

EFFECT OF VITAMIN C SUPPLEMENTATION ON SOME PRODUCTIVE AND PHYSIOLOGICAL PARAMETERS IN LAYING HENS

G. M.El-Gendi¹; M. M. Iraqi¹ and A.A. Abd Elrahman²

1- Animal Production Department, Faculty of Agriculture, Zagazig University, Benha Branch

2- Biochemistry Department, Faculty of Agriculture, Zagazig University, Benha Branch

SUMMARY

Two hundred and sixteen Hy-Line laying hens were used to study the effect of vitamin C supplementation during summer months on some productive traits, egg quality, plasma and yolk total lipids and cholesterol.

The results showed that pullets treated with vit. C had lower ($P<0.001$) egg production rate and significantly higher ($P<0.001$) egg weight and egg mass. In addition, their eggs were characterized with significantly higher ($P<0.001$) absolute and relative weights of albumen and yolk. Significant improvements ($P<0.05$) in shell quality estimated as weight and shell weight per unit surface area (SWUSA) was attained with vit. C supplementation. Dietary vit. C supplementation showed highly significant effects on feed consumption and conversion. Pullets of control group had the better feed conversion when compared with those supplemented with vit. C.

Plasma calcium and inorganic phosphorus increased in vit. C supplemented birds. Plasma calcium significantly increased ($P<0.01$) as the time passed reaching its maximum value at the end of the experiment. Plasma total lipids content was significantly lower ($P<0.001$) in controls and in pullets fed 400 g/ton vit. C, the latter had significantly the lowest value of plasma cholesterol content. Dietary vit. C supplementation decreased yolk total lipids and cholesterol, the rate of decrease was positively correlated with the level of vit. C supplemented.

Significant ($P<0.01$) positive correlation was noted between egg production and each of plasma calcium and cholesterol. Inverse relationships were found between yolk cholesterol and each of plasma total lipids and cholesterol. Positive highly significant ($P<0.01$) regression coefficients were found for most studied traits on plasma calcium. Egg production, egg weight, shell, albumen and yolk weights increased by 2.9 eggs, 0.89, 0.15, 0.42 and 0.30g, respectively for unit change in plasma calcium. The results obtained demonstrate that ascorbic acid supplementation can be effective in reducing egg cholesterol and has influences on egg quality.

INTRODUCTION

Increasing attention has been focused on the potential role of vitamin C supplementation in preventing over-reaction to heat stressful stimulation to help chickens and other animals to cope with such challenges (Jones et al., 1996).

Earlier studies in poultry have shown that exogenous ascorbic acid supplemented in feed or drinking water or by injection improved performance of chickens during heat stress (Pardue and

Thaxton, 1982 and Pardue et al., 1984).

In laying hens, there are inconsistent reports concerning the influence of ascorbic acid supplementation on egg production, egg weight and shell quality. Some reports indicated an improvement in the previously mentioned parameters as a result of vit. C supplementation (Bell and Marion, 1990; Orban et al., 1993; and Zapata and Gernat, 1995), whereas others, Ahmed et al., (1967) and Rowland et al., (1973) showed insignifi-