A STUDY OF SOME ENVIRONMENTAL FACTORS AFFECTING PERFORMANCE OF CHICKEN

By

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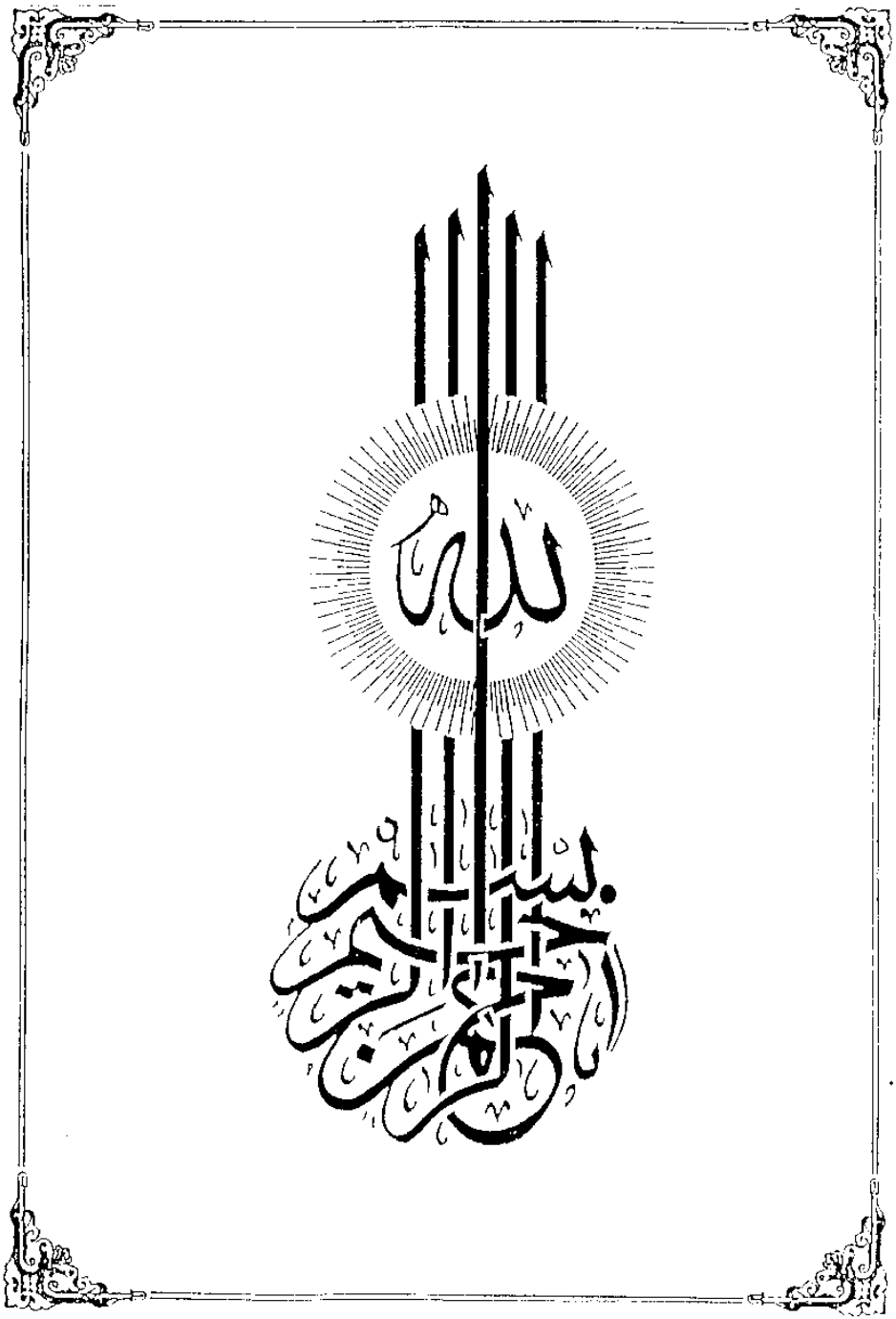

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ABSTRACT

This study was conducted at Poultry Farm in Department of Animal Science, Faculty of Agriculture, Oklahoma State University, Stillwater, U.S.A. The study was designed to evaluate effects of different levels of feed restriction on bird body size and if restrictive feeding is a means of increasing efficiency utilization and to improve bird thermobalance during heat distress through reduce heat gain and increase heat loss for minimizing the deleterious effects of heat distress or to exploit biological relationships for reducing bird heat production and increasing heat dissipation extent and or efficiency.

Four experiments were carried out as follows: Experiment (1) The 460 H&N International pullets were allowed to consume feed ad libitum to 8 weeks of age at which time they were individually caged, divided into 4 groups with 3 groups limit fed at 50, 65 and 80% of the 4th group's ad libitum consumption level. Feed restriction treatments were continued to 20 weeks of age. Experiment (2) The 20 week old pullets, 3 pullets per feeding level (50, 65 80% and full-fed) averaging 805, 966, 1109 and 1251g; respectively placed in individual cyclic temperature (24-37 C) metabolic-respiratory chambers such that bird thermobalance could be determined. Experiment (3) The 31 week old layers were transferred and housed within 2 environmentally controlled room; a constant thermoneutral (24 C) and cyclic heat distress (27-37 C). Experiment (4) The effects of previous feeding and environmental history were examined during week 37 by placing 48 birds; 24 per temperature treatment (TN and HD). The birds were placed in indirect calomitry respiratory chambers set to mimetic the two chamber environment.

According to the performance of pullets through these experiments, the results reported herein indicated that: (Experiment 1) The reduction in body weight was positively correlated with the degree of restriction and body weight at sexual maturity decreased with increasing feed restriction level. Also, age at sexual maturity increased with the severity of restriction. (Experiment 2) Restricted birds had the lower heat production, heat content, non-evaporative and evaporative cooling comparing with full-feeding birds when exposed to heat distress. (Experiment 3) Cyclic heat distress reduced body weight gain, egg production, egg size and shell quality, while improved feed efficiency. (Experiment 4) Acclimated birds to heat distress had a lower heat production, non-evaporative cooling evaporative cooling, heat content and respiration rate. Long term adaptation to heat distress appears not to be due to increased efficiency of respiratory evaporative heat loss but that sensible heat loss became enhanced by an increased blood flow to the unfathered extremities.

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