

Freeing your dog of round worms is nearly impossible with one single treatment.

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It is a myth to believe one can free his dog of round worms with one single treatment. Even the best dewormers available at this moment can't do the job 100 percent like it should be. To get rid of all the roundworms in your dog, especially the dangerous *Toxocara canis*, more than a 'one day treatment' is required.

1 Herbs, glass pills and piperazine

For man and animals alike, the plant kingdom was the first medicine chest. The bark, berries, roots, leaves, flowers and seeds of all sorts of plants were used against worms. Most of these natural remedies have only limited activity or work only as a purgative. The great drawback of natural remedies is that they are difficult to standardize and the activity is very variable.

In the 19th century the search for new dewormers was a matter of uncritical empiricism. A typical example was the "glass pill": fragments of finely crushed glass were mixed with fat or ginger to form a worming pill. The idea was that the glass splinters would fatally wound all the worms without penetrating the mucosal layer of the stomach and intestine. The effect of such a "splinter bomb for worms" was never critically evaluated.

In the early 20th century the dewormers available for dogs were arsenic compounds, ground male fern root, finely chopped pumpkin seeds, fig tree sap, alkaloids, calomel and garlic in milk. All these remedies showed fairly poor activity. Moreover, the capsules or tablets were so large or impractical that administering was a formidable task. Usually the animals had to be fasted before treatment. For puppies in particular, the whole procedure was so laborious that they usually remained untreated.

The accurate evaluation of anthelmintics began in the early part of the 20th century with the use of critical tests. In these tests the nature of the infection was established by faecal examination and the experimental animals were killed by euthanasia in order to count the number of worms remaining in the intestine after treatment. This number was then compared with the number of worms expelled from the animal (critical test) or with the mean number from a control group (control test). This gave fairly accurate data about the activity of a product.

The first narrow-spectrum anthelmintics such as phenothiazine and piperazine (1953) were evaluated in tests of this type. Especially, piperazine was the dewormer for ascarids in all animal species. Although the efficacy against adults was nearly eighty percent, it remained the most used dewormer for years. Piperazine was rather cheap and safe and after treatment one could see "the result", i.e. the large roundworms, in the faeces. Of course, the owner was not aware of the fact, that still up to 20% of the worms were remaining in the gut of the animals and that all the immatures were still alive.

The dewormers of the seventies and later such as pyrantel, nitroscanate and the benzimidazoles had a broad spectrum. They were safe and were active against 'all the worms'. Moreover, for pyrantel and nitroscanate one needed just one single treatment....and because man likes easy solutions for complicated problems, it is hard to tell the whole story to the dog owner.

2 The myth of a 'one single deworming' solution

The anthelmintic activity evaluated with faecal examination for the presence of worm eggs (EPG), is valuable only as a general indication of the efficacy of the product; but it is not a scientific reliable test. Even the results of faecal examination, done by the best laboratories, underestimate the real infection with 20 to 25 per cent for roundworms and even 4 to 5 times for tapeworms (Nichol et al, 1981). One should not forget, that male worms, the immatures and somatic larvae are not laying eggs. The number of eggs in the faeces further depends of the consistency of the faeces, the time of the day, the age of the worms, the worm species involved and the technique used. A negative faecal examination does not mean, or is not synonym for 'there are no worms in the dog'.

Only with series of several critical tests one can evaluate the efficacy of dewormers. In the data of table 1, one can see that the efficacy of a one single treatment is insufficient against the dog roundworm and that not all the worms are excreted. Moreover, the variability in the results of nitroscanate (17.5 % to 90.1%) and pyrantel (37.1% to 89.8%) after a single treatment is too wide. That means for nitroscanate for instance, that sometimes

you kill only 17% of the worms, and when you are lucky sometimes you kill 90%. In every case, several worms are still present in the treated dog and that is, due to the zoonotic potential a real danger for the dog owner and his children.

Moreover, carnivores have a short intestine with a fast gut transit for the feed and the orally given anthelmintic. The gut transit is even faster in cases of diarrhoea, a not so uncommon symptom in dogs with worms. Different experiments with pyrantel elucidate differences in the uptake of pyrantel pamoate as well as in the total amount of drug ingested or absorbed by adult and preadult worms. Adult worms can limit or even reduce the ingestion of the anthelmintic for more than 4 h. This leads to the assumption that repeated treatments with lower concentrations of the anthelmintic in the gut will be more effective than high concentrations given only once (Mackenstedt et al, 1993). This phenomenon explains, maybe the wide variability in the anthelmintic activity of a one single treatment.

The veterinarian is responsible for the results of the treatment. A dewormed puppy or dog should not be a 'poisoned present' still harbouring dangerous worms. He should take care as much as possible that the pet is free of dog round worms after a treatment. That is possible after treating the dog with the best dewormers for ascarids, (namely the benzimidazoles), and when using these products in a multiple day treatment schedule. Due to the complicated life cycle of *Toxocara canis*, these anthelmintics should be used in a deworming scheme based on the life cycle of the worms and at certain critical moments in the dogs life to guarantee the best results in the long run.

Table 1 One single treatment is insufficient against *Toxocara canis*

Anthelmintics	% activity	References
Nitroscanate (50 mg /kg)	71.4 (17.5-90.1)	Hopkins,T.J. (1991)
Pyrantel 14.4 mg/kg (=5 mg base)	74.7 (37.1-89.8) 79.7	Hopkins,T.J. (1991) Emde,C. (1993)
Pyrantel+febantel+praziquantel (14.4 mg/kg; 15mg/kg; 5 mg/kg)	93.8 (84-97.6)	Hopkins,T.J. (1991)

The efficacy of anthelmintics, especially the nearly insoluble benzimidazoles, can be improved, not so much by increasing the dose, but by giving the dose in intervals over several days. The worms in the gut cannot fast that long.

So to ensure sufficient contact time between the anthelmintic and the worms it is better to spread the dose over more than one day. That is also the reason why a standard dose can be used. Benzimidazoles are deworming the gut content and not a number of kilograms dog, based on live weight.. In man a standard dose of one tablet mebendazole in the morning and one in the evening during 3 days is given independent of the body weight.

3 Routine deworming made easy.

In Germany, the regulatory authorities (BGA) recommended to all veterinarians that one single treatment for *Toxocara canis* is insufficient to prevent the danger of toxocariosis. The best prevention is to follow a strict deworming schedule based on the life cycle of the worms and the age and gender of the dog. Therefore the routine deworming should be made easy and handy. Deworming can often be a chore since dogs do not readily accept tablets, paste, or granules. Sometimes the products have a bad taste or they are too voluminous. Deworming by an injection is unpleasant for the dog. The administration of a dewormer should not disrupt the precious relationship between a dog owner and his pet and whenever possible medicine should not be forced on pets. So finding a formulation that most dogs would accept should make routine deworming easy.

4 'Treats' from the hand

With a new formulation of the benzimidazole flubendazole regular treatment becomes a treat instead of a chore.

The addition of special flavours make the tablet very tasty. This palatable tablet is readily and eagerly accepted by dogs. You can put the tablet on the palm of your hand and offer it to the dog, letting the animal take it spontaneously. The palatability of the final tablets was studied in six different experiments, using a total of 476 dogs varying in breed, sex and age. Nine dogs out of 10 of the privately owned dogs took these tablets straight from the hand spontaneously. This is a far better acceptability than the most commercial dog feeds on the market.

So, the dog owner has no longer excuses for not deworming his dog. This new product is an all round dewormer active against most of all common roundworms, whipworms, hookworms and some tapeworms in dogs. It is safe and excellently tolerated at the recommended dosage. Freeing dogs of worm parasites is the vets responsibility. Not the price nor the argument 'it is just one treatment', should be the most important criteria for the choice of the right anthelmintic, but its safety, efficacy and the practical use in a scientifically based deworming schedule.

Flubendazole: trade mark Flubenol KH™

Literature

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