab. 4: Prevalence of *Cystoisospora* spp., *Sarcocystis* spp., *Toxoplasma gondii* and *Toxocara mystax* per age group of examined cats

Age (years)	Examined cats with known age n	<i>Cystoisospora</i> positive cats		<i>Sarcocystis</i> positive cats		<i>Toxoplasma</i> positive cats		<i>Toxocara</i> positive cats	
		n	%	n	%	n	%	n	%
up to 1	1229	101	8.2	9	0.7	12	1.0	117	9.5
> 1–5	495	20	4.0	5	1.0	5	1.0	30	6.1
> 5–10	375	7	1.9	0	0	2	0.5	7	1.9
> 10	374	6	1.6	1	0.3	3	0.8	4	1.1
total	2473	134	5.4	15	0.6	22	0.9	158	6.4

Although safe broad spectrum anthelmintics are used more or less routinely today, helminth infections - especially with ascarids in young dogs and cats up to one year - are still prevalent. In addition, infections with *Giardia* and coccidia are found even more often, both diseases which have only little awareness amongst pet owners. The relatively low percentage of infection rates with tapeworms must be questioned as the flotation method is not sensitive enough to give a realistic figure about the prevalence of cestodes.

Conclusions

- The results demonstrate high prevalences of endoparasites in dogs and cats in Germany.
- Both young and adult dogs and cats should be routinely checked by faecal examination for endoparasite infections.
- In case of gastrointestinal disorders protozoan infections with *Giardia* and coccidia should be considered.
- A coproantigen-test for *Giardia* is recommended.
- Dogs and cats which are at risk for cestode infections based on their lifestyle should be dewormed on a regular basis even without positive faecal diagnosis.