3A.2 PERFORMANCE OF LAYERS UNDER VARIOUS HEAT COMBATING PRACTICES DURING SUMMER

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INTRODUCTION

Domestic fowl being a homeotherm can live comfortably only in a relatively narrow zone of thermoneutrality, extending from 14.5°C to 25.5°C (Freeman, 1969) and deviation especially on higher side reduces both the survival rate and production. High environmental temperature during summer season is stressful and has adverse effect on productive and reproductive performance of layers (Akram *et al*., 1999). Very expensive methods of cooling such as air conditioning, pad cooling and total environment controlled housing cannot be used for the survival of poultry during summer. It is, therefore, imperative to look into the opportunities and scope of cheap methods of cooling.

MATERIALS AND METHODS

The present study was conducted at the Poultry Experiment Station, University of Agriculture, Faisalabad (Pakistan) on 300 White Leghorn (Euribrid) pullets at the age of 24 weeks. Three units under each of the following 4 heat combating systems and the control were maintained under cage housing in the similar and equal sized (7.6x7.0 meters) separate rooms. Treatment included, Desert cooling system, Surface wetting system, Time limited feeding twice daily during cool hours i.e. 5.00 am. to 6.00 am. and 7.00 pm to 8.00 pm and Ascorbic acid supplementation at the rate of 150 ppm in feed. The body weight of individual bird and feed consumption was recorded weekly. Daily egg production and egg weight (once weekly) was recorded through out the experiment. The data collected was tabulated and tested using ANOVA technique using MSTAT package.

RESULTS AND DISCUSSION

The body weight of layers decrease progressively during the first 4 weeks in all the experimental groups. This decrease was more severe in case of control birds followed by those under time limit feeding and ascorbic acid supplementation systems. This was possibly due to the fact that maximum diurnal ambient temperature of the control (38.5±2.98°C) birds was relatively higher as compared to the respective values for layers kept under environmental cooling devices. Hence, the birds under desert cooling during the heat stress (HS) phase were found to be significantly heavier to those under all groups including the control. The mean feed consumption of the birds in desert cooling and water sprinkling systems, apparently, showed an increase over that of the control birds during the HS phase, possibly resulting in a corresponding increase in the body weight and/or egg production in these groups than the control. Mean feed intake as well the mean body weight were found minimum in the time limit fed birds for the overall experimental period. The results are in line with the findings of Li *et al.* (1992) who claimed that 2 meals per day decreased feed intake at higher temperature. The birds kept under the desert cooling system maintained maximum egg production throughout the experimental phase except in water sprinkling system that resulted in somewhat improved overall egg production (67±1.08%) as compared to that (64.00±0.96%) of the control birds during the HS phase. The result indicated no favourable impact of ascorbic acid supplementation regarding egg production thus confirming the findings of Bell and Marrioin (1990).

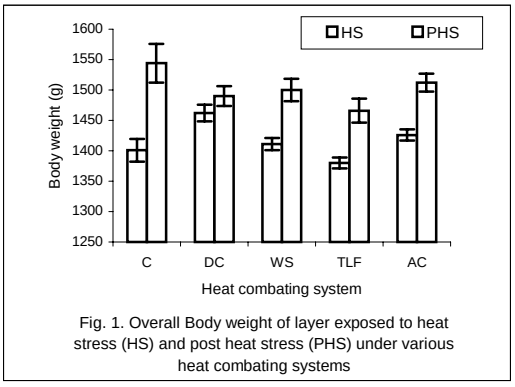

Fig. 1. Overall Body weight of layer exposed to heat stress (HS) and post heat stress (PHS) under various heat combating systems

The desert cooling and water sprinkling systems proved helpful in maintaining significantly higher egg weight during the HS phase. Wilson et al. (1957) who reported slightly higher egg weight in water sprayed hens at 100°F. The impact of ascorbic acid supplementation with respect to improvement in egg weight was not evident in the presents study. However, Orban *et al.* (1993) and

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Sahota *et al.* (1996) found improvement in egg weight by ascorbic acid supplementation. Feed efficiency was not significantly affected by the heat combating systems during the heat stress phase, however, it appeared relatively better under desert cooling and poorest in the case of ascorbic acid supplementation. Feed efficiency in terms of feed intake in kg per kg egg mass output showed, in general, similar trend after the first week as discussed under feed efficiency on per dozen basis. The desert cooling system only could maintain superiority in feed efficiency in term of feed intake in kg per kg egg mass over the control group. In conclusion, performance was much better in birds kept under desert cooling system as assessed by body weight, feed consumption, egg production and egg weight.

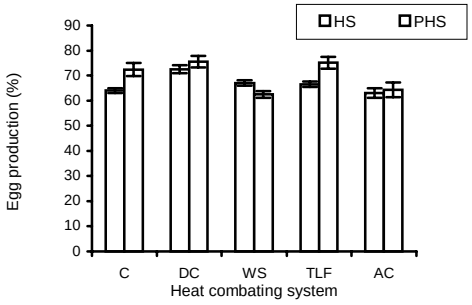

Fig. 2. Overall egg production of layer exposed to heat stress (HS) and post heat stress (PHS) under various heat combating systems

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