A STUDY OF SOME FACTORS AFFECTING EGG QUALITY

BY

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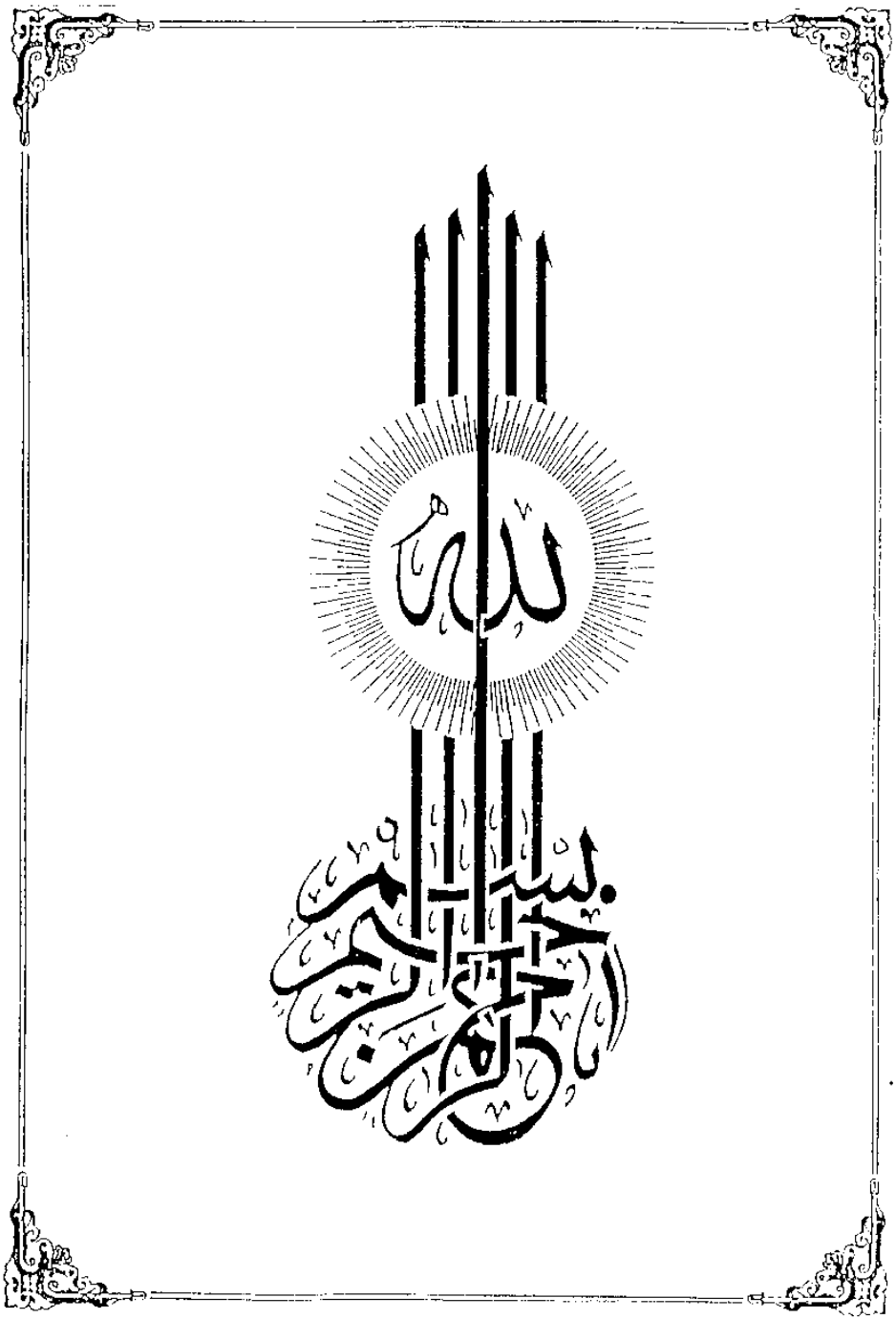

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INTRODUCTION

The hen's productive performance is influenced by many factors, of which the physiological ones. Several investigators reported that high environmental temperature causes heat stress to hens which results in fewer number of eggs, smaller eggs with low interior quality. (Ahvar, et al.,1982).

Mode of laying, clutch size time interval between each two successive eggs in a given clutch and position of the egg in the clutch, are also physiological factors responsible for the variations in egg components and interior egg quality.

Since local strains could be reared for more than two years, the age of such hens could influence egg size, egg components and interior egg quality, the effect of age was studied.

Another problem faces the consumer which is the short holding period for egg after laying under several environmental conditions. Such temperatures affect the interior egg quality.

Another problem facing the consumer/producer relationship is the bacterial contamination of shells of eggs. This point of view was taken into consideration.

The purpose of these experiments is to throw light on such physiological factors affecting egg production, egg components and interior and exterior quality of eggs.

REVIEW OF LITERATURE

Factors affecting the interior quality of eggs have been investigated for several years, with primary emphasis on environmental factors during storage of eggs and inherited differences among hens.

A: The internal quality of eggs:

It is known that deterioration in egg quality occurs directly after they have been laid, unless they are to be preserved under certain environmental conditions (Wesley and Stadelman, 1959 Skala and Swanson, 1962; Carter, 1968; Baker and Vadehra, 1970a; Stadelmen and Cotteril, 1973; Mountney, 1976, and Pavloviski; 1986).

Under proper storage and handling procedures and conditions, this deterioration can be slowed and a high quality egg maintained for longer periods of time.

Stadelman and Cotteril, (1973) reviewed the changes that occur in the egg from time of lay until consumer usage. These include: thinnig of the albumen, PH changes, weakening and stretching of the vitelline membrane, loss in weight and increase in water content of the yolk.

The maintenance of egg quality can be achieved by three basic methods:(1) refrigeration. (Mellor and Gardner, 1970; Maurer, 1975; Heath, et al., 1976; Osterle and Kepner, 1980; Amer and Petersen, 1983); (2) direct protection of the shell Marion, 1968; Meyer and Spencer, 1973; Imai; 1981; (3) A combination of refrigeration with one of the shell protecting methods.

Wesley and Stadelman (1959) reported that Haugh unit Values, yolk index, and thin albumen diameter are the most practical interior quality measurements to use to get a relatively complete quality description of a normal egg. They also found that Haugh units, shape of thick albumen, and percent inner thin albumen did not change significantly during the first 24 hours after lay when eggs were held at 12.8°C. with a relative humidity of 70 percent.

The same authors concluded that, percent of thick albumen was not as good an indicator of internal quality as some other measurements. The eggs used for their study apparently were all from one strain of chickens.

Similar results were obtained by Baker and Vadehra (1970b) who found that the shape of the firm thick albumen envelope (Upstanding or flattened) is more important than the actual amount. They concluded that the relative position of the yolk (centered or not) may influence the height of the thick albumen and thus affect the measurement.

Skala and Swanson (1962) studied the variation in initial quality of eggs. They selected hens within a strain that laid high quality eggs and compared them to hens in the same strain that laid poor quality eggs. They found that the higher quality eggs were heavier and contained a larger amount of total white than did the lower quality egg. They also found that the total white of the high quality eggs contained a significantly higher percentage of thick white and a lower percentage of weight of outer thin white than did the lower quality eggs.

These findings were confirmed by King et al. (1961)Amer (1972) and Petrovska and Spacek (1981) who stated that there were considerable variations in the percentage of egg components among strains and individuals withen each strain.

Studies concerning the proportions of egg components are of particular interest to processors wanting to alter the relative yield of yolk and albumen.

Cunningham et al. (1960) reported that the relative amount of albumen to yolk per egg was not influenced by the season of the year, but that as the birds aged the percent of yolk per egg increased. It has also been reported that individual hens produce eggs of different composition.

Marion et al. (1965); found significant differences in egg weights of albumen, yolk and shell from three lines of White Leghornes. Since egg size was correlated with most factors, they concluded that most of the genetic variation in components was covariation with egg size. They reported also that hens in their second year of production laid eggs with 0.7% less shell and 0.5% more yolk as compared with eggs laid during their first year. In contrast, Squibb et al. (1959) observed a significant increase in shell thickness during the second year of production when compared with shell thickness during the pullet year, but these authors indicated that this increase was probably caused by environmental factors and not by aging.