

AN INVESTIGATION OF FACTORS INFLUENCING RATE OF LAY, EGG WEIGHT
AND EMBRYONIC GROWTH IN BROILER BREEDER HENS

by
Leigh McLoughlin

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ABSTRACT

The laying performance of broiler breeder hens is characteristically poor. Of the eggs that are produced, a large proportion are rejected before setting because they are either too small or excessively big, and of the eggs that are set, hatchability rates are often low, depending on the age of the hen. Since so much is still unknown about broiler breeders, many avenues of research would be fruitful. In this study, four disparate aspects were investigated as a means of improving the number of hatchable eggs per hen.

The effect of linoleic acid intake on egg weight of broiler breeders and laying hens was compared. Analysis of both published and experimental data revealed that egg weight was influenced significantly by this fatty acid. Breeder egg production was affected concomitantly. Increasing linoleic acid intake of young hens would increase early egg size and the number of eggs set, while decreasing the linoleic acid intake of ageing breeders would decrease egg size and production.

The influence of 20 week body weight and nutrient intake on early laying performance of 360 broiler breeders was determined. The excellent performance achieved was independent of 20 week body weight. Laying performance and weight gain increased as food allocation and nutrient density increased. A comparison of theoretical and recommended nutrient intakes revealed that hens are overfed pre-peak and that energy intakes should not decline post-peak as is recommended.

The investigation into the effect of breeder age (egg size) on embryonic and chick growth revealed that exponential embryonic growth was restricted within small eggs due to a lower yolk supply, rate of yolk absorption, and water loss. Chicks from small eggs were light, and grew relatively slowly. However, during times of chick shortage, small eggs could be used successfully if managed correctly.

In the fourth experiment in this series, the response of laying hens to dietary tryptophan was measured successfully, but the objective of comparing this response with that of broiler breeders failed. As a result of overestimating the tryptophan requirement of breeders, the coefficients of response could not be estimated. It was concluded that an additional breeder tryptophan trial should be conducted.