

OMPHALITIS AND YOLK SAC INFECTION

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Omphalitis and yolk sac infection commonly cause disease in young chicks. Omphalitis is inflammation of the umbilicus (navel). It is usually accompanied by yolk sac infection due to the close anatomic relationship. Because the avian embryo lacks a physical connection to the hen, all of its nutritive requirements (except for oxygen) must be contained within the egg. Early on, the embryo develops special membranes external to its body to access the nutrients in the egg and to carry out various essential physiological functions. One of these membranes is the yolk sac. The yolk sac envelopes the yolk, which serves as the food source for the developing embryo. When the chick hatches, remaining, unused yolk material is drawn into the abdomen (at the level of the umbilicus) and the body wall closes in around it. This area can serve as an entry point for bacteria to enter the body. Several different bacteria including *Proteus* spp., *Enterobacter* spp., *Pseudomonas* spp., *Klebsiella* spp., *Staphylococcus* spp., *Streptococcus* spp., *Clostridium* spp., and *Enterococcus* spp. have been implicated in causing yolk sac infection; however, *E. coli* is undoubtedly the most commonly isolated pathogen. Opportunistic bacteria often become involved and mixed infections are common (3).

There are multiple sources of bacteria that can ultimately cause yolk sac infection with fecal contamination of eggs likely being the most important (2). Contamination can occur from poor hygiene in the nests, floor eggs, incubation of dirty eggs or eggs with shell defects, poor egg storage conditions, high humidity levels during incubation and bacterial penetration through poorly healed navels. Bacteria may also be acquired in ovo if the hen had salpingitis or oophoritis. Additionally, yolk sac infections may result after bacterial translocation from the intestine or bloodstream. The navel is not affected in this case.

The incidence of chicks with omphalitis and yolk sac infection increases after hatching and then declines by about day six. Occasionally losses can occur up to three weeks of age. Consequences of omphalitis and yolk sac infection can be severe. Infection can result in the deprivation of nutrients and maternal antibodies with resultant immunosuppression. Chicks that survive are often stunted and do poorly in general. The absorption of toxins and systemic spread of *E. coli* may ultimately result in death.

Physical signs comprise depression, drooping of the head, and huddling around heat sources. The navel may have failed to close completely and become red, wet and inflamed. A scab or “navel button” may be present over the navel. In severe cases, the body wall and overlying skin become affected and may undergo lysis, resulting in chicks that look dirty and wet. These birds are commonly called “mushy chicks”. Affected birds are often off feed and water.

The Pathological lesions associated with omphalitis and yolk sac infection may include swelling, edema, redness and occasionally abscessation of the navel. The yolk sac is usually distended because it is not being absorbed and inflammatory products are added. The yolk generally has an abnormal colour, consistency and smell and may even contain visible exudate. The blood vessels

surrounding the yolk sac are hyperemic. If the chick lives longer than a few days and the infection becomes systemic, pericarditis and perihepatitis are commonly seen. Other non-specific pathological changes include pasty vents, emaciation, visceral gout, contracted shanks and enlarged gall bladders (2).

Unfortunately, there is no specific treatment for omphalitis and yolk sac infection. The use of antibiotics to treat colibacillosis may be recommended in some cases in accordance with susceptibility testing based on the prevalent bacterial type involved, but is probably of little value (7). The disease can be prevented by careful control of temperature, humidity, and sanitation in the incubator at the hatchery. Only clean, un-cracked eggs should be set and the incubator should be cleaned and disinfected thoroughly between hatches.

Optimal brooding conditions are fundamental in reducing the overall impact of omphalitis and yolk sac infection. Careful regulation of the environment through management of feed, water, temperature, litter, lighting, and ventilation are important. Low brooding temperatures and fasting after hatching in particular, can increase the incidence of infection and mortality (2). Brooding is so critical that detailed brooding programs have been and continue to be developed. One of these programs is Platinum Brooding® which has shown to be very successful at mitigating losses associated with yolk sac infection.

References

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