Don't just go through the motions: a smarter approach to fecal parasite testing

The utility of coproantigen testing in screening populations

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Medical Affairs Specialist

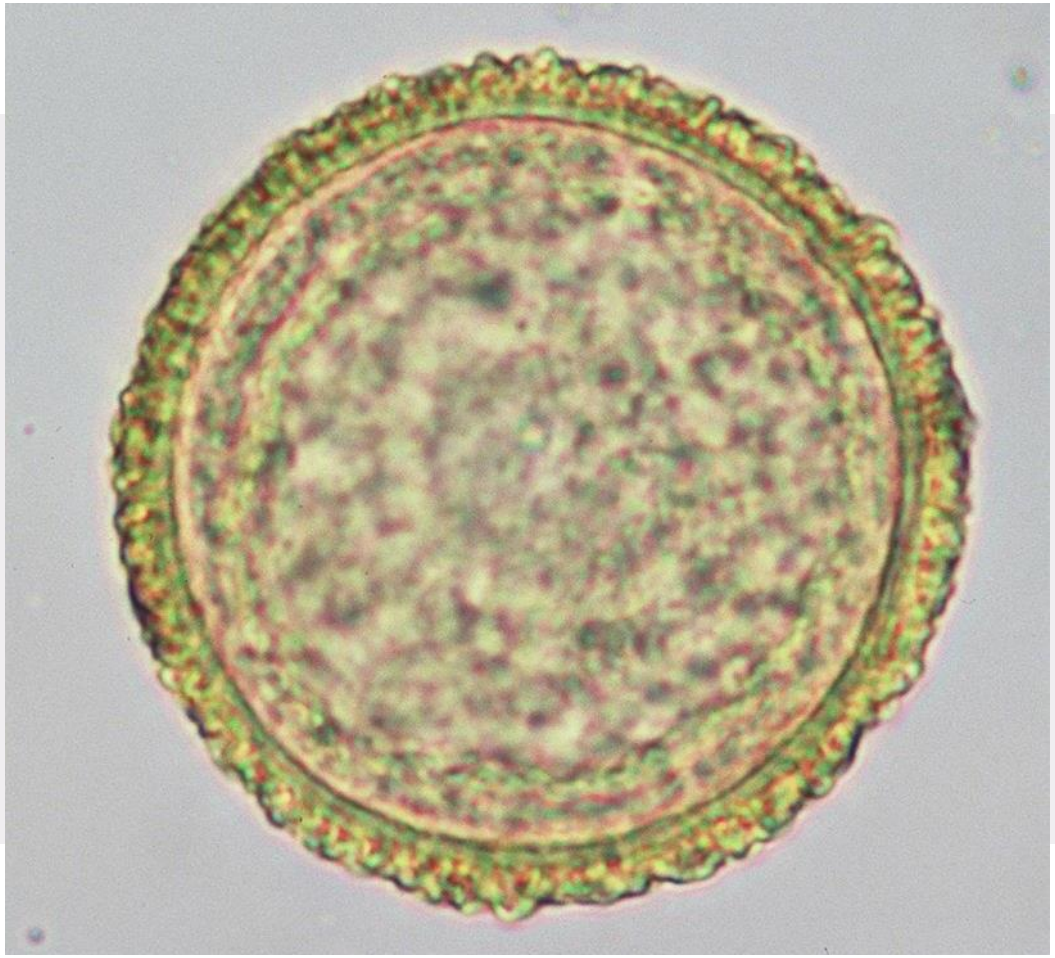
IDEXX Laboratories

Agenda

1. Learn why regular screening for parasites is important.
2. Recognize the risks intestinal parasites pose to people and pets
3. Understand that fecal antigen testing provides highly accurate detection of the most common and clinically relevant intestinal parasites detected during routine screening of pets.
4. Learn why follow up testing is critical for successful parasite management.

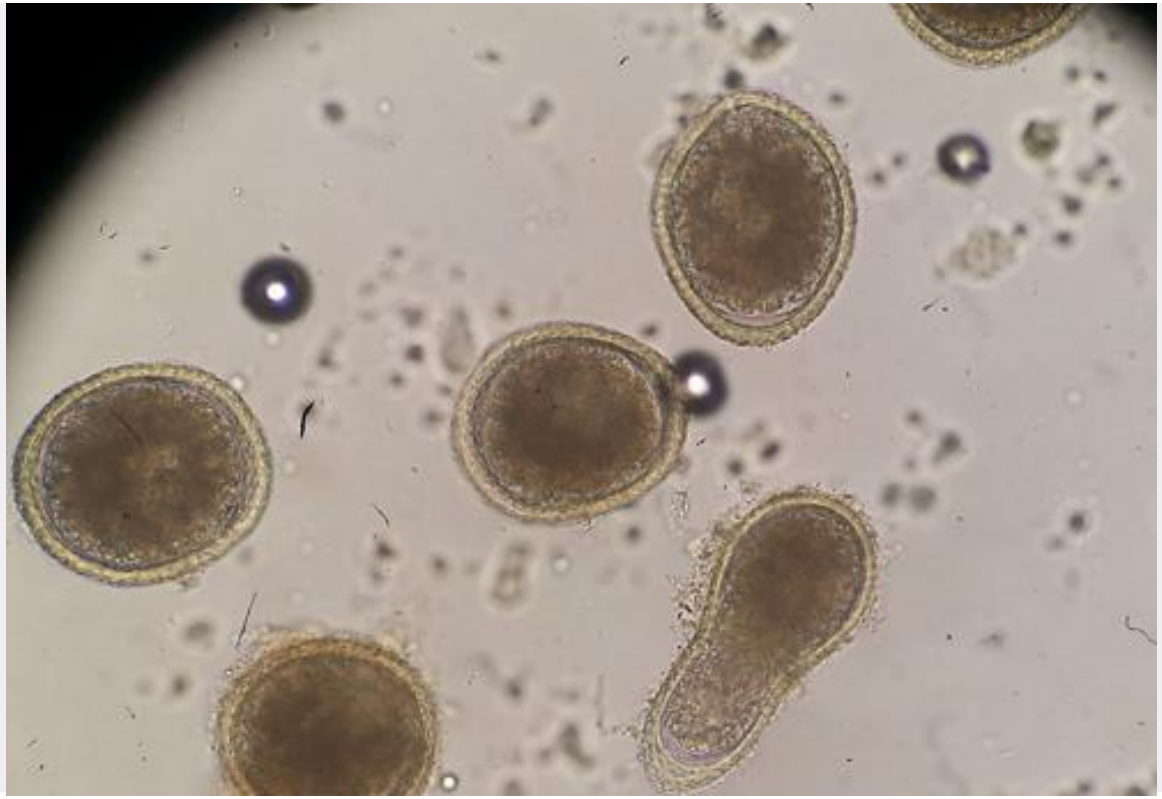
Why is regular screening for parasites is important?

Before we get started: parasite or artifact?



Source: MicrolabNW. Cedar pollen. MicrolabNW Photomicrograph Gallery. Accessed March 13, 2024. www.microlabgallery.com/gallery/Korean%20Cedar%201a.aspx

Which one is the parasite?



Source: Bowman DD. *Georgis' Parasitology for Veterinarians*. 10th ed. Elsevier Health Sciences (US); 2014.

Why do we perform fecal testing?

- Ensure the health of pets
- Reduce transmission of potentially zoonotic parasites to people
- Evaluate the efficacy for anthelmintic treatment

Source: Companion Animal Parasite Council. General guidelines for dogs and cats. Updated April 2025. Accessed October 20,2025 www.capcvet.org/guidelines/general-guidelines

Conduct fecal examinations at least four times during the first year of life, as young animals are more susceptible to parasitic infections. For healthy adult animals, fecal testing should be conducted at least two times per year, with frequency adjusted based on the individual's health status, environmental exposure and lifestyle factors such as travel, outdoor access, or contact with other animals. Based on sample size, clinical signs, suspected parasites, and skill and experience of the clinic or laboratory, fecal centrifugation float, fecal antigen testing, fecal PCR (polymerase chain reaction), or AI (artificial intelligence) methods are available.

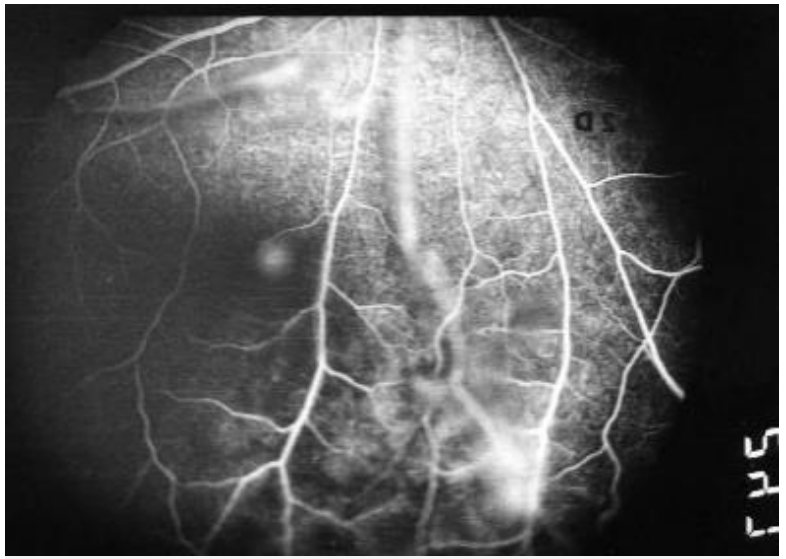
For routine fecal examinations, fecal antigen can serve as a highly accurate and effective screening method for intestinal parasitism.

Source: Companion Animal Parasite Council. General guidelines for dogs and cats. Updated April 2025. Accessed October 20,2025 www.capcvet.org/guidelines/general-guidelines

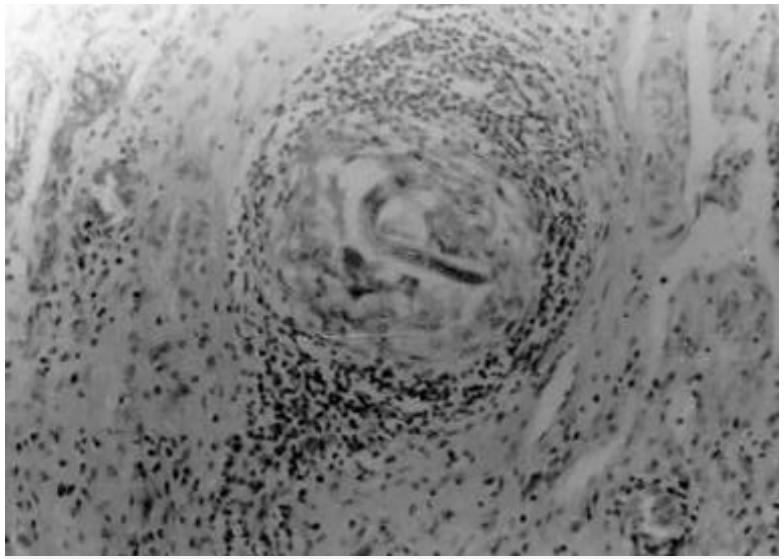
What happens if you miss an infection?

1 in 10 companion animals has gastrointestinal (GI) parasites.[1]
Missed infections can put pets and people at greater risk.

Cutaneous larva migrans (CLM)



Ocular larva migrans (OLM)



Visceral larva migrans (VLM)
in liver tissue

Source: Data on file at IDEXX Laboratories, Inc. Westbrook, Maine USA.

Zoonotic pet parasites: Roundworm

> Millions of human cases of ***Toxocara*** larva migrans are ultimately suspected in the United States each year.[1]
>
> **—Dr. Peter Schantz, CDC**

Up to 14% of the U.S. human population has *Toxocara* antibodies.[2]

- Greatest risk: young children, dog and cat owners
- Occurs from accidental ingestion or (less likely) eating undercooked meat
- Clinical disease in people:
  - Visceral, ocular, neural larva migrans
  - Covert toxocariasis[3]

References

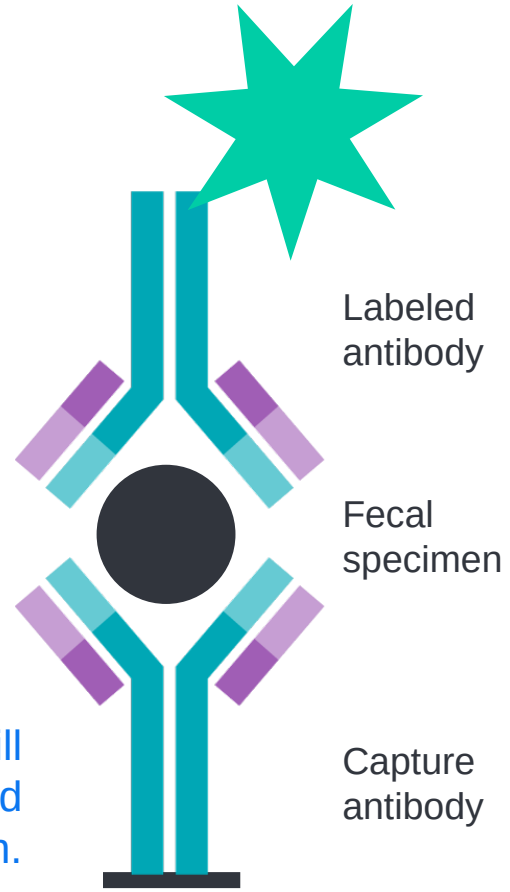
1. Schantz PM. *Toxocara* larva migrans now. *Am J Trop Med Hyg*. 1989;41(3 Suppl):21–34. doi:10.4269/ajtmh
2. Centers for Disease Control and Prevention. Toxocariasis FAQs. Reviewed September 3, 2020. Accessed March 13, 2024. www.cdc.gov/parasites/toxocariasis/gen_info/faqs.html
3. Nathwani D, Laing RB, Currie PF. Covert toxocariasis—a cause of recurrent abdominal pain in childhood. *Br J Clin Pract.* 1992;46(4):271.

Fecal Dx® antigen

a highly accurate and effective screening method for intestinal parasitism.

What is parasite antigen testing?

- Method for detecting proteins—coproantigens—secreted or excreted by parasites in the intestinal lumen
- Uses unique markers for hookworm, roundworm, whipworm, *Cystoisospora* and flea tapeworm—**produced by the parasites** and not the eggs or oocysts



Antigen testing helps to fill some of the gaps associated with egg detection.

Fecal Dx antigen testing

Ever-expanding testing menu for detection of common canine and feline intestinal parasites

2014	2015	2015	2023	2024
				
Whipworm	Hookworm	Roundworm	Flea tapeworm	*Cystoisospora*

Images courtesy of IDEXX parasitology

Fecal antigen can identify infection during the prepatent period and before eggs are shed in the environment

Earlier diagnosis and treatment can prevent problems associated with parasitism, including zoonotic diseases, keeping people and their pets healthy.

Parasite	Prepatent period
Hookworm	14–21 days
Roundworm	21–35 days
Whipworm	74–90 days
Flea tapeworm	14–35 days
Cystoisospora	4–13 days

Hypothesis:
To evaluate the utility of fecal coproantigen in screening for the most common intestinal parasites in dogs and cats

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Results for 898,299 samples submitted to a commercial reference laboratory (IDEXX Laboratories) over the three-month period from March 6, 2024, through June 6, 2024, with paired results for coproantigen immunoassay and centrifugal fecal flotation (O&P) were used for analysis. 83.7 % of samples were negative by both coproantigen and O&P. 6.1 % were positive on both methods and would result in the same treatment indicated. An additional 9.4 % of samples had a positive coproantigen result indicating a need for treatment but had no parasite detected by O&P. Finally, when samples with evidence of coprophagy are excluded, only 0.6 % of samples had a positive O&P result but were negative for all coproantigens. Coproantigen was more effective at identifying dogs and cats where antiparasitic management was needed than O&P. The results of this study support the use of coproantigen immunoassay testing as a highly accurate and effective screening method for intestinal parasitism.

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Retrospective study

+ Samples submitted to IDEXX Reference Laboratories for paired fecal coproantigen and centrifugal fecal flotation ova and parasite (O&P) testing
+ Study period
  - March 6, 2024–June 6, 2024
+ 898,300 samples
  - 767,953 (85.5%) canine
  - 130,347 (14.5%) feline

Burton KW, Michael H, Drake C. The utility of coproantigen testing in screening populations. *Vet Parasitol*. 2025;336:110459. j.vetpar.2025.110459

The study was designed to evaluate the use of antigen in routine screening

For veterinarians who routinely test for intestinal parasites, Fecal Dx™ antigen testing from IDEXX **provides the most actionable clinical results** to support diagnostic and treatment decisions.

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Evaluation of fecal coproantigen and O&P results

+ Positivity for any of 6 fecal coproantigens was compared to O&P findings for any parasite observed on O&P.
+ Parasites were grouped into common treatment groups and evaluated.

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Study highlights

+ Coproantigen testing is an accurate and effective screening for intestinal parasites.
+ Fecal flotation results rarely alter the treatment indicated by coproantigen results.
+ Coproantigen testing includes the most diagnosed parasites found on fecal flotation.
+ 9.2% of samples were positive for a coproantigen when fecal flotation was negative.

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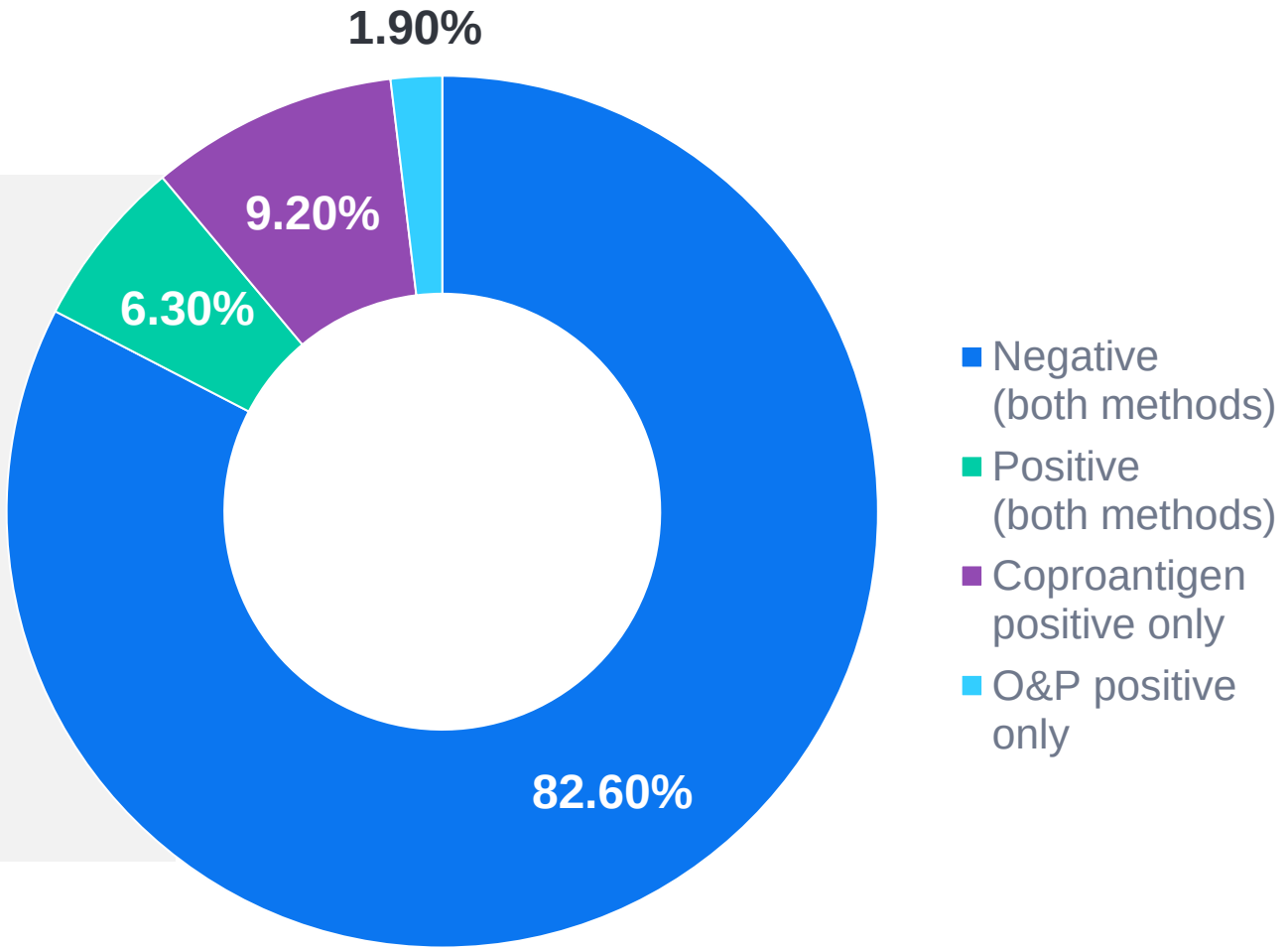
IDEXX

Study results: Fecal coproantigen versus O&P

Any of 6 antigen results compared to any O&P result

+ **9.2%** of all samples were coproantigen positive and O&P negative
+ Only **1.9%** of results were O&P positive and negative for all 6 coproantigens



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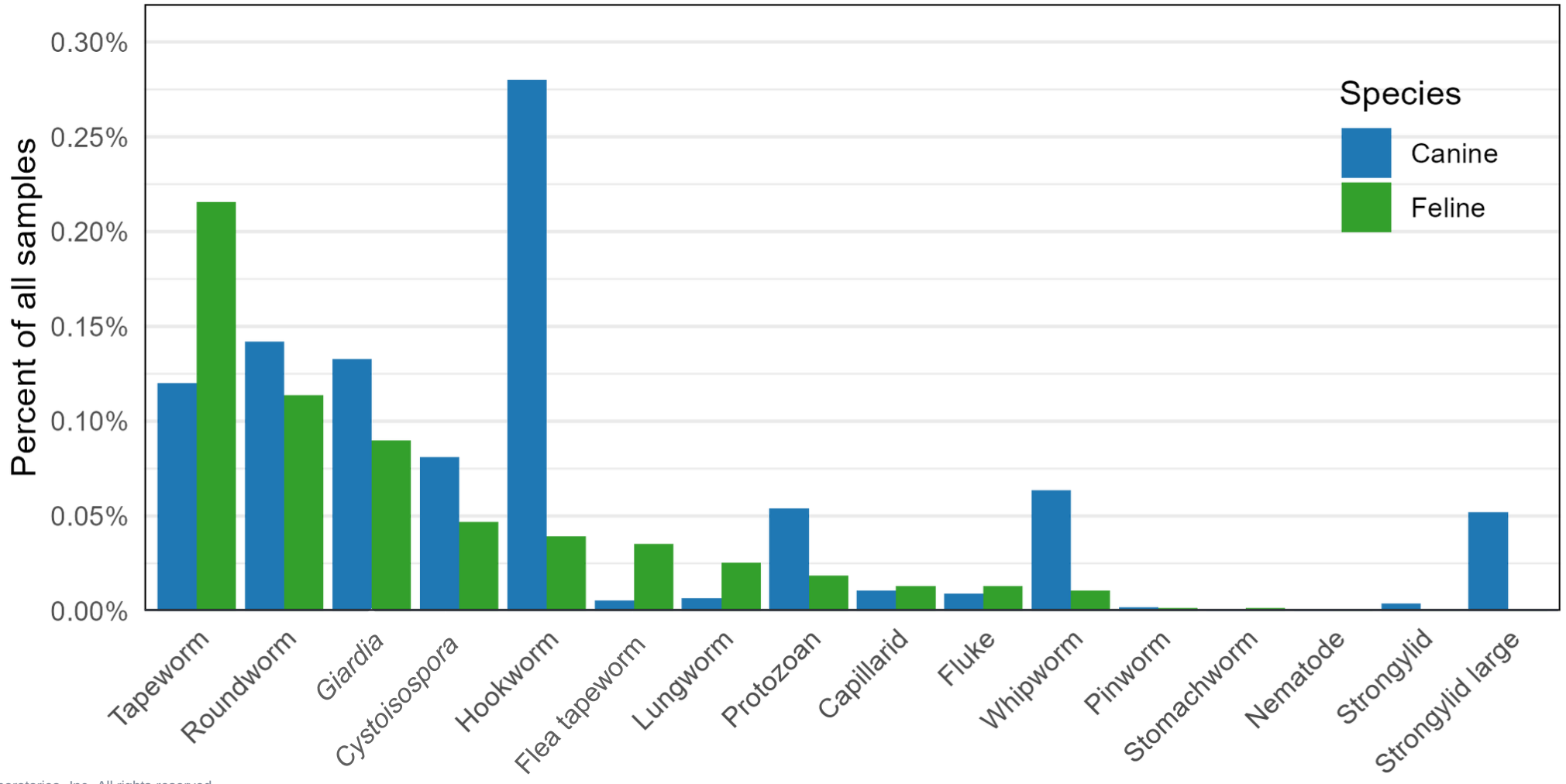
Analysis of coproantigen negative vs. O&P positive treatment group

Of the parasites found on O&P when all coproantigens were **negative**, which were found?

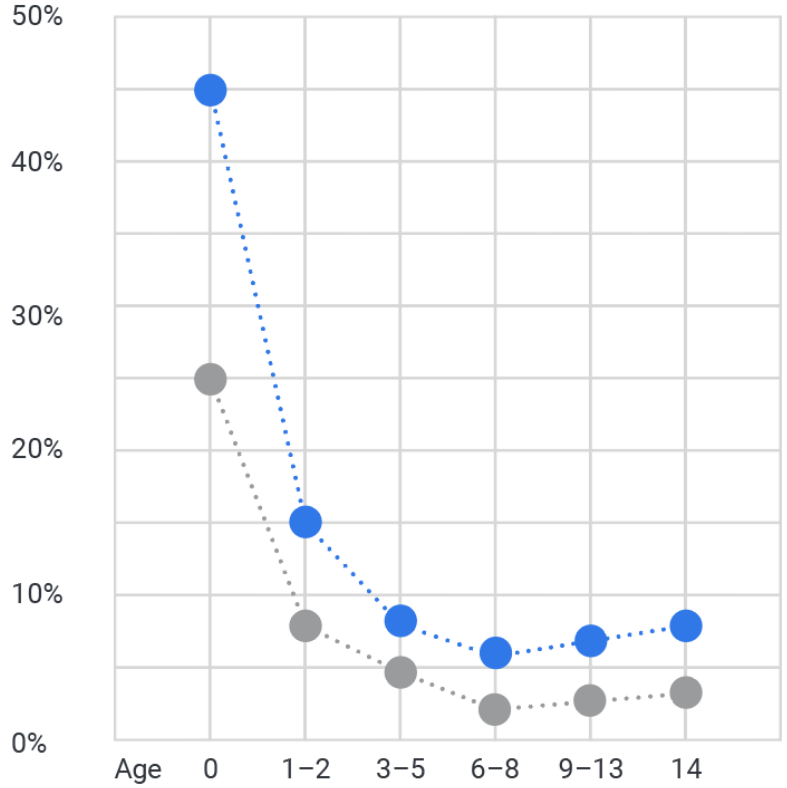


Parasitism identified more frequently in younger animals by both methods.[1]

Canine

Up to 2x more

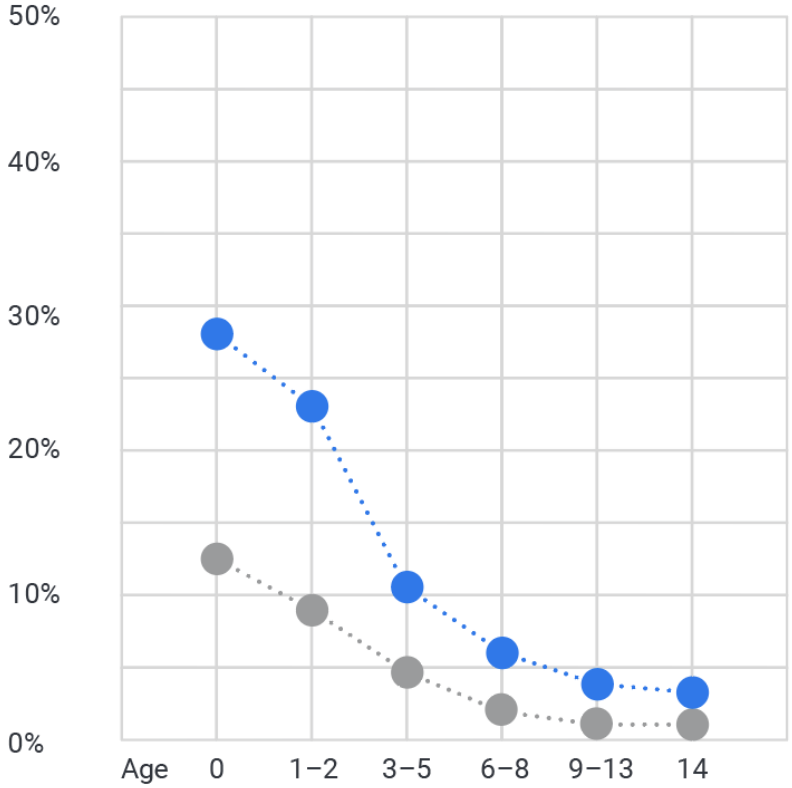
Percent positive samples



Feline

Up to 2x more

Percent positive samples



Parasitism identified more frequently in younger animals by both methods.[1]
The proportions of positive results by each methodology.
Point size represents the relative proportions of patients in each age category by method and age group.

Antigen testing
Flotation

Reference

1. Burton KW, Michael H, Drake C. The utility of coproantigen testing in screening populations. Vet Parasitol. 2025;336:110459.

Overall diagnostic agreement between coproantigen and O&P

88.9%

Diagnostic agreement by parasite antigen

Antigen result for each parasite compared to the O&P result

Giardia cyst

93.2%

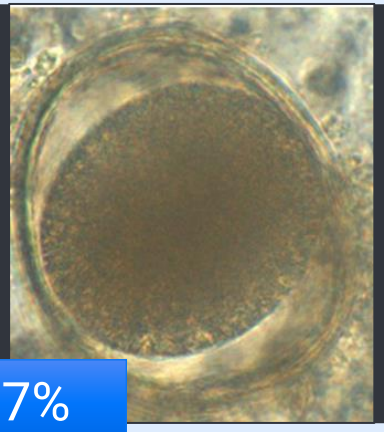
Cystoisospora

98.8%

Whipworm

99.6%

Roundworm (Ascarid)



98.7%

Hookworms

97.8%

Tapeworm segments (*D. Caninum*)

99.4%

Centrifugal fecal flotation alone rarely changes the clinical management of the patient without clinical signs.

- Only **0.63%** of all the samples were O&P positive only and were negative for the coproantigen for the same parasite.
- Tapeworms other than *D. caninum* represent the largest group of parasites found in this study (0.14%) that are often treated by veterinarians regardless of clinical signs.
  - Centrifugal fecal flotation is an insensitive method of diagnosis for tapeworms identified in this study and are most often diagnosed by direct visualization of segments on the feces or the patient.
- *Aelurostrongylus abstrusus* larvae, *Filaroides* spp. larvae in dogs and flukes (*Alaria* spp. and *Platynosomum* spp.) and capillarids were identified in <0.001% of cases.
- All other O&P only positives occurred in less than 10 samples each.

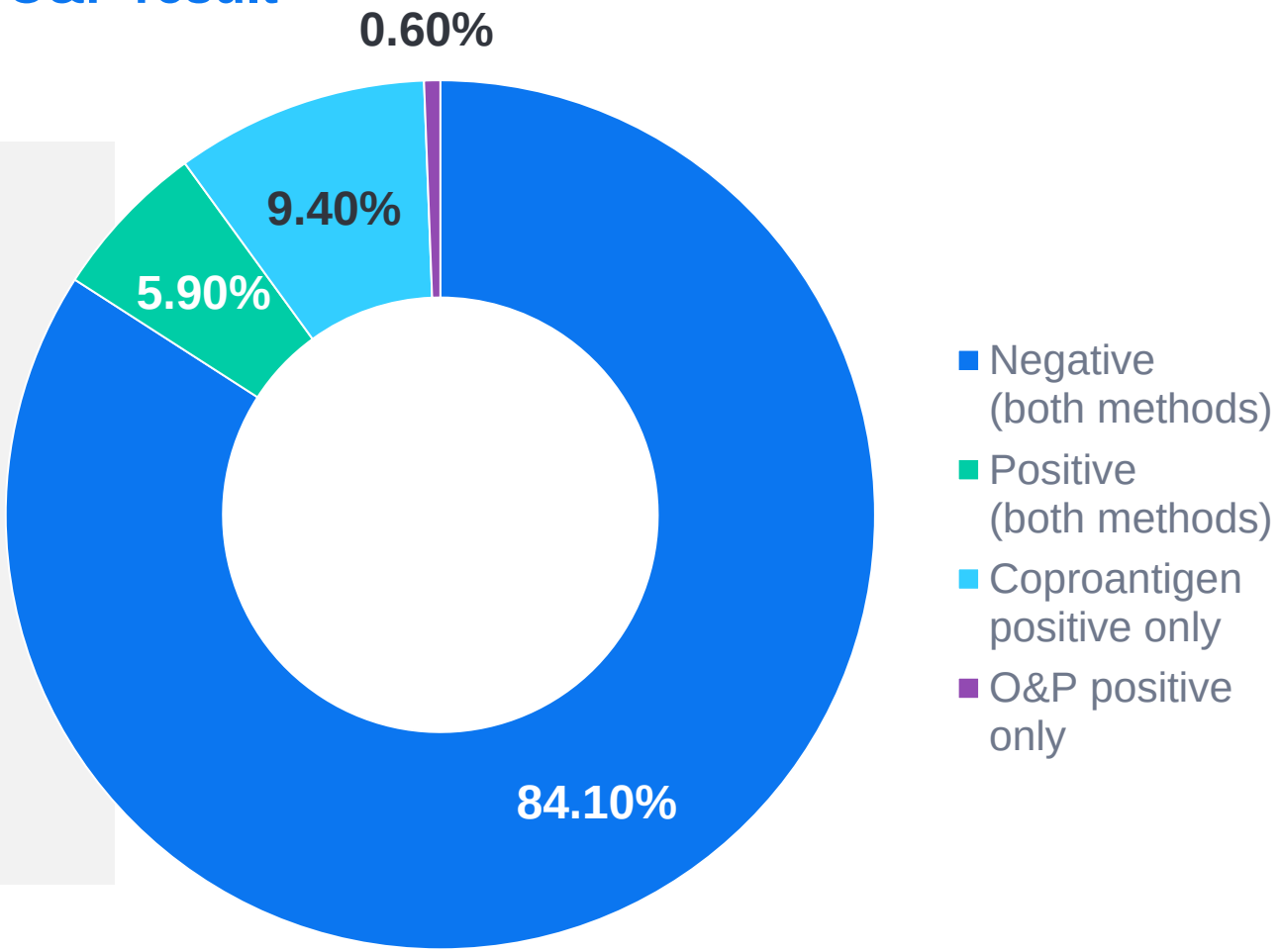
Fecal coproantigen versus O&P excluding coprophagy samples*

Any of 6 antigen results compared to any O&P result

This eliminated **16,219** samples that could be false positive on O&P because the dog or cat consumed the egg/cyst and didn't have an active infection.

Eliminating potential coprophagy and noninfective species, the O&P only group **decreases from 1.9% to only 0.6%** of all results

This increased coproantigen agreement with O&P



*If eggs or parasitic elements were found via O&P that are parasites of another species and not found to infect canines or felines, the results of those O&P findings were considered to be a result of possible coprophagy.

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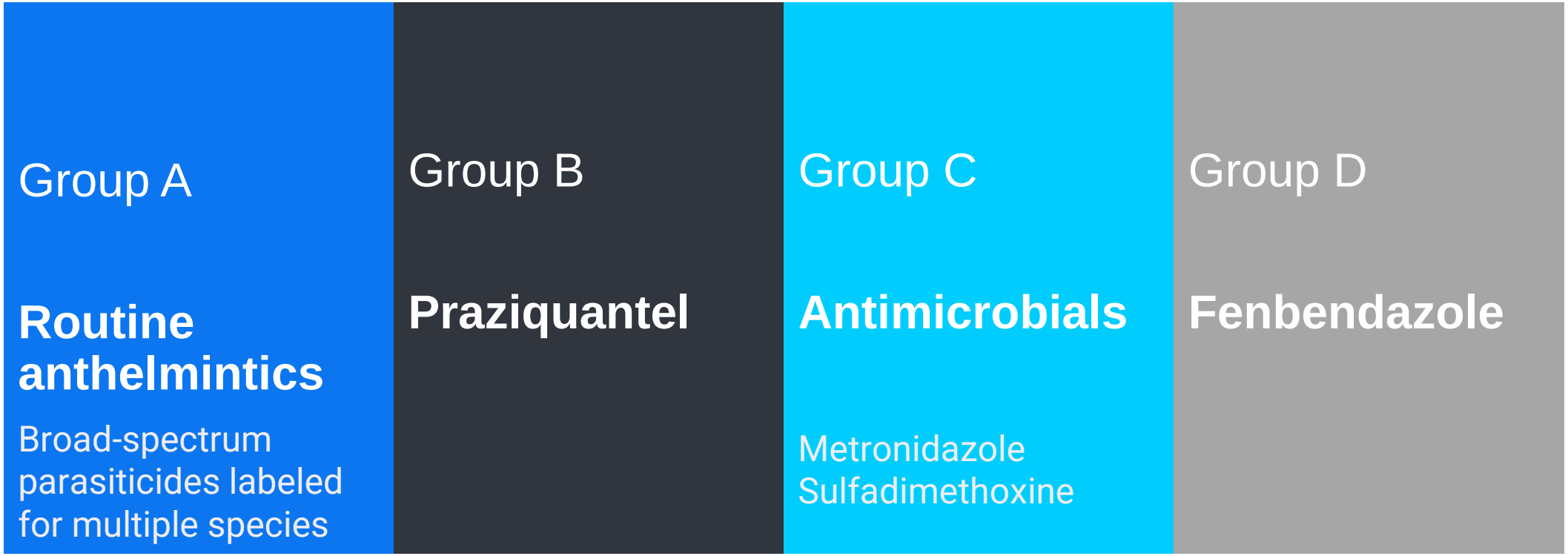
Treatment group analysis

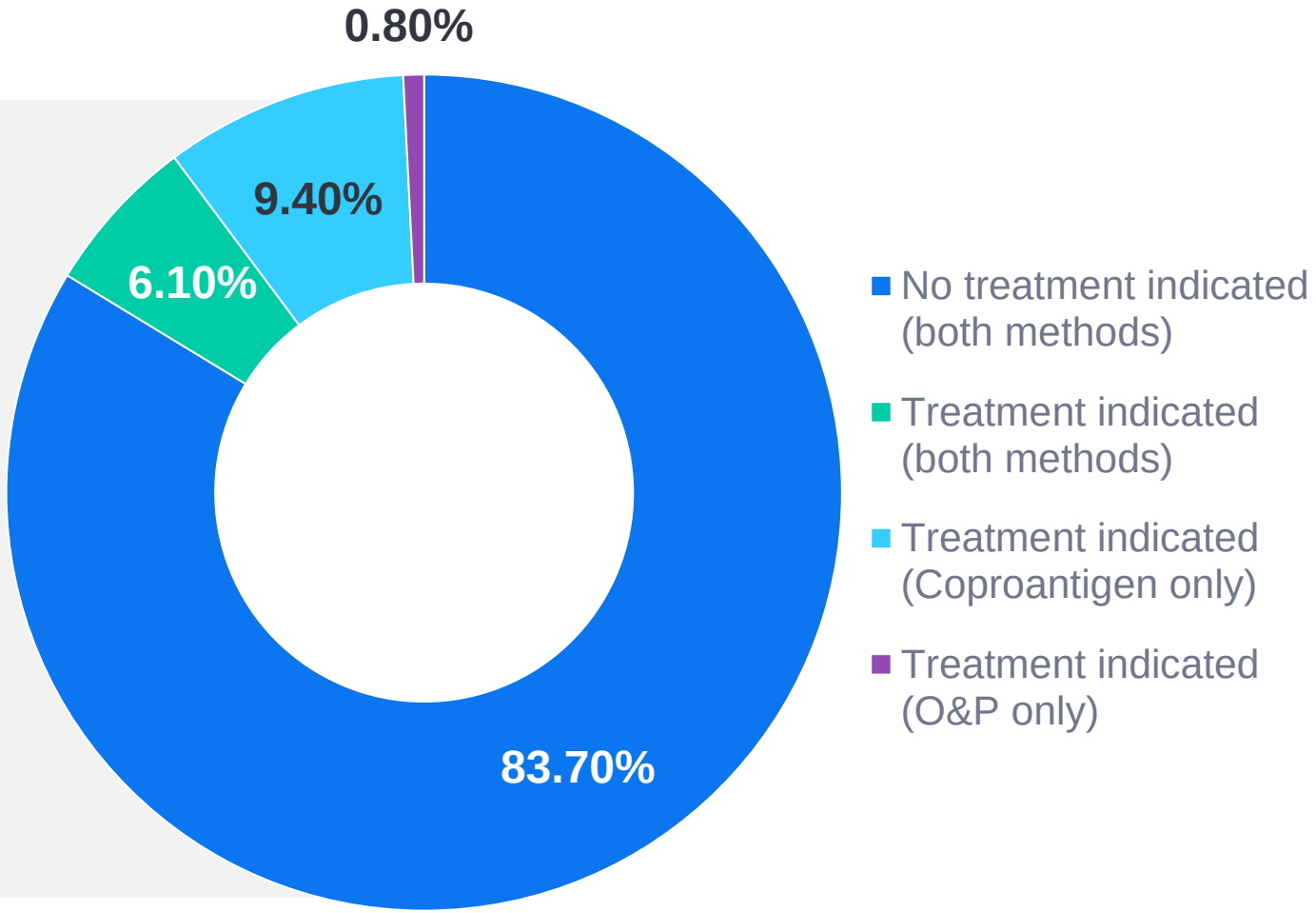
Parasites were grouped into **4 treatment groups** to further evaluate results of coproantigen vs. O&P results:



Treatment analysis—all groups combined

Evaluating whether Fecal Dx® antigen testing and O&P would result in the same treatment

- **9.4%** of all samples were positive for 1 or more fecal antigens, which indicated treatment needed
- Only **0.8%** of the time, O&P indicated a need for treatment in samples that were antigen negative
- Excluding potential coprophagy samples, this number drops from **0.8% to 0.6% results**



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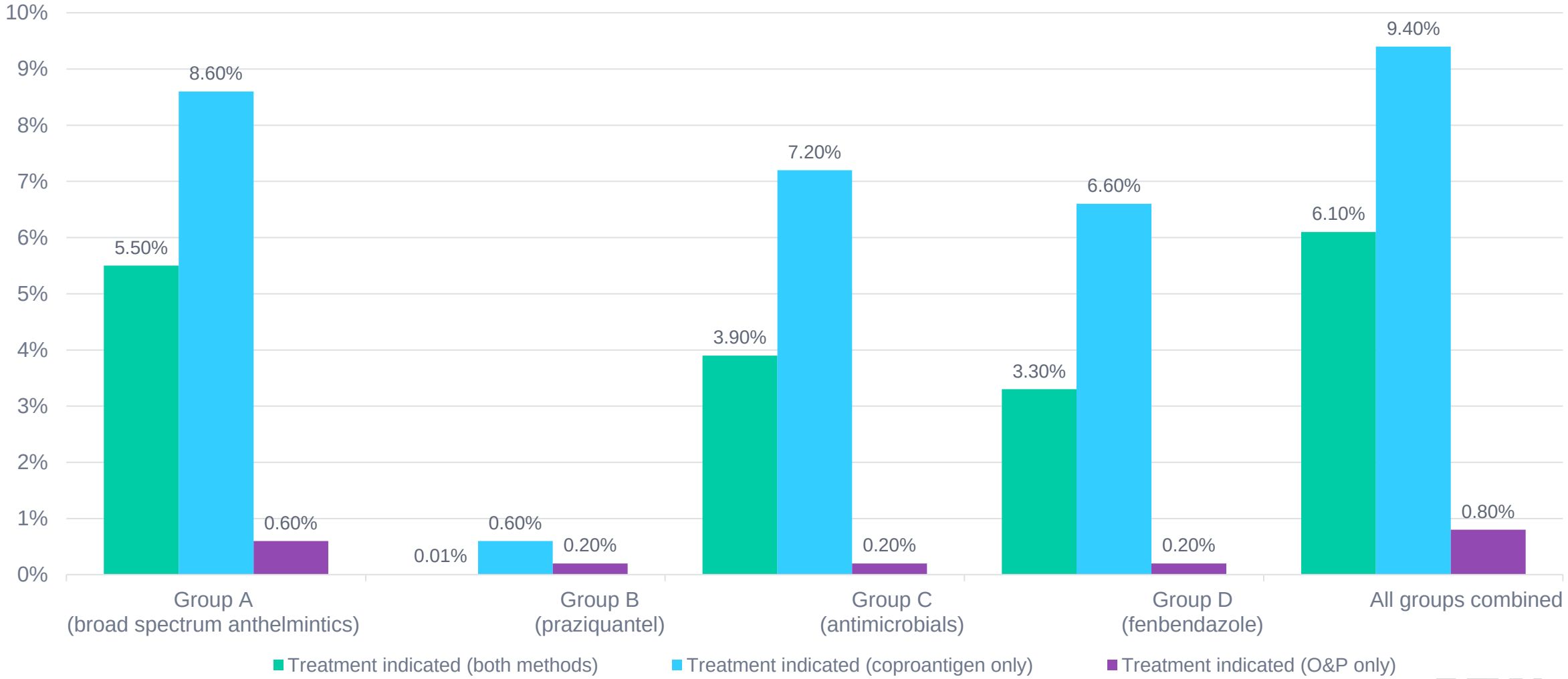
Treatment analysis—individual group results

Evaluating whether Fecal Dx® antigen testing and O&P would result in the same treatment



So what does this mean clinically?

+11

per month

Study conclusion

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The utility of coproantigen testing in screening populations

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ABSTRACT

Detection of intestinal parasites is essential for veterinarians to assess risk of parasite infections. Traditionally, detection of intestinal parasites has relied primarily on detection of ova with fecal flotation methods. The purpose of this study was to evaluate the clinical utility of a commercially available coproantigen immunoassay detecting roundworms, hookworms, whipworms, *Dipylidium caninum*, *Giardia* and *Cystoisospora* spp. for detecting GI parasite infections in dogs and cats. The study evaluated test positivity of coproantigen and centrifugal fecal flotation and how often fecal flotation results would lead to clinical management changes compared to the result on coproantigen.

Results for 898,299 samples submitted to a commercial reference laboratory (IDEXX Laboratories) over the three-month period from March 6, 2024, through June 6, 2024, with paired results for coproantigen immunoassay and centrifugal fecal flotation (O&P) were used for analysis. 83.7 % of samples were negative by both coproantigen and O&P. 6.1 % were positive on both methods and would result in the same treatment indicated. An additional 9.4 % of samples had a positive coproantigen result indicating a need for treatment but had no parasite detected by O&P. Finally, when samples with evidence of coprophagy are excluded, only 0.6 % of samples had a positive O&P result but were negative for all coproantigens. Coproantigen was more effective at identifying dogs and cats where antiparasitic management was needed than O&P. The results of this study support the use of coproantigen immunoassay testing as a highly accurate and effective screening method for intestinal parasitism.

1. Introduction

Detection of intestinal parasites in dogs and cats is essential for veterinarians to assess risk of parasite infections. Some of these intestinal parasites also pose a zoonotic risk to people. For the protection of pets and people, routine fecal testing is recommended as part of wellness visits. The Companion Animal Parasite Council (CAPC) recommends fecal testing two to four times in the first year of life and at least two times per year in adults, depending on patient health and lifestyle factors (CAPC General Guidelines for Dogs and Cats WWW Document, 2022).

Traditionally, detection of intestinal parasites has relied primarily on fecal flotation methods. These methods include passive fecal flotation, sugar centrifugal flotation, and zinc sulfate centrifugal flotation, with varying sensitivity and specificity (Dryden et al., 2020; Dryden et al., 2005). More recently, coproantigen immunoassays, PCR and automated digital fecal slide scanners have introduced additional diagnostic methodologies for intestinal parasites. Coproantigen is a commercially available high-throughput immunoassay, which uses unique capture and detection antibodies to detect parasite specific antigens. The assay uses a barcoded, magnetic bead (BMB) technology (Applied BioCode) as previously described (Esty et al., 2023) as well as the assay protocol previously described by Esty and Elsmore (Elsemore et al., 2023; Esty et al., 2023). The assay protocol yields a mean fluorescent intensity (MFI) for each BMB in a microwell, and the final assay result represents the background-corrected median (MFI) for each of the antigen specific BMBs in a single well. Coproantigen immunoassays (Fecal Dx® immunoassay; IDEXX Laboratories, Inc.) utilize unique capture and detection antibodies developed against recombinantly expressed proteins of roundworms (*Toxocara* spp., *Toxascaris* spp., *Baylisascaris* spp.), hookworms (*Ancylostoma* spp., *Uncinaria* spp.)(Elsemore et al., 2017; Hauck et al., 2023), whipworms (*Trichuris vulpis*, *Trichuris felis*)(Elsemore et al., 2014), flea tapeworms (*Dipylidium caninum*) (Elsemore et al., 2023), *Giardia* spp. (Dryden et al., 2006) and *Cystoisospora* (*C. canis*, *C. ohioensis-like*, *C. felis*, *C. rivolta*) (Porter et al., 2024).

Abbreviations: O&P, Ova and Parasite centrifugal fecal flotation; BMB, barcoded, magnetic bead; MFI, mean fluorescent intensity; NOP, no ova or parasites seen.

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The results of this study show an increased level of coproantigen parasite detection over O&P alone and that the O&P results rarely alter the treatment or management of the patient unless clinical signs are observed.

Since most fecal screening diagnostics performed as part of a preventive healthcare program are performed on patients that are not currently exhibiting clinical signs, **coproantigen immunoassay testing can serve as a highly accurate and effective screening method for intestinal parasitism.**

In summary

- Overall, **only 0.8%** of all screening fecal exam findings were coproantigen negative and would have clinically relevant O&P findings that could indicate a different treatment need.

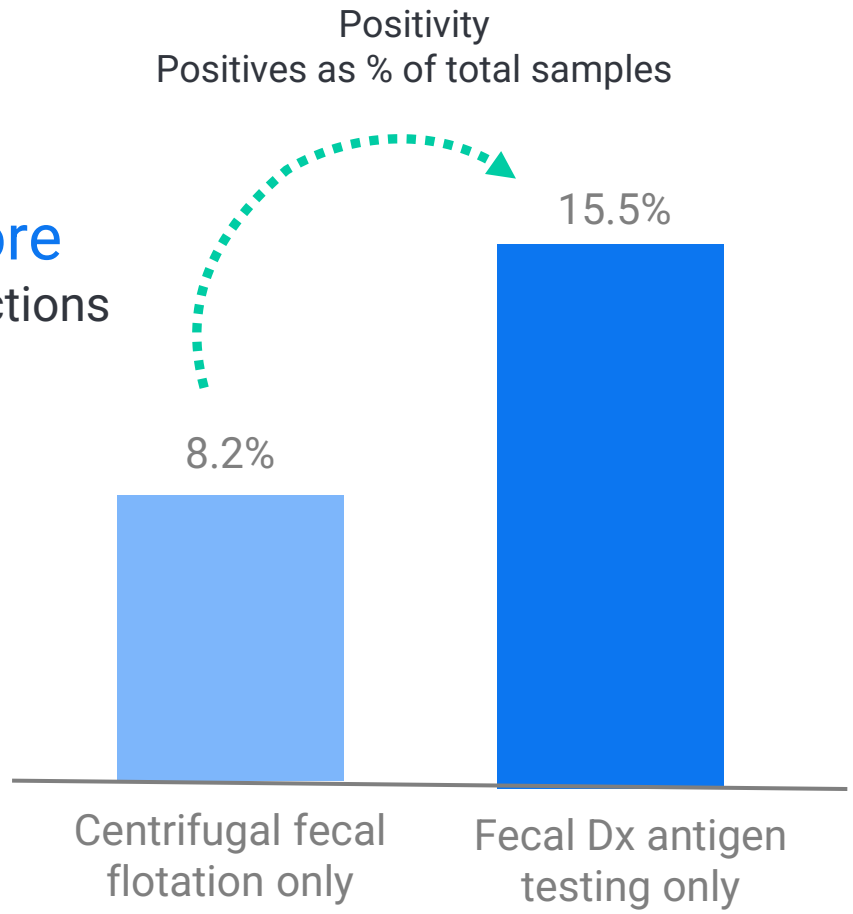
- Coproantigen found an additional **9.2% more positive samples** than O&P alone.
  - 11 more patients a month that could need treatment

- When common treatments are considered, O&P would only uncover that **0.2%–0.6%** of all patients could need treatment.

- Patient age and reason for visit do not change the results.

The study shows Fecal Dx antigen testing detects more parasitic infections than centrifugal flotation ™

Up to **2x** more parasitic infections detected*

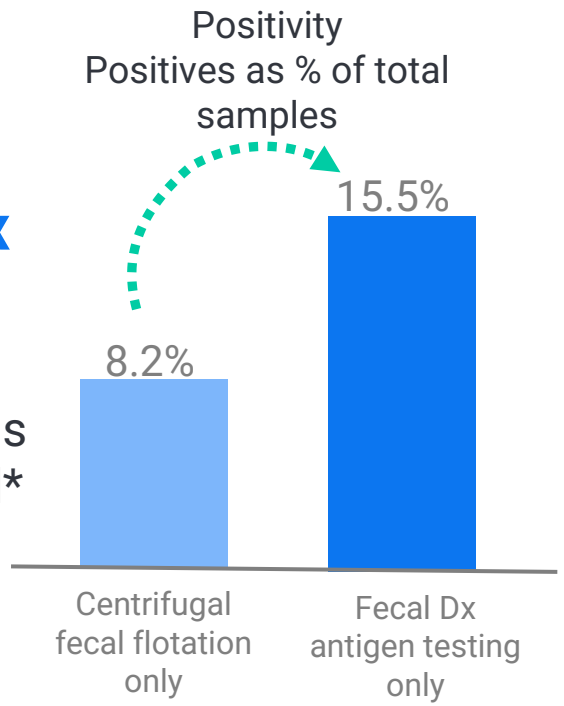


*Cumulative antigen positivity for 6 antigens/any O&P positive = 1.9x more. Cumulative antigen positivity for 6 antigens/O&P positives for those same parasites = 2.3x more.

Peer-reviewed studies

Greater than 15 peer-reviewed studies show Fecal Dx™ antigen testing detects more parasitic infections than centrifugal flotation

Up to **2x** more parasitic infections detected*



*Cumulative antigen positivity for 6 antigens/any O&P positive = 1.9x more. Cumulative antigen positivity for 6 antigens/O&P positives for those same parasites = 2.3x more.

+ Fecal antigen testing finds up to **2x more positive** infections compared to centrifugal floatation.[1]
+ In naturally infected dogs with varying numbers and ages of helminths present, the recommended **centrifugal flotation method of testing may fail** to identify infection.[5,6]
+ Per a national dog park study, **Fecal Dx™ antigen testing alone found 55% more** hookworm, whipworm, and ascarid infections than centrifugal flotation.[6]

IDEXX

Peer-reviewed studies

Greater than 15 peer-reviewed studies show Fecal Dx™ antigen testing detects more parasitic infections than centrifugal flotation

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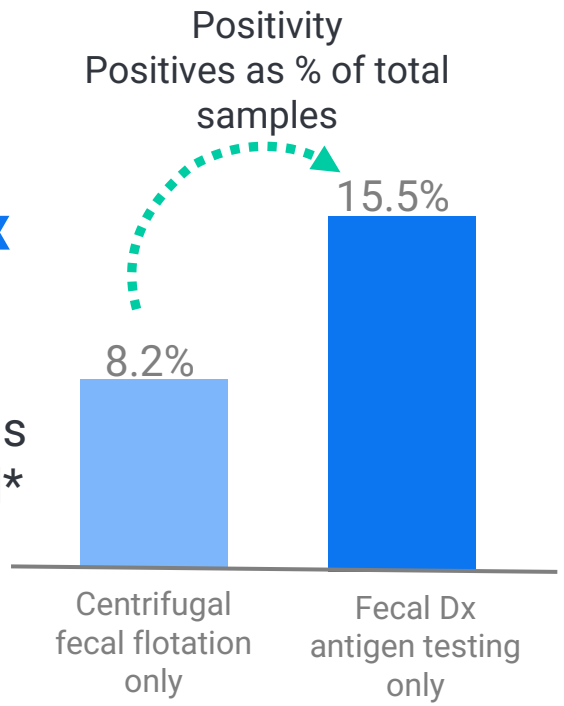

*Cumulative antigen positivity for 6 antigens/any O&P positive = 1.9x more. Cumulative antigen positivity for 6 antigens/O&P positives for those same parasites = 2.3x more.

+ Fecal Dx™ antigen testing combined with centrifugal flotation **finds 79% more** hookworm, whipworm, and ascarid infections than centrifugal flotation alone.[6]
+ **Microscopic examination of fecal samples cannot detect prepatent infections** or those involving only one sex of nematode.[7]
+ **Antigen testing can alert the veterinarian that nematodes are present** even when there are no detectable eggs in the feces. [4,7,6]

Fecal Dx™ antigen testing benefits

- Enabling veterinarians to develop **targeted, efficient treatment and prevention plans** ensuring high pet owner compliance and confidence in treatment
- **Early and highly accurate** detection of the **most common intestinal parasites**: hookworm, roundworm, whipworm, flea tapeworm, and Cystoisospora. Giardia is included in select profiles.
- **Detects parasite-specific antigen** rather than relying on presence and detection of eggs.
- Fecal antigen testing finds up to **2x more positive infections than centrifugal floatation**.
- **Parasite infections can be missed with flotation**, leading to missed diagnoses.
- **For screening,** fecal antigen testing **provides highly accurate detection of the most common and clinically relevant intestinal parasites**. Flotation rarely detects additional and clinically relevant infection.

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What patients should we treat?

- Does the patient have clinical signs?
- Is the parasite zoonotic?
  - Are they shedding eggs or oocysts?
- Is the patient immunocompromised?
- Is there evidence of anthelmintic or antimicrobial resistance for the parasite?
- Could it be a result of coprophagy?
  - If eggs or parasitic elements were found that are parasites of another species and not found to infect canines or felines, the results could be a result of possible coprophagy.

When should I test for *Giardia*?

- When you have clinical suspicion of infection
  - Patient with current symptoms or history of soft or diarrheic stools
- CAPC recommends testing symptomatic dogs and cats with a combination of
  - direct smear,
  - fecal flotation with centrifugation, and a
  - sensitive, specific fecal ELISA *or* by PCR optimized for use in companion animals
- Repeat testing performed over several (usually alternating) days may be necessary to identify infection

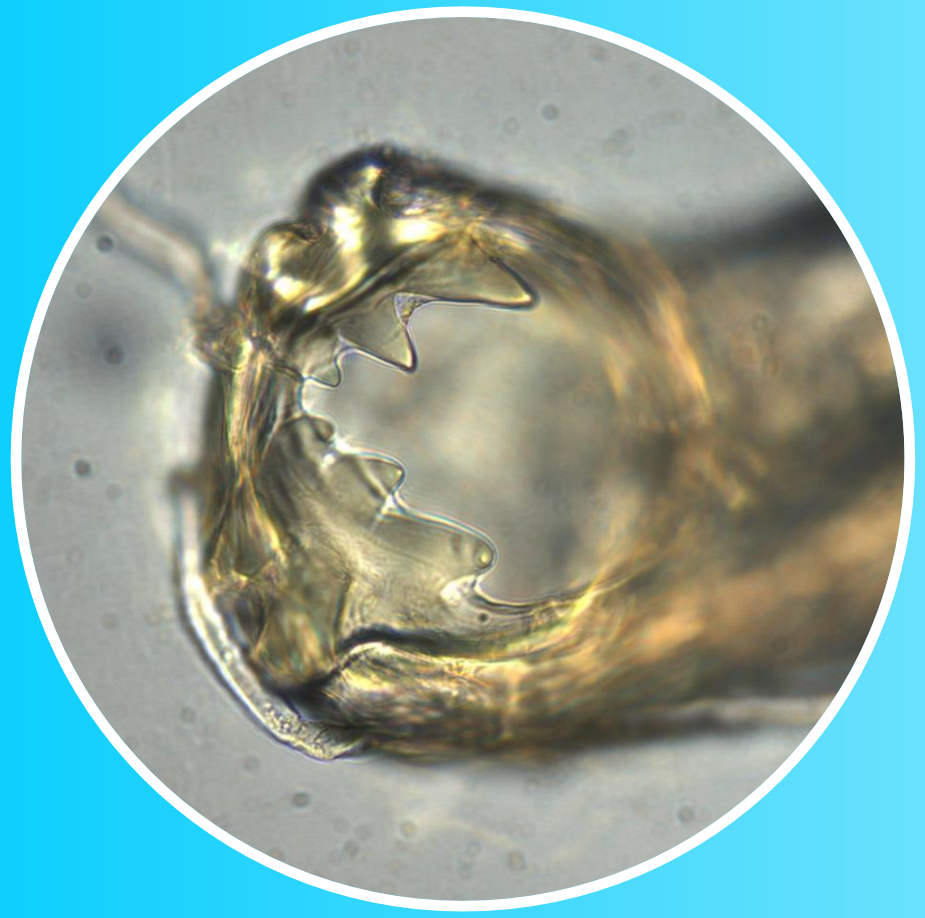
Source: Companion Animal Parasite Council. CAPC guidelines: *Giardia*. Updated March 29, 2023. Accessed February 22, 2024. www.capcvet.org/guidelines/giardia

How soon after treatment for ***Giardia*** can I expect to see negative results?

- Follow-up testing for ***Giardia*** may be done 24–48 hours after treatment if clinical signs have not resolved
  - CAPC recommends retesting via centrifugal fecal flotation
- ***Giardia*** antigen tests may remain positive for variable amounts of time and are not ideal for determining treatment success.
- Reinfection is common; prepatent period is only 5-6 days
- It is not necessary to retest for ***Giardia*** antigen if the patient demonstrates improvement in clinical signs following treatment.

Source: Companion Animal Parasite Council. CAPC guidelines: *Giardia*. Updated March 29, 2023. Accessed February 22, 2024. www.capcvet.org/guidelines/giardia

But now we know…..



- Hookworm resistance is real.
- Testing 10–14 days following deworming helps uncover potential lack of efficacy in treatment.
- Fecal egg counts are your best method to evaluate anthelmintic efficacy following a positive fecal antigen or O&P result.
- Strict fecal hygiene is key to help prevent transmission to naïve dogs.

When should we retest for intestinal parasites?

Retesting a **healthy** dog that is maintained on a broad-spectrum monthly control product may not be necessary.

If a follow-up test is deemed necessary

- Retest by antigen and flotation **10–14 days** following the final dose of anthelmintic.
- If the antigen or the float is still positive, this could be because:
  - There was inadequate compliance with the treatment.
  - Lack of efficacy or potential resistance to the anthelmintic.

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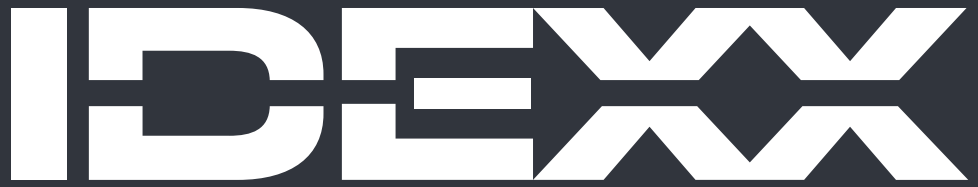
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