

NEMATODES

AKA: Roundworms

Not for the squeamish



Roundworms: The scourge of pet owners and equine enthusiasts. Everything you need to

know about them, but didn't know you didn't know. Well, not everything you need to know, but some things.

Roundworms are the most numerous of the three parasitic worms infesting the world.

There are trematodes-flukes, and cestodes-the segmented worms. Roundworms are called Roundworms because they are round in cross-section. Nematodes come in many shapes and sizes but the one we might be most acquainted with looks like a strand of spaghetti; they're whitish/yellowish, long and skinny, and are rounded on both ends. You may have observed one or more of these worms after a dog or cat vomited them up. (Yes, it happens). Roundworms are not the little white worms exiting, or stuck to, your cat's anus; those are tapeworms. (Told you it wasn't for the squeamish). And those little things that look like grains of rice are not the whole worm; they are segments of the worm. Tape worms are segmented worms, and those rice-looking pieces are the egg sacs that have broken off the main worm and are excreted to the outside of the animal to go out into the environment and seek new digs, if you will. But tapeworms are a whole different critter; back to roundworms.

There are three types of nematodes: Free-living worms that can live in salt water, fresh water, or soil; Worms that live on plants; and the nematodes that parasitize animals and humans. This last group is the one we will concentrate on. They can infect wild animals or domesticated animals, including dogs and cats, ruminants (cattle, sheep and goats), horses,

pigs, rodents, rabbits, and birds. The female nematode can produce several thousand eggs per day; she may lay one-celled eggs, eggs with many cells, eggs that contain first-stage larvae, or, some types of nematodes actually keep their eggs in their uterus and give birth to live larvae. Regardless of the type of egg, it eventually develops into the larval stage of the roundworm. These larvae develop through five stages before it becomes an adult, sexually active worm capable of reproducing.

Larval stages one, two and three can develop either inside the host animal, or in the external environment, i.e. eggs or stage one larvae are excreted in the feces and live in the environment while they develop into stage 3 larvae. Larval stage 3 (L3) is the infective stage for the host animal, and the L3 must return to the host animal in order to survive. Eggs and larvae can live and flourish in the external environment as long as environmental conditions are right—it needs to be warm and moist for the little buggers to survive. Hence, this hot, dry weather we're having is our friend because it kills the roundworm larvae! Larvae also cannot survive during the cold winter.

The life-cycle of the nematode may involve an intermediate host, such as a mosquito, which transports the infective larvae to the host animal, or may be a direct life cycle, where the infective L3 develops in the environment then directly infects the host animal. Infective larvae may be ingested by dogs, for example when a dog eats feces; by a child when a child playing in the grass or dirt is externally contaminated with the larvae then transfers the larvae into his/her mouth (the moral of this story is WASH YOUR HANDS); by flies, which lay eggs in wounds and sores; or by larvae entering an animal's open wound. Heartworm in dogs is spread by a female mosquito ingesting roundworm eggs or larvae when she bites an infected animal. These microfilariae are incubated by the mosquito and develop into third stage larvae, then are transferred to an uninfected dog when it is bitten by the mosquito. As the mosquito is sucking

blood while biting an animal the larvae exit the mosquito's mouth and penetrate the skin through the bite wound. The larvae molt to a pre-adult worm, migrate to the dog's heart, where they set up shop, produce thousands of eggs per day and start the process all over again. It's important to A) clean up feces regularly, B) wash your hands after being outdoors, C) have your dogs (cats can get heartworms too) tested, and D) treat your pets with heartworm preventives.

Horses can ingest heartworm microfilariae by (you guessed it) eating their feces (yes, they do, even though we want to believe they don't) which harbors eggs/larvae, or by eating grass inhabited by roundworm larvae. In a pasture, the larvae crawl around on the blades of grass; if environmental conditions are not favorable, or if they are not ingested while at the proper larval stage, they die after a length of time (this time frame differs between types of worms); if environmental conditions are right for survival and they are ingested by the horse, they enter the horse's stomach, migrate to the roundworm's system of choice (stomach, heart, lung, intestine), molt to adulthood, and produce offspring.

Roundworms can also enter an animal's system by flies laying eggs in open skin wounds and sores, the animal accidentally eating an infected fly, or by face flies depositing eggs as it feeds around the eyes of the host animal. Whichever method the infective larvae is ingested, it flourishes in the warm, moist environment of a live body, molts to a reproductive stage, migrates to whatever system that particular roundworm favors, and inhabits and infects that system of the host animal.

The key to containing roundworms in horses are A) keeping corrals free of manure, so the animal does not re-ingest it and the larvae don't get into the soil, B) proper pasture

management, i.e. rotating pastures. (There are two schools of thought on 'dragging' the pasture to spread out manure piles; one argument is that spreading it knocks the manure apart and it can disintegrate better; one argument is that spreading it just spreads the worm larvae around) and C) keeping your horses on a regular de-worming program. Some de-wormers target certain types of roundworms better than other types. Without getting into specific types of worms, it's difficult to advise which de-wormer to use. Some de-wormers are more effective at certain times of the year, and to be effective long-term, de-wormers should be rotated so tolerance is not built up against it. It's best to have fecal samples tested by a veterinarian, then to target the specific parasite with the proper and most effective de-wormer.

So there you have it. Those pesky nematodes are all around us. We will never be able to eradicate the roundworms and have a worm-free environment, but with a little knowledge, some de-wormers, and a lot of perseverance we may be able to control them in our immediate environment and in our pets and livestock. If you're interested in more information contact me and I can tell you what I know about specific worms in our animals, or of course you could ask a veterinarian, who knows the straight scoop.

Happy pooper-scooping and de-worming!

See you on the trail.

Janine