THE DECREASE OF THE NEGATIVE EFFECTS OF HIGH TEMPERATURES ON "ROSO" LAYING HYBRID PRODUCTION BY MODIFYING FORAGE RATIO

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Abstract

It was study the influence of the protein and aminoacides levels on the eggs production in Roso hens exposed at the alternative high temperature (from 35˚C in the day until 25˚C in the night). The birds were kept in the acclimatization room. The relative humidity was 77%. The experimental period was 8 weeks (for 32 until 39 weeks of age). The 3 experimental groups were fed on the izocalorice diets (2750kcal/kg). At the group 1 the protein, lysine and metionine+cystine levels were in concordance with the feeding standardize. At the group 2, the protein, lysine and metionice+cystine levels were increased whit 10%. At the group 3, the protein level was identical whit the group 1, but the lysine and metionine+cystine levels were identical with the group 2. The eggs productions was: 45 eggs at the control, 31 eggs at the group 1, 36 eggs at the group 2 and 32 eggs at the group 3 (p≤0,05). The weight eggs were: 63.4g at the control, 51,74g at the group 1, 53,36g at the group 2 and 52g at the group 3. It was obtained a mass-egg production on: 2,8kg, 1,6 kg, 1,9 kg and respectively 1,7kg (p≤0,05). The negative effects of high temperature were attenuated by the increase in protein, lysine and metionine+cystine levels with 10%.

Key words: high, temperature, laying, hybrid, forage, ratio

INTRODUCTION

High temperatures are a major factor of stress for laying hens. In the event that can not provide optimum conditions microclimate, one of the solutions to mitigate the negative effects of heat stress represents an increase of nutrient density ratios.

MATERIAL AND METHOD

Experiences have been conducted in 2 air-conditioned rooms, the 154 chickens hybrid Roso, the age of 31 weeks, divided into four lots randomized (witness L1 L2 L3). In the first room thermostat chickens in the group were maintained at constant temperature of 20 ± 1 ° C. In the second room thermostat lots of birds L1 L2 and L3 were exposed to temperatures up alternatives to 35 ± 1 º C day and 25 ± 1 º C at night(by increasing progressively in accordance with a scheme for the introduction of heat stress). In both rooms humidity was 77%. For two weeks, the birds were accommodate terms experimental variation of ambient temperature. After this accommodation period, followed the experimental period, which lasted 8 weeks (32-39 weeks). The birds were housed in batteries, many hens per cage 3. Biological material has been increased in these batteries, in terms of technological temperature, since the age of 20 weeks, is also recorded and the production of eggs. During the experiment, the zootechnical results have been watched: the production of eggs, egg weight, mass-production or consumption of specific fodder combined evolution and body weight. Ratios used in the experiment were izocalorice, make it an energy metabolized by 2750 kcal / kg. In group (M) and L1, breeds had managed levels in energy, protein and amino acids in accordance with the rules of furajare for Roso chickens housed at the ambient temperature of 20 ° C (10), make it 17.5% crude protein 1% Lizin, 0.71% metionona + Cystine. On lot 2 were used rations to levels in crude protein and amino acids (Lizin Cystine + methionine) increased by 10% compared to the norm, make it 19.2% crude protein, 1.1 and 0.78% lizina Metionona% + cistina.La lotul3 was used rations with the protein under the rule, but has provided a level in amino acid increased by 10% (1.1% lizina and 0.78% Cystine + methionine). During the experimental period feeding stuffs and water were provided ad libitum, with daily record of ingestion of the cages and lots. Light program was the recommended technology, being of 16 hours of light per day. The egg production and their weight were daily recorded.

The data regarding the productive performances were statistically worked, using the Student significance test. Egg production. The data regarding egg production expressed percentually on each hen, are presented in Table 1.It's been observed that, during 32-39 weeks, there were significant differences between lots. Thus, in terms of average number of accumulated eggs, it was 45 eggs to group, 31 eggs at L1, 36 eggs at L2, L3 and 32 to L3,the differences between lots were statistically assured ($p \leq 0,05$).The maintenance of hens at high temperatures determined a decrease of egg number, in comparison to the maintenance at 20ºC, having lower values with 30,7% at L1, 20,7% at L2 and 27,9% at L3. By the increase by 10% the

level of protein in lizine and Cystine + methionine (lot 2), egg production increased 16% compared with the lot 1, while the increase in amino acid levels had no significant impact on cumulative production of eggs and the percentage average lay in terms of statistical achieving equality between the average values. Andrade and col.(1996) in a series of experiments carried out on chickens Rhode Island, have noted that most of the protein by 20% resulted in heat stress conditions gain a significant production of eggs, while the temperature at 21ºC there was no productive effect. Daily average consumption of mixed fodder was of 119,5 g at witness lot; 97,8g at lot1; 98,1g at lot 2 and 98,4g at lot 3. It was observed that at high alternative temperatures (35ºC/25ºC),the daily average consumption decreased with 18,2% at lot 1; 17,9% at lot 2 and 17,7% at lot 3, in comparison to the witness lot(20ºC). Andrade and col.(1996)obtained a decrease of 25% of the average consumption of mixed fodder at lots at the temperature of 32ºC, in comparison to the results obtained at 21ºC.

This decrease of ingestion of NC has influenced only the temperature, not the content of protein ratios, the differences between lots 1.2 and 3 are insignificant in terms of statistics. Jones and col. (1999) in experiments carried out on Rhode Island chickens; found that the birds under heat stress (35ºC) do not change ingestion depending on the food content of energetic ratio.

Table 1

Productive parameters obtained during experimental period

Specification	M	L1	L2	L3
Total nr. of eggs/head	45	31	36	32
% of witness lot	100	69,6	79,3	71,6
Average laying percent	89,9	62,9	71,6	64,8
% of witness lot	100	70	79,6	72,1
NC consumption,g/head/day	119,5	97,8	98,1	98,4
% of witness lot	100	81,8	82,1	82,3
Average egg weight,g	63,2	51,74	53,36	52,0
% of witness lot	100	81,9	84,4	82,3
Total egg-mass,kg	2,8	1,6	1,9	1,7
% of witness lot	100	57,1	67,9	60,7
Specific consumption,kg NC/kg Egg-mass	2,4	3,4	2,9	3,2
% of witness lot	100	142	121	133
Initial weight	1790	1785	1787	1789
Final weight,g	1920	1700	1800	1730
% of witness lot	100	88,5	93,8	90,1

The specific consumption was of 2,4kg NC/kg eggs at witness lot, 3,4 kg NC/kg egg mass at lot 1; 2,9 kg NC/kg mass at lot 2 and 3,2 kg NC/kg egg mass at lot 3.It was observed that a high temperature determines a significant increase of specific consumption at all experimental lots, while the 10% increase of protein level and in amino acids determined an

improvement of the utilization efficiency of food with 14,7%(lot 2 in comparison to lot 1).
This can be explained by the fact that the need for maintenance of hens at high temperatures was reduced and consequently, efficient use of feed has increased. Increase by 10% only in amino acid levels had no significant effect on the efficiency of utilization of food (lot 3 in comparison to lot 1.)

Average weight of the egg. At the witness lot has been recorded an average weight of 63.4 g of eggs, the lot 1 51.74 g to lot 2 of 53.36 g and 52g of lot 3, the differences between lots being uninsured statistically($p \geq 0,05$). Because high temperatures influence egg weight (Nyoya 1995 Tzschentke 1996 Kzarisiima and Balnave 1996), the values obtained in experimental plots, compared with the witness lot, were lower by 18.4% in lot 1, 15.8% of the lot 2 and 18% in lot 3. Jones and col. (1999), in experiments carried out on Rhode Island chickens, found that egg weight was not influenced by a 15% increase in the level of energy and protein. However ,in the present paper, has been observed an improvement in the average weight of the egg of 3% to lot 2 compared with lot 1, while at lots between 1 and 3 was recorded statistically equality between average values.

Egg mass production has presented average values of 2.8 kg / hen at witness lot, 1.6 kg / hen at lot 2 and 1.7 kg / hen at lot 3. The values recorded in experimental lots were lower compared with the group, with 42.9% in L1, L2 at 32.1% and 39.3% at L3 ($p \leq 0,05$). On lot 2 it has been recorded an improvement in the production of mass-egg, with 18.8% at L1 and 11.8% at L3.Because the production of eggs has increased at lot 2, compared to lots 1 and 3, quantity of egg mass was made by default, the differences being statistically assured ($p \leq 0,05$).

CONCLUSIONS

1. In terms of increase by 10% compared to normal levels in crude protein, lizine and metonine + Cystine (lot 2) at Roso chickens exposed to alternative heat stress (from 35ºC to 25ºC at night), the production of eggs:
- decreased with 20,7% in comparison to the production obtained at witness lot (foddered at the level of the norm and maintained at 20ºC);
- increased with 16% and respectively 12,5% in comparison to the results obtained at lots 2 and 3, maintained at alternative temperatures (from 35ºC to 25ºC at night)and foddered with the same normal level, but with a different content of amino acids ($p \leq 0,05$).

2. At lot 2, average egg weight recorded the following values:
- lower with 15,8% in comparison to the witness lot;
- higher with 3% and respectively with 2,6% in comparison to lots 1 and 3;

3. Specific consumption (kg NC/kg egg-mass)obtained at lot 2 was:
-higher with 21% in comparison to the witness lot;
-lower with 14,7% in comparison to lot 1 and with 9,4% in comparison to lot 3.

4. By the increase with 10% at the lizine level and respectively metonine+cystine (lot 3) were not recorded significant results in comparison to the foddered lot (L1).

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