Broiler breeders, regional problems and solutions

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Summary

Asia is one of the fastest growing regions in the world for poultry meat production as well as for broiler consumption. Consequently, large populations of breeder flocks are based in this part of the world. Although there is a higher degree of complexity and some unique factors concerning broiler breeder performance issues in Asia (especially in parts of South-East Asia) but fundamentally the basic challenges in the region are the same as those recognized in many other countries around the globe. Today's broiler breeders are high performance animals. As such they require a housing environment that is capable of providing relief from the physiological, metabolical, and environmental stresses that these birds are commonly exposed to. Especially the effect of heat stress and high humidity bears heavily on the performance potential of the modern genetics. Consequently, at any company properly scaled ventilation systems in combination with appropriate stocking densities must be in place at all phases of the rearing and production period.

A frequently encountered opportunity is low hatchability. More often than not this is related to poor male performance and male BW management during both, the rearing and the production phase. Another frequently noted problem is low peak production and difficulties maintaining persistency in production during the second part of the laying cycle. A lot of these issues find their origin in faulty rearing conditions marked by poor flock uniformity and lack of control over body weight development as well as an unfavorable body composition. Systematic and regularly scheduled necropsies of representative and randomly selected birds can provide essential feedback information. This can then be used to determine the most appropriate feed allocations or adjustments in dietary specifications going forward.

Variability in feed quality either due to raw material variation and/or mycotoxin contamination can add further complications to the production system. Only stringent quality control procedures and anticipatory, preventative interventions with, for example, mycotoxin binders might help to reduce some of these deleterious effects.

Good biosecurity in and around the poultry premises as well as effective water- and feed hygiene management techniques are essential. However, there are still often unnecessary short comings as these are easily to control with commonly available commercial products and/or improved standard operating procedures.

A big problem represent also frequently prevailing disease challenges, especially respiratory diseases (NDV, IB, AI, etc.) and a general problem with too high, mostly female-affected depletion. Only up-to-date vaccination programs imbedded with effective serological monitoring programs and heightened biosecurity measures can contribute some relief in these areas.

Less frequently occurring opportunities consist of start-up problems with chicks from young GPS flocks, feather pecking problems during rearing, low initial egg weights at the onset of lay as well as occasional egg shell quality deficiencies.
Introduction

Success in broiler breeders is really based on two main premises. The first one is to have a structurally well designed breeder division (farm, hatchery, feed mill, nutrition-, veterinary-, logistics department, etc.) concept following the common rules and principles that define a high efficiency production system commonly found around the world. Biosecurity and sanitation, for example, are at the top of a long list of pivotal factors and necessary departments that characterize such a system. One main purpose of this physical infrastructure is to provide the birds with environmental conditions that allow breeders to perform under a multitude of unique, local constrains as the genetic potential of the lines keep continuously changing over time.

The second part is the people and the operational side of the business. Successful companies have - in simple terms - people and staff that know what, when and how to do in a timely, proactive manner. In all sincerity, this second aspect is all about being “close” to the birds and to manage and lead the flocks from the time of placement until the end of the production cycle.

What makes Asia unique - as far as this can be generalized - is often the extent of the complexity and the multitude of factors that impede on the flocks concurrently. Often these factors tend to be even more extreme (temperature range, humidity, raw material quality, endemic diseases, etc.) especially in some South-East Asian countries and more so than in other parts of the world. Regardless of this, the basic problems surrounding broiler breeders in the Asian region are the same as anywhere else in the world. Tentative solutions and answers for broiler breeder related problems can only be effective if they take the unique local circumstances into consideration. The aim of this paper is to discuss some of the challenges related to low hatchability, poor peak egg production and the impact of variability in feed quality on broiler breeder performance.

Regional problems and solutions

Low hatchability

Low hatchability can occur in principle at any time throughout the live of a flock. Usually, however, this manifests itself often at the onset of lay as well as towards the second half of the laying cycle. A systematic approach to solving the problem is needed in order to find out the root-cause. In this context, a first step is to discern whether or not the eggs are actually fertile or not. A standard break-out analysis of 50-100 randomly selected eggs will quickly indicate whether or not this is an egg handling, hatchery or incubation problem or an on-farm infertility issue. If the eggs are largely infertile the attention should focus towards the farm. The flock should be carefully observed and monitored. Special attention should be placed on frequency and completeness of mating behavior. Overly aggressive males and too high a male population may cause fighting among the males and they may start intimidating the females. Sufficient copulations needed to achieve high rates of fertility are more likely attainable with fewer rather than more males in the barn. Important is also that females and males are properly synchronized. Males generally mature a little earlier than females when reared on the same lighting schedule (Slide 1).
Rearing conditions and especially stocking density have a strong effect on the development of the so-called "male dominance" which is needed to obtain high fertility through intensive mating activity. The females likewise should show receptive behavior. If sperm volume and sperm quality are high then fertility should be good. However, also incorrectly managed and fed females can display a low fertility. For example, excess lysine and isoleucine in the hen diet reduce fertility significantly (Ekamy et al., 2013). Once in production, a crucial aspect represents the management of the male. Roosters have to continue to grow and stay in good body confirmation at all times in order to remain effective. Especially the breast fleshing must be monitored frequently together with the weekly BW assessments (Slide 2).
Low protein diets are associated with better fertility rates than high protein feeds (Tyler and Bekker, 2012). Females should not become too heavy and too fat as this tends to interfere with the retaining of spermatozoa in the female oviduct. If the eggs are leaving the farm as fertile eggs and the hatchability is still low then the hatchery should check their egg handling, egg storage, egg disinfection and their egg setting procedures. Excessive use of hatching egg sanitizers, lack of turning; overheating, bacterial contaminations, etc, can all interfere with obtaining a good hatchability of fertile eggs.

**Poor peak production**

A sub-standard peak egg production is often the result of deficiencies incurred either during the rearing period or around the time of light stimulation and/or in association with inappropriate increases in feed allocation up to peak feed target levels (Ekmay et al., 2012). The timing of synchronization of sexual maturity in this regard can be very complex and is linked to a large number of different factors (Slide 3).

**Slide 3**: Summary of interacting factors influencing the onset of sexual maturity in broiler breeders

Care must be taken that the sex separate feeding systems indeed provide only access for the intended sex and that no “stealing” of feed between males and females takes place. Hens must remain in good body conformation, should not be too fat and follow closely the growth trajectory as recommended by the primary breeding company (Van Emous et al., 2013). Quite often, flocks suffer from poor uniformity levels often linked to problems with heat stress or episodes of disease exposure which interfere with maintaining a high degree of uniformity. Managing good uniformity starts with day-old chick uniformity and should - wherever possible - be followed by repeated flock gradings for both, males and females preferentially at 4, 8, 12 and 16 weeks of age. Where labor is limited the focus should be on prioritizing the gradings at an early bird age.

From time to time on the basis of a systematic data collection system representative and randomly selected birds should be posted and their body confirmation and condition assessed. The results from these necropsies help to understand the impact of a company’s management-, nutrition- and feed allocation program. All this information has to be carefully analyzed and integrated. Ultimately, it creates the basis for future feed allocation adjustments and dietary feeding strategies aimed at improving peak production.
In some cases, applied vaccination schedules are very extensive and rely - amongst other things - also on using killed vaccines that represent a significant stress factor to the bird due to both, the individual handling as well as the type of vaccine and/or serotype selected.

**Variability in feed quality**

Broiler breeder performance is easily influenced by the compositional quality of the feed provided to the birds. Asia and especially parts of South-East Asia have historically experienced many challenges linked to high environmental humidity levels and complex tedious transport routes. The culmination of high humidity’s and long transport favors the development of mold growth and the production of their respective mycotoxins. Mycotoxins have many negative impacts on the bird’s metabolism, immune system and reproductive tract. Any type of nutrient variability in combination with mycotoxin contamination will rapidly eliminate all the effort placed into grading and maintaining a high degree of uniformity. In addition, the ability of the breeder flock manager to properly project a weekly growth response in relation to a pre-set increase in feed allocation is becoming very difficult. Wherever possible, larger breeder companies should benefit from having designated breeder feed plants for the exclusive production of high quality feeds from raw materials of validated quality and consistency including a mycotoxin screen. Should supplies become that limited that inferior feedstuffs have to be used then a preventative supplementation with a mycotoxin binder may be beneficial. A well balanced diet is only as good as long as the birds are physically capable of consuming the feed in a relative consistent amount of time and with minimal feed wastage. Wherever possible the feed should be provided in crumbled or pelleted form to counteract any potential selective feeding habits on part of the birds. Fine grinding may aid pellet quality but breeders in Asia could often benefit from a greater inclusion of structured insoluble dietary fiber components especially during the time of the most severe quantitative restriction (rearing period).

**References**


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