Research on the Influence of the Light and Sexing on Growth Performance and Slaughter Results at Young Quails from Mixed Balotești Population of Eggs-Meat

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Abstract

The purposes of determining the influence of the light and sexing on growth performance and slaughter results at young quails from Balotești population, was organized an experiment on 150 quails between age 28 and 70 days. The chicks were divided into two groups (control and experimental), and growth and slaughter performance were determined separately by sex. Have studied 2 lighting programs, a program of continuous lighting with photoperiod duration of 16 hours (16L+8N, control group) and a program of lighting with asymmetric hour intervals with photoperiod duration of 16 hours (10L+2N+6L+6N, experimental group). Males and females from the experimental group were recorded average performances of growth higher during the period 28-70 days. Live weight at the age of 70 days was higher with 7.54%, average weight gain was higher with 14.86% and feed conversion rate was lower with 13.51% at males from experimental group compared to males from the control group. Also, the live weight at the age of 70 days was higher with 18.09%; average weight gain was higher with 35.12%, while feed conversion rate was reduced 30.08% on females from the experimental group compared to females from the control group. The results of the slaughter at the age of 70 days were superior in the case of females from both groups versus males. The average weight of the carcass was higher with 17.53% in case of females than that of males from the experimental group, and the carcass yield was 65.37% at females and 65.56% for males. Also, the average weight of the carcass was higher with 5.08% in case of females compared to that of males from the control group, and the carcass yield was 64.20% to females and 66.70% on males. Superior results recorded in the case of females and males from the experimental group recommended the program of lighting with asymmetric hour intervals in the growth of youth quail. Also the higher slaughter results recorded in the case of females of the two groups recommended them in the meat production through a broiler of quail that combine advantages in the production of both males and females.

Keywords: *quail, youth, light, carcass, females, and males*

INTRODUCTION

The programs of asymmetric fractionated light present an interesting potential for poultry whereas help to the application of the restricted feed supply and enables savings of electricity (Elena Popescu-Micloșanu, 2007).

It has been demonstrated that the carcass quality is affected specifically by several factors including gender, age, the quality of compound feed and breed (Almeida *et al.*, 2002).

The gender of quails also play a role on fattening performance and body weight (Perez and Slaes, 1997; Okamoto *et al.*, 1989).

MATERIALS AND METHODS

Research was conducted on a number of 150 quails, of which 75 males and 75 females divided into two groups (control and experimental). Growth performances were tracked during the 28-70 days, separated by gender. The control group

of males and females was subjected to a program of continuous light with photoperiod duration of 16 hours (16L+8N), and males and females from the experimental group had been subject to asymmetric hour intervals with photoperiod duration of 16 hours (10L+2N+6L+6N). At the age of 70 days was appeal to the slaughter of males and females, which averages slaughter results separated by gender. The environmental conditions in which experimental took place were framed within the literature. Statistical data processing was used Microsoft Excell 2010 and to test the differences in average Student test was used.

The researches were conducted in quails farm Ioniță T. Lucian Unincorporated enterprise located in Gherghița, Prahova County.

RESULTS AND DISCUSSIONS

Average growth performance recorded on male youth from the two batches during the period 28-70 days

At the age of 70 days (tab. 1), the average live weight of males from the experimental group (183.75 ± 1.66 g/head) was with 16.13 % higher as the males from the control group (191.75 ± 2.65 g/head), difference being very significant. Total weight gain from 28 to 70 days was with 14.47 % higher in the case of males from the experimental group (59.88 g/head), compared to the control group (51.31 g/head). Total consumption of compound feed has been almost the same on the

two groups, with only 1.55% higher in the case of males from the experimental group (1155.40 g/head/period) compared to the witness (1137.50 g/head/period). Specific consumption on the period 28-70 days was lower with 13.12 % at the experimental males (19.26 g/g gain) compared with males from the control group (22.17 g c.f. /g gain). Average mortality was 1.17% in the control group, while in the experimental group was no mortality.

The influence of light on the growth performance on females in the two batches during the period 28-70 days of growth

At the age of 70 days (tab. 1), females average live weight of the experimental group (234.40 ± 8.05 g/head) was with 16.13 % higher as the females from the control group (196.58 ± 2.65 g/head), being very significant differences.

Total weight gain from 28-70 days was with 38.55 % higher in the case of females from the experimental group (106.92 g/head) compared with females from the control group (65.70 g/head). The total consumption of compound feed was higher with 8.02 % in the case of experimental group (1310.00 g/head/period) compared to the witness (1205.00 g/head/period). Specific consumption at 28-70 days was lower with 11.51% to the experimental group (12.24) compared to the witness (18.34 g c.f./g gain). Average mortality was 1.50 % in the control group, while in the experimental group was no mortality.

Tab. 1. Average growth performance recorded on male and female youth from the two batches during the period 28-70 days

Specification	Males		Females	
	Control group	Experimental group	Control group	Experimental group
Live weight at 28 days (g/head)	132.44 ± 3.35^{ns}	131.76 ± 2.54^{ns}	129.85 ± 2.35^{ns}	131.55 ± 2.67^{ns}
LW 70d	183.75 ± 1.66^{aaa}	191.75 ± 3.48^{aaa}	195.55 ± 1.78^{bbb}	238.47 ± 5.58^{ccc}
AWG 28 – 70d	51.31	59.99	65.70	106.92
C.c.f 28 – 70d	1137.50	1155.40	1205.00	1310.00
SP 28 – 70d	22.17	19.26	18.34	12.24
AM	1.17	-	1.50	-

Note : LW 70 d – live weight at 70 days (g/head); AWG 28 – 70 d - Average weight gain during 28 – 70 days (g/head); C. c. f. 28 – 70d - Consumption of c.f.in the period 28- 70 days (g/head); SP 28 – 70d - Specific consumption in the period 28 - 70 days (g c.f./g gain); AM - Average percentage of mortality (%)

The influence of gender on the growth performance of the quails in the two groups during the period 28-70 days of growth

The average live weight at the age of 70 days was higher with 6.03 % on females from the control group compared to the males from control group (table 1), the difference being very significant. Weight gain during the period 28-70 days was higher with 21.90 % at females compared to males from the control group. Specific consumption was lower with 17.28 % at females compared to males from the control group.

The average live weight at the age of 70 days was higher with 19.60 % at females compared to males from the experimental group, the difference being very significant. The weight gain during the period 28-70 days was higher with 43.89 % at females compared to males from the experimental group, and specific consumption was lower with 36.45 % at females compared to males from the experimental group.

The average results at slaughter of the quails from the two groups at the age of 70 days depending on the light program and gender

The average weight of the carcass after bleeding at the male of the experimental group (table 2) (187.25 ± 3.60 g/head) was with 5.61 % higher as the males from the control group (176.75 ± 1.35 g/head), the difference being very significant. The average weight of the carcass after plucking at the males from the experimental group (168.75 ± 2.63 g/head) was with 6.58 % higher from those in the control group (157.65 ± 1.51 g/head), the difference being very significant. The average weight of the carcass after evisceration at males from the experimental group (126.00 ± 3.89 g/head) was with 3.77 % higher as the males from

the control group (121.25 ± 2.01 g/head), being very significant difference.

Carcass yield was 66.70 ± 0.82 % at males from the control group and 65.56 ± 0.73 % at males of the experimental group, the difference being insignificant.

The average weight of the blood of males from experimental group was 4.50 ± 0.49 g while the males from the control group it was 5.00 ± 0.56 g, the difference being insignificant. The average weight of flakes at males from the experimental group was 18.50 ± 0.49 g while the males from the control group it was 19.25 ± 1.04 g, the difference being statistically insignificant.

The average weight of organs and intestines at males from the experimental group was 25.50 ± 0.68 g, while the control group was 22.25 ± 1.00 g, the difference being insignificant.

The average proportion of blood at males from the experimental group was 2.32 ± 0.23 % while the control group it was 2.74 ± 2.32 %, the difference being insignificant. The average proportion of flakes from males to the experimental group was 9.92 ± 0.32 % while the control group it was 10.89 ± 0.58 %, the difference being insignificant. The average proportion of males' organs and intestines from the experimental group was 15.21 ± 0.55 % while the control group was 14.17 ± 0.70 %, difference being insignificant.

The average weight of the carcass after bleeding at females from the experimental group (tab. 2) (227.00 ± 7.61 g/head) has been with 16.52 % higher as the females from the control group (189.50 ± 2.54 g/head), being very significant difference. The average weight of the carcass after plucking at the experimental group (207.00 ± 6.50 g) was with 16.83 % higher as the females from the control group (172.17 ± 2.37 g),

Fig 1. Average weight gain and specific consumption at males and females from the two groups during the period 28-70 days

the difference being very significant. The average weight of the carcass after evisceration at females from the experimental group (152.80 ± 4.80 g) was with 17.32 % higher from those in the control group (126.33 ± 3.58 g), the difference being very significant.

The carcass yield in case of females was 65.37 ± 0.72 % in the experimental group and 64.20 ± 1.34 % in the control group, the difference being insignificant.

The average weight of blood at females from the experimental group was 7.08 ± 0.68 g while the control group it was 7.40 ± 0.94 g, the difference being insignificant. The average weight of flakes at the experimental group was 17.33 ± 0.81 g while the control group it was 10.00 ± 0.60 g, being very significant difference. The average weight of organs and intestines at the experimental group was 23.83 ± 0.82 g, while the control group was 30.80 ± 1.00 g, being very significant difference.

Tab. 2. The average results at slaughter of the quails from the two groups at the age of 70 days depending on the light program and gender

Specification	Males		Females	
	Control group	Experimental group	Control group	Experimental group
CWB (g)	176.75 ± 1.35^{bbb}	187.25 ± 3.60^{aaa}	189.50 ± 2.54^{bbb}	227.00 ± 7.61^{ccc}
CWP (g)	157.65 ± 1.51^{bbb}	168.75 ± 2.63^{aaa}	172.17 ± 2.37^{bbb}	207.00 ± 6.50^{ccc}
CWE (g)	121.25 ± 2.01^{bbb}	126.00 ± 3.89^{aaa}	126.33 ± 3.58^{bbb}	152.80 ± 4.80^{ccc}
CY (%)	66.70 ± 0.82^{ns}	65.56 ± 0.73^{ns}	64.20 ± 1.34^{ns}	65.37 ± 0.72^{ns}
BW (g)	5.00 ± 0.56^{bbb}	4.50 ± 0.49^{ccc}	7.08 ± 0.68^{bbb}	7.40 ± 0.94^{ccc}
FW (g)	19.25 ± 1.04^{ns}	18.50 ± 0.49^{ns}	17.33 ± 0.81^{ddd}	20.00 ± 0.60^{ccc}
OIW (g)	22.25 ± 1.00^{ns}	25.50 ± 0.68^{ns}	23.83 ± 0.82^{ddd}	30.80 ± 1.80^{ccc}
BP (%)	2.74 ± 0.29^{bbb}	2.32 ± 0.23^{ccc}	3.59 ± 0.27^{bbb}	3.12 ± 0.33^{ccc}
FP (%)	10.89 ± 0.58^{ns}	9.92 ± 0.32^{ns}	9.13 ± 0.58^{ns}	8.83 ± 0.11^{ns}
OIP (%)	14.17 ± 0.70^{ns}	15.21 ± 0.55^{ns}	13.83 ± 0.39^{ns}	14.77 ± 0.59^{ns}

Note : CWB - Carcass weight after bleeding (g); CWP - Carcass weight after plucking (g); CWE - Carcass weight after evisceration (g); CY - The carcass yield (carcass eviscerated/live weight) (%); BW - Blood weight (g); FY - Flakes weight (g); OIW - Organs and intestines weight (%); BP - Blood proportion (%); FP - Flakes proportion (%); OIP - Organs and intestines proportion (%)

Tab. 3. Average weight and the weight of components of the carcass at males and females from the two groups slaughtered at the age of 70 days

Specification	Males		Females	
	Control group	Experimental group	Control group	Experimental group
Chest weight (g)	57.75 ± 1.54^{aaa}	60.00 ± 1.59^{aaa}	59.58 ± 1.44^{ddd}	79.80 ± 2.88^{ccc}
Thighs weight (g)	28.75 ± 0.32^{aaa}	31.00 ± 0.67^{aaa}	29.58 ± 0.45^{ddd}	36.00 ± 0.73^{ccc}
Back weight (g)	22.00 ± 0.67^{aaa}	26.25 ± 1.67^{aaa}	23.83 ± 0.95^{ddd}	27.00 ± 1.47^{ccc}
Wings weight (g)	9.00 ± 0.21^{ns}	9.25 ± 0.34^{ns}	9.17 ± 0.33^{ns}	10.40 ± 0.14^{ns}
Chest proportion (%)	47.61 ± 0.96^{ns}	47.71 ± 0.51^{ns}	47.28 ± 0.64^{ns}	52.16 ± 0.89^{ns}
Thighs proportion (%)	23.75 ± 0.28^{ns}	24.69 ± 0.29^{ns}	23.63 ± 0.45^{ns}	23.66 ± 0.34^{ns}
Back proportion (%)	18.13 ± 0.42^{ns}	20.68 ± 0.27^{ns}	18.85 ± 0.46^{ns}	17.67 ± 0.83^{ns}
Wings proportion (%)	7.43 ± 0.16^{ns}	7.38 ± 0.26^{ns}	7.34 ± 0.35^{ns}	6.87 ± 0.21^{ns}

The average proportion of blood at females from the experimental group was 3.12 ± 0.33 % while the control group it was 3.59 ± 0.27 %, the difference being insignificant. The average proportion of flakes from the experimental group was 8.83 ± 0.11 % while in the control group it was 9.13 ± 0.58 %, the differences being insignificant. The average proportion of organs and intestines at the experimental group was 14.77 ± 0.59 % while in the control group it was 13.83 ± 0.39 %, the difference being insignificant.

In an experiment conducted of Omer C. *et al.* (Turkey, 2009), the researchers have settled a difference of 13.08 % between the body weight of females and males quail at 6 weeks age. The authors have used an intermittent light program (23 L: 1 D) from 2 weeks of age.

The differences were higher in the present experiment because the intermittent light program and the age of slaughtering (10 weeks) were different. Also, the researchers have found a difference of 2.70 % between carcass yield from females and males, the values being smaller than those registered at females and males from the experimental group.

Average weight and the components weight of the carcass at males and females from the two groups slaughtered at the age of 70 days

The weight of the chest at males from the experimental group (table 3) was 60.00 ± 1.59 g, with 3.75 % higher compared to the control group (57.75 ± 1.54 g). Thighs weight at the experimental group was 31.00 ± 0.67 g with 7.26 % higher compared to the control group (28.75 ± 0.32 g). The weight of the back at the experimental group was 26.25 ± 1.67 g, with 16.19 % higher compared to the control group (22 ± 0.67 g). The weight of the wings at males from the experimental group was 9.25 ± 0.34 g and 9.00 ± 0.21 g to the control group.

The chest proportion of males from the experimental group was 47.71 ± 0.51 % and 47.61 ± 0.96 % to the control group. The thighs proportion of the experimental group was 24.69 ± 0.29 % and 23.75 ± 0.28 % to the control group. The back proportion of the experimental group was 20.68 ± 0.27 % and 18.13 ± 0.42 % at the control group. The wings proportion of males from the experimental group was 7.38 ± 0.26 % and 7.43 ± 0.16 % in the control group.

The chest weight of the females from the experimental group (tab. 3) was 79.80 ± 2.88 g, with 25.34 % higher compared to the control group (59.58 ± 1.44 g). The thighs weight of the females from the experimental group was 36.00 ± 0.73 g, with 17.77 % higher compared to the control group (29.58 ± 0.45 g). The spinal cord weight of females from the experimental group was 27.00 ± 1.47 g, with 11.74 % higher compared to the control group (23.83 ± 0.95 g). The wings weight of females from the experimental group was 10.40 ± 0.14 g, with 11.83 % higher compared to the control group.

The chest proportion of females from the experimental group was 52.16 ± 0.89 % and 47.28 ± 0.64 % in the control group. The thighs proportion of females from the experimental group was 23.66 ± 0.34 % and 23.63 ± 0.45 % in the control group. The back proportion of females from the experimental group was 17.67 ± 0.83 % and 18.85 ± 0.46 % in the control group. The wings proportion of females from the experimental group was 6.87 ± 0.21 % and 7.34 ± 0.35 % in the control group. The proportion of carcass components at males and females was insignificant in relation with batch and gender.

CONCLUSIONS

As a result of research we can say that the use of the program light with asymmetric hour intervals with photoperiod duration of 16 hours lead to the recording of superior growth performance over the period 28-70 days compared to the continuous light program with length of photoperiod of 16 hours.

Regarding birds gender, at females studied have registered higher growth performance compared to males from birds in the control group and the experimental group too.

Considering the results, we can say that it is recommended to use in the youth growth of quail the lighting program with asymmetric hour intervals and photoperiod duration of 16 hours during 28-70 days of growth. Upper slaughter results obtained from females of the two groups recommended direct use in meat production and application of selection techniques in order to obtain a broiler quail.

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