

Basic Studies Helping Pinpoint Location of Blackhead Parasites

Basic studies are helping pinpoint location of blackhead parasites in turkeys. This should lead to timing of drugs to knock out the organisms when they are most vulnerable.

Much of the USDA work on this costly and serious disease is being carried on with a harmless strain of the blackhead parasite. Use of this strain has helped researchers to turn up other new and useful information on disease aspects that are obscure when the disease is severe.

Blackhead is caused by a microscopic parasite — *Histomonas meleagridis* — that attacks the two ceca (blind gut) and liver of turkeys and sometimes chickens. The histomonad spends part of its life in the eggs of the cecal worm, *Heterakis gallinae* — a parasite that's commonly found in the ceca of turkeys and chickens.

Cecal worm infected birds pass large numbers of microscopic eggs in their droppings. If the birds have blackhead, these worms' eggs may carry histomonads. Turkeys and chickens acquire blackhead by swallowing the infected worm eggs with soil, feed, or water. Infected turkeys may die in large numbers. Losses result also from slow gains, marketing delays, and carcass down-

grading.

Chickens are not very susceptible to blackhead but may carry cecal worms, which are parasitized by the histomonads. If chickens and turkeys are raised together, susceptible turkeys can easily acquire blackhead.

Several years ago, ARS researchers at the Agricultural Research Center, Beltsville, Md., found that some of their turkeys had blackhead organisms but showed no symptoms and thrived normally. Variations in virulence of the blackhead parasite had long been recognized, and Beltsville scientists at first thought the strain was merely attenuated or weakened.

Research with 600 turkeys and 300 chickens for three years proved it was a true—but harmless—strain of the blackhead organism. The only obvious differences are that the harmless form is generally larger and has more flagella (whip-like structures).

Work with this non-pathogenic strain is helping parasitologist Everett Lund and associates to study, among other things, the probable timing of medication in relation to the life cycle of the worm and histomonad.

It's important to know when to treat infected birds, what kind of



SEVENTY-TWO WESTERN EWES from the Sand Hills of Nebraska are getting use to the rolling hills of Lancaster County this week. They were purchased by Robert Harnish, R2 Conestoga, to develop a commercial herd. He has a herd of Shropshires and plans to use his Shrop-

shire rams to produce the lamb crop. Helping unload the ewes was County Agent Max Smith, who made arrangements for the sale and delivery. The rest of the car-load of 211 went to Juniata, Adams and York Counties. (LF Photo)

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drugs to use, how to use them, and for how long. For instance, medication can be used to destroy either the cecal worm or blackhead parasite.

To be really effective in controlling blackhead by acting on the cecal worm, drugs must do one of several things: (1) kill the larvae before they get in the cecal membrane, (2) weaken cecal worm eggs so larvae are less viable, (3) toughen cecal worm egg shells so larvae can't get out, or use up their energy in doing so and thus are less viable, (4) kill the larvae in the cecal wall. The latter might be accomplished by using drugs easily absorbed by the cecal membrane but harmless to birds.

Presently used medication against the cecal worm is partially effective. It keeps the worm from maturing. Although worm numbers are reduced by such treatment, it must be continued for several years in order to eliminate the disease. The hardy cecal worm eggs can survive on or in the soil for two or three years.

One of Lund's aims is to find out when and how histomonads get into and out of cecal worm eggs. Such knowledge would enable use of drugs at a specific time to destroy the histomonads before they find refuge in the worm eggs or cecal wall.

To get this information, Lund is feeding turkeys worm eggs carrying either no histomonads or only the non-pathogenic strain. After three to six weeks, pathogenic histomonads are injected rectally. The birds are slaughtered no sooner than 30 days after the first dosage. This allows time for the worms to mature. Then the worms are removed from the ceca and eggs are removed from the worms.

So far, all eggs collected have either been free of histomonads or have carried only the non-pathogenic histomonads — the kind originally introduced. Lund is gradually narrowing down the time between doses so infection will take place. Thus, he can establish the time the pathogenic histomonads enter the worm egg. Basic information on immunization is also coming out of this work.

Indications are that the histomonad usually leaves the worm egg after the worm enters the cecal membrane. And it looks as if the histomonad is carried within the larval worm — not merely within the egg shell.

The cat is apparently resistant to botulism, but it can carry the disease — causing organisms and spread the disease after death if the carcass comes in contact with animal feed, the American Veterinary Medical Association says.

A long, dry, whistling cough increasing in severity may indicate that a dog is suffering from a lung infection by a yeastlike fungus. The organism can infect man, the American Veterinary Medical Association reports.

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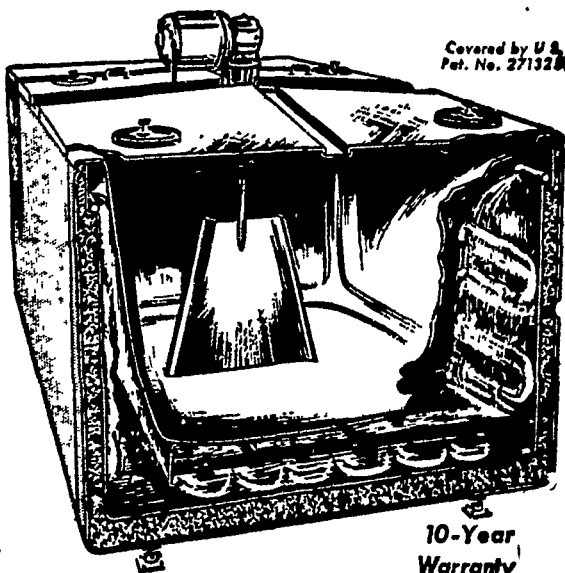
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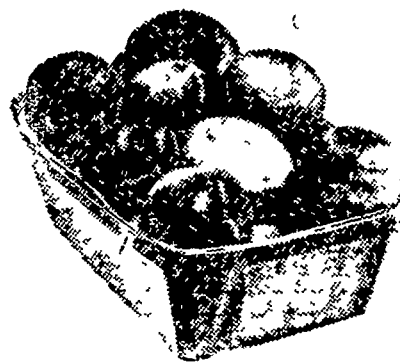
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