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POULTRY

EGG SHELL QUALITY

By R. J. BISHOP, B.Sc. (Agric.), Poultry Adviser

Recent overseas work and local industry developments indicate that the calcium content of feed for laying hens in Western Australia should be increased to achieve satisfactory egg shell strength. Age, temperature and breeding are other important influences on egg shell quality.

WEAK-SHELLED eggs have always been a problem to the poultry industry, but the problem has become more acute with modern developments.

In discussing this problem, it is convenient to group the influences on egg shell quality into four main classes—physiological, nutritional, environmental and genetic factors. Of the many items considered in the review, those which most affect the egg producer are briefly discussed below.

Age
Towards the end of their laying year, pullets lay thinner-shelled eggs. This physiological effect of age is the major obstacle to maintaining shell quality in the egg industry today. With the modern trend towards breeding birds for long periods of high production, shell strength may become a problem before the flock's rate of lay has fallen low enough to warrant selling.

Although increases in calcium intake improve shell strength, high intakes will not prevent the fall in shell quality associated with ageing. Even if hens are well
fed and healthy there is a little the producer can do to stop this decline in egg shell quality.

If birds are kept for a second season of lay, a rest by natural or forced moulting will bring about a substantial improvement in egg shell quality.

Nutrition

One of the most important factors influencing egg shell strength or thickness is the calcium supply in the layer's feed which is readily controlled by the poultry farmer.

Calcium is the most important nutrient influencing egg shell quality. Some of the factors which affect the calcium requirements of a laying hen are its size, age, breed or strain, feed efficiency and rate of lay. The energy, protein and phosphorus levels in feed and the temperature also affect the layer's calcium needs.

Other nutrients which influence egg shell quality are zinc, manganese, vitamin D and possibly vitamin C when hot weather prevails.

Recent overseas work has shown that layers require a higher level of calcium than was previously thought adequate.

In the past the general practice has been to feed 2.25 per cent. calcium in all mash diets. However, recent research has shown that this level is inadequate for maximum shell strength and calcium contents higher than 2.25 per cent. improve shell quality.

High producing birds need between three and four grams of calcium per bird per day to achieve maximum shell strength; 3 per cent. calcium in the diet should ensure this rate of intake.

Temperature

Heat has an important influence on egg shell quality, especially during summer when temperatures average over 70 degrees F. for long periods. Temperatures consistently above 70 degrees have been found to reduce egg shell thickness.

Experiments on dietary calcium levels conducted at temperatures above 70 degrees have clearly shown that calcium levels higher than 2.25 per cent. have a beneficial effect on egg shell strength.

High temperatures affect shell quality more severely when the humidity is also high.
Breeding
Perhaps the best way of overcoming the problem of thin-shelled eggs is by breeding for better shell quality. This is particularly important when trying to eliminate the fault of weaker egg shells from older pullets.

 Breeders selecting for shell quality must take account of modern trends towards smaller body size, greater feed efficiency, high production rates and longer production life which all put a greater strain on the shell-forming organs of the layer.

However, because egg shell quality traits are not strongly inherited, special breeding methods must be used to make these improvements and genetic progress is only slow.

BOOKS FOR FARMERS

THE following books on agriculture, recently published and obtainable to order from most booksellers, have been added to the stock of the Library Board of W.A. and may be borrowed freely from any public library associated with the Board, or consulted at the State Library of Western Australia.

**Poultry**

**BROODING CHICKS WITH INFRARED LAMPS:** Leaflet No. 397 issued by the United States Department of Agriculture. [Washington (D.C.), 1955].

**INCUBATION:** The artificial hatching of eggs: Bulletin A64 issued by the Division of Animal Industry of the New South Wales Department of Agriculture. 4th ed. [Syd.], 1965.

**POULTRY FARMING:** prepared by the Poultry Section in conjunction with the veterinary Staff of the Department of Agriculture of Victoria. 10th ed. Melb., [1961].

**TABLE CHICKENS:** Bulletin No. 168 issued by the British Ministry of Agriculture, Fisheries and Food. 2nd ed. Lond., 1965.

**Farm Management**

**THE CONCRETE ROAD:** Leaflet No. 33 (on) Fixed equipment of the farm issued by the British Ministry of Agriculture, Fisheries and Food. [Rev. ed.] Lond., [1965].

**ELECTRICITY FOR FARM AND ESTATE:** Leaflet No. 20 (on) Fixed equipment of the farm issued by the British Ministry of Agriculture, Fisheries and Food. [Rev. ed.] Lond., [1965].

**THE REPAIR AND MAINTENANCE OF FARM BUILDINGS:** Leaflet No. 26 (on) Fixed equipment of the farm; issued by the British Ministry of Agriculture, Fisheries and Food. [Rev. ed.] Lond., [1965].

**Livestock**


**F.R.S.T AID ON THE FARM, WITH NOTES ON THE DISEASES OF CATTLE, PIGS AND SHEEP:** by P. West. Lond., 1956.

**INTERNAL PARASITES OF SHEEP:** Use the right drug for the job; by J. S. Healey: Bulletin A.D. 65 issued by the Division of Animal Industry of the New South Wales Department of Agriculture. [Syd.], 1965.

**MASTITIS IN CATTLE:** Bulletin AD. 73 issued by the Division of Animal Industry of the New South Wales Department of Agriculture. [Syd.], 1965.


**SHEEP PRODUCTION AND GRAZING MANAGEMENT:** by C. R. W. Spedding. Lond., 1965.


**General**


**Bee-Keeping**

**THE WORLD OF BEES:** by M. Hoyt. Lond., 1966.
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