

Predicting the future is fraught with risks but one man offers his thoughts regarding what may occur in the broiler grow-out of poultry meat production in the foreseeable future. His approach is broad and pragmatic, focusing on the critical needs and challenges that will impact the success of an industry that is a fascinating blend of biological principles, wholesome food production, human resources and profitability.— Dr Mike Eckman



What lies ahead in commercial broiler production?

Four topics rank at or near the top as areas of concern in food animal production in first world countries, less so in developing countries.

They are:

- food safety
- animal welfare
- feed grade antibiotics
- waste and environmental management

I am hesitant to place these aspects in the category of "business as usual", but I will. Why? Because they are - and will continue to be - basic to the fabric of food animal production. These four factors cut across all phases of live production (pullet/breeder, hatchery, broiler, feed mill, catching/live-haul). For the purpose of this discussion, I consider them inherent but not my primary focus, when looking at the broiler phase of production.

I will therefore focus on the technical and operational aspects that impact broiler rearing:

- genetic package - broiler progeny
- environmental needs of the birds
- management at the farm level
- data collection and analysis
- education and human resources

Perhaps surprisingly, my predictions are focused on neither new nor novel technology but rather a reflection of needs, priorities and the degree of implementation in terms of facilities, equipment and management at the farm level.

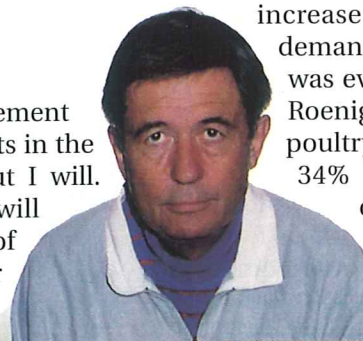
Poultry meat in global perspective

Let us first put the broiler industry in perspective on a global basis and then proceed to specifics in the broiler grow-out. On a worldwide basis, the dramatic increase in per capita consumption and the demand for poultrymeat, particularly broilers, was evident in a comprehensive publication by Roenigk in 1999. During the period 1988-1998, poultry consumption increased by 77%, pork by 34% and beef by 5%. Reasons for the consumption patterns among the major meat sources are many and varied.

Looking to the future, however, it is evident that the efficiency of broilers (when compared to that of all other meat animals for the conversion of feed grains to edible animal protein) presents production advantages in first world countries, yet is a necessity in developing countries.

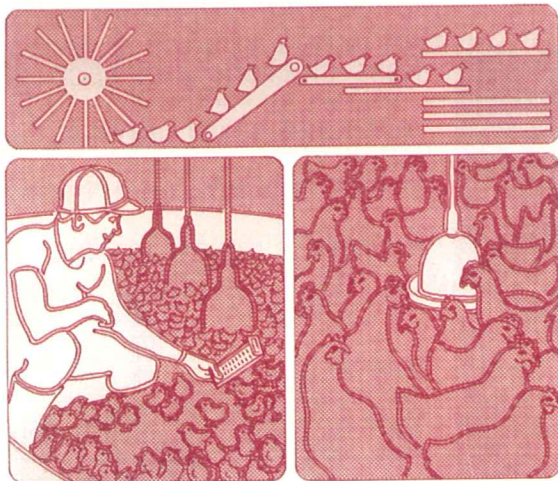
Poor grain yields and water shortages in many third world countries are identified as significant incentives for the utilisation of the most efficient and economical food animals. Obviously, the broiler as a major food animal is second to none in the conversion of feed grains to animal protein and therefore sits in a very enviable position as the meat of choice to feed the world. Further, countries with substantial corn or milo and soybean production are positioned to provide the most efficient and economical feeds for intensive broiler production.

In essence, the future of broiler production is bright but faced with potential challenges and



Dr Mike Eckman

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opportunities that are inherent in any dynamic business characterised by extensive growth, rapid evolution and success.

As an industry, we have made enormous progress in the 20th century with regard to all facets of live production (genetics, nutrition, housing, equipment, health, disease surveillance and diagnosis) and consumer acceptance. The rate of progress in most categories has ranged from steady to extremely rapid. Sometimes, accelerated progress in one area can create problems in others (e.g. genetic selection for rapid growth exceeds our ability to manage broiler progeny and compromises breeder parent performance). Our industry chose the avian species rather serendipitously as a food animal only to find later that it is the animal of choice for the large-scale production of efficient, economical and wholesome meat that is rapidly becoming the consumer's choice on a global basis.

Future challenges and opportunities

I will now attempt to briefly outline some of the challenges and opportunities that may be reflected in technology, management skills and/or implementation schemes necessary for the continued growth, survival and profitability of an industry that is poised to be the meat of choice on a global basis. I will focus on factors that may offer the greatest impact in the broiler grow-out during the next decade. From a global perspective, we must remember that broiler meat provides protein to populations that vary from those on the verge of starvation to those demanding value-added products with price of little concern. Therefore, a variety of broiler programs in terms of target weight, age, yield, carcass quality and final product will continue to be required.

The genetic selection for improved broiler performance (i.e. growth rate, feed efficiency, yield, carcass quality) has been at the expense of breeder performance in the yielding breeds - and rightfully so. One has only to grasp basic genetics and heritability to realise that the industry can't have it both ways in terms of maximum breeder and broiler performance. In general, we may sacrifice breeder performance (liveability, egg numbers, fertility, hatchability) to obtain broiler performance, only to be unable to meet the needs of the broiler for optimal expression of genetic potential. One example is lighting programs, which serve as a governor on growth rate in broilers in order to reduce ascites, heart attacks, skeletal problems and mortality.

For years, the broiler grow-out phase has been taken for granted. Continually high standards were expected in the face of improved genetic potential. Although there has been tremendous improvement in facilities and equipment for rearing broilers, they continue to lag behind the needs of the explosive genetic package in broiler progeny. Genetic potential that is not expressed is of no value - and may even create disappointing results when the environmental needs of some flocks are not provided at the farm level. Such environmental shortcomings may range from marginal housing and/or equipment to limited management skills or implementation. In the typical integrated operation, the pullet/breeder, hatchery, feed mill and live-haul phases are integral parts of the complex. However, we must never forget that our business is broiler meat, thus all inputs must be recouped on the basis of quality, quantity and cost of total saleable product.

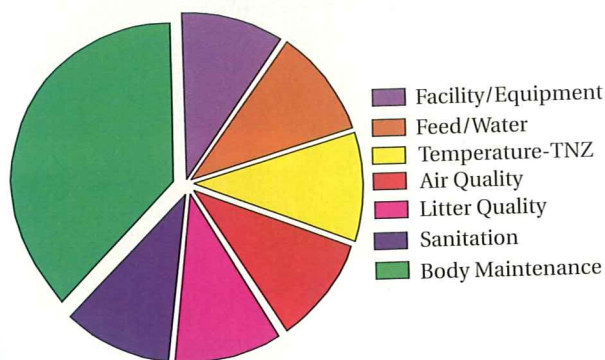
Although the precise needs of the modern-day broiler are rarely met on a consistent basis across an entire commercial complex, opportunities in this area have been identified and substantial progress is being made. In the simplest of terms, the modern-day broiler requires:

- environmental protection
- feed and water
- climatized air and
- integrated health programs.

These needs appear simple, however, when targeting millions of broilers on a continuous basis under a variety of conditions. In a typical integrated, commercial complex, their implementation is extremely challenging. In a typical complex that places one million broilers per week, approximately 500 broiler houses are required and usually represent a variety of facilities, equipment and growers. The "Super Seven" management factors in broiler performance are graphically depicted in Figure 1.

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Figure 1: "Super-seven" management factors for optimum broiler performance



The factors are inter-related, inseparable and apply to broilers grown anywhere in the world. Such factors are basic to meeting the needs of the modern-day, commercial boiler and should apply everywhere.

Making the most of genetic potential

The opportunities for capturing the genetic potential in the broiler grow-out include

- improved facilities/equipment
- better management skills
- grower/farmer education.

Regardless of which opportunities exist for improvement, they must be identified, verified, implemented and monitored. Most geographical areas of intensive broiler production include a vast array of housing, equipment and skill levels among growers. Constant updating of facilities, equipment and grower education is necessary and there are certainly costs in time and resources for modernisation. Many environmentally controlled,

state-of-the-art facilities exist today. Computerised controllers that identify the individual(s) responsible for facility and equipment operation and provide extensive logging of data are utilised. Facilities with conventional, transitional and tunnel ventilation modes capable of a complete air change per minute have been developed. Facilities and equipment provide climatized air via combinations of absolute temperature and wind chill and deliver an effective temperature at or near the flock's thermal neutral zone.

Broiler grow-out in the Age of Information

The design of facility and equipment is only one part of the equation in broiler rearing. The other parts of the equation are operational management and program implementation. Both facilities and equipment are complex and require training and experience for smooth operation. Such operational skills include mechanical capabilities, basic concepts in ventilation, air quality, absolute temperatures, wind chill, relative humidity and of course, biological principles relating to the avian species and the infectious causes they will encounter. Sophisticated computerised equipment for providing and monitoring environmental influences are now commonplace but require the continuous collection and interpretation of data. Such data, both historical and current, can be of great predictive value if analysed appropriately. Future application of statistical procedures for the correlation of biological principles and economic values will offer significant opportunities for progress in broiler performance.

In the foreseeable future, progressive companies will select and implement the "best-fit" technology for their genetic package and provide comprehensive educational programs targeting farm managers and/or growers. This will require rigorous data collection and astute analysis that reflect all grow-out facilities within each complex. Computerised networks for data analysis will allow decision-makers to assess both the process and implementation of programs representing all facilities, equipment types and growers at the farm level. In contrast, the days of service personnel riding up and down the roads "looking" at broiler flocks will decline. On-site visits by live production personnel will continue but involve considerably more data collection and analysis via programs that query, rank and correlate performance parameters. Some companies will develop and incorporate sophisticated statistical programs. Others will not. Growers will be required to possess substantial knowledge of avian biology,

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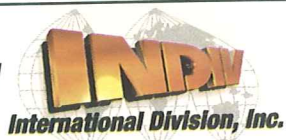
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environmental control and computer applications. Obviously, the industry is already applying many of these practices - but often to a rather limited extent. The broiler industry has always generated enormous quantities of live production data for assessing "bottom line" economics but in-depth analyses of biological correlations for predictive value are rare.

The broiler industry can be characterised as brutally competitive, innovative, customer-focused and generally profitable. It has been blessed with an extraordinary array of genetics in the avian species, a simple feed and allied industries with technical expertise and products that seem inexhaustible. It should be - and has been - successful. As one phase in the vertically integrated poultry operation, broiler grow-out must now focus on optimising performance. This can be accomplished by exploiting the genetic potential it has selected on a vast and consistent basis in all extremes of weather at the farm level. The necessary technology and tools are either existing or soon will be developed. The challenges lie in the education and development of human resources, the co-operative efforts of all phases within a poultry complex and program analysis that will identify and implement the best programs for optimal broiler performance. Such programs must be implemented within the infrastructure and economic confines of the industry and compatible with the long-term goals of major food animal production.

In summary

The commercial broiler industry may well continue to produce the meat of choice on a global basis in the 21st century. Some companies will identify, assess, and implement the combination of genetics, facilities and programs that will optimise broiler performance for their individual situation. Some will not. Such assessment will likely be a dynamic mixture of science-based information, technology transfer, implementation and continual assessment. I envisage broiler production teams consisting of avian biologists, engineers, economists, statisticians, business administrators and educators, each of which will address both immediate and long-term program selection and implementation. The foundation for this optimisation will be human resources and educational programs that focus on the process and implementation of pertinent programs via information assessment and subsequent prioritisation of goals.

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