Current Health Issues in Broiler Breeder Males

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Much genetic progress has been made with broiler performance over the last several decades. One method to quantify this genetic improvement is to compare broiler performance from several generations ago with present-day broilers. For example, the average number of days to 5 lbs in 1998 was 50.5 days. In 2002, the time required has improved to 46.9 days. Birds have become more feed efficient as well, with an average FCR of 1.97 in 1998 compared to an average of 1.87 in 2002.[1]

Consequently, advancements in broiler performance also places demands on breeder performance. Parent stock is only one generation ahead of the broiler and these birds possess similar growth and performance characteristics. Therefore, expertise in management, animal husbandry, and disease recognition and intervention continue to be increasingly important. Flock supervisors and managers will maintain key roles to maximize the genetic potential and performance from these birds. This presentation will provide additional tools to recognize several common disease challenges and assist to maximize the genetic potential available in the modern-day broiler breeder male.

Coccidiosis Management

From the day of hatch until flock depletion, males are subjected to many stressors. Vaccinations, transportation stress, competition for feed and drinker space, and handling stress, are just a few of these demands. The early days of rearing are no exception, and proper management and control of coccidiosis is an area of high importance.

Immunity to coccidiosis (*Eimeria* species) occurs through replication in the intestinal tract of the bird. After ingestion of coccidial oocysts from either a vaccine or the environment, the parasite progresses through several life cycle stages. It is through this process of ingestion and parasite replication that the bird develops immunity.

There are four primary species of *Eimeria; Eimeria acervulina, E. maxima, E. tenella, and E. necatrix.* Species of *Eimeria* require differing numbers of replication cycles to generate immunity. Typically, birds are capable of developing protective immunity to *E. acervulina* and *E. maxima* after two cycles. *E. tenella* usually requires three cycles, while *E. necatrix* is the lease immunogenic, requiring four or more replication cycles.

It is important to remember that when live vaccines are used, birds are exposed to organisms fully capable of causing disease. If the vaccination process is not administered and handled properly, a variety of problems including intestinal malabsorption and/or maldigestion, poor flock uniformity, increase in flock mortality, inadequate weight gains, and/or secondary bacterial infections may develop.

The success of a coccidial vaccine program is also dependent on proper litter management. Coccidial oocysts shed into the litter require a certain amount of moisture to sporulate and become infective. In situations with excessive amounts of moisture in the litter, a large number of infective oocysts may be presented to the bird during the

time of re-exposure, resulting in an overwhelming infection. Conversely, very dry conditions can result in insufficient sporulation and prevent re-exposure and immunity development. The latter is often manifested by coccidial disease breaks several weeks into the rearing stage (6 – 8 weeks of age). Factors that may affect the amount of sporulation in the litter include leaking drinkers, inadequate or excessive ventilation, house "sweating" during the winter months, inadequate litter depth, and half-house brooding. It is important to note that after the birds are turned into the full house after brooding, they will be moving onto litter with a limited number of infective oocysts. Therefore, it is a good idea to move some of the litter from the brooding area into the non-brood area to improve the uniformity of exposure ("seeding" with oocysts).

Additional factors that may affect immunity development include nutrition and feed intake. Marginal diets in protein and amino acids may impair the development of protective immunity. Feeding restriction programs encourage litter ingestion, exposing the bird to greater numbers of oocysts.

When evaluating a coccidial control program, there are several factors to consider. It is highly recommended to monitor flocks for vaccination reaction. Typical monitoring programs should concentrate on the peak reaction time period, which is between 2 – 4 weeks of age. This monitoring should include visual observation of the flock for signs of digestive disturbance such as feed passage, loose or bloody droppings, and more severe problems such as an increase in mortality or inadequate weight gains. Intestinal lesion-scoring systems can be implemented to provide an insight to the vaccine reaction, especially as it relates to those coccidia that do not have a tremendous amount of outward signs like *E. maxima* and *E. acervulina* (i.e. normal scores in vaccinated birds should not exceed scores of +1 or +2).

Administration of amprolium 10 days after vaccine administration has been very effective in reducing the potential risks associated with excessive vaccine reactions (particularly *E. tenella and E. maxima*), and to protect against a wide range of conditions among growers. Dosing at a level of 10 ounces per gallon of stock solution, given for 2 – 3 consecutive days, will serve to buffer the reaction without interfering with immunity development. The cost of administration at this low level and duration is justifiable economically, as well. Vitamin supplementation (particularly the fat-soluble vitamins A, D, E, and K, and B vitamins) for 3 – 4 days should also be provided after the cessation of amprolium due to the intestinal damage associated with the vaccine reaction.

Vaccination Handling and Techniques

A solid, well designed, breeder vaccination program is the cornerstone of an effective broiler vaccination program. Attention to detail during this process will keep minor problems from becoming major headaches.

In regards to vaccinations that require handling of birds, monitoring for vaccine placement and reaction should help to pinpoint deficiencies, and allow for corrective action. For breast muscle injection, ensure that placement of inactivated (killed) vaccines is in the proper location without damaging the deep pectoral muscles, or internal organs such as the liver. With wing web (WW) vaccine administration, ensure that the WW stab is on the underside of the wing, as many feathers as possible pushed away from the point of injection, and the needle does not damage the wing muscle.

Vaccination "takes" should be monitored 5 – 7 days after vaccination. Monitor for vaccine placement location and degree of reaction. With good technique and handling, flocks should be achieving >90% accuracy.

Fowl Cholera Control Strategies

Fowl cholera, *Pasteurella multocida*, continues to present challenges for breeder operations. Potential problems include increased mortality, reduced production, and overall poor flock performance. Several key areas should be kept in mind for control programs, among them are the following[2]:

1. Vaccinate pullets and cockerels a minimum of 2 weeks before moving to the breeder farm.
2. Use the milder vaccine strains of PM-1 and/or M-9; both induce less disease than the more virulent CU strain.
3. Consider using a treatment level of antibiotic in the first load of breeder feed, to "clean-up" any remaining vaccine organisms circulating in the birds (2 weeks after vaccination).
4. Use the correct titer of vaccine. High titer serials of CU or PM-1 have the potential to induce fowl cholera.
5. Avoid severe feed restrictions. If males are stressed in this manner, vaccine-induced fowl cholera is more likely to develop.
6. Avoid rough handling of males during vaccination and during move. Severe stress on the legs and joints can provide opportunities for chronic fowl cholera.
7. Consider using bacterins before giving a live vaccine. Bacterins help to control the vaccine-induced bacteremia and help prevent "settling" in the bones and joints.
8. Prevent contamination of live fowl cholera vaccine during use. Staphylococcus easily contaminates needles and open vaccine bottles, and injection of unwanted bacteria can lead to leg health problems later.
9. As discussed previously, proper vaccine technique and handling is critical. Avoid injecting live vaccine into the wing muscle. This can increase the dosage by 10x, and increase the risk of vaccine–induced fowl cholera.

Leg Health Issues

Leg health issues can develop from a variety of reasons and ages. Poor bone mineralization can lead to rickets and secondary bacterial infections. Severe respiratory vaccine reactions may also lead to secondary bacterial infections in the bones and joints, especially from *Staphylococcus aureas*. This section will be primarily concerned with controlling infections from Staphylococcus[3].

Staphylococcus infections most commonly involve inflammation of the tendon sheaths (tenosynovitis) and joints, and tend to occur more frequently during specific periods of life. It is during these periods of life that males are particularly susceptible to staphylococcal infections. Examining each of these critical periods for areas of improvement within your breeder operation will help to minimize the risk of disease. Following are several points to consider during these time periods:

1. 0 – 2 weeks: Navel infections and femoral head necrosis may be related to hatchery contamination, trauma, poor early nutrition, or poor brooding conditions.
    a. Diets deficient in essential minerals and/or vitamins may predispose to rickets. Ensure that proper nutrition is available and accessible to cockerels.
    b. Stressors related to improper brooding such as cold temperatures and water quality and/or quantity should be avoided.
2. 4 – 6 weeks: Infected hock and stifle joints may be noted secondary to harsh coccidiosis and respiratory vaccine reactions.
    a. As previously discussed, minimize the incidence of severe coccidiosis by proper monitoring and vaccination follow-up.
    b. Monitor respiratory vaccine handling and techniques to ensure proper administration and avoid "rolling reactions."
3. 10 – 20 weeks: Infected hock and stifle joints secondary to the stress of vaccination, feed restriction, and sexual maturation.
    a. Overcrowding, poor feed distribution and insufficient feeder space exacerbate these problems.
    b. Ensure that weight goals are achieved.
4. 24 – 30 weeks: Infections secondary to the stress of moving, mating, placement of feed restriction devices (Noz-bones), and insufficient feed amounts or availability may also contribute to development of lesions.
    a. Slats and equipment should be well maintained. Avoid slat heights greater than 22 inches, and/or consider using supplemental ramps or an increased amount of shavings to help reduce injury.
    b. Care should be taken to achieve the same rate of sexual development in males and females and to adhere to recommended mating ratios.

Effective long-term solutions to prevention of staphylococcus problems should focus on minimizing all factors that may contribute to infection. Identifying and removing the likely sources of staphylococci and reducing any factor that may increase the susceptibility of the birds to infection will help to ensure success in this arena.

References

1. Industry Reporting Service based on information from 1998 to 2002.
2. Glisson, J.R., Protecting Broiler Breeders Against Fowl Cholera. Ross Tech. June 1996
3. Jensen, E.L.; Miller, C.L., Staphylococcus Infections in Broiler Breeders. AviaTech. 2001.