

STUDIES ON NAVEL INFECTION OF CHICKS AND POULTS

By

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A very common disease of chicks and poults which is frequently called navel infection has been causing increasingly heavier losses each brooding season. In 1945 a systematic investigation of this disease was begun. All chicks and poults showing incompletely healed navels were cultured and the types of bacteria determined. It has been generally assumed by Glover (1) and Hinshaw (2) that a disease characterized by failure of the navel to heal was due to several different types of organisms and was largely the result of incubator insanitation.

In 1945 heavy losses were suffered in the turkey poults hatched by the North Dakota Agricultural College poultry department. Since these were pedigreed birds it was easy to determine the hens from which the eggs came. It was found that the offspring from certain hens died from navel infection while from others there was high livability. The study was continued in 1946 in the same flock, but no correlation between the hens and poults dying of navel infection was found.

At this time three methods of determining the agent causing the disease were employed. Material was cultured on various types of media both in aerobic and anaerobic incubation and bacteria free filtrates of tissue were injected into chick embryos. No single type of micro-organism was found with sufficient frequency to indicate a bacterial infection of specific nature.

In the chick embryo trials it was found that less than 10% of the embryos died when the filtrate was bacteriologically sterile, but that approximately half of the chicks that hatched from the inoculated embryos died during the first two weeks after hatching with typical lesions.

In some cases it was possible to transfer the virus from embryo to embryo over a period of several generations.

Attempts were made to infect mature hens with bacteria free filtrates of tissue from chicks and poults that had developed the disease in the normal manner. Most hens were resistant to infection, but in some instances they died with lesions consisting of severe inflammation of the oviduct and ovaries. Bacteria free filtrates from these tissues were lethal to a high percentage of chick embryos.

The results of incubator and brooder trials give further indication that navel infection is a specific disease and also that it is

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very hard to eliminate from a premise. One producer has submitted poults and chicks in 1944, 1945, 1946, and 1947 in which a diagnosis of navel infection has been made each time. These birds had been obtained from hatcheries that were not experiencing undue losses from navel infection.

Evidence has been obtained that the infective material will live for over a year in an incubator. An 1100 egg capacity incubator is used in the laboratory continuously for incubating eggs for chick embryo inoculation and to furnish chicks for other experimental work. The usual routine is to remove eggs for embryo inoculation on the 10th day of incubation and transfer them to an incubator in another room. If the eggs are to be allowed to hatch they are removed on the 19th day and hatched in individual boxes in order to pedigree the chicks. In one experiment eggs from the same source as those mentioned above were obtained, but since the chicks were not to be pedigreed they were allowed to hatch in the hatching trays in the incubator. In this brood of chicks there was a high incidence of navel infection.

In several field outbreaks the owners have lost nearly all of their early broods from navel infection and have then tried to clean and disinfect their brooder houses for later broods. It is a frequent occurrence for them to suffer heavier losses in their second broods than they did in their first.

The post mortem appearance of a chick or poult with navel infection is quite characteristic. When the skin is pulled from the abdominal wall it shows the area as very red in chicks and bluish-black in poults. The navel is not properly healed and may have a fibrinous core which pulls out with the skin.

The yolk is usually very large and ruptures easily freeing a fluid that has a very foul odor. There is frequently a peritonitis and the intestines often show inflammation. The liver is invariably mottled with or entirely yellow in color.

There may be few if any visible symptoms. Many times, particularly with poults, the bird will be observed to eat or drink and start to walk away, stagger and be dead within a matter of minutes.

The death losses usually start within 24 hours after hatching and become progressively higher each day for about a week. The death rate then decreases for another week after which there are usually very few deaths.

We frequently find edema or dropsy associated with navel infection, but this appears to be a secondary condition brought about from disturbances in the circulatory and urinary systems. If many poults or chicks develop the edema or "mushiness" it is advised to feed a mash of grain only for a week and to use a "soft" water for the birds to drink.

We have found no medicine that is of any value in treating flocks with navel infection. Increasing the brooder temperature

has been of some apparent benefit. The areas around the brooder should be large enough so that the well birds can move to cool areas.

SUMMARY

The information available indicates that the disease navel infection of chicks and poults is a specific infectious disease which may be caused by a virus.

Infection appears to pass from the hen to poults through the egg.

The etiological agent appears to survive for considerable periods of time on poultry house equipment.

An outbreak of navel infection may be due to infection from the hen, in the incubator, in transit or in the brooder house.

It is suggested that certain types of peritonitis and salpingitis in hens may be a manifestation of the action of the virus found associated with navel infection in young birds.

Bibliography

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