

DOMINION OF CANADA.  
DEPARTMENT OF AGRICULTURE  
HEALTH OF ANIMALS BRANCH

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# ENTERO-HEPATITIS OR BLACK-HEAD

AND THE

BIOLOGICAL LABORATORY SYSTEM  
OF RAISING TURKEYS

BY

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BULLETIN No. 19

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JANUARY 18th, 1916

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## ENTERO-HEPATITIS OR BLACK-HEAD IN TURKEYS.

This disease, first described in 1895 by Dr. Theobald Smith (then Pathologist to the United States Bureau of Animal Industry), has since menaced the very existence of the turkey industry on this continent.

The cause of the disease is a very small microscopic parasite technically known as the "Ameba meleagridis." The parasite invades the liver, and the two blind portions of the intestine known as the caeca. It derives the name entero-hepatitis from the lesions noted in the liver and intestine. The term black-head was first applied as the head of affected birds has a very dark blue or black appearance. The dark appearance is caused by the lesions in the liver and consequently is more prominent about the head.

The losses from this disease have been enormous, and the increase in the price of this very desirable table bird can, we believe, be attributed solely to its ravages. Certain localities in Ontario which supplied eight carloads of turkeys ten years ago are now supplying barely two carloads, and the explanation is that the birds become affected with black-head and die before they become of a marketable age. Many individual losses have been reported to us of ninety per cent and over.

From the information which we have it is evident that there is not a province in Canada where entero-hepatitis or black-head does not make itself felt with more or less severity each season.

These reports of losses coming constantly to our notice confronted us with the necessity of offering some assistance which would have as its ultimate object the restoration of the turkey industry. Experimental work at the Biological Laboratory was first undertaken in 1905. The progress for some years was slow, as many features connected with turkey raising were very imperfectly understood. As we made progress it became necessary to broaden the scope of our investigations, and in 1910 we eliminated the possibility of conveying the infection from the adult bird to the poults by resorting to the artificial incubation of the eggs and the artificial brooding of the poults. This undertaking was in direct opposition to the advice of expert turkey breeders, who held that it was impossible to make such a radical departure from nature even if this was essential to control certain factors connected with our experiments. By this means, we secured healthy stock and carried them over without deaths or evidence of infection.

Having made some progress in this direction, we enlisted the co-operation of the Poultry Division of the Experimental Farms system, they first hatching our eggs in 1913. Success attended this effort, and in 1914 this was repeated upon a somewhat larger scale. In 1915 the turkey plots and housing facilities designed by the staff at the Biological Laboratory were placed at the disposal of the Poultry Division of the Experimental Farms system, as well as the entire number of eggs secured during that season. In doing this we desired that they undertake the full control of the field experiments for the purpose of effectively arriving at a practical basis upon which turkeys may be raised successfully. This experiment resulted in bringing to maturity 40 per cent of the poults hatched. Eight of these which were no longer required for experimental purposes were killed and dressed at seven months an average of sixteen pounds each. One individual dressed nineteen pounds two ounces. (These were raised in semi-confinement, or thirteen turkeys on a plot of less than one-quarter acre.)

Certain new findings have been made each year that the experiments with turkeys have been conducted at the Biological Laboratory, and we now feel that sufficient progress has been made to enable interested individuals to raise turkeys successfully

providing they will comply with the suggestions we offer. We desire to point out that while certain requirements have impressed themselves upon us in connection with the raising of turkeys we have not given up our experimental work and are arranging to continue our studies with a view of improving our methods.

We may mention that the Poultry Division of the Experimental Farms system is undertaking turkey experiments on a much larger scale than formerly and that they are co-operating with us in an endeavour to revive the turkey industry. Not only are they conducting experiments at Ottawa but also at certain branch Farms. We may also point out that they would not now consider such co-operative experiments feasible but for the progress that has been made at the Biological Laboratory, from which we have evolved a system that is giving excellent results.

#### TURKEY RAISING BY THE BIOLOGICAL LABORATORY SYSTEM.

In the rearing of turkeys it must be understood that great care and cleanliness are at all times necessary. Our experiments indicate that the best result will be secured in rearing healthy stock if the eggs are artificially hatched in a reliable incubator and the poults brooded in a device that experience has shown to be free from defects. (We do not deem it desirable to specify any particular incubator or brooder, believing that this should be left to individual experience and judgment.) We have followed the system which we here recommend for a number of years, and now consider that it provides a practical means of carrying turkeys through to maturity. It is not perfect, but is an advance on any scheme heretofore suggested. By following it we have matured healthy birds from infected breeding stock and believe that others can readily do likewise.

*Care of the Poults.*—The care of the poults is very important, and for the first seventy-two hours it is essential that they be kept warm and given no food, owing to the fact that the unabsorbed yolk of the egg provides sufficient nutriment during this period. It is far better to have them hungry and properly emptied out before giving the first feeding than to overfeed. The first food should not be large in amount, and bran moistened with skim-milk with which chopped dandelion heads or onion tops has been mixed will prove suitable. Plenty of skim-milk should be available at all times. The bran mixture should be sparingly fed, preferably every two hours. After ten days cracked chick feed is advised, and is usually composed of cracked corn, cracked rice and cracked wheat. Green feed of some sort should be liberally provided at all times. Lettuce is an excellent and easily available form of green food. Suitable grit must always be accessible.

The poults being in the brooder are kept upon the board floor of a colony house or specially constructed turkey shelter and not permitted on the ground during the first ten days. The floors must be cleansed each morning and should be disinfected periodically (at least once a week) with any good disinfectant. The use of sand and air-slacked lime on the floors will prove advantageous. An abundance of sand should always be available, and this will be better suited to the requirements of the poults if mixed with equal parts of air-slacked lime, wetted, allowed to dry, crushed and placed in a suitable box within easy access. The turkeys will eat freely of this, the sand supplying a portion of the grit required and the lime provides material required in the formation of bone.

After ten days the poults may be permitted access to the ground on bright sunny days, but should not be let out before 10.30 or 11 in the morning and should be taken in by 3.30 or 4 in the afternoon. Moisture is fatal to young turkeys, and every care should be exercised to prevent their becoming drenched or even wet with dew or rain. When permitted access to the ground the poults must not come in contact with adult turkeys or other fowl. They must not be allowed on ground that has been occupied by other fowl within the preceding six months. These conditions can be provided for

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by placing a temporary fence of five-foot two-inch mesh chicken wire around the area in which the turkeys are to be raised. This fence need not be expensive as heavy stakes will hold the wire sufficiently firm. Our reason for being so particular in this connection is the fact that we have on a number of occasions observed lesions of enterohepatitis among ordinary domestic fowls, and we have evidence of its transmission to turkeys.

Small runways covered with wire should be used in order to prevent birds of prey such as crows or hawks gaining access. Provision must also be made to exclude cats, dogs, skunks or other animals. Fowl of other varieties should not come in contact with the turkeys or the ground which they may subsequently occupy during a given season.

The foregoing instructions should be followed during the first six or seven weeks, after which time the poults will be able to get out earlier in the morning, but under no consideration should they be allowed out before the dew is off the ground, and on rainy days they should be kept on their clean, well sanded and limed board floors. After about three or four weeks the poults will show a desire to leave the brooder and roost at some convenient height. Preparation should be made for this, suitable dropping boards provided which may be observed in order that any deranged condition of the digestive tract may be noted. This will require close observation and is easily attended to. *Should one individual poult be found to have a diarrhoea containing yellow particles or froth, it must be immediately isolated and the whole of the colony house cleansed and disinfected.* The sick bird being isolated, should be specially nursed and kept in a warm place. The food should be curtailed and muriatic acid should be placed in the drinking water. Ferric chloride may be used instead of muriatic acid or equal parts of each. Two teaspoonsful of the muriatic acid or ferric chloride should be used to the quart or one teaspoonful of each. (The muriatic acid and ferric chloride to be used are of the strengths used by druggists in filling prescriptions and known as B.P., or the strength specified by the British Pharmacopœa.)

Unless the runways provide an abundance of animal food, insects, grasshoppers, bugs, etc., this should be supplied preferably by green cut bone, or in its absence beef scrap, tankage or animal meal.

*Parasites.*—Parasites are as fatal to turkeys as to other individuals of the feathered tribe. Dust baths should always be provided. A dust bath should be available from the outset. A box with sides three inches high filled with dry coal ashes or fine dry earth is suitable. When the poults are outside, if the soil is light, an area about four feet square should be dug up for dusting purposes. When disinfecting the quarters thoroughly disinfect the dust bath, throw it out and provide a fresh one.

The roosts are kept free from mites by the use of the remedies usually used for other poultry. Many good commercial dusting powders are available. The disinfection already referred to and explained in detail below will assist greatly in preventing the development of parasites.

*Disinfection.*—At the beginning of the season the houses or shelters which are to contain turkeys should be thoroughly disinfected. This may be accomplished by preparing a good whitewash (40 pounds of quick-lime to the barrel of water) and adding thereto 3 per cent of a good commercial disinfectant (this 3 per cent means that 12 ounces of the disinfectant is added to the pail of lime wash), which should be applied with a spray pump to all portions of the shelter or colony house, the turkeys being removed to other clean quarters till the shelter or colony house is again dry.

By following the foregoing simple instructions our experiments have demonstrated that it is possible to successfully rear turkeys.

Our turkeys in 1915 were from late hatched (June 10) 1914 breeding stock, and reared by the Poultry Division of the Experimental Farms system. They were hatched May 16 and on December 15 (seven months) eight of these averaged sixteen pounds each when dressed. One individual weighed nineteen pounds and two ounces. These

birds were all raised in our experimental plots, where thirteen birds were allotted to an area of less than one-fourth of an acre and did not at any time during the season have free range. This limited area was necessary to control our experiments, but we believe that larger plots are desirable if circumstances will permit.

We believe that others using the knowledge which we have gained will be able to do so profitably, providing they conform to the general principles which we have presented above.

*Caution.*—The turkey being a semi-wild bird may be more at home in trees, on tumble-down stone walls or at the back of some ramshackle building than in sanitary quarters, nevertheless should black-head gain access to the flock it is absolutely necessary to conform to the suggestions above outlined and to provide suitable quarters with proper care.

In the development of this system of rearing turkeys, I wish to acknowledge the hearty co-operation and advice given by the Veterinary Director General, the Laboratory staff and also the great assistance that has been rendered by the Poultry Division of the Experimental Farms system, particularly that during the last few years by Mr. F. C. Elford, Dominion Poultry Husbandman.