

RESEARCH ON THE INFLUENCE OF LIGHT AND COMPOUND FEED UPON PRODUCTION PERFORMANCE IN THE PERIOD AFTER THE LAYING PEAK OF QUAILS FROM BALOTESTI POPULATION

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Abstract

In order to determine the influence of light and compound feed upon production performance of laying quails was organized an experiment on 200 adult females aged 28 weeks of laying, in the post-peak period of laying. Were studied for 20 weeks 2 lighting programs, that is, a program M of continuous lighting and length photoperiod of 16 hours (16L+8N) and a E program of lighting with asymmetric hour intervals, with photoperiod duration of 16 hours (10L+2N+6L+6N). Also, there have been used two food recipes of compound feed with different nutritional parameters (M2 and E2, richer in protein, lysine and methionine in comparison with M1 and E1).

As a result of the carried out research it was found that the average laying percentage of batch E2 was higher with 9.50% compared with batch E1, and specific consumption was lower with 16.56%. Live weight was higher with 7.63% and average egg weight was higher with 4.17% at batch E2 compared with batch E1. At batch M2 the average percentage of laying was higher with 12.22% compared with the batch M1, and specific consumption was reduced by 11.00%. Live weight was higher with 20.32% and average egg weight was higher with 7.18% at batch M2 compared to batch M1.

As a result of research we can say that the use of a program lighting with asymmetric hour intervals with photoperiod duration of 16 hours after the peak of laying lead to obtain enhancement productive performances on quails for production of eggs to consumption. The use of compound feed with higher protein levels and richer in amino acids lysine and methionine contributes to the improvement of the productive performance of laying quails during this period.

Keywords: quail, eggs, production, light, compound feed

INTRODUCTION

Light is one of the factors that powerfully influence the productivity of quails. If programs of lighting with continue photoperiod lead to obtain higher productions at the expense of viability of quails, it is true that the use of programs of lighting with asymmetric hour intervals contribute on one hand to improve production performance of quails, to improve their viability and to better feed conversion and feed wastage reduction.

An asymmetrical lighting program presents a main period of darkness (night),

followed by a period of normal day interrupted by periods of darkness [2].

The scarcity protein of compound feed on birds leads to decrease in intensity of laying and reduces eggs weight. Of amino acids, methionine and lysine act in conjugate over the size of the egg, the first by controlling the egg white mass, and the second the yolk mass. Methionine and lysine deficiency or one of these amino acids from food is reflected by the reduction of the weight of the eggs. A short age of methionine has the effect of decreasing the production of eggs as a result of the reduction in the activity of some enzymes involved in the formation of the egg. Deficiency or excess of lysine leads to lower intake and egg production [4].

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MATERIAL AND METHOD

Research was conducted on a number of 200 laying quails from mixed Balotesti population in the period 29-48 weeks of laying in after peak laying. M1 and M2 batches have been subject to a program of continuous light with photoperiod duration of 16 hours daily (the same program was applied in the period 1 to 28 weeks of laying) and batches E1 and E2 were subjected to a program of lighting with asymmetric hour intervals with the length of photo period of 16 hours too. Also, M2 and E2 batches have received a compound feed with a higher

protein level, the richest in fats and the essential amino acids lysine and methionine (experimental recipe) compared with compound feed given to batches M1 and E1 (control recipe, feeder that it was administered during 1-28 weeks of laying). The structure of the recipes has been made up of: cereals, groats, corn gluten, oil, amino acids, monocalcium phosphate, calcium carbonate, salt and vitamin-mineral premix. The environmental conditions were within the limits laid down by the specialty literature.

Table 1 Nutritional parameters calculated of the two recipes for laying quails used in the experimental period

Nutritional parameters	Control diet of compound feed for adult quails	Experimental diet of compound feed for adult quails
Metabolizable energy/kg(kcal;Mj)	2800 (11.72)	2810 (11.76)
Crude protein (%)	18.20	19.8
Crude fat (%)	3.70	5.8
Methionine + cystine (%)	0.75	0.88
Lysine (%)	1.05	1.16
Calcium (%)	3.40	3.50
Phosphorus (%)	0.70	0.70
Choline (%)	0.03	0.03
Salt	0.40	0.40
Cost per kg (€)	0.37	0.35

The researches were conducted under quails farm Ioniță T. Lucian Individual Enterprise, located in Gherghița, Prahova county.

For the statistical processing of the data it has used the program Microsoft Excell 2010 and for testing differences method was used ANOVA and Fisher test.

RESULTS AND DISCUSSION

1. Evolution of the average percentage of laying, the average weight of the egg and specific consumption of compound feed at quails in the two batches during the period 29-48 weeks of laying

Group M1 (tab. 2) laying percentage was highest in the week 35th (62.50%), highest average egg weight was observed in the week 38th (1.43 g/egg), and the lowest specific consumption was recorded in the week 35th (53.84 g c.f./egg).

Group M2 (tab. 2, fig. 1, fig. 2) the highest percentage of laying was registered in the week 40th (76.00%), highest average egg weight was recorded in the week 39th (12.35 g/egg), and the lowest specific consumption was registered in the week 40th (50.85 g c.f./egg).

Group E1 (tab. 2, fig. 1, fig. 2) the highest percentage of laying was registered in the week 39th (79.45%), highest average egg weight was observed in the week 44th (12.10 g/egg), and the lowest specific consumption was recorded in the week 34th (48.32 g c.f./egg).

Group E2 (tab. 2, fig. 1, fig. 2) the highest percentage of laying was recorded in the week 35th (92.25%), highest average egg weight was recorded in the week 43th (12.65 g/egg), and the lowest specific consumption was recorded in the week 35th (37.54 g c.f./egg).

Table 2 The average percentage of laying, the average weight of the egg and the specific consumption at quails from the two batches during the period 29-48 weeks of laying

Week of laying	Batch M1			Batch M2			Batch E1			Batch E2		
	EP	EW	FCR									
29	55.50	10.65	62.63	59.65	10.00	57.83	56.50	9.90	60.97	58.00	10.23	56.10
30	57.66	10.75	56.36	60.45	11.30	57.89	57.85	10.25	57.99	64.55	10.33	52.28
31	60.75	10.55	53.49	64.65	11.45	55.68	60.35	10.35	55.97	67.77	10.55	49.87
32	59.55	10.85	56.50	65.75	11.80	57.79	65.67	10.55	54.07	73.44	10.76	45.95
33	61.45	10.58	54.92	70.75	11.65	53.00	70.45	10.60	54.57	78.45	10.88	44.02
34	60.75	11.00	56.87	72.75	11.75	50.85	75.65	10.85	48.32	82.56	11.10	43.12
35	62.50	11.15	53.84	75.54	12.00	52.29	76.00	10.95	50.85	92.55	11.24	37.54
36	57.54	10.95	62.18	74.60	12.15	51.54	78.96	11.25	47.94	90.50	11.88	38.61
37	56.65	11.30	63.54	74.00	11.88	55.40	77.55	11.35	48.93	89.95	12.13	39.52
38	58.75	11.43	63.82	73.75	11.68	52.20	78.23	11.35	50.68	87.75	12.11	41.88
39	54.50	11.24	66.97	75.67	12.35	52.20	79.45	11.45	51.03	85.75	12.23	44.92
40	57.75	10.95	64.93	76.00	12.20	50.85	77.35	11.65	49.96	85.00	12.50	44.70
41	58.25	11.23	61.11	74.50	11.84	50.53	75.45	11.70	51.68	84.50	12.54	45.85
42	56.75	10.96	68.33	75.60	11.75	51.57	72.80	11.85	56.31	84.00	12.55	43.63
43	60.56	11.15	58.86	73.70	12.25	55.90	72.45	11.85	60.12	83.75	12.65	46.56
44	58.75	10.73	56.93	74.60	12.10	52.94	71.00	12.10	58.09	82.00	12.55	47.25
45	54.75	10.65	62.10	70.50	11.75	51.77	70.50	12.00	56.24	80.75	12.45	46.62
46	53.45	10.55	60.80	60.60	11.78	58.58	68.67	11.85	60.36	80.00	12.25	47.50
47	50.20	10.50	68.92	60.00	11.50	57.16	67.45	11.75	60.10	78.65	11.85	47.04
48	51.60	10.00	67.82	59.00	10.85	60.50	64.30	11.45	60.18	76.80	11.95	50.19

Note : EP – egg percent (%), EW – egg weight (g/egg), FCR – feed conversion ratio (g c.f./egg)

2. Influence of light and compound feed upon medium performance of production on quails from four batches during the period 29-48 weeks

Table 3 The average performance of the production at quails from four batches in the period 29-48 weeks

Specification	Batch M1	Batch M2	Batch E1	Batch E2
Average percentage of laying (%)	57.38 ± 0.62 <i>aaa</i> <i>bbb</i>	69.60 ± 1.22 <i>aaa</i> <i>ccc</i>	70.83 ± 1.32 <i>bbb</i> <i>ddd</i>	80.33 ± 1.66 <i>ccc</i> <i>ddd</i>
Average live weight (g/head)	187.05 ± 0.65 <i>aaa</i> <i>bbb</i>	207.37 ± 2.38 <i>aaa</i> <i>ccc</i>	217.30 ± 3.75 <i>bbb</i> <i>ddd</i>	235.25 ± 4.63 <i>ccc</i> <i>ddd</i>
Average weight of egg (g)	10.86 ± 0.07 <i>aaa</i> <i>b</i>	11.70 ± 0.10 <i>aaa</i> <i>cns</i>	11.25 ± 0.12 <i>b</i> <i>ddd</i>	11.74 ± 0.15 <i>cns</i> <i>ddd</i>
Average production per head (eggs/head/week.)	4.03	4.87	4.96	5.62
Compound feed consumption (g/head/day)	34.91	37.65	38.54	36.34
Specific consumption (g c.f./egg)	61.05	54.33	54.72	45.66
% mortality	1.27	0.44	0.23	0.10

2.1. The influence of light on the production performance at quails from batches M1 and E1 in the period 29-48 weeks of laying

Average percentage of laying in the period 29-48 weeks was higher at group E1 with 13.45% compared with batch M1, difference being very significant.

The average live weight at group E1 (217.30 ± 3.75 g/head) was higher with 13.92% compared to the group M1 (187.05 ± 0.65 g/head), the difference being very significant.

The average weight of the egg at group E1 (11.25 ± 0.12 g/egg) was with 3.47% higher compared to the group M1 (10.86 ± 0.07 g/egg), the difference being significant.

The average egg production per head was 4.96 eggs per head/week at group E1, with 18.75% higher than at group M1 (4.03 eggs/head/week). The average consumption of compound feed was higher at group E1 (38.54 g c.f./head/day) with 9.42%, and specific consumption of compound feed was lower with 10.37% at group E1 (54.72 g c.f./egg) compared to group M1 (61.05 g c.f./egg). The average percentage of mortality was higher at group M1 (1.27%) compared to group E1 (0.23%).

2.2. The influence of light on the production performance at quails from batch M2 and E2 in the period 29-48 weeks of laying

Average percentage of laying in the period 29-48 weeks was higher at group E2 (80.33%) compared to group M2 (69.80%) with 10.73%, the difference being very significant.

The average live weight at group E2 (235.25 ± 4.63 g/head) was higher with 11.85% compared to group M2 (207.37 ± 2.38 g/head), being very significant difference.

The average weight of the egg at the batch E2 was 11.74 ± 0.15 g/egg, while at the batch M2 this was 11.70 ± 0.10 g/egg, difference being insignificant.

The average egg production per head was 5.62 eggs per head/week at batch E2 with 13.35% higher than at batch M2 (4.87 eggs/head/week). The average consumption of compound feed was higher at batch M2 (37.65 g c.f./head/day) with 3.48%, while specific consumption of compound feed was lower with 8.67% at batch E2 (45.66 g c.f./egg) compared to batch M2 (54.33 g c.f./egg). The average percentage of mortality was higher at batch M2 (0.44%) compared to the batch E2 (0.11%).

The average performance of superior production obtained at batch E1 versus batch M1, and batch E2 compared to batch M2 shows a very significant influence of the light program with asymmetric hour intervals with

photoperiod duration of 16 hours during the period from 29 to 48 weeks. Fractionation the period of lighting leads to stimulate production of eggs on quails in the period after the peak laying.

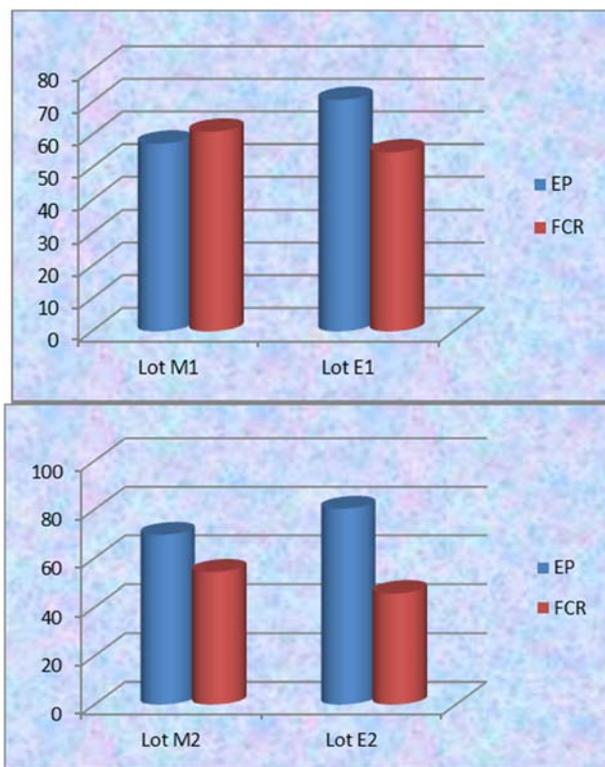


Fig. 1 The influence of light on the average laying percentage (EP) and specific consumption (FCR) at quails from four batches during the period 29-48 weeks of laying

2.3. Influence of compound feed on the production performance at quails from batches M1 and M2 in the period 29-48 weeks of laying

Average percentage of laying in the period 29-48 weeks was higher with 12.22% at group M2 (69.60%) compared to the group M1 (57.38%), difference being very significant.

Average live weight at group M2 (207.37 ± 2.38 g/head) was with 20.32% higher compared to the group M1 (187.05 ± 0.65 g/head), being very significant difference.

The average weight of the egg at batch M2 (11.70 ± 0.10 g/egg) was higher with

7.18% compared to batch M1 (10.86 ± 0.07 g/egg), the difference being very significant.

The average egg production per head at batch M2 (4.87 eggs/head/week) was higher with 17.25% compared to batch M1 (4.03 eggs/head/week). The average consumption of compound feed was higher at batch M2 (37.65 g c.f./head/day) with 7.28% compared to batch M1 (34.91 g/head/day), and specific consumption of compound feed was lower with 11.00% at batch M2 (54.33 g c.f./egg) compared to batch M1 (61.05 g c.f./egg). The average percentage of mortality was higher at batch M1 (1.27%) compared to batch M2 (0.44%).

2.4. Influence of compound feed on the production performance at quails from batch E1 and E2 in the period 29-48 weeks of laying

Average percentage of laying in the period 29-48 weeks was higher with 9.50% at group E2 (80.33%) compared to group E1 (70.83%), difference being very significant.

The average live weight at group E2 (235.25 ± 4.63 g/head) was with 7.63% higher compared to the group E1 (217.30 ± 3.75 g/head), being very significant difference.

The average weight of the egg at group E2 (11.74 ± 0.15) was with 4.17% higher

compared to the group E1 (11.25 ± 0.12 g/egg), the difference being very significant.

The average eggs production per head at group E2 (5.62 eggs/head/week) was with 11.74% higher than at group E1 (4.96 eggs/head/week). The average consumption of compound feed was higher at group E1 (38.54 g c.f./head/day) with 5.71% than at group E2 (36.34 g c.f./head/day), and specific consumption of compound feed was lower with 16.56% at group E2 (45.66 g c.f./egg) compared to group E1 (54.72 g c.f./egg). The average percentage of mortality was higher at group E1 (0.23%) compared to the group E2 (0.11%).

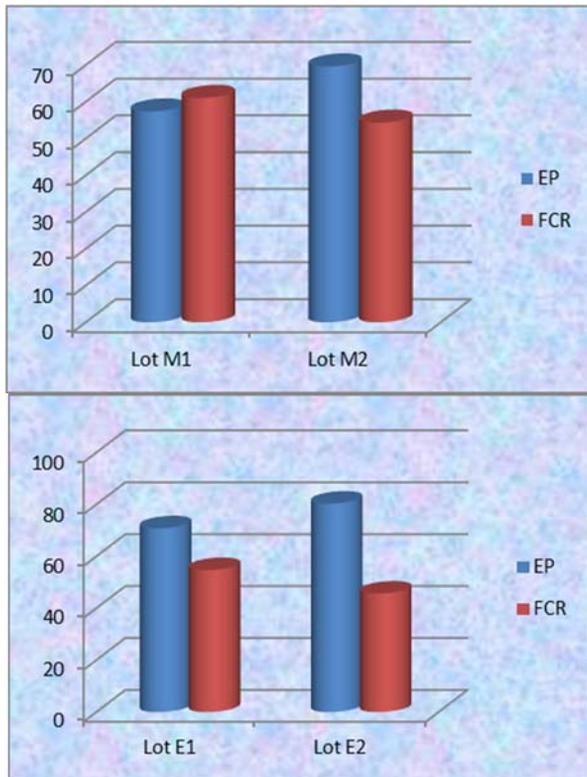


Fig. 2 Influence of compound feed over the average laying percentage (EP) and specific consumption (FCR) at quails from four batches during the period from 29 to 48 weeks of laying

In a study concerning the performance of the average production during the period from 1 to 48 weeks of laying, in which study quails were exposed to a program of continuous lighting with photoperiod of 24 hours daily, carried out in Romania at laying

quails in the same population of mixed quails, authors [3] found the following average production performance for the period from 29 to 48 weeks of laying: 45.41% the average lay rate, respectively 3.36 eggs/head/week; the average weight of

the egg was of 10.62 g/egg, average live weight of 268.46 g/head, the average consumption of compound feed was 36.77 g c.f./head/day, and the average specific consumption was 82.63 g c.f./egg.

CONCLUSSIONS

As a result of research we can say that the use of lighting program divided in hour asymmetric intervals with duration photoperiod of 16 hours lead to the recording of production performance superior to quails from batches E1 and E2 versus M1 and M2, which have been subjected to continues lighting program with photoperiod of 16 hours.

Average percentage of laying in the period 29-48 weeks was higher at group E1 compared with the group M1 with 13.45%, and specific consumption of compound feed was lower with 10.37% at group E1 compared to the group M1. Average percentage of laying was higher at group E2 compared to the group M2 with 10.73% and specific consumption of compound feed was lower with 8.67% at group E2 compared to the group M2.

Also, compound feed composition (M2 and E2, richer in protein, lysine and methionine in comparison with M1 and E1) influences very significant production performance of quails in the period after the peak of laying. Average percentage of laying in the period 29-48 weeks was higher at

group M2 compared with group M1 with 12.22%, and specific consumption of compound feed was lower with 11.00% at group M2 compared to group M1. Average percentage of laying was higher at group E2 compared to the group E1 with 9.50%, and specific consumption of compound feed was lower with 16.56% at group E2 compared with group E1.

In order to establish the exact influence of light and compound feed composition upon performance production of laying quails in the period after the peak of laying it is necessary to further carry out new studies.

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