



CONCERNING POULTRY

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Photos: Monique de Vrijer and
GD Deventer

WORM INFESTATION

Almost all chickens, especially when allowed to free range, will become infected with worms. Many poultry keepers will be alerted when he suspects his birds to have worms. In this article I will try to write down the ins and outs of worm infestation and also explain why at random worming is not always the right thing to do.

Chickens can be infested with the following three main worm varieties: Roundworms, Caecal worms and Hairworms (all nematodes) Apart from these the chickens can also be affected by Gapeworms (nematodes) and Tapeworms (cestodes).

Normally a chicken can live quite well with the worms. The chicken is the host and the worms certainly don't intend to kill their host, for that would mean their end as well! So there is a certain balance between chicken and worm. However, in some cases the worm infestation will become too serious; this may be due to lack of resistance (caused by a virus or moult) but it can also happen when there is a lot of contact with droppings of infected chickens.

Young chicks are more susceptible than older birds; on their first contact with worms they have not been able to build up resistance. Mark you! There will never be a total resistance, so older chickens surely can get infested with worms!

The chicken hardly ever falls acutely ill from worm infestation. Still it is rather difficult to notice symptoms at an early stage. Birds (and chickens as well) are masters in hiding symptoms of illness. By the time that you notice there is something wrong, it will often already be in an advanced stage.

Symptoms

Common symptoms are: emaciation (especially on breast) and sometimes loose droppings (diarrhoea). In the last case the feathers round the vent area will be dirty and maybe the eggs as well. Some worms may cause blood in the droppings.

Comb and wattle colour will be fading, and so is the leg colour, (especially noticeable on yellow legged breeds) Listless birds with dull, ruffled plumage, sometimes neck moult will appear and often the lay will decrease or stop. In severe cases of worm infestation the chickens will go off their legs and may even die from exhaustion.

The hard thing with these symptoms is that these are all rather common symptoms. Many other diseases, such as for instance Coccidiosis (not a worm but protozoa) can give the same symptoms and sometimes the chicken is infested with both diseases. (However, coccidiosis will mostly happen to younger chickens and after an infection the birds will develop a resistance to the exposed coccidia, different from worm infestation). The symptoms that appear can be caused by various reasons.

Loss of body weight occurs because the feed that is eaten by the chicken is also digested by the worms. Due to this, many nutrients are lost for the chicken and this will cause a deficiency.

Intestinal worms may damage the bowel. This damage will lead to infections and will cause emaciation, because it enables the bowel to assimilate these nutrients. This will also often cause diarrhoea.

If the roundworms are in great enough numbers they can form a ball and actually block the intestine.

Nematodes

The Roundworm (Ascaridia galli) and the Caecal worm (Heterakis gallinae)



Roundworms are large worms that can be seen with the naked eye when in the faeces. Typically they are white, about the diameter of a spaghetti-strand and about 2 to 4 inches in length. Roundworms are very common in chickens, although not in large numbers.

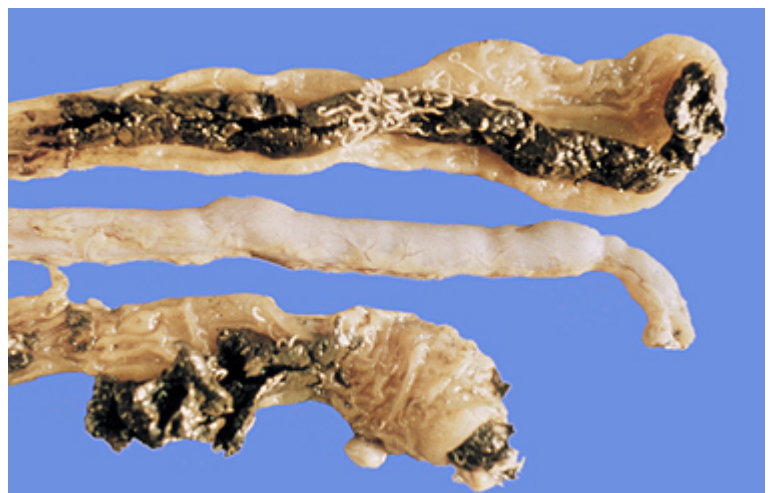
Roundworms (left) and Caecal worms (right below) in the intestine.

Photo: GD Deventer

The Roundworm lives in the bowel and the Caecal worm in the top of the appendix.

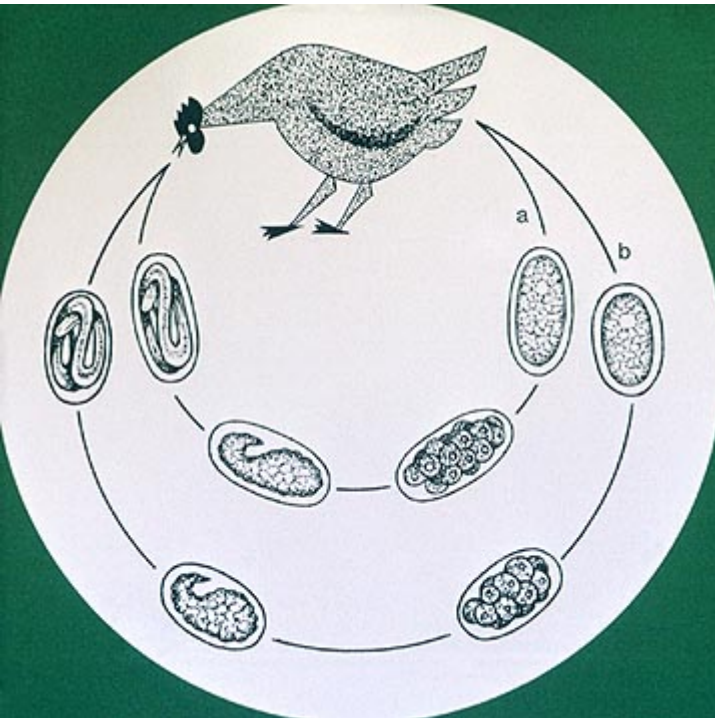
Round worms are only pathogenic if they come in large numbers.

(In a very severe infestation they can also appear in the oesophagus, crop, gizzard, oviduct, or, when the bowel bursts, in the body cavity).



Method of infection:

Roundworms lay a lot of non-infective eggs, which will pass in the faeces. Non-infective means that the egg cannot do any harm as it cannot yet develop into a Roundworm. The non-infective eggs have to incubate first. When circumstances are optimal (so the right temperature and humidity), they incubate in 10 to 12 days and reach the infective stage. The infective eggs are in the litter, the soil, the pasture etc. so the chicken will pick them up (oral). Now when the chicken ingests these eggs, the larvae will hatch in the bowel and in about 5 weeks they will develop into adult roundworms.



Left:

Life cycle of the Roundworm (a) and the caecal worm (b) The chicken passes non-infective eggs in the faeces and after incubating a larva develops in the egg. The chicken infects itself by picking up the infective egg.

Picture: GD Deventer

Caecal worms form another group. These worms are found mostly in the lower end of the gut - the caeca. Normally they cause less harm than other worms; however, they can carry another parasite (Histomonas) into the bird. Histomonas is the cause of Blackhead-infection (among others in turkeys).

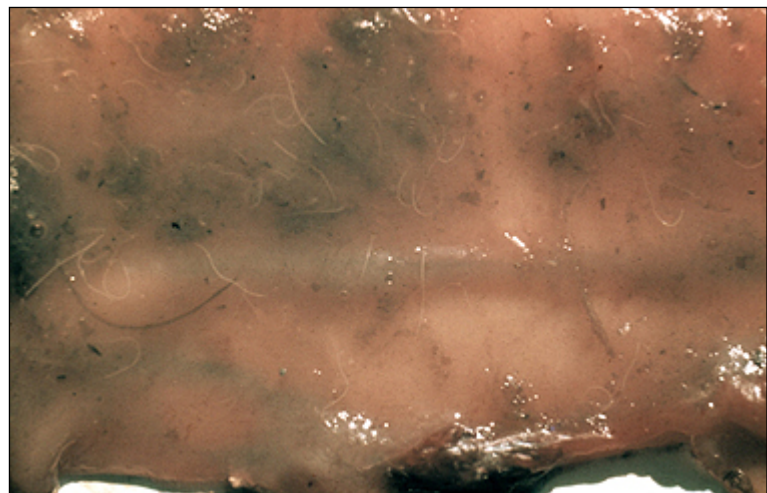
The Hairworm (*Capillaria*)

Hairworms cannot be seen in the droppings with the naked eye. They are very thin, only 0,05 mm and measure 1 to 2 cm ($\frac{1}{2}$ to 1 inch) in length. There are many species of Hairworm, of which the one in the small intestine (*Capillaria obsignata*) is the most prevalent.

The Hairworm is very pathogenic, which means that the chicken will show symptoms of illness with only a light infection.

This worm causes weight loss, anaemia, reduced lay, (bloody) diarrhoea and death.

Right: Hairworms in the small intestine.
Photo: GD Deventer



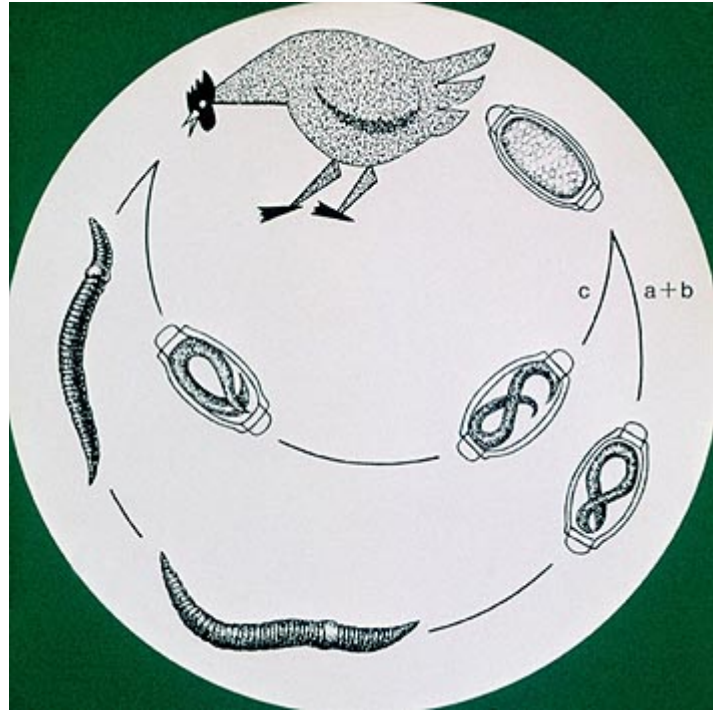
Method of infection:

The method of infection is direct; the same as with the Roundworm (The eggs are laid and passed in the droppings), but besides that some species of *Capillaria* have an indirect life cycle and use an intermediate host, in this case Earthworms. Using an intermediate host means that the host ingests the eggs and the eggs

incubate in the host into a larva. Once a susceptible chicken ingests an infested Earthworm, the chicken infects itself and the larva will develop into a mature worm. For some species of *Capillaria* holds that the infection can only be carried by an intermediate host. The most prevalent species of *Capillaria* in chickens does not need a host.

Right: Life cycle of *Capillaria*. Chicken passes non-infectious eggs in the droppings, after incubating the egg becomes infective and a larva develops in the egg. The chicken can get infected by eating the infective egg (c) or an earthworm ingests the egg (a+b) and acts as an intermediate host. The chicken will get infected by eating the intermediate host (in this case the earthworm).

Picture: GD Deventer



Gapeworm or Trachea worm (*Syngamus trachea*)

This worm can be found in turkeys, quails, pheasants, Guinea fowl and Peacocks, but also sometimes in chickens. As you could tell by the name, it is situated in the respiratory tract (trachea). When the infected birds open their beaks in a gasping manner, you are sometimes able to see some gapeworms in the throat (in the windpipe). The eggs are passed in the trachea and can also be found in the droppings (by microscopic search) while they are coughed up into the mouth of the bird, swallowed and passed in the faeces.



Left: Gapeworms in the trachea.

Photo: GD Deventer

Gapeworm infestation is mostly noticed because the chicken will literally gape. Not just once, but frequently going on time after time. On

opening their beaks in a gasping manner they show signs of respiratory distress due to damage to the lungs and the trachea, caused by the worms. As well as gasping for breath, depression and head shaking in an attempt to remove the worms is also seen. The chickens will lose weight and will finally die.

Way of infection:

The life cycle of the gapeworm is similar to that of the Roundworm; the parasite can be transmitted when birds eat embryonated worm eggs but more often by eating Earthworms containing the gapeworm larvae.

Cestodes

The large Tapeworm (*Raillietinae*) and the small Tapeworm (*Davainea proglottina*)

Tapeworms are flattened, ribbon-shaped worms composed of numerous segments. Each of the segments can produce eggs. Sometimes you can see a segment of the tapeworm in the droppings or hanging out of the bird's cloacae. They are of a white or yellowish colour, looking a bit like flat rubber bands. The large Tapeworm can be some 15 cm (6 inches) long.



Large Tapeworm (left) and small Tapeworm (below right) Photos: GD Deventer

Small Tapeworms are very small (only 2 to 5 mm) and careful examination is often necessary to find them.

Tapeworms are not as prevalent as



roundworms and Hairworms.

Large Tapeworms are not very pathogenic; the damage tapeworms produce in poultry is controversial. On the contrary, small Tapeworms are very pathogenic and cause weight loss, anaemia, general enfeeblement and death.

Method of infection:

Tapeworms also spend part of their lives in intermediate hosts, being mainly snails (small tapeworm) and beetles (large tapeworms).

Free range chickens can easily become infected by eating the intermediate hosts; chickens that are kept in runs hardly do.



**Left:
Caecal worms
(Heterakis) from
a chicken's caeca.
Photo:
Francisca Velkers**

Treating worm infestation

Many poultry keepers treat their chickens with routine medication against worms. But this is not always necessary! Giving a treatment does not only imply that you remove possible worms, but also that you disturb the balance that is between a healthy chicken and worms.

Personally I am against preventive worm medication if there is no reason for that. Apart from the fact that you will disturb the chicken's resistance against worms, I simply think it is needless to put up your chickens 'hit or miss' with medicine.

Some poultry keepers worm on a regular basis, say every two months. This is absolutely useless, because worms don't have a chance to cause an infestation in such a short time. Generally it takes 3 to 6 weeks before the infective eggs can develop into adult worms. So it will take quite some time before an infestation is serious enough to cause the chickens to fall ill.

On the other hand, when the chickens are suffering from worm infestation, you have to worm them. There are several wormers on the market which have to be mixed with the drinking water or the food.

Right: It is also possible that the chicken is infested with different worms; this is called a mixed infection. In the photo you see a mix of roundworms and large tapeworms in the bowel.

Photo: GD Deventer



Some useful tips

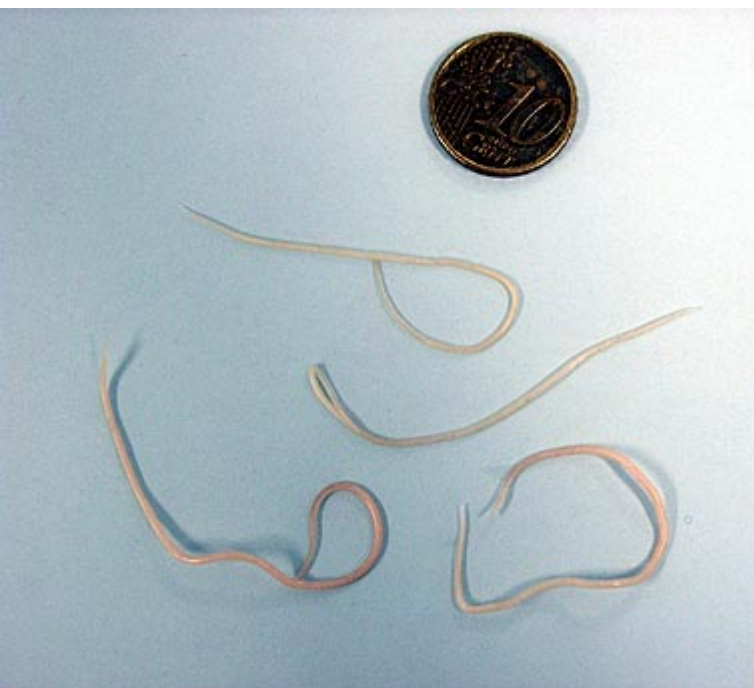
Wormers that have to be mixed with the drinking water cannot be recommended for free range chickens that will probably have excess to other drinking sources (like puddles, pools and ponds, other waterers and such). Because of that the chickens will not drink enough of the water with the wormer, so get too small a

dose and the treatment will not catch on. In this case you had better keep your chickens housed temporarily or choose another wormer.

The wormers that have to be mixed with the feed are made to worm the chickens during the course of the treatment. This method is very effective, if only you see to it that a sufficient amount of feed is provided, preferably unlimited. If only an adjusted amount of feed is provided, the chickens that are highest in rank will eat more than the lower ranked



chickens, giving the latter too little (and these are most probably the chickens that suffer from worm infestation). During the treatment the chickens must not be given extras like green feed or be able to eat grass because they will eat less of the medicated food then, in which way the treatment will not catch on due to under-dosing.



Left: Large roundworms, together with a 10 eurocent piece to compare the size.
Photo: Francisca Velkers

Apart from the medicines that are mixed with the drinking water or the food, there are also wormers that are given to the chickens orally or by injection. However, all these treatments are not developed or approved for chickens. This means that proper worming of the chickens is not proved and also unknown is how long possible residues of the medicine will be found in meat and eggs.

To prevent possible residues of the medicine in the meat and/or eggs, most medicines have withdrawal times as stated on the labels of the products. The withdrawal time starts when you stop using the product and during the recommended time (as well as during the cure!) you should not eat eggs or meat of the treated chickens. However, one often uses medicines that are not particularly developed for chickens and so there is no written withdrawal time. In those cases you had better inquire at your vet's.

In The Netherlands only flubendazol (as in 'Flubenol) is approved for chickens by the Food and Drug Administration (and this medicine has no withdrawal time for eggs when dosed at the suggested rate), so for all other medicines you have to inquire at your vet's.

When the chickens have suffered a lot from worm infestation it is recommended to supply them with some extra vitamins after the wormer treatment.

Except from treating the birds it is certainly recommended to clean the chicken house as well and if possible, to dig up the run regularly. Worm eggs don't die from cleaning with disinfectants. So it is better to clean the surface with a high pressure cleaner or a steamer. Also giving the floor a good scrub with a brush will be very effective. And for those who have the possibility: burning the soil with a flame-gun works wonders!



How to identify worm infestation

When a chicken shows symptoms of worm infestation, then it is not always clear what kind of worm is involved.

To make sure, the first thing to do is bring some fresh droppings to your vet. By means of a microscopic investigation the vet can determine if there are worm eggs in the droppings. Beforehand you had better inquire at the vet's about how to collect the droppings.

In this way you can diagnose not only which worms are involved, but also if worming is necessary. This depends on the species and the number of eggs that are found. In some cases the eggs are counted (not every vet does this) and it is advised to worm when the number of eggs increases a certain amount.

Some extra remarks

Diarrhoea in chickens will sometimes cause some confusion. Often the droppings from the caecae are seen as diarrhoea. The caecae of chickens is emptied once a day. Because the 'common' droppings are produced much more often and the 'caecae-droppings' are soon trodden on, the poultry keeper will not often see these faeces. It looks a bit like a brownish coloured fudge crème; it contains no white (urine) part or any food parts and has a really specific odour. When these caecae-droppings are yellowish or orange brown and frothy, this can point to a caecae problem.

The other droppings are from the bowel; these are the droppings that are most seen in the pen. They come as little droppings topped with some white, which consists of uric acid. They are mostly light brown coloured and may contain undigested food parts and can even be slightly greenish when the chickens have eaten green feed or grass. If we don't see nicely formed droppings but a flat, thin mass (beware; not the caecae droppings!) then this is diarrhoea. It will often stick to the vent feathers and dirty the eggs.



Left: This is very obvious a case of diarrhoea. In this photo, several roundworms are also clearly to be seen.

To end with

Another subject of confusion is the orange red little strings that are sometimes found in the chicken's droppings. These little orange strings look like worms, but they are not!

It is a form of mucus from the bowel. When the bowel does not function well and there is insufficient uptake of nutrients, parts of the mucous membrane will die and pass in the droppings. As the bowel can also not digest pigments like carotene, these little strings are coloured orange-red.



Left and below left: no worms, no blood either, but orange-red coloured little strings of bowel mucus. As many strings as on the second photo is not often seen.



Beware! This COULD occur because of a worm infestation or coccidiosis infection, but not necessarily. So if you notice this regularly, we advise you to have it investigated by your vet, to find out if it may be caused by worms or coccidiosis. Other causes can be bad nourishment or a bowel infection.

But if you only see these typical droppings once in a while you should not worry, as it often is quite harmless.

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