THE INCUBATION EGGS SANITATION INFLUENCE ON THE OBTAINED PERFORMANCE IN THE GROWTH OF THE HATCHED CHICKENS FROM TREATED EGGS

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Abstract

The research was done on a batch of 1344 incubation eggs, descending from the meat chicken commercial hybrid „COBB-500”; out of these eggs, 1008 were decontaminated, in 3 work modules (A, B and C), each containing 336 eggs. The decontamination of the mineral shell of the studied eggs was made with a new substance, named Sodium dichloroisocyanurate. For the A module a 0.6g ‰ a.s. solution was used, for the B module a 0.4 g ‰ a.s. solution and for the C module a 0.2 g ‰ a.s. solution. The decontamination technique of the eggs contained four work stages: water wash, for the removal of impurities on the mineral shell; water rinsing; decontamination; the temporary holding of eggs at a 18°-19°C temperature. The hatched chicks from the treated eggs were studied over all the growth period, from day 1 to day 41, determining their quality, weight growth dynamic, food consumption, losses from the effective and the resulted meat production. The hatched chickens in A module became L1exp. batch (279 heads) the ones from the B module – L2exp. batch (279 heads), and the ones from the C module – L3exp. (279 heads) in addition a control batch was formed – Lc(279 heads), with hatched chickens from untreated eggs. Incubation egg sanitation with Sodium dichloroisocyanurate, 0,4g ‰ a.s., proved to be the one with the best results in the growth of hatched chicks from the eggs treated this way (average live weight at 42 days - 2572,64 g; IC kg nc/kg gain – 1.84; losses in the effective 1.78%).

Key words: sanitation, incubation, broiler chicken

INTRODUCTION

Performance achievement in poultry husbandry is conditioned by the existence of a powerful hatching sector, which should be able to valorise the results from breeder farms and provides best health status to new hatched chicks – a warranty for high poultry production achievement [1], [2], [3], [4], [7]. Among the factors that could decisively influence the eggs hatching performances and chicken rearing ones, sanitation of incubation eggs is a key factor, providing high levels at hatching and viability to obtained day old chickens [5], [6]. Our researches focused on the same problems, the efficacy of eggs decontamination being assessed when a new decontaminant substance, of Romanian origin, was tested.

MATERIAL AND METHODS

Researches have been carried out on “COBB-500” chickens, hatched from certain eggs treated with sodium dichloroisocyanurate solution, prepared at different concentration, as well as from untreated eggs. 4 experimental groups were set up: 1 control group – Lc and 3 experimental treatments: L1exp. group, which comprised chickens hatched from eggs treated with sodium dichloroisocyanurate solution, 0.6g ‰ a.s.; L2exp. group, which consisted of chickens hatched from eggs treated with sodium dichloroisocyanurate solution, 0.4g ‰ a.s. and L3exp. group, which included chickens hatched from eggs treated with sodium dichloroisocyanurate solution, 0.2g ‰ a.s.

Climate controlled halls and permanent litter were used within the S.C. “AVI-TOP” S.A Iași, for fowl rearing till slaughtering (41 days). Chickens were fed with certain mixed feed recipes, presented in table 1.
The analysed traits were: weight gain dynamics, feed consumption, flock casualties and their reasons, meat yield and its quality. Working methods were specified by scientific literature.

RESULTS AND DISCUSSIONS

Weight gain dynamics
At day old, chickens hatched from untreated eggs weighted 42.21 g (Lc group). In experimental groups, variation limits were comprised between 42.20 g in L1exp. and 42.63 g in L3exp. High homogeneity was recorded for the studied trait (V%=6.659-7.612). No statistical significance occurred between the studied groups (1.6278 (F) < 0.005).

During slaughtering (41 days), achieved live weights were different among groups. Thus, highest weight was found in L2exp. group (2572.64 g), while the lowest occurred in Lc group (2522.40 g). L 1exp. was situated close to control, with an average of body weight of 2523.40 g, while L 3exp. (2558.44 g) was found closer to L2exp. group (tab. 2).

Compared to Lc group, live weights of experimental groups chickens were higher, +1.99% in L 2exp.; +1.43% in L 3exp. and +0.04% in L1exp group.

Variation coefficients values indicated poor to average homogeneity (V%=9.242-10.467). Differences between means were not statistically significant.

Assessment of average live weight recorded by each gender did not reveal displacements of groups succession for females. However, L3exp. and L2exp. pullets proved to be the heaviest when they reached 41 days [6].

Average daily weight gain
The average daily weight gain reached different values across the entire
experimental period: 60.49 g in Lc group; 60.52 g in L1exp group; 61.72 g in L2exp group and 61.36 g in L3exp group. Therefore, this trait was 2.03% higher in L2exp group, 1.44% higher in L3exp group and 0.05% higher in L1exp group, compared to control.

Table 3. Feed consumption in studied chicken broilers

<table>
<thead>
<tr>
<th>Recipe type</th>
<th>Weight gain-kg</th>
<th>Feed intake-kg</th>
<th>FCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starter</td>
<td>456</td>
<td>1100</td>
<td>2.41</td>
</tr>
<tr>
<td>Grower</td>
<td>1637</td>
<td>2600</td>
<td>1.58</td>
</tr>
<tr>
<td>Finisher</td>
<td>700</td>
<td>1300</td>
<td>1.85</td>
</tr>
<tr>
<td>Overall</td>
<td>2793</td>
<td>5000</td>
<td>1.79</td>
</tr>
</tbody>
</table>

Table tab. 3 reveals the feed conversion rate values (kg feed/kg gain). Highest conversion value was calculated in Lc group – 1.86, followed decreasingly by L2exp group-1.84; L3exp group – 1.83 respectively by L1exp group, with a value of 1.79.

Flock casualties and their reasons
Analysis of flock casualties revealed very low values, comprised between 1.78% in L2exp group and 2.23% in Lc. Accidental situations occurred as reasons

Resulted meat yield
Slaughter efficacy
This is a very relevant trait for meat production assessment. Live weight (g) and carcasses weight (g) were considered when slaughtering efficacy (dressed weight) was calculated on fresh and refrigerated (24 hours post slaughtering) carcasses. This parameter was separately calculated for each gender. In cockerels, its values varied between 68.07% (Lc) and 69.92% (L3exp.) for fresh carcasses, respectively from 66.82% (Lc) till 68.12% (L2exp.) for refrigerated carcasses (V%=6.178-14.752).

Dressed weight on fresh pullets carcasses oscillated between 69.62% in L2exp. and 71.72% in L3exp. group, while refrigerated carcasses dressed weight reached the minimal value of 68.41% in Lexp. group and the maximal one of 70.73%, in Lc group. No statistical significance occurred for the components used in slaughtering efficacy computation, for any gender.

Trenched parts participation in carcasses formation
Certain anatomic parts were studied in our investigations: breast, thighs and shanks, wings and remnants, the acquired data being presented in tab. 4.

Small differences occurred between groups for males values. They were statistically different only for thighs weight (5.1298 (F)>F0.01 (3; 36) 4.51**).
In females, significant statistical differences occurred for carcass weight: 3.3062 (F) > F_{0.05}(3; 36) 2.9200 * and breast weight: 3.1367 (F) > F_{0.05} (3; 36) 2.9200*.

Similar as males, in females were found heavier trenched parts in L2exp. group than in other groups. Closer to L2exp. were consecutively found the Lc, L3exp. and L1exp. groups, with certain little exceptions.

Thus, breast weight represented 632.20 ± 10.606 g in L2exp. group, followed by other groups: Lc, with 624.80 ± 14.908 g; L3exp. with 621.60 ± 11.014 g and L1exp., with 593.60 ± 12.256 g (V%=5.305 – 7.311).

CONCLUSIONS

1. When chickens hatched from treated and untreated eggs were slaughtered (41 days) it was found that highest average live weight occurred in L2exp. group (2572.64 g), while the lowest one in Lc group (2522.40 g). Close to Lc group was situated the L1exp. group (2523.40 g), while L3exp. group – 2558.44 g – was closer to L2exp. group. Percentage differences, compared to Lc group (=100%), were +1.99% in L2exp. group; +1.43 in L3exp. group and +0.04% in L1exp. group.

2. Highest feed conversion rate value (kg feed/weight gain) was recorded at Lc group (1.86), followed by L2exp. (1.84), L3exp. (1.83) and L1exp. (1.79) groups.

3. Flock casualties represented 2.23% in Lc; 2.16% in L1exp.; 1.78% in L2exp. and 1.96% in L3exp.

4. Slaughter efficacy values were not statistically significant between groups. Efficiency calculated for refrigerated meat varied between 66.82% (Lc) and 68.12% (L3exp.) at males, while for females, ranged from 68.41% (L1exp.) till 70.73% (Lc).

5. Sanitation of incubation eggs, using sodium dichloroisocyanurate 0.4g ‰ a.s., proved to provide best results in rearing the chickens hatched from eggs treated in such manner.

REFERENCES