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STUDY ON EVOLUTION OF PRODUCTION PARAMETERS TO THE QUAIL YOUTH OF BALOTEŞTI POPULATION BETWEEN 0-6 WEEKS OF GROWTH BY DAILY LIGHT DURATION

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Abstract

In order to determine the influence of the daily duration of illumination on growth parameters as weight gain and feed valorization in young quail of Baloteşti population, an experiment was organized by a total of 600 chickens divided into two groups of 300 animals each. A lot has been exposed to light 24 hours a day during 0-6 weeks of growth and the other to 24 hours light per day during the first 3 weeks and 14 hours per day in the last 3 weeks of growth. Overall, growth parameters were higher in chicks subjected to a daily 24 hours light per day, while the mortality rate was reduced by about 50 % and the electricity consumption for lighting by 20.83%in the other group.

Keywords: quail, youth, growth, lighting duration.

INTRODUCTION

Light, as duration, intensity and intensity and variation of duration and intensity influences determinately the growth and reproduction of wild birds, but also that of the domestic ones. Quail, raised of less time by humans compared to other species of birds and has a very short growth duration is more in control by light. Most farmers raise young quail under continuous light, so to locate and benefit better of feeding and watering places, although it seems that they learn to focus in the early days of life and the wild chickens grow in the spring to a light period of the day of 14-15 hours. Thus, Woodard et al., 1973; Alexandru, 2001; Văcaru - Opriş et al., 2002; Van et al, 2004 recommended illumination of 24 hours of 24 hours per day throughout the youth raising period. Coban O. (2008) used 24 hours light per day in the first week of chicks life, 21 hours the second week and 14 hours per day in the third week to the end of the growth of young quails. Popescu - Micloșanu (2007) recommends the first weeks 24 hours light /day with 30 minutes of darkness for resting at start. Further, light can be kept constant (24 hours a day) or the duration is reduced quickly or gradually, leading to 10 to 15 hours / day.

MATERIALS AND METHODS

The experiment was conducted in Lucian T. Ioniță Individual Enterprise society Bucharest, farm located in the Gheorghița commune, Ungureni village, Prahova County, on a total of 600 quail chicks of the Baloteşti population that was divided at hatching into two groups housed in two separate rooms.

The control group was subjected to 24 hours of light per day for the entire growth period of 6 weeks, while the other experimental group, to 24 hours light per day for the first 3 weeks and to 14 hours /day during the last three weeks of growth. The light intensity was the same in both analyzed groups.

Also, chicks from both groups were maintained on permanent litter at ground during 0-3 weeks of age and in adult quail batteries for between 4-6 weeks of growth. The feeding chickens of both groups was performed with quail chicks mixed feed type starter during 0-3 weeks and growing feed type during 4-6 weeks of growth.

Other environmental conditions of the experiment were within the limits of literature. The measurements were made individually by simple random sampling and processing was performed using Microsoft Excel 2010.

RESULTS AND DISCUSSIONS

The results are shown below in summarized main groups of parameters on weight gain, food consumption and mortality as registered in the study.

1. The average weight and weekly average weight gain in quail chicks of the control group versus the experimental group during 0-6 weeks of growth

Table 1 presents the weight gain evolution of chickens. As expected, benefiting of the same growing conditions during 0-3 weeks, average body weight evolution was about the same in both studied groups, the difference between them being insignificant. Thus, at the age of 3 weeks chickens in the control group had an average weight of 110.65 ± 1.76 g, while the experimental group 108.33 ± 1.95 g.

Table 1. Changes in body weight and weekly weight gain of quail chicks in the control group compared with the experimental growth during 0-6 weeks

Age	Average live weight (g)		Average weekly weight gain rate (g)	
	Control group	Experimental group	Control group	Experimental group
Day1	8.44 ± 0.80	8.35 ± 0.88	x	x
1 week	30.85 ± 0.95	29.55 ± 1.58	22.41	21.20
2 weeks	54.75 ± 1.45	55.75 ± 1.75	23.90	26.20
3 weeks	110.65 ± 1.76	108.33 ± 1.95	55.90	52.58
4 weeks	147.75 ± 2.78 aaa	135.45 ± 2.15 aaa	36.90 ± 1.15 ddd	27.12 ± 1.95 ddd
5 weeks	175.75 ± 2.85 bbb	155.55 ± 2.45 bbb	28.00 ± 1.75 eee	20.10 ± 1.65 eee
6 weeks	200.50 ± 2.95 ccc	167.55 ± 2.32 ccc	24.75 ± 1.55 fff	12.00 ± 0.85 fff
Weeks I-III	x	x	34.07	33.33
Weeks IV-VI	x	x	29.88	19.74
Weeks I-VI	x	x	31.98	26.53

Note: between values marked with the same letter are significant differences

At the age of 4 weeks average live weight was 147.75 ± 2.78 g / head in the control chickens group and 135.45 ± 2.15 g in the experimental group, the difference of 8.3 % between them being very significant and at 5 weeks of 175.75 ± 2.85 g / head in control chickens and 155.55 ± 2.45 g in the experimental group, 11.5 % difference between them being very significant. At 6 weeks the weight was 200.50 ± 2.95 g / head in control chickens and 167.55 ± 2.32 g in the experimental group; the difference between them, of 16.4 % was very significant.

The average weekly weight gain recorded around the same evolution during 0-3 weeks of growth in both groups analyzed, the differences being insignificant.

In the fourth week of life the control chicks saw an average weight gain of 36.90 ± 1.15 g/capita, while the chickens in the experimental group registered a gain of 27.12 ± 1.95 g/head, the difference between them being highly significant. In the week V in control chickens the gain was 28.00 ± 1.75 g/capita, while in the experimental group of 20.10 ± 1.65 g/head, the difference being very significant. In the sixth week of life the control chicks saw an average gain of 24.75 ± 1.55 g/capita, while those in the experimental group of 12.00 ± 0.85 g; the difference was very significant.

The average weight gain during the period of IV - VI weeks was of 29.88 g/week in control chickens, who benefited from the possibility of continuous feeding and watering during the 24 hours illumination and 19.74 g, by 33.93% less in those of experimental group, with low light duration by 41.7%, in the same period of growth. Average gain between I- VI weeks was 31.98 g/week in control chickens and 26.53 g, by 17.04% lower in the experimental group.

2. Average daily consumption of mixed feed and specific consumption of the quail chicks in the control group versus the experimental group

At chickens in the control group there was an average consumption of 4.70 ± 0.55 g combined feed / head / day in the first week of growth (Table 2), of 9.55 ± 0.85 g/head/day in the second week, 12.50 ± 1.35 g in the third, to 15.55 ± 1.75 g in the fourth week, of 20.35 ± 2.25 g in the fifth and 24.58 ± 2.12 g in the sixth week of growth.

The chickens in the experimental group recorded an average consumption of 4.85 ± 0.82 g combined feed / head / day in the first week of growth, 9.83 ± 0.95 g in the second, 12.11 ± 1.45 g in the third, to 10.45 ± 1.55 g in the fourth week, of 14.43 ± 2.30 g in the fifth and 18.54 ± 2.22 g / head / day in the sixth week of growth.

Table 2. Combined feed consumption and specific consumption evolution in quail chickens

Week	Average consumption of mixed feed (g / head / day)		Specific consumption of feed (g / g gain)	
	Control group	Experimental group	Control group	Experimental group
I	4.70 ± 0.55	4.85 ± 0.82	1.47	1.60
II	9.55 ± 0.85	9.83 ± 0.95	2.78	2.63
III	12.50 ± 1.35	12.11 ± 1.45	1.57	1.61
IV	15.55 ± 1.75aaa	10.45 ± 1.55aaa	2.95 ± 0.46ddd	2.69 ± 0.87ddd
V	20.35 ± 2.25bbb	14.43 ± 2.30bbb	5.08 ± 1.86eee	5.03 ± 1.76eee
VI	24.58 ± 2.12ccc	18.54 ± 2.22ccc	6.95 ± 2.10fff	10.81 ± 2.06fff
Weeks I-III	8.92	8.93	1.94	1.95
WeeksIV-VI	20.16	14.47	3.32	6.18
Weeks I-VI	14.54	9.30	3.47 ± 0.45	4.06 ± 0.33
TOTAL, g	610.26	491.47	x	x

Note: between values marked with the same letter are significant differences

The differences between the average combined feed consumption in the two groups were not significant during 0-3 weeks of growth and were very significant in 4-6 weeks, when the control chickens consumed on average 14.54 g/head/day, by 36% more than those in the experimental group.

The total combined feed in the control group during 1-6 weeks was 610.26 g/head/period, while in the experimental group it was of 491.47 g/head, with 19.50% less compared with the control group.

The differences between feed valorization of combined feed in the two groups were not significant during 0-3 weeks of growth and very significant in 4-6 weeks, when the control chickens consumed on average 3.32 g feed/g weight gain, by 46.3% less than the experimental group. Average specific consumption in the control group during 1-6 weeks was 3.47 ± 0.45 g/head/week, while in the experimental group it was of 4.06 ± 0.33 g/head, with 14.50% more compared with the control group.

3. Evolution of mortality in quail chicks in the experimental group compared with controls during 0-6 weeks of growth

In both groups the highest mortality was recorded in the first week of life (5% in the control group and 3.33 % in the experimental), when the very small quail chicks learn to orient in the environment. In the week 5th and 6th of life, although in the experimental group the lighting was reduced to 14 hours a day, there was no mortality in chickens, which have already accustomed to locate food and water and seems to benefit from the period of 10 hours darkness to rest.

If the control group during 4-6 weeks of growth recorded a total mortality rate of 7.33%, similar to the 1-3 weeks of growth (8.67%), in the experimental group during 4-6 weeks of growth percentage was significantly lower than in 1-3 weeks period (0.67% vs. 7.33%).

On the whole, in the period 1-6 weeks of growth, control chickens had an average mortality of 2.67%, while in the experimental group a rate of 1.33%, the difference between the two groups being highly significant.

The rate of total mortality during 1-6 weeks of growth in the control group chickens was 16%, while those in the experimental group recorded a total of 8%.

Table 3. Mortality of the quail chicks in the experimental group compared with control during 0-6 weeks of growth (%)

Growthweek	Control group	Experimental group
1week	5 %	3.33 %
2weeks	1.67 %	2 %
3weeks	2 %	2 %
4weeks	2.33 %	0.67 %
5weeks	2.67 %	0 %
6weeks	2.33 %	0 %
Average 1-3 weeks	2.89 %	2.44 %
Average 4-6 weeks	2.44 %	0.22 %
Average 1-6 weeks	2.67 %	1.33 %
Total 1-3 săptămâni	8.67 %	7.33 %
Total 4-6 săptămâni	7.33 %	0.67 %
Total 1-6 weeks	16 %	8 %

The total duration of illumination of the house in the 6 weeks of growth was 1008 hours in the control group and 798 hours in the experimental, which led to a reduction in electricity consumption required for illumination by 20.83 %.

CONCLUSIONS

From the research presented we can say that the application, in the growth period of 1-6 weeks of 24 hours light per day, resulted in superior growth parameters in the young quails of control group as respects in the body weight that averaged 200.50 ± 2.95 g/capita, up by 16.4% compared to the experimental group and the specific consumption of 3.47 ± 0.45 g/g gain, decreased by 14.50% compared to the experimental group.

Reducing the length of the light at 14 hours a day during the last three weeks of growth has led to a significant reduction of mortality rate to the experimental group, which was of 8%, compared to 16% in the control group, as well as of the energy consumption for the housing lighting, by 20.83%.

It remains to be further studied the effect of reducing the duration of illumination in young quail upon the future adult birds, exploited either to the production of eggs for consumption, or to the production of hatching eggs. Also, given the positive effect in reducing mortality in quail chickens, it is necessary to further study witch is the optimal age at which it can be applied the reduction of the illumination and also witch is the optimal duration of daily illumination to which can be reduced the light from the maximum of 24 hours per day.

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