

Chapter 6 - FACTORS AFFECTING BROILER PERFORMANCE

Contents:

- Introduction
- House temperature
- Litter quality
- Feed wastage and feed deprivation
- Diseases and culling
- Human factors

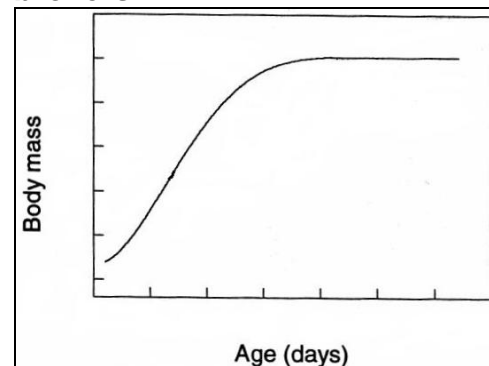
A. Introduction

There are several measures that can be used to evaluate the performance of a flock of broilers – growth rate, days to market, mortality, and feed efficiency. Feed is typically the most costly expense in broiler production. As a result, feed efficiency is typically the primary tool by which a flock is evaluated. In North America, feed efficiency is calculated by dividing feed intake by weight gain, resulting in typical values around 1.8 for 42 day old broilers. Thus the lower the number (referred to as Feed Conversion Ratio – FCR) the more efficient the flock was in using the feed supplied. In some European countries, however, feed efficiency is calculated as weight gain divided by feed intake, and a corresponding value would be 0.56. For Europe, therefore, higher numbers represent a more efficient feed conversion.

TYPICAL GROWTH CURVES FOR BROILERS

As is typical of all animals, broilers experience a period of rapid growth early in their development (see Figure 6.1). This is then followed by a slow rate of growth as more feed is used in maintaining the already existing body structure. As a result, feed efficiency is much better in the first weeks of broiler production and then declines with increased target market weight.

Figure 6.1 - Generic growth curve for broilers.



Today broiler companies have moved from standardized growing programs to one tailored to meet specific local goals and economic conditions. Many factors affect both growth rate and feed intake, and thus affect feed efficiency. The single largest factor

affecting feed efficiency is the energy level of the feed. Several years ago high energy feeds were given - examples 3,000 kcal/kg (1361 kcal/lb) in the starter; up to 3,200-3,300 kcal/kg (1452-1497 kcal/lb) in the finisher. Now, because of the cost of energy-rich feedstuffs, as well as other management problems, much lower energy values are typically used in formulating all diets of a feeding program. Broilers are also being grown to a wide variety different market weights. Feed efficiency declines as broilers get older so can not be compared with different age flocks.

B. House temperature

Probably the most important non-dietary factor influencing feed conversion is the ambient temperature of the poultry house. Chickens are homeotherms (warm-blooded) meaning they maintain a relatively constant body temperature regardless of the environmental temperature. Broilers perform best when there is minimal variation in house temperature over a 24 hour period of time. There is a trade off between energy provided by feed or fuel, and the most economical temperature will depend on the relative prices of the two.

In a cool environment, broilers will eat more feed but many of the calories they obtain from this feed will be used to sustain normal body temperature. When the calories are used for warmth, they are not converted to meat. Optimum temperatures allow the broilers to convert nutrients into growth rather than using the calories for temperature regulation. The ideal environmental temperatures for promoting feed conversion will be provided by your service personnel.

At high environmental temperatures, broilers consume less feed, and convert this feed less efficiently. The biological cooling mechanisms that birds use during hot weather (panting, etc.) require energy, just as the warming mechanisms do during cool weather.

C. Litter quality

Litter conditions significantly influence broiler performance and, ultimately, the profits of growers and integrators. Litter is defined as the combination of bedding material, excreta, feathers, wasted feed, and wasted water. See Chapter 14 for more information on the use of litter amendments.

D. Feed wastage and feed deprivation

Placing too much feed in the chick feeders results in feed wastage and contributes to an inferior feed conversion. To prevent excessive loss of feed, add small quantities of feed to the feeder lids by running the automatic feeders frequently for short periods. This will stimulate the chicks to eat more often. Also, this will encourage the chicks to feed from the automatic feeding equipment quickly.

Feed deprivation can occur during the growing period and contribute to an inferior feed conversion. This often occurs the first time the automatic feeding system is raised. Be careful not to raise the feeders too early and/or too high during the production cycle. Early feed deprivation will result in uneven growth, causing poor uniformity.

E. Diseases and culling

The general health of a flock influences feed conversions. Sick broilers do not perform well. Watch closely for early signs of disease and treat broilers quickly and properly. Carefully use vaccines and medication since reactions caused by improper administration can adversely affect weight gain and feed conversion. Eliminate, as early in the grow-out as possible, broilers that have no chance of making it to market.

Obviously an unhealthy broiler is likely to have poor feed efficiency. The main reason for this is that feed intake is reduced, and so again proportionally more feed is directed towards maintenance. With enteric diseases there can be more subtle changes in feed utilization because various parasites and microbes can reduce the efficiency of digestion and absorption of nutrients. A broiler with sub-clinical coccidiosis is not likely to absorb nutrients with optimum efficiency, because the oocytes will destroy some of the cells lining the gut. More recently the phenomenon of so-called 'feed-passage' has been observed in broilers. Undigested feed particles are seen in the excreta, and so consequently feed efficiency will be affected. The exact cause of this problem is unknown, but is most likely the consequences of a microbial challenge.

F. Human factors

Research studying the relationship between human behavior, broiler fear levels and productivity indicate potential that exists to improve productivity by reducing fear levels in broiler chickens. In this study, the behavioral response of broilers to humans was used in the study as a measure of broilers' fear of humans. A significant positive correlation was observed between speed of movement and first week mortality, which would appear to be mediated by broiler fear levels. This would indicate that very young broilers may be susceptible to stressors such as the stockperson's speed of movement. However, this susceptibility may be reduced as the broilers grow and become habituated to stockperson behavior.