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Trichomoniasis of Turkeys

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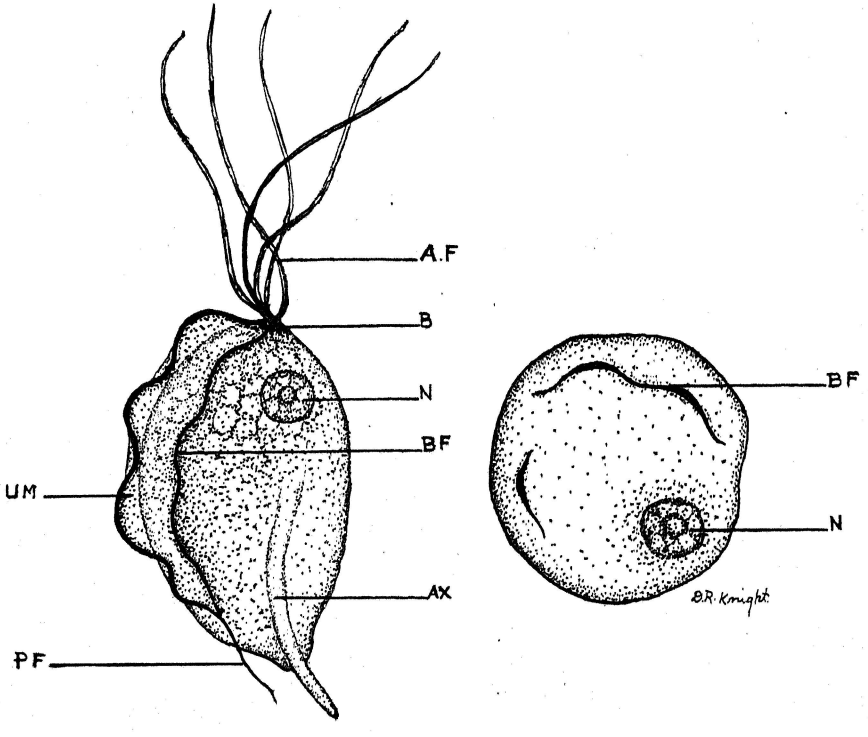
SUMMARY

1. Trichomoniasis of turkeys has been the cause of heavy losses in this state during the past few years. The cecal form of the disease is most prevalent.
2. Experiments have shown that birds affected with trichomoniasis have a marked depletion of Vitamin A.
3. Turkeys fed on a high Vitamin A diet are more resistant to the disease.
4. A diet consisting of ground oats, yeast, and cod liver oil, as outlined, is reasonably successful for controlling an outbreak of trichomoniasis.
5. An aniline dye, gentian violet, is helpful in treating severe cases of trichomoniasis.



Motile Stage
AF—Anterior flagella
B—Blepharoplast
N—Nucleus
BF—Basal fiber
AX—Axostyle
UM—Undulating membrane
PF—Posterior flagellum

Quiescent Stage
BF—Basal fiber
N—Nucleus

Fig. 1.—Drawings of live trichomonads (greatly enlarged). *Left.* The motile or active stage commonly seen in fresh preparations. *Right.* The quiescent stage of the parasite. (Although Allen reports one short and four long flagella, this anatomical feature was not observed in these studies. *Proceedings of the Helminthological Society of Washington,* Vol. 7, No. 2, July, 1940.)

Trichomoniasis of Turkeys*

D. R. KNIGHT, H. C. MCDOUGLE, A. J. DURANT

Trichomoniasis of turkeys and chickens was observed in Missouri for several years prior to 1938. The disease had been increasing to an alarming extent in the turkey flocks in this state, and in many cases was causing serious losses. A survey showed that infection was present in 35 per cent of Missouri turkey flocks.

NATURE OF DISEASE

Trichomoniasis is a protozoan disease of the digestive tract and liver of turkeys, chickens and other fowls. It appears to be perpetuated by birds which pass through an attack of the disease and become carriers. Young growing birds when exposed directly to these carrier birds or indirectly by flies quickly contract the disease and unless control measures are instituted heavy mortality may be expected. There are apparently several different species of the trichomonad but the one causing greatest losses in Missouri is found in the lower digestive tract, particularly the ceca. The liver may also be affected. Very little trichomoniasis of the crop is reported in this state, though it is common in California and some other states.

AGE OF BIRDS AFFECTED

Turkeys from 3 to 18 weeks of age are most susceptible to this disease. However, the heaviest mortality occurs in those 10 to 12 weeks of age, and mortality is very high (50-70%) if nothing is done to control or prevent its spread. Though older birds may become heavily infected, the loss will usually be low. However, the resultant loss in weight and vigor is very often a serious handicap to the turkey producer.

SICK BIRDS LOW IN VITAMIN A

During the course of this research it was observed that birds affected with trichomoniasis were invariably greatly depleted in Vitamin A. This observation led to some experiments concerning artificial or laboratory growth of these parasites upon a special culture media. This culture media containing a relatively high per cent of Vitamin A was found suitable for the multiplication and growth of the trichomonad. This observation, coupled with the knowledge of Vitamin A deficiency, suggested the possibility of a nutritional factor being directly associated with trichomoniasis.

*The Missouri Turkey Growers Association has cooperated in this study by paying part of the cost.

A spectrophotographic analysis of the livers of healthy birds compared to those sick with trichomoniasis confirmed the observations that sick birds were actually suffering from a deficiency of Vitamin A.

Experiments have also shown that birds on an extremely high Vitamin A diet seemed to tolerate great numbers of the parasites in the digestive tract without coming down with the disease, whereas birds on a low Vitamin A diet became sick and died. From these observations and experiments it was concluded that any reasonable diet high in Vitamin A might be successful in combatting trichomoniasis. A successful diet for the control of trichomoniasis has been devised and will be explained under control measures.

SYMPTOMS

The outstanding symptoms of trichomoniasis are loss of appetite, peculiar tucked-up position of the crop region, foamy browning droppings, weakness, peculiar chirping sounds, and indications of being chilled. In general, the younger the bird the more quickly it will die with trichomoniasis; the older the bird the more resistant. Very young birds may die 3 or 4 days after an attack, while older birds may live for several weeks, and in still older birds none may die, but as has been previously mentioned they may show loss of appetite, weight and vigor. Some of the symptoms of Vitamin A deficiency are invariably present. Fig. 2.

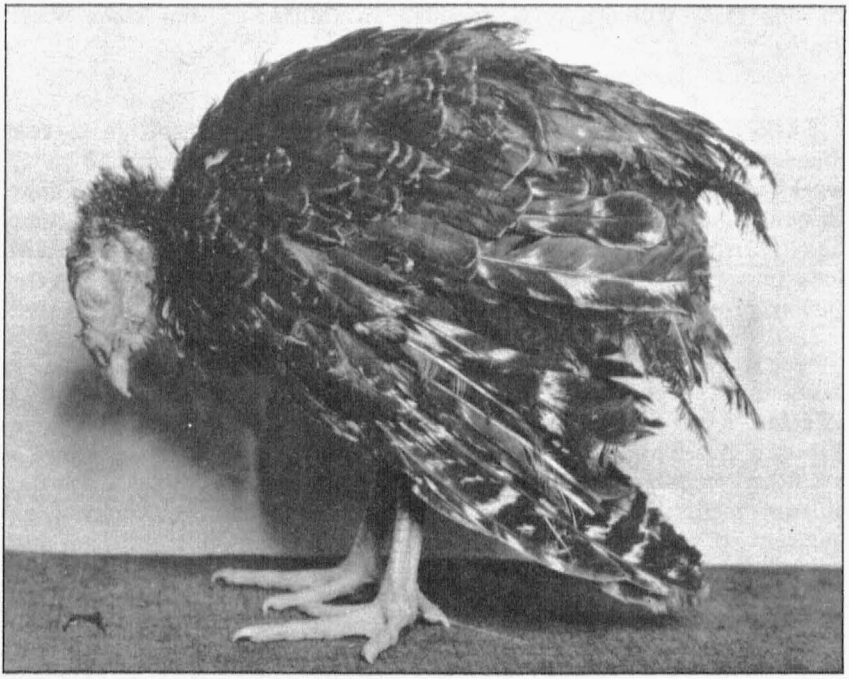


Fig. 2.—An advanced case of trichomoniasis in a nine-weeks old poult.

DIAGNOSIS

The diagnosis of this disease in the field is somewhat difficult and uncertain, since there are other diseases which might be mistaken for trichomoniasis. It is much better; therefore, to submit (by prepaid express) sick birds to the veterinary department of the Missouri Experiment Station for examination and diagnosis. A diagnosis may easily be made by a microscopic examination of the fresh, warm droppings. The trichomonads are seen as small, pear-shaped motile bodies, showing a typical rolling movement (Fig. 1). The parasite loses its motility soon after the death of the bird. However, in the field if young birds become sick in ten days after they are hatched and show the symptoms described, this disease may be suspected, though it is well to have a definite diagnosis in order to distinguish it from such diseases as coccidiosis, pullorum disease, and in older poults, blackhead.

POSTMORTEM EXAMINATION

Postmortem examination of affected birds may show a slight inflammatory condition of the lower intestine and ceca, though in older birds there is no inflammation and usually the only symptom is the foamy cecal contents, unless the liver is involved. However, when

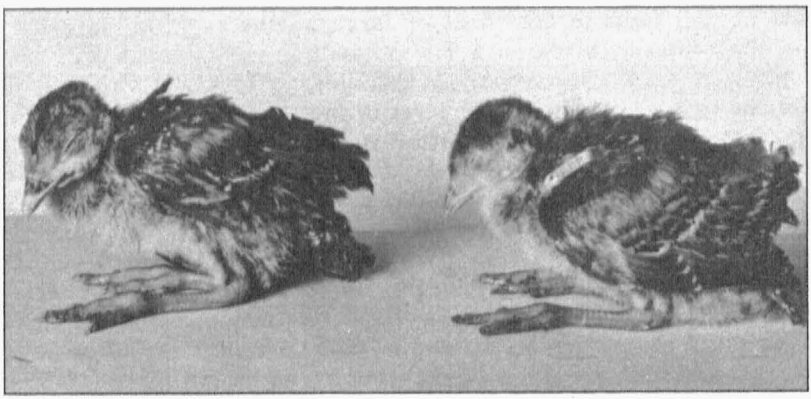


Fig. 3.—Three-weeks-old poults affected with Trichomoniasis. Note the position assumed by the birds by resting their weight on the hocks. This is especially noticeable in young poults.

present the liver changes may be mistaken for blackhead, as the lesions of both diseases when present in the same bird are quite similar. Few liver lesions have been observed in turkeys affected with trichomoniasis in Missouri. If the birds are observed with the changes in the liver it would probably indicate either blackhead or trichomoniasis. A laboratory diagnosis is necessary to determine the disease or diseases present. In some cases both diseases occur at the same time in the same bird.

PREVENTION

The old saying, "An ounce of prevention is worth a pound of cure," can well be applied in the control of trichomoniasis in turkeys. Birds recovering from the acute form of the disease may become carriers of the trichomonad. Young poults readily become infected if they are exposed to these carrier birds or to grounds which have been recently occupied by the carrier birds. In view of this fact young poults should be raised at least a mile or more away from old stock or turkeys which may be carriers of the trichomonad. If possible, separate caretakers and equipment should be provided. Since flies are one means of spreading trichomoniasis, the control of flies on the turkey farm is important. Care should be exercised also to be sure that breeding stock which is purchased is not infected with trichomoniasis. The health of the birds introduced can be determined by flock history and by microscopic examination of the droppings before the birds are introduced on to the uninfected farms. All free-flying birds should be guarded against as much as is practical on a farm, since there is a possibility that they may mechanically carry trichomonads.

TREATMENT OF AFFECTED FLOCKS

As has been mentioned, birds on an extremely high Vitamin A diet are resistant to the effect of large numbers of the parasites. On the contrary, birds on a low Vitamin A diet are readily susceptible and develop symptoms quite early. It is reasonable to assume that a high Vitamin A level in the feed would be successful in combatting trichomoniasis after it appears in a flock.

Flock treatment with a feed containing a high per cent of Vitamin A, and which has proven successful in controlling the disease in a high per cent of cases is prepared as follows: Two pounds of baker's yeast, or other forms of live yeast is added to one hundred pounds of ground whole oats. This mixture is placed in a fifty gallon barrel (either wooden or metal) and enough water added to form a paste having the consistency of molasses. This mixture is placed in a warm place and allowed to ferment over night (twelve to fifteen hours). At the end of this time five pints of high grade cod liver oil, or one pint of high biological assayed fish oil (3000 international units of Vitamin A per gram) is added to the fermented paste and mixed thoroughly. The mash is then fed in troughs to poults, all they will consume in twenty or thirty minutes.* Rinse the troughs with clean water after each feeding to control flies. Feed this mash three or four times a day for a week or ten days or until the poults show a marked improvement. Keep the regular starting or growing mash before the poults at all times. Never ferment more mash at a time than can be consumed by the poults in one day. If the poults

*This mash without the cod liver oil was developed by Capt. J. Brohan, Manager State Prison Farm, Claysville, Missouri.

do not relish the fermented mash it has been suggested that enough dehydrated alfalfa leaf meal be added to the fermented mash to make a crumbly mixture. The addition of the alfalfa leaf meal seems to increase the palatability of the mash for the birds in some of the affected flocks.

TREATMENT OF ADVANCED CASES

The loss of appetite is one of the problems in the control of this disease, since poults will often refuse to eat and become so weak they finally die from starvation. It is necessary, therefore, to hand-treat these birds individually. There are two recommended procedures. One is to give gentian violet as a medicine and the other to force feed. Experiments have shown that gentian violet, which is an aniline dye, kills the trichomonads in the digestive tract. This dye stains the intestinal wall and fecal material a deep violet color. Gentian violet may be obtained from most drug and chemical supply houses. The dye is tolerated by the poults in rather large doses but it has been found that smaller doses given every other day (3 doses) for a period of six days is most effective.

Fig. 4.—Two-ounce bulb syringe with an eight-inch hard rubber nozzle. It is used for administering the gentian violet solution, or the thin yeast food.

For the intestinal form of trichomoniasis the drug may be administered by two methods. First, by giving orally an enteric coated tablet containing the proper dose; and second, by giving orally a water solution of the dye with a rubber bulb syringe, expelling the solution directly into the crop. The correct dosage for the enteric coated tablet is as follows:

1	lb.	poult	is	given	1/16	grain	of	gentian	violet*
3	"	"	"	"	1/8	"	"	"	"
5	"	"	"	"	1/4	"	"	"	"
8	"	"	"	"	1/2	"	"	"	"
10	"	"	"	"	1	"	"	"	"
12	"	"	"	"	1 1/4	"	"	"	"

Give every other day until three doses have been administered.

*At present the enteric coated gentian violet tablets can be obtained in ½ grain tablets. The tablets may be divided to obtain the desired dosage. The cost is about ½ cent per bird.

If the water solution of gentian violet is to be used a stock solution may be prepared in concentration of one part of the dye in one thousand parts of water. (Cauton should be observed, as this dye stains clothing and tissues very heavily.) To make up the stock solution weigh out one gram of gentian violet and add it to 1000 cc, or one quart of water. This stock solution should be kept in a tightly stoppered glass bottle. The proper dosage of this solution is best measured with a graduated cylinder or pipette and poured into a small glass container, such as a cup or a laboratory beaker. This measured quantity is then drawn up with a bulb syringe (Fig. 4) and administered orally to the poults. The dosage table for the solution of gentian violet is as follows:

Poults	weighing	1	lb.	should	be	given	5	cc	of	the solution
"	"	3	lbs.	"	"	"	10	"	"	"
"	"	5	"	"	"	"	15	"	"	"
"	"	8	"	"	"	"	20	"	"	"
"	"	10	"	"	"	"	25	"	"	"
"	"	12	"	"	"	"	25	"	"	"

Give every other day until three doses have been administered.

Of the two methods of administering the gentian violet, it is more desirable to use the enteric coated tablet than the water solution, even though the cost of the enteric coated tablet is somewhat greater.

It should be emphasized, that even though gentian violet will kill the trichomonads by direct contact, this drug will be successful *only as an adjunct* to the method of feeding outlined, and that it should be depended on only under the conditions explained.

After the very sick poult has been given the first dose of gentian violet it is then ready to be force fed. Add enough water or skimmilk to a portion of the fermented mash to form a thin mixture of the proper consistency, which can easily be drawn into the bulb syringe. (The bulb syringe, one or two ounces, should be of rubber and firmly attached to a hard rubber nozzle about six to eight inches in length, Fig. 4.) A sufficient quantity of the diluted mash is then administered to fill the crop firmly. Care should be taken not to overfill and force the feed up the esophagus into the trachea. The poult may be force fed four to six times a day until recovery is sufficient for it to feed normally. Oftentimes a single forced feeding will be sufficient for the bird to resume eating. Again it may take several days of forced feeding to bring about sufficient recovery.

A few birds may fail to respond to treatment if they have had the disease for some time and normal digestive functions are practically lost.

Trichomoniasis of turkeys, chickens, and other birds may become more serious in this state. This publication is no indication that a solution of the problem has been found. Its purpose is merely to present such scientific information as is available concerning the prevention and control of this highly fatal disease of turkeys.