

Intestinal Parasite Control Guidelines

Intestinal parasites can cause mild to major health problems for shelter animals, and some can be spread to staff. This information sheet details types of parasites, the symptoms they cause, a range of treatments, and a suggested basic parasite control protocol for shelters.

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Why are intestinal parasites a reason for concern in shelters?

Intestinal parasites (worms and protozoans) are common in animal shelters in the U.S. and often cause illness in the animals they infect. Diarrhea is most common, but anemia, coughing and even death can occur. On the other hand, many parasites may cause infections but animals may show no clinical signs. This means that some animals that appear perfectly healthy may be causing spread of infections and environmental contamination.

Several intestinal parasites of dogs & cats are zoonotic – that is, they can also cause disease in human beings, including shelter staff, adopters, or even just members of the general public who visit animal shelters. Shelter workers, with their constant exposure to animals and their feces, are at particularly high risk.

Significant contamination of the environment by worm eggs or protozoan oocysts can be a major problem that is difficult to resolve. Many of these eggs or oocysts are extremely resistant to cleaning and disinfection. This can be particularly problematic in a shelter environment, where there is often a dense population of animals and/or a constant influx of new animals.

Which intestinal parasites should we be concerned about?

The most common intestinal parasites in companion animals include (click on each parasite for additional information):

- **Tapeworms:** [Cyclophyllidean Tapeworm](#) and [Diphyllobothriidean Tapeworm](#)
- [Roundworms](#)
- [Hookworms](#)
- [Whipworms](#)
- [Coccidia](#)
- [Giardia](#)
- [Trichostrongylus axei](#)
- [Cryptosporidium](#)
- [Toxoplasma](#)

Diagnosis of intestinal parasites

Protocols should be based on known prevalence of parasites for the region. [The Companion Animal Parasite Council](#) is one resource for such information, as are local practitioners, veterinary schools, diagnostic laboratories and the scientific literature.

Diagnostic testing for parasites may provide additional information specific to the shelter either to refine general treatment protocols or direct the response to an increase in symptomatic animals. Additionally, diagnostic tests are sometimes indicated to direct treatment in an individual.

Note that several of the available tests are prone to false positives or false negatives. In addition, due to the parasites life cycle (e.g. intermittent shedding or a long pre-patent period) the test may be negative even in an infected animal.

Finally, many internal parasites can be found in clinically normal animals. Simply identifying a parasite does not mean it is the cause of the animal's clinical signs, nor does it necessarily require treatment. In some cases, it is more appropriate to simply treat likely infections based on the animal's history, signalment (species, age, etc.), clinical signs, and known risks in the population. Additional testing is indicated in severely ill animals, those that fail to respond to empirical treatment, or in the event of an outbreak..

There are many types of diagnostic tests available to diagnose intestinal

parasite infections:

Gravitational/standing vs. centrifugation techniques. The commonly used Fecalizer® system is probably the most familiar standing fecal float technique. While standing methods are easier and quicker, and do not require a centrifuge, centrifugation techniques are more sensitive for detection of certain parasites, particularly Giardia cysts. Giardia will very likely be missed if only a standing technique is used. Centrifugation may also improve detection of whipworm eggs.

Instructions for performing a fecal flotation with centrifugation:

1. Suspend 2-5 grams (about the size of 2-5 raisins) of feces in 5-10 ml of flotation solution. This can be done by mixing in a paper cup using a tongue depressor.
2. Suspend 2-5 grams (about the size of 2-5 raisins) of feces in 5-10 ml of flotation solution. This can be done by mixing in a paper cup using a tongue depressor.
3. Pour the strained liquid into a centrifuge tube (15-20ml size).
4. Add more flotation solution to completely fill the tube and create a positive or reverse meniscus at the top
5. Place a coverslip on top of the tube and place the tube in the centrifuge (This step will only work when using a centrifuge with free-swinging buckets. This step must be modified for fixed-angle centrifuges).
6. Centrifuge the tube for 10 minutes at 600 rpm.
7. Remove the coverslip by lifting straight up and placing it on a microscope slide.
8. Examine the slide (entire coverslip) within 10 minutes, at 10X. Use 40X to confirm identification of parasite eggs or cysts.

Direct fecal smear (wet preparation). This is made by breaking up a small particle of fresh feces in a drop of saline solution on a microscope slide. Placement of a coverslip over the sample is recommended. Be careful not to make the smear too thick. This method is more sensitive than a fecal float for detecting Giardia trophozoites and can also be used to detect Tritrichomonas. Detection of Giardia is more efficient if the sample is diarrhea rather than formed stool. The slide should be scanned at 10X, with 40X used to confirm identity of parasites.

Idexx SNAP ELISA tests (for Giardia). Very sensitive. Not recommended for screening of non-diarrheic shelter dogs, or for use to test recovered dogs post-treatment to verify cure, as its high sensitivity may detect clinically unimportant infections.

Fecal protozoal culture (InPouch TF test). This is a practical, affordable

in-house test for detection of *Tritrichomonas*. It was designed for use in cattle, but it can easily be used with a peppercorn-size amount of fresh cat feces. Test kits are available at <http://biomeddiagnostics.com/tfoetus>. The cost is approximately \$50 for 20-test-kit.

Other diagnostic tests available from laboratories:

- PCR (Polymerase Chain Reaction). This is an excellent method for detecting *Tritrichomonas* in cats.
- Immunofluorescent antibody (IFA) techniques - for *Giardia* & *Cryptosporidium*
- Acid fast stain - for *Giardia* & *Cryptosporidium*

Treatment of intestinal parasites

Ideally it is best to treat all shelter animals with a single all-purpose dewormer that is inexpensive, safe, convenient to administer, highly effective against a broad spectrum of parasites, and appropriately labeled for the intended use. Unfortunately, such an ideal product does not exist. Listed below are various deworming medications that may be useful in a shelter.

Oral anti-parasite medications:

- **Pyrantel** (Nemex®, Strongid®, others) – effective against roundworms and hookworms. Inexpensive and easy to administer. For dogs and cats. Is safe to give to pregnant animals and to neonatal puppies and kittens. Requires repeat dosing. Should not be used in conjunction with piperazine.
- **Fenbendazole (Panacur®)** – effective against roundworms, hookworms, whipworms, some tapeworms (*Taenia*) and *Giardia*. Must be given for at least 3 consecutive days in order to effectively treat whipworms, and 5 days for *Giardia*. Safe, but can be difficult to administer and relatively expensive. Available in granule or liquid formulations. Safe in pregnant animals. Labeled for use in dogs, but is effective and safe in cats.
- **Febantel (Rintal®)** – effective against roundworms, hookworms, and whipworms. Formulated for use in horses, so doses for dogs and cats must be carefully calculated. May not be readily available.
- **Piperazine** (Pipa-Tabs®, Seargent's Worm-Away®, others) – effective against roundworms, including *Toxacara*, *Toxascaris* and *Baylisascaris*. Not effective against hookworms (or any other parasites), which greatly limits its usefulness. For dogs and cats. Is safe to give to pregnant animals and to neonatal puppies and kittens. Requires repeat dose. Should not be used in conjunction

with pyrantel.

- **Praziquantel (Droncit®)** – effective against nearly all tapeworms (*Diplydium*, *Taenia*, *Echinococcus*, *Diphyllobothrium*, and at a higher dose, *Spirometra*). Relatively expensive, very safe. Can be given to pregnant animals. Should not be used in animals younger than 4 weeks. Single dose. For dogs and cats. Injectable form also available (see below). It is also important to control fleas when treating *Diplydium caninum* infections.
- **Epsiprantel (Cestex®)** – effective against most tapeworms (*Diplydium caninum* and *Taenia*). Should not be used in pregnant animals or animals younger than 7 weeks. Single dose. For dogs and cats. It is also important to control fleas when treating *Diplydium caninum* infections.
- **Pyrantel + praziquantel (Drontal®)** – effective against roundworms, hookworms, and tapeworms (*Diplydium*, *Taenia*, *Echinococcus*, *Diphyllobothrium*, and at a higher dose, *Spirometra*). Formulated for use in cats, but can also be used in dogs. Relatively expensive, very safe. Can be given to pregnant animals. Should not be used in animals younger than 4 weeks. Repeat dose required for treatment of roundworms or hookworms, single dose for tapeworms. It is also important to control fleas when treating *Diplydium caninum* infections.
- **Pyrantel + praziquantel + febental (Drontal Plus®)** – effective against roundworms, hookworms, whipworms, and several tapeworms (*Diplydium*, *Taenia*, *Echinococcus*, *Diphyllobothrium*, and at a higher dose, *Spirometra*). There is also some evidence that this product may also be helpful in treating *Giardia*. Relatively expensive. Single dose for treatment of all worms except for whipworms. Formulated for use in dogs, but not cats. Should not be used in pregnant animals or puppies younger than 3 weeks or less than 2 pounds. It is also important to control fleas when treating *Diplydium caninum* infections.
- **Ponazuril (Marquis Paste®)** – This product, made by Bayer, is labeled for use in horses, so it must be carefully diluted. Concentration of the paste is 15% [150mg/gram]. It can be mixed with water, VAL syrup, Lixotinic, and palatable other liquids. The drug is expensive (about \$200 per tube) but after dilution the cost per dose is only about 25-50 cents. Shelters have used it in very young animals (2 weeks of age, less than 1 lb), and report great success. Prophylactic treatment of all puppies and kittens is recommended for shelters in which *Coccidia* is common. A “recipe” for [diluting Marquis to a 100 mg/mL dilution can be found here](#).
- **Toltrazuril (Baycox)** – This is labeled for treating coccidia for poultry. Used as an alternative treatment for coccidiosis in dogs and cats, and the oocyte shedding stage of toxoplasmosis in cats. Not

commercially available in the US, but can be imported.

- **Metronidazole (Flagyl)** – This drug is an antibiotic that is also used to treat infections such as Giardia, Trichomoniasis, and Amoebiasis. This medication is illegal in all food animals and has a narrow margin of safety.
- **Sulfadimethoxine (Albon®)** – Albon is an antibiotic suspension that is used to treat a variety of conditions in small animals. Albon can be used to treat coccidia in dogs and cats.
- **Amprolium (Corid®, Amprovine®)** – Amprolium is an anticoccidial drug effective that is used off label in dogs and cats for coccidiosis. Use longer than 14 days may cause thiamine deficiency.
- **Ronidazole** – This is an antiprotozoal drug used off label in veterinary medicine to treat Tritrichomonas foetus infection in cats. It is labeled for treatment of histomoniasis and swine dysentery. This medication should not be handled by pregnant women. This drug must be compounded.

Injectable anti-parasite medications:

- **Ivermectin (Ivomec®)** – This medication is formulated for cattle, but can be used in dogs and cats. Extreme caution should be used in dose calculation because overdoses can be fatal. Injectable product can be given subcutaneously, orally, or, for some external parasites, topically (for more information about external parasites see section below). This formulation of ivermectin provides a dose many times higher than that found in heartworm preventatives. Effective against roundworms and hookworms. Also effective against some external parasites (ear mites and sarcoptic mange mites). For more information, see section on external parasites. Ivermectin is not reliably effective against whipworms. Single dose effective for most parasites. Inexpensive. Can be used in dogs and cats. Should NOT be used in collie-type breeds, in dogs that may be infected with heartworm, in puppies less than 6 weeks old, or in kittens less than 4 weeks old.
- **Praziquantel (Droncit®)** – effective against nearly all tapeworms (*Diplydium*, *Taenia*, *Echinococcus*, *Diphyllbothrium*, and at a higher dose, *Spirometra*). Relatively expensive, very safe. Can be given to pregnant animals. Labeled for use in dogs and cats at least 4 weeks of age. Single dose. Oral formulation also available (see above).

A suggested Basic Parasite Control Protocol for shelters:

Ideally, a shelter's deworming program should be based on a knowledge

of which parasites are present in the particular shelter population. For a map of prevalence of parasites in the US, see [CAPC prevalence maps](#). However, there are some general guidelines that apply to nearly all shelter populations.

All dogs, cats, puppies and kittens entering shelters should be treated for certain parasites in order to protect the rest of the shelter population, prevent environmental contamination or infestation, and minimize zoonotic threats to shelter staff and the public.

A minimum shelter parasite control protocol should consist of prophylactic treatment of all shelter dogs and cats for the most common parasites at the time of intake. This should consist at least of a dewormer effective against roundworms and hookworms, and flea preventive (+ tick preventative for dogs). The most straightforward products to use for this basic internal and external parasite control protocol are an oral dewormer containing pyrantel pamoate (Nemex® and Strongid® are the most commonly used products), and topical products such as imidacloprid (Advantage) and/or fipronil (Frontline). For more information on external parasites please visit our [Flea Treatment in Animal Shelters page](#).

In addition to deworming on intake, puppies and kittens should also be dewormed repeatedly with pyrantel every 2 weeks from 2 weeks to 16 weeks of age. *Re-treatment is very important!*

All pregnant and nursing dogs and cats should also be dewormed with pyrantel every 2 weeks while housed in the shelter or foster care.

For all other adult dogs and cats, a second dose of pyrantel is recommended 2-3 weeks after intake, if still in the shelter.

If whipworms, tapeworms, Giardia, coccidia, ear mites, or other parasites are common in the shelter population, the intestinal parasite protocol can be modified as needed. For example:

If coccidia is a problem in your puppies and kittens, we recommend giving Ponazuril (Marquis Paste) to all puppies and kittens starting at 2-3 weeks of age, repeated in 7-14 days, and then as needed based on clinical signs/ fecal exams.

Frequently Asked Questions about intestinal parasite control

Which intestinal parasites should we treat?

Ideally, a shelter's deworming program should be based on a knowledge of which parasites are present in your particular shelter population. However, there are some general guidelines for deworming that could apply to nearly all shelter populations. For example, in puppies and kittens, roundworms and hookworms are ubiquitous. These are particularly important because they can be transmitted from mothers to puppies or kittens through the placenta and/or the mammary gland, so infections are extremely common in young animals, and can be severe. Up to 80% of puppies are infected with roundworms, but typically only about 20% of these infections are detected on fecal exam, so they should be treated regardless of fecal exam results. Also, roundworms and hookworms are both zoonotic, another reason that great care should be taken to control them.

Lastly, environmental contamination with roundworm eggs is practically impossible to get rid of, another reason to treat animals prophylactically to prevent shedding. Whipworms are less common than roundworms or hookworms, and are also generally less of a concern in a shelter environment. Thus it may not be necessary to treat for whipworms unless whipworm eggs are found on a fecal exam. However, like roundworm eggs, whipworm eggs are also very resistant to disinfection, so it is not a bad idea to treat all dogs over three months of age for whipworms too.

Many shelters only treat for tapeworms if worm segments are noted in the feces or near the anus, tapeworm eggs are seen on a fecal exam, or if the animal has fleas. Treating all animals for fleas on intake is probably more important than treating all animals for tapeworms.

If coccidia is a problem in the puppies and kittens at the shelter, it is recommended to give Ponazuril (Marquis Paste) to all puppies and kittens starting at 2-3 weeks of age, repeated in 10-14 days, and then as needed based on clinical signs/ fecal exams.

Which animals should be treated for intestinal parasites?

The Companion Animal Parasite Council (CAPC) recommends that all companion animals be treated year-round with broad-spectrum heartworm antihelminthics that have activity against parasites with zoonotic potential. Therefore, it would be ideal to make treatment for common parasites as widely available for all shelter animals as possible. However, limited shelter resources often necessitate compromises that are less than ideal.

However, some general guidelines for parasite treatment should apply to nearly all shelter populations. As stated above, roundworms and hookworms are extremely common in puppies and kittens, so it may be

particularly important to prophylactically deworm all animals under the age of 3 or 4 months.

It should be noted that a national study of intestinal parasites in shelter dogs found parasites in dogs of all age groups. In this study, hookworms and whipworms were just as common in older dogs as they were in puppies, although roundworms and coccidia were less common in adults than in puppies. Thus the recommendation is to treat all animals at intake with a broad spectrum dewormer such as pyrantal.

What is the suggested basic deworming protocol?

The most practical dewormer to use for treatment of roundworms and hookworms is pyrantel (Strongid® or Nemex®). Puppies and kittens should be treated immediately on intake (as early as 2 weeks of age), and again every 2-3 weeks until 8-12 weeks of age. *Re-treatment is very important!*

For deworming of adults, two doses of pyrantel are recommended: one immediately on intake, another 2-3 weeks later if still in the shelter.

If whipworms, tapeworms, Giardia, or coccidia are diagnosed, or other parasites are a common problem, a protocol should be developed with a veterinarian.

What about environmental contamination?

The eggs or cysts of some parasites are very resistant to disinfection and will persist in the environment for a very long time. Examples of these are roundworms and coccidia. Other parasites, such as Giardia and Tritrichomonas, are quite fragile in the environment and are easily destroyed by most disinfectants as well as by drying.

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