

Some Questions and Answers About "Worms" in Chickens and Turkeys

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THERE has been an increasing demand by the poultry producers of Oregon for information on "worms" that infest chickens and turkeys. The Oregon Agricultural Experiment Station and many other institutions have conducted numerous studies that have contributed knowledge for the control of the common animal parasites of chickens and turkeys. The results of these studies furnish the basis for this circular, which is prepared in a question and answer style. Poultrymen who do not find time to read the entire circular may find it convenient to refer to the answer following a particular question with which they are concerned.

1. What are "worms"?

To most poultrymen the term "worms" refers to the common roundworm (*Ascaridia lineata*) and tapeworms (several different species) that infest the small intestine, and the small pinworm (*Heterakis gallinae*) that infests the ceca. A more correct and applicable term for such worms is "animal parasites of the intestinal tract." There are other less common animal parasites that infest birds that may also properly be considered under the common term, worms.

2. What is a vermicide?

The term vermicide refers to any agent or drug that kills intestinal parasites (worms).

3. What is a vermifuge?

The term vermifuge refers to any agent or drug that expels worms from the intestinal tract. In this case the worms may not necessarily be killed.

4. What is the first step to take if one suspects a worm infestation in chickens or turkeys?

Have a veterinarian or some competent person perform a post-mortem examination on two or three affected birds. This is necessary to determine the kind of worms present and the extent of the infestation so that sound advice may be given.

5. Are roundworms and tapeworms the cause of much loss to poultry producers in Oregon?

At present the loss is quite small when considering poultry losses in general. A few individual producers, however, have sustained heavy losses. Roundworm infestations in the turkey flocks of Oregon have been on the increase during the past few years because of improper use of the turkey range.

6. What does the common roundworm look like? (See Figure 1.)

The mature roundworm varies from about 1 to 3½ inches in length and

both ends taper. They are about the diameter of a piece of baling wire and because of their structure and general appearance may be referred to as "wire-worms." They are usually ivory-white or cream-colored and are found most

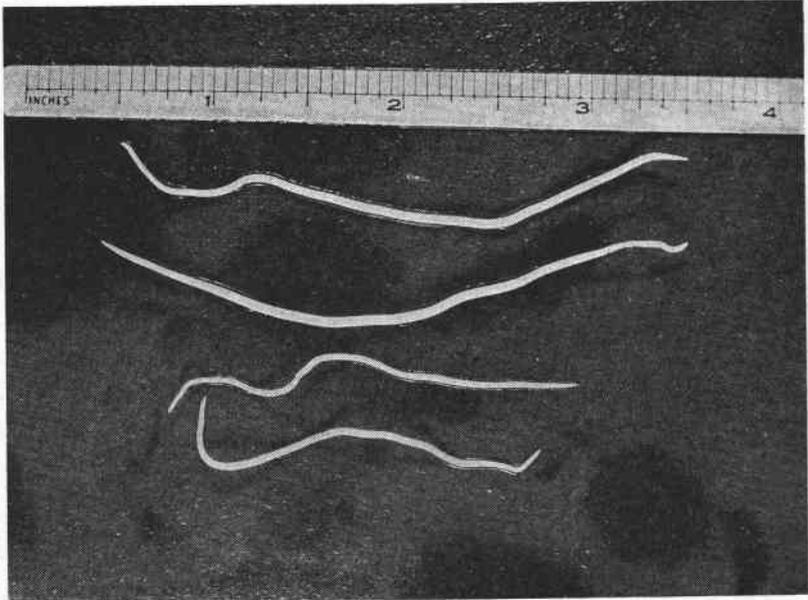


Figure 1. Common roundworms (*Ascaridia lineata*) that infest the small intestine of chickens and turkeys. Two females (above), two males (below).

commonly in the small intestine. The male worms are shorter and smaller than the females.

7. Do young growing birds suffer more from an infestation of roundworms than mature or near-mature birds?

Yes. The younger the birds are when they are infested the more severe are the effects on the birds. The number of worms that infest a bird at one time also has an influence on the severity of symptoms produced. A mature bird may become infested with a few roundworms without causing any noticeable effect on its health, while a young bird 6 to 8 weeks old infested with the same number of worms might become a cull as a result of the infestation.

8. What are the symptoms observed when young growing birds become infested?

Young growing birds become generally unthrifty with unkempt plumage. The hackle feathers become ruffled and appear to stand out from the neck. The infested birds lose their appetites. There is loss of body weight and growth is retarded if the infestation is allowed to remain in the bird over a period of time. It must be kept in mind that these symptoms may appear when birds are affected by other diseases, so they cannot be considered diagnostic.

9. How does the common roundworm reproduce?

The female deposits eggs that are microscopic in size in the intestinal contents. The eggs are discharged from the bird when the droppings are passed. At this time the freshly passed eggs are incapable of growing into worms if picked up by a susceptible bird. Under favorable conditions of moisture and proper temperature, an embryo worm will develop within the worm egg in approximately 2 weeks. If a susceptible fowl eats a fully embryonated worm egg, the young worm (larva) is released from the egg and develops in the intestinal tract where it reaches maturity and may start to lay eggs after about 2 months.

10. What treatment is recommended for a flock of chickens or turkeys that are heavily infested with roundworms?

The most effective treatment for roundworms in the small intestine is nicotine sulphate. It may be given to individual birds in tablets or pills or it may be mixed with the mash and given as a flock treatment.

11. What kind of tablets are recommended for the individual treatment of the common roundworm and where may they be obtained?

Several companies produce nicotine sulphate tablets or pills that may be obtained from veterinarians, drug stores, and poultry supply and feed stores. It is advisable to use tablets that are recommended for the elimination of roundworms only, rather than tablets that are a mixture of several drugs and recommended for several different kinds of worms.

12. How should the individual treatment be given?

Directions for dosage and other details are included with each package of tablets. These directions should be followed closely. Make certain that the proper dosage is used. It will make a difference whether young growing chicks or poults or mature chickens or mature turkeys are being treated.

Individual treatment of an entire flock of mature chickens or turkeys is usually not necessary. The flock may be culled and the birds that appear out of condition may be segregated and given individual treatment.

When birds are given individual treatment for roundworms, they should be confined to the house. In case turkeys are outside, a small corral bedded with straw may be used to confine the birds for 3 or 4 days after treatment. The droppings passed during this period should be cleaned out and burned to make certain of destroying the millions of worm eggs that might otherwise contaminate the soil of the range.

13. How should flock treatment for the common roundworm be given?

Several concerns prepare nicotine sulphate in a powder or granular form for mixing with the poultry mash. The directions for mixing and feeding are included with each package.

For flock treatment through mash, tobacco dust has been quite effective. It is prepared by mixing 2 per cent by weight of tobacco dust, with a nicotine sulphate content of at least 1.5 per cent, into the regular poultry mash and feeding this treated mash for a period of 2 or 3 weeks. The nicotine sulphate in tobacco dust is not very stable so it is advisable to prepare only enough treated mash to last a few days at a time. The tobacco dust should be kept in an airtight container with tight-fitting cover.

If the flock is given treatment in the mash and allowed to remain on the contaminated range, the birds will reinfest themselves. It is desirable, therefore, when flock treatment is given to move the birds on to clean range as soon

as the treated mash is discontinued. It should be understood that treatment is used to assist in correcting an already bad roundworm infestation but is not useful to prevent the birds from becoming infested.

14. Can serious roundworm infestations be prevented in chickens and turkeys?

Yes.

15. How?

By adopting a program of range rotation and sanitation that will reduce contamination. One of the most important places that becomes contaminated is the growing range. Using the same range year after year may build up a heavily contaminated range. It should be understood that most roundworm infestations need not become serious unless the poultryman fails to heed the warning when a few roundworms are found in the intestine of vigorous healthy birds. Although a few roundworms may not seriously affect the health of the birds, the danger lies in not planning to prevent the accumulation of contaminated droppings over a period of time. Too often action is not taken until after the birds are suffering from a heavy infestation. The growing range for turkeys as well as for chickens should not be used more often than once every other year. The range should have a full 12 months or more rest. During this time it may be cultivated to grow a crop but care should be taken not to use chicken or turkey manure as fertilizer.

16. Why can some poultrymen raise birds on the same range year after year and have no trouble from roundworms?

It is recognized that some poultry raisers use the same range year after year with no trouble. Naturally, if the worms are not introduced on to the place there will be no trouble from worms. These suggestions apply to those places where roundworms are found in the birds and there is likely to be trouble from an accumulation of contamination over a period of time. Each poultry raiser should consider the roundworm problem in the light of his own

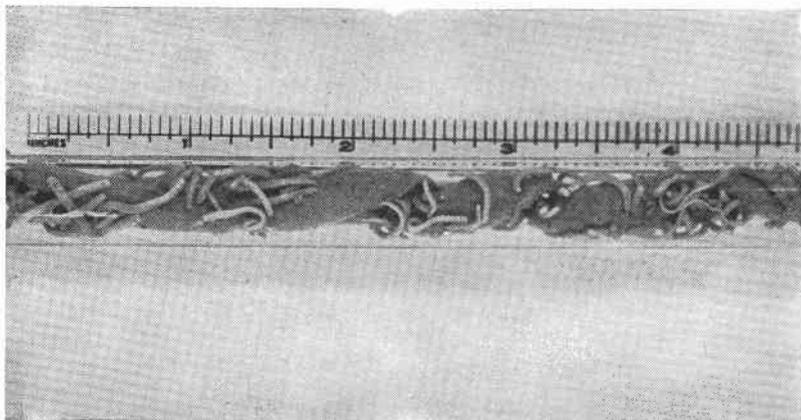


Figure 2. Tapeworms (*Choantaenia infundibulum*) attached to the mucous membrane or lining of the small intestine of a chicken. The intestine has been split open to expose the worms. Note the segments.

conditions and not expect to avoid trouble simply because some neighbor or friend has raised poultry for years without having trouble.

17. How may roundworms be introduced on to a poultry farm?

There are many ways by which roundworms may be brought to a poultry farm. Visitors or the poultryman himself may carry embryonated worm eggs on footwear from an infested poultry farm to a clean one. Bringing on to the farm partly or fully matured birds that are infested may also introduce the parasites. These are perhaps the most common means of transmitting an infestation of roundworms. There are many other possibilities such as worm eggs being carried by wild game or free-flying birds, streams that flow through contaminated ranges, various insects or bugs mechanically carrying the eggs, and borrowed equipment such as roosts, feeders, crates, etc., that are not thoroughly cleaned.

18. What do tapeworms look like? (See Figure 2.)

There are several different kinds or species of tapeworms and they vary greatly in size. Some are so small they are not readily seen without the aid of a microscope. Others may be 8 to 10 inches in length. Tapeworms in general are milk-white or cream-colored and are made up of numerous segments. Because of this segment arrangement some tapeworms appear like a string of beads. The head of the worm is usually attached to the mucous membrane or inner wall of the small intestine. Starting at the attached or head end the segments are quite small and may be indistinguishable one from the other, but they keep getting larger and toward the free end of the worm individual segments are prominent. This is true whether the tapeworm is of a species that is short or one that is long when mature. There are no male and female tapeworms. Each segment contains male and female sexual organs and the eggs develop and are fertilized in the segment.

In some tapeworms segments are constantly growing out from the head and those at the free end of the worm develop into mature segments with eggs. The mature or ripe segment may break loose from the worm and be passed out in the droppings. On freshly passed droppings these small segments, about $\frac{1}{8}$ to $\frac{1}{2}$ inch long, may be seen stretching and contracting.

19. Will these freshly passed segments develop into tapeworms if they are eaten by a chicken or turkey?

No.

20. How do tapeworms reproduce?

Starting with the mature tapeworm in the small intestine either the mature segments filled with eggs break free from the rest of the worm and pass out with the droppings or the eggs are released from the mature segments in the intestine where they mix with the food in the intestine and are passed out with the droppings. In the droppings outside the bird the tapeworm eggs will not develop into a stage that will become a tapeworm unless they are picked up by a suitable intermediate host such as a bug, insect, slug, snail, slug, or earthworm. When the eggs are consumed by the proper intermediate host they develop into a cystic stage that contains a young head of a tapeworm. In this cyst stage the parasite may live for a long period of time or until after the intermediate host dies. When a susceptible bird eats an insect, slug, earthworm, etc., that is serving as an intermediate host for a tapeworm cyst, the cystic stage is released in the intestine of the bird and may develop into a mature tapeworm.

This type of life cycle is often referred to as an indirect life cycle while the life cycle of the roundworm is referred to as a direct life cycle.

21. Is there an efficient practical vermicide for all tapeworms that may infest chickens or turkeys?

No. In general the efficiency of tapeworm treatments is quite low against many species of tapeworms. The fact that segments may be seen in the droppings following the use of a tapeworm remedy does not necessarily mean that the entire tapeworm has been removed. In many instances the head is still left attached to the mucous membrane where it may proceed to grow a new group of segments.

22. How should a flock of mature laying hens infested with tapeworms be handled?

Cull the flock of all nonproducers and birds that lack condition. Keep the birds confined to the laying house. Provide the birds with a well-balanced ration. Supplemental feeding of moist mash or pellets may be helpful in stimulating food consumption. Supplying a well balanced ration and using supplemental feed will often improve the general condition and health of the birds and frequently many tapeworms may be shed in the droppings.

There is no justification to use a worm treatment on a flock of birds in egg production merely because tapeworm segments are observed in the droppings or a few tapeworms are found in one or two birds on post-mortem examination.

23. Can tapeworms be controlled in young birds on range?

Yes.

24. How?

A system of range rotation similar to that suggested for roundworm control will succeed in most cases. Do not crowd the young birds on range. Place mature birds in the laying house and keep them there. Develop a program of fly control supplemented with fly traps and poison. Frequent cleaning of the dropping boards will reduce fly breeding places. In the case of a heavily contaminated range it may be necessary to keep the birds away from such a range for 2 years to break the cycle effectively. Poultry litter should not be used on a range to be used for rearing young birds.

25. Is the small pinworm of the ceca a cause for loss of chickens and turkeys in Oregon?

No. During 17 years of post-mortem examinations at the Poultry Disease Laboratory there has not been a single case in which pinworms were considered the cause of loss. It may be assumed, however, that should young birds become extremely heavily infested with pinworms they might cause symptoms and loss.

26. What does the pinworm of the ceca look like? (See Figure 3.)

The pinworm of the ceca (*H. gallinae*) is a small stiff worm. It is about $\frac{1}{4}$ to $\frac{1}{2}$ inch long and is usually of an ivory-white color. Because of its location, size, and rigid structure the worm has been commonly called "cecal worm" or "pinworm." One end is often acutely curved back on itself to make an eye or head to the pinlike worm.

Because of the small size these parasites may not easily be seen in the cecal feces unless there is a heavy infestation.

27. What is the life cycle of the pinworm?

The life cycle is direct for the pinworm and is quite similar to that of the large roundworm as given after question 9.

28. **Are pinworms of the ceca important as a factor in the transmission of blackhead in turkeys?**

Yes. The egg of the pinworm may carry and protect the otherwise fragile parasite that causes blackhead in turkeys. Turkeys that eat pinworm eggs that carry the blackhead organism may become infected.

29. **Does the control of the pinworm help to control blackhead infection?**

Yes. The control of pinworms, however, does not necessarily insure against blackhead infection.

30. **How may pinworms be controlled?**

The rotation of ranges suggested for roundworm control will also control the pinworms.

31. **Is there a satisfactory treatment for the pinworm of the ceca in chickens and turkeys?**

Yes. The tobacco dust flock treatment as suggested following question 13 is quite effective. Recent experiments have shown that phenothiazine is an

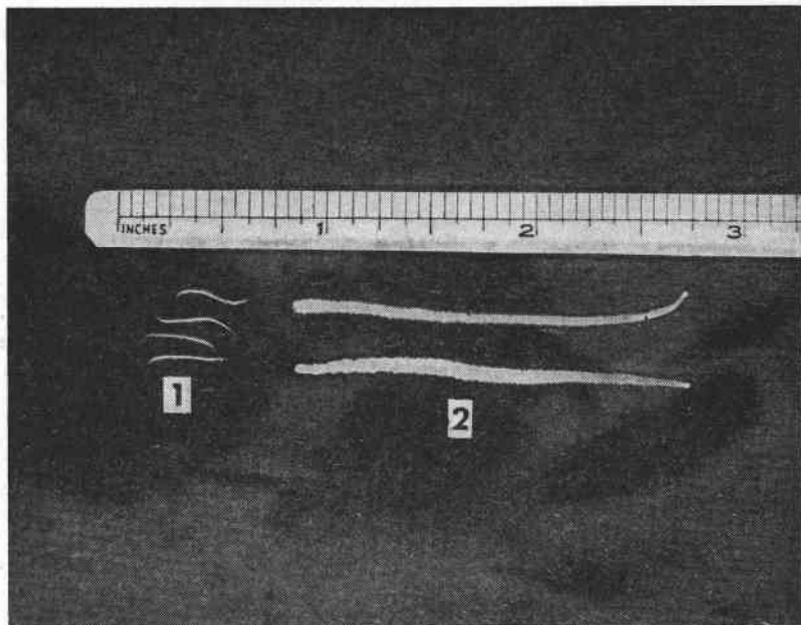


Figure 3. Pinworms of the ceca (1) and tapeworms (2). The small end of the tapeworm has the head, which attaches to the lining of the small intestine with suckers and hooks.

effective treatment for pinworms. Phenothiazine is apparently not efficient in the removal of the large roundworm from the small intestine.

A flock treatment of phenothiazine is easily given by feeding treated mash

for a period of 10 to 14 days. After 3 or 4 weeks the treatment may be repeated. Continuous feeding of treated mash is not advisable.

For mixing, the regular mash should be used at the ratio of $4\frac{1}{2}$ pounds of phenothiazine to each ton of mash. Smaller lots may be mixed at the ratio of $3\frac{1}{2}$ ounces of phenothiazine to each hundred pounds of mash. Only phenothiazine that is prepared and labeled for treatment of livestock and poultry should be used.

32. As a routine practice is it desirable to give chickens or turkeys a treatment for worms at regular or periodic intervals?

No. Promiscuous treatment of birds for worms without first determining whether the birds have worms and what kind are present is not advisable. Such a procedure is expensive and is of no value to a flock of birds that are not infested. Further, repeated worm treatments may actually prove harmful and affect the rate of lay of birds in heavy egg production.

33. What is a summary statement about worms in chickens and turkeys?

To summarize, worms or animal parasites of the intestinal tract can be controlled and in many instances prevented by proper range management and by avoiding the common methods of introducing the parasites on to the ranch.

Worm treatments may be poisonous and actually cause more damage to the birds than the worms unless they are used according to the directions of the manufacturer. Treatments at best are just a means of making the best of an already bad situation.