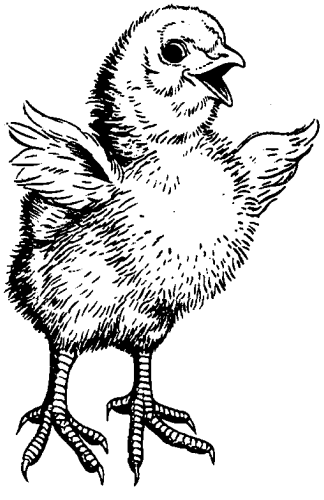
CURRENT CONCEPTS IN Broiler Production WINTER 1996

Broiler Breeder Health Issues



Avian Influenza (AI) continues to be a problem for the poultry industry in Mexico. The Mexican industry and government are making progress in controlling and eradicating avian influenza, but the disease is still active in several states. An H7 avian influenza virus was recently isolated in poultry in New York Viruses in this group have the potential to become highly pathogenic.

The threat of AI persists and must be taken seriously by poultry producers. The diagnostic laboratories in Alabama are monitoring for AI by testing a portion of sera from every flock sample submitted for National Poultry Improvement Plan or other serological testing. All tests are negative to date.

Infectious Laryngotracheitis (LT). One of Alabama's cases last winter was in a flock of young broiler breeders. Mortality was low, but the disease was detected early and vaccination was started before the virus increased in virulence (became "hot").

This flock had not been vaccinated for LT. Many broiler breeders in Alabama are vaccinated routinely as pullets for LT. For many years this routine vaccination has been successful in preventing LT in this segment of the industry. Mixing of LT vaccinated and nonvaccinated birds must be avoided. Mixing vaccinated and nonvaccinated birds will allow a vaccine virus to increase in virulence and cause disease. LT vaccinations in spike male programs should be synchronized with the pullet/hen program.

Marek's Disease has been seen recently in pullets and young breeder flocks, showing a pattern of increased culls and mortality. Crusts and scabs on the skin of the leg shanks were confirmed by histopathology to be Marek's disease skin leukosis). Tumors also occurred in the liver, spleen, ovary, and kidney, either as diffuse enlargement or white nodular lesions.

Possible causes of Marek's disease in pullets and breeders include missed vaccinations, reduced vaccine titer at the time of administration, and the presence of a new challenge strain of virus. Marek's disease must be differentiated from lymphoid leukosis and reticuloendotheliosis which have different prevention strategies.

Reticuloendotheliosis was identified in a breeder flock in south Alabama 2 years ago, but no new cases have been identified. The outbreak 2 years ago was linked to contamination of fowl pox vaccine with reticuloendotheliosis virus. The vaccine had also been administered to the birds when they were at a young age. As a result of this investigation, new procedures

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AU Notes

The Poultry Science Department continues to increase undergraduate student numbers and improve teaching programs. Undergraduate enrollment reached an all-time high with 80 students signed up for fall quarter, 1995. The healthy increases recorded in student numbers can be attributed to a coordinated effort between industry leaders and Poultry Science Department representatives, particularly Dr. Roger Lien. Hopefully, the increase in individuals receiving poultry training will help fill the many technical positions opening up in all phases of the industry.

The undergraduate and graduate curricula are being reorganized to more accurately meet the needs of Poultry Science Department students. This process will take some time but will result in a logical progression of courses for those interested in a degree in Poultry Science.

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have been approved by the USDA for testing serials of poultry vaccines for reticuloendotheliosis virus contamination.

Chick Anemia Virus. Sporadic problems exist in which hens seroconvert to this virus while in production. Chicks hatched during the window between hen exposure and seroconversion are most likely to develop anemia and immunosuppression. The Alabama diagnostic laboratories are helping to field test a new serology ELISA kit which will help to screen for susceptible flocks. This serology kit is awaiting government licensing before it is available for general use.

Current Concepts In Broiler Production is a publication of the Alabama Cooperative Extension System with the cooperation of the Department of Poultry Science at Auburn University. This publication is designed to provide new and emerging concepts and information to those involved in broiler and breeder production.

Information on management, feeding, and disease will be compiled from research underway at Auburn University, as well as from other sources. New technologies and practices will be highlighted as they become available.

Fowl Cholera continues to be a low-grade disease problem on some broiler breeder farms. Recent cases have had more severe joint involvement than cases in the past Problems in chick mortality can sometimes be traced to cholera in a breeder flock. Shell quality is affected by cholera, and chick problems may be manifested as an increased incidence of aspergillosis and coliform infections.

Staphylococcosis is a continuing problem in pullets and breeders, and it needs to be differentiated from fowl cholera and *E. coli* infections. Staphylococcal arthritis in pullets often occurs after the birds have been handled for vaccination. Birds should be handled gently when vaccinated to avoid bruised, injured joint and bone tissue that serves as a focus for staphylococcus localization and infection.

Infectious Coryza. No new cases of coryza occurred in Alabama broiler breeders during the past year, but cases continue to emerge from small hobby flocks. A reservoir of coryza exists among hobby flocks in Alabama and is one of the primary reasons to practice strict biosecurity. An outbreak of coryza on an Alabama broiler farm in the recent past was an economic disaster.

Mycoplasma Infections. *Mycoplasma gallisep ticum* (MG) was recently identified in two broiler breeder flocks in north Alabama. The flocks were taken out of production.

Mycoplasma synoviae (MS) continues to occur sporadically in broiler breeders and is often linked to predictable source of infection-commercial layers or a hobby flock. Research conducted by Dr. Susan Lockaby at the State Diagnostic Laboratory in Auburn has shown an MS isolate from Alabama broiler breeders to be pathogenic in broiler chickens.

Deep Pectoral Myopathy has been seen with increasing incidence in the past year and is likely a reflection of the continuing selection for breast (pectoral) muscle yield. Hens were submitted for laboratory studies because cholera was suspected. The hens were inactive, and the cull rate was increased. The deep pectoral muscle was either swollen and discolored white or severely atrophied, indicative of prior damage to the muscle.

The cause of deep pectoral myopathy is muscle stress caused by overexertion of the wings. Management factors such as increased slat height and high vehicular traffic flow near the breeder house may influence the expression. Inactive hens are often damaged by trauma inflicted by active males.

This information was provided by Dr. Fred Hoerr, Director, State Diagnostic Laboratory, Auburn, Alabama.

Start-To-Finish Quality Control

Commercial poultry producers must successfully deal with a complex array of challenges, ranging from feed and chick costs to disease outbreaks. Decisions must be made so that costs are minimized and profits maximized. These decisions must always be made with the knowledge that they will affect a complex biological system, namely the living birds. Some changes can be made with little consequences to the dynamics of the biology while others will have a profound effect on the system. In other words, management changes really do affect the bird which in turn affects profitability

Healthy birds are the result of the optimization of many factors including management, nutrition, genetics, and exposure of pathogens. When one of these factors is less than optimal the other factors must, if possible, compensate for deficiencies. Pathogen contamination of feed ingredients and feed is one example. Increased exposure from this avenue forces the immune system to work harder and draw further on the nutritional requirements of the bird. Healthy birds are continuously exposed to a diverse group of potentially pathogenic organisms, including fungi, viruses, and bacteria. Minimizing exposure, whatever the source, means the birds' immune system is less challenged and the body can concentrate more on growth.

Many of the pathogens found in feed ingredients and finished feed are not overtly pathogenic. They do not directly make birds

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sick. However, because they are more insidious in their effect, they are often not detected and, therefore, not dealt with. At times their effect may be invisible, but at others they may take the form of early chick mortality, stunting, or decreased feed efficiency. In any case the result is the same: the birds do not grow as efficiently and costs are increased.

Exposure to many pathogens is unavoidable in many cases, but the level and frequency of exposure can be minimized in both feed ingredients and finished feeds. When this exposure is minimized, birds are better able to realize their full genetic and physiological potential. Quality ingredients, both nutritionally and microbiologically, must be used. No feed production process can fully overcome the inclusion of grossly contaminated ingredients. Such feed is also sure to affect the animal that eventually ingests it

New monitoring programs are necessary to ensure the quality of the feed ingredients is maintained. Monitoring is also necessary to ensure new feed production techniques adequately deal with those pathogens that do make it into the system. Transportation techniques and systems should also be examined so that quality products remain so after leaving the feed mill. Feed quality does not stop at time of delivery but must be maintained at the farm. After all, it matters little to the bird where bacterial contamination occurred; it only matters that contamination is present. Systems must be in place to ensure feed is delivered to the bird in a manner that minimizes contamination

Monitoring the microbiological quality of feed from start to finish is truly cost effective quality control Quality control of feed ingredients ensures a high quality feed. The high quality feed ensures optimization of the growth of birds. Optimization of bird growth ensures a high quality product and ultimately consumer satisfaction. As has been said many times, an ounce of prevention is worth a pound of cure. With each passing year the pound of cure becomes more expensive. Avoiding that cost comes with monitoring and controlling poultry exposure to food borne pathogens.

This information was provided by R. A. Norton, Poultry Science Department, Auburn University and is reprinted from the Proceedings of the Alabama Poultry and Egg Association Fall Broiler Seminar, Guntersville, AL August 29-30, 1995.

Farm Management Influences Coccidiosis Control

Parasites of the genus *Eimeria* are highly host adapted and have found a comfortable niche in commercial poultry operations. The cocci organism has adjusted so superbly to the biology of the chicken that infection is less likely to kill the host than in the past, provided the host is not stressed by environmental or other factors. Unfortunately, these parasites, if left uncontrolled, still exact an economic cost on poultry producers through lost growth potential due to gut trauma. For this reason, substantial efforts have gone into controlling this parasite at a level that will minimize its economic impact on a poultry operation.

Prudent control of coccidiosis involves the use of non-nutritive feed additives to keep infections below levels that begin to influence broiler growth and feed conversion. Hue to the adaptive nature of *Eimeria,* this organism is unlikely to be shut down for even a moderate length of time across an entire operation. For this reason, feed additive programs that use a relaxed pressure approach with low-level cycling of coccidial populations so that the birds develop a subtle immunity have been the major programs used by broiler operations for many years. Combining these relaxed-pressure programs with good house management has been the most economical method of controlling avian coccidiosis.

Environmental Inputs

The poultry industry has relied for four decades upon feed additive programs for economic control of coccidiosis. This is as it should be, considering the economic damage possible due to coccidiosis. Few, however, have looked critically at the role of house management and environmental conditions in limiting the viability of coccidia. Both effective feed additive programs and good broiler house management are necessary to keep cocci at manageable levels.

There are few, if any, feed additive programs that will control coccidiosis in the face of high litter moisture in flocks subjected to multiple stressors. On the other hand house conditions that minimize parasite viability allow a wide variety of feed additive programs to work effectively and provide poultry integrators with a number of options for coccidiosis control. Those house conditions necessary to maximize the effectiveness of feed additive programs are worth considering.

Viability of coccidia in a broiler house is closely related to litter moisture levels. Wet, caked litter has been associated with an increase in the number and viability of bacterial pathogens as well as *Eimeria* species. Litter moisture levels of greater than 25 to 30% are associated with greater coccidiosis challenge. Once coccidia and the bacterial pathogens have survived or proliferated due to wet Litter, reducing the potential for health problems in the short term can be difficult. Viability of broiler house microorganisms is often further increased by high placement densities and/or insufficient downtime between flocks. Even exhaustive broiler house sanitation programs do not overcome the increased viability of infectious causes if placement

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density is pushed to the limits.

Optimum downtimes between flocks also affect the viability of coccidia and other health-related microorganisms. Downtimes of 7 days or less place birds back in the house before coccidia oocyst viability drops off. Most operations maintain a downtime schedule of 14 days to allow broiler house organisms to die off.

Many management and environmental factors influence a poultry farmer's ability to maintain litter moisture within an acceptable range. Ventilation rates must be carefully coordinated with added heat in winter and evaporative cooling systems in summer so that relative humidity and, therefore, litter moisture are controlled.

One of the factors credited with improving litter moisture, water bacterial load, and bird health is enclosed drinker systems. Nipple and cup-type systems have been shown to reduce litter moisture, and the wholesale conversion to these systems has greatly improved bird health through better house conditions.

Stress Factors

The raising of poultry on a commercial scale exposes birds to a number of stressors. Environmental and other stress factors play a part in the broilers' ability to cope with disease challenges. Producers that minimize the combined exposure of broilers to these stress factors in an economical manner will realize added efficiencies in production costs. Providing nutritionally balanced feeds made from quality raw ingredients can optimize growth and feed efficiency. Implementing vaccination and feed additive programs can help producers avoid serious setbacks in bird health. On-farm conditions, however, probably produce the most stressors affecting bird health.

Broilers are raised most efficiently when environmental temperature matches the birds' needs at each stage of growth. Deviations from what is called the zone of thermal neutrality, where house temperature matches body needs, are costly in terms of feed efficiency and may trigger health problems. Most producers realize that chilling birds adds to ascites problems and reduces the broilers' ability to fight off infections from organisms naturally present in the chicken house. Heat stress also weakens a birds immune system and compromises intestinal integrity to the point that birds are more vulnerable to intestinal infections.

Conclusions

Nutritionists for most broiler operations have a unique opportunity to view a number of production inputs from the practical perspective of their importance in influencing the bottom-line cost of broiler production. Coccidiosis control through the use of non-nutritive feed additives is only one of the factors a nutritionist tracks in monitoring production costs. The most economical and most sensible method of coccidiosis control involves combining a feed additive program that allows broilers to develop some immunity and limits selection of resistant coccidia strains with a stringent management plan that controls litter moisture and minimizes stress.

Operations have typically made frequent changes in feed additive programs hoping for a "random" improvement in bird performance. Perhaps maintaining a more stable feed additive program year-to-year would provide better results if attention is turned toward fine-tuning management programs in the field.

This information was provided by J. B. Hess and M. K. Eckman, Poultry Science Department, Auburn University and was reprinted from the Proceedings of the Pfizer Technical Symposium, Santiago, Chile, Oct. 11, 1995.

We would like to compile an updated list of individuals interested in receiving *Current Concepts In Broiler Production* on a regular basis. If others in your organization would like to receive this publication, please fill out this form and return it to:

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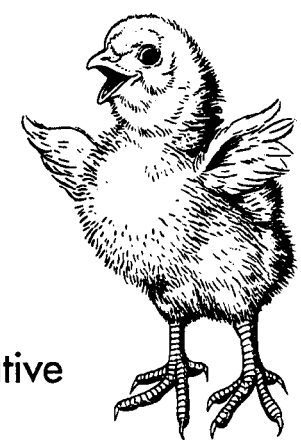

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