AVERAGE PRODUCTION PERFORMANCES OF THE „PHARAOH" AND „BALOTESTI" LAYING QUAILS POPULATIONS

L. Ioniţă, Elena Popescu-Micloşanu, I. Custură, Minodora Tudorache

University of Agronomical Sciences and Veterinary Medicine Bucharest, Romania
e-mail: ionita_luc@yahoo.com

Abstract

The purpose of the research was to establish the evolution of the egg laying production performance from the „Balotesti" and „ Pharaoh" population in the interval of egg laying weeks 1 – 35. An experiment has been organized at the biggest quail farm in Romania and the only one where the quails are systematically selected; the performances of 900 quails from the two populations are studied. The birds have been maintained with the same fodder, in the same space and in the same environment conditions. The research has shown that the quails from the Balotesti population have an average egg laying percentage of 78.90 ± 2.24, a combined feed consumption of 33.85 ± 0.85 g/capita, a specific consumption of 44.79 ± 1.75 g/egg, a body weight of 225.99 ± 3.11 g/capita and an egg weight of 12.08 ± 0.15 g, while the egg laying quails from the Pharaoh population have in the same egg laying interval an average egg laying percentage of 65.85 ± 2.50, a combined fodder consumption of 36.45 ± 0.96 g/capita, a specific consumption of 47.47 ± 2.35 g/egg, a body weight of 250.58 ± 3.37 g and an egg weight of 12.85 ± 0.17 g. In conclusion it can affirmed that the Balotesti laying quails population can be used for egg production, but also in a scheme of improvement as maternal population, and the Pharaoh population can be used directly for meat or as paternal population for obtaining a meat hybrid.

Key words: quail, two populations, egg production

INTRODUCTION

The quail is the smallest species of birds raised for meat and eggs [11], as well as laboratory animals [3]. Japanese quails growth experienced great development in recent decades due to biological characteristics of this bird, which determines the high level of production and economic efficiency as well as for the market requirements for quail eggs and meat, with recognized quality (high nutritional and biological value, particularly taste) and recommended by naturist medicine for their therapeutic effect.

Among the main productive characteristics of the quail is highlighted: fast rate of growth (reach adult weight to 5-6 weeks after hatching), early sexual maturity, short interval between generations, high laying rate, low feed and low places accommodation [1]. To determine the productive parameters of quails in Romania were made and continues to be conducted research on biological material existing in the largest quail farm in Romania [7], [13].

MATERIAL AND METHOD

The experiment took place in the S.C. Ferma Nova SRL Bucharest on an initial flock of 900 adult birds, divided into two groups, as follows: 600 quails from the „Balotesti" population and 300 from the „Pharaoh" population. Study duration was 35 weeks from entry into lay (age of 6 weeks). The birds were fed the same mixed feed, maintained in the same area and under the same environmental conditions. Cage area used was 150 cm^2 / head (30 female and 10 male quails used for breeding), the same for both groups.

The feeding line was of 100 cm, and the watering was of 20 linear cm for each cage. Water and mixed feed were given ad libitum.

The average air relative humidity in the shelter was 65%, while the average temperature inside the shelter, during

pursued, was 24° C. The microclimate in housing was controlled using digital thermo-hygrometer and directed by fan and closing / opening the air inlets inside the shelter. Ventilation was made through depression using a standard ventilation 5 m^3/kg body / hr. Microclimate conditions inside the shelter in which the experiment was conducted were within the limits set by the literature [2], [18].

The data analysed were represented by: individual body weight of birds per cage egg production, individual egg weight, consumption of mixed feed and mortality. Differences between the two groups were tested using Student test.

RESULTS AND DISCUSSIONS

THE EVOLUTION OF THE EGG PRODUCTION FOR THE PERIOD 1 TO 35 WEEKS LAY

From an average laying of 15.76 ± 0.64% in the Baloteşti batch of quail (Table 1, Figure 1) and 8.18 ± 0.12% in the group of Pharaoh quail, the former has risen more, up to the level of 91.45 ± 1.87 % in batch Baloteşti and 84.35% ± 1.60 in group of Pharaoh in the 8th week (peak of lay) and then decreased gradually until the end of the period to 75.51 ± 1.88% in the Baloteşti batch, respectively, 58.00 ± 2.24 % in the Pharaoh batch.

In a study conducted in India on a flock of Japanese quails in lay 9-15 weeks [14] was determined an average of 90.19% laying, a percentage which is slightly higher compared with those determined in the Baloteşti quails in the same period (86.91%) and significantly higher compared with the population of Pharaoh quails (78.61%).

In a study conducted in Brazil during 1-24 weeks of laying [5] it has been found an average of laying in a variety of Italian quails of 79.23%, a percentage that is similar to that found in quails in this studied Baloteşti population (79.02% for the period of 1-24 weeks of lay) and significantly higher (by 11.81%) compared with the average of laying quails in Pharaoh population led to (67.42%) for the period of 1-24 weeks of laying.

In a study conducted in Poland [17] was established an average lay during the laying 1-29 weeks of 81.60%, a percentage that is similar to that found in this studied population of Baloteşti quail for the same period (79.20%) and significantly higher compared to the average lay led to Pharaoh in Romania for the same period (66.59%).

The egg laying persistence for the Balotesti quails was above the level of 80 % for 25 weeks long, starting with the 4th laying week (83.57 ± 2.18 %) until the 29th week (80.00 ± 2.05 %). For the Pharaoh lot, the laying persistence was above the level of 70% for 11 weeks, starting with the 4th laying week (72.91% ± 1.96) until the 15th week (73.27 % ± 2.34).

The production characteristics for the Balotesti quails are similar to those recorded by some researchers [6] for a lot of eggs quails, which had the egg laying point in the 9th laying week and a persistence of the laying of over 80% until the 20th laying week, while other researchers [16] affirm that the egg production of quails starts to decrease after the 26th week of laying.

As a result from the same table, the average egg laying percentage in the interval of laying weeks 1-35 was 78.90 ± 2.24 % for the Balotesti lot, while for the Pharaoh batch it was 65.85 ± 2.50 %, by 13.05 % lower than the Balotesti lot, the difference between lots being very significant in favor of the Balotesti one.

The annual average egg laying percentage varied between 76 and 81 % according to some authors [4], while others [8] have determined a percentage of 82%.

The production performances for the Pharaoh quails are superior to those recorded by some authors [12] for the meat quails, respectively an average laying between 64 % and 69 %.

The average egg laying production per capita and per week in the interval of egg laying weeks 1-35 for the Balotesti lot was 5.52 ± 0.15 eggs/capita/week, while for the Pharaoh lot it was of 4.61 ± 0.27 eggs/capita, 16.48% lower than the Balotesti, the difference being distinctly significant in favor of Balotesti lot of quails.

Table 1
The evolution of egg production for Balotesti quails compared to the Pharaoh population in the interval weeks 1 – 35 of laying

Week of egg laying	"Baloteşti" quails			" Pharaoh" quails		
	% egg	Egg prod. per capita/week	Cumulated egg production	% egg	Egg prod. per capita/week	Cumulated egg production
1	15.76 ± 0.64	1.10 ± 0.11	-	8.18 ± 0.12	0.57 ± 0.08	-
2	46.67 ± 2.23	3.26 ± 0.13	4.37	28.10 ± 1.82	1.97 ± 0.19	2.53
3	69.52 ± 2.15	4.87 ± 0.32	9.23	57.34 ± 1.43	4.01 ± 0.23	6.55
4	83.57 ± 2.18	5.85 ± 0.14	15.08	72.91 ± 1.96	5.10 ± 0.27	11.65
5	85.55 ± 1.87	5.98 ± 0.12	21.07	77.24 ± 2.20	5.41 ± 0.23	17.06
6	85.88 ± 2.21	6.01 ± 0.14	27.08	79.10 ± 2.42	5.53 ± 0.22	22.60
7	88.80 ± 2.23	6.22 ± 0.20	33.30	82.98 ± 2.23	5.81 ± 0.24	28.41
8	91.45 ± 1.87	6.40 ± 0.18	39.70	84.35 ±1.60	5.90 ± 0.21	34.31
9	91.12 ± 1.45	6.38 ± 0.17	46.08	84.16 ± 2.22	5.91 ± 0.18	40.23
10	90.30 ± 1.16	6.32 ± 0.19	52.40	82.56 ± 1.44	5.77 ± 0.23	46.01
11	87.22 ± 1.31	6.11 ± 0.18	58.51	81..89 ± 2.36	5.73 ± 0.26	51.74
12	86.45 ± 1.22	6.05 ± 0.23	64.56	78.56 ± 2.34	5.49 ± 0.27	57.24
13	84.14 ± 1.23	5.89 ± 0.19	70.45	77.56 ± 2.33	5.43 ± 0.18	62.67
14	82.12 ± 2.20	5.75 ± 0.23	76.19	75.57 ± 2.10	5.29 ± 0.21	67.96
15	82.00 ± 2.12	5.74 ± 0.24	81.93	73.27 ± 2.34	5.12 ± 0.15	73.10
16	81.56 ± 2.09	5.70 ± 0.34	87.65	67.82 ± 2.13	4.74 ± 0.19	77.83
17	81.23 ± 1.89	5.68 ± 0.17	93.33	66.14 ± 2.10	4.63 ± 0.23	82.47
18	81.00 ± 2.16	5.67 ± 0.18	99.00	66.15 ± 2.32	4.63 ± 0.19	87.10
19	80.55 ± 2.26	5.64 ± 0.21	104.64	65.44 ± 2.21	4.58 ± 0.23	91.68
20	80.45 ± 2.45	5.63 ± 0.23	110.27	65.15 ± 1.93	4.56 ± 0.22	96.25
21	80.34 ± 2.15	5.62 ± 0.26	115.89	65.15 ± 1.16	4.56 ± 0.24	100.80
22	80.32 ± 2.16	5.62 ± 0.18	121.52	64.55 ± 2.30	4.52 ± 0.23	105.32
23	80.32 ± 1.84	5.62 ± 0.21	127.14	64.45 ± 2.12	4.51 ± 0.18	109.83
24	80.23 ± 1.46	5.61 ± 0.21	132.75	64.00 ± 2.33	4.48 ± 0.23	114.31
25	80.13 ± 1.36	5.61 ± 0.19	138.36	63.85 ± 2.30	4.47 ± 0.18	118.78
26	80.10 ± 2.53	5.61 ± 0.17	143.97	63.25 ± 2.33	4.43 ± 0.18	123.20
27	80.10 ± 1.33	5.61 ± 0.17	149.58	62.45 ± 2.16	4.37 ± 0.22	127.58
28	80.00 ± 2.24	5.60 ± 0.27	155.18	62.33 ± 2.10	4.36 ± 0.25	131.94
29	80.00 ± 2.05	5.60 ± 0.17	160.78	62.00 ± 2.12	4.34 ± 0.21	136.28
30	78.73 ± 1.86	5.51 ± 0.18	166.29	61.19 ± 2.13	4.28 ± 0.22	140.56
31	78.12 ± 2.29	5.46 ± 0.21	171.76	61.15 ± 2.10	4.28 ± 0.20	144.85
32	77.78 ± 1.94	5.44 ± 0.22	177.20	60.10 ± 2.11	4.20 ± 0.20	149.05
33	77.67 ± 1.56	5.43 ± 0.19	182.64	58.85 ± 2.12	4.11 ± 0.14	153.17
34	76.77 ± 1.64	5.37 ± 0.20	188.01	58.50 ± 1.76	4.09 ± 0.12	157.27
35	75.57 ± 1.88	5.28 ± 0.14	193.30	58.00 ± 2.24	4.06 ± 0.15	161.33
X±S $_X$	***78.90 ± 2.24******	***5.52 ± 0.15******	***193.30***	***65.85 ± 2.50******	***4.61 ± 0.17******	***161.33***

The average cumulated egg production per capita in the interval of egg laying weeks 1-35 was for the Balotesti batch of 193.30 eggs/ interval and for the Pharaoh quails lot this was of 161.33 eggs, by 16.54% lower.

OTHER PRODUCTION CHARACTERISTICS IN THE WEEKS 1-35 OF LAY

The average feed consumption in the studied egg laying interval (Table 2) for the Balotesti lot was of 33.85 ± 0.85 g combined feed (c.f.)/capita/day, while for the Pharaoh lot it was of 36.45 ± 0.96 g combined feed /capita/day, by 7,13% higher, the differences between the two lots being very significant.
For an egg laying lot of quails from Turkey, some researchers [10] have determined an average feed consumption (31.33 g feed/capita), similar to the one determined for the Balotesti quails population and inferior to the one of the Pharaoh population.

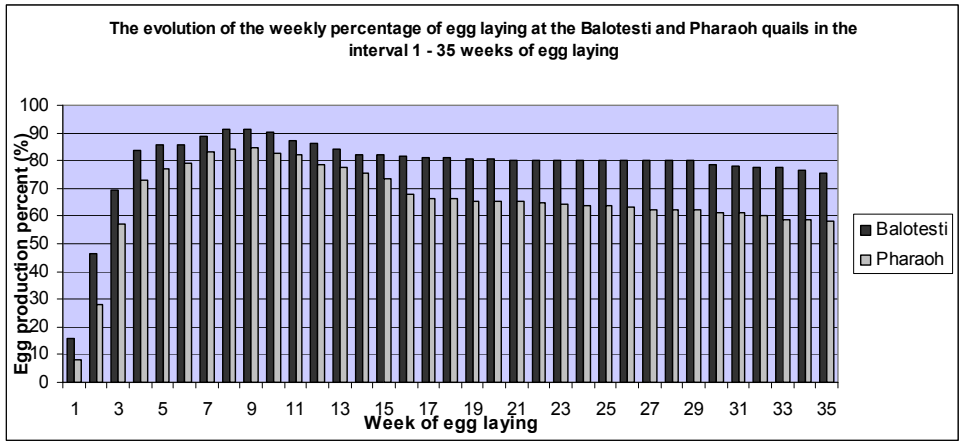

Figure 1: The evolution of the weekly percentage of egg laying for the analyzed quails in the interval 1-35 weeks laying

The specific consumption per egg in the laying interval of weeks 1 – 35 for the Balotesti lot was of 44.79 ± 1.75 g of combined feed /egg, while for the Pharaoh batch of quails it was of 47.47 ± 2.35 g of combined feed /egg, 5.65 % higher for the Pharaoh quails, the differences between the two lots being very significant.

Some authors have determined for the egg laying weeks 9-15 [14] and weeks 1-29 of laying [17] an average fodder consumption and specific consumption similar to the ones established for the Balotesti quails population (28.75 g/capita/day and 38.30 g/egg, respectively 31.7 g/capita and 35 g/egg).

Table 2
Other production characteristics in the weeks 1-35 of laying for the studied lots

Specification	Baloteşti quails	Faraoh quails
Average combined feed consumption (g/capita/day)	33.85 ± 0.85***	36.45 ± 0.96***
Specific consumption (g c. f./egg)	44.79 ± 1.75***	47.47 ± 2.35***
Average egg weight (g/egg)	12.08 ± 0.15**	12.85 ± 0.17**
Average body weight (g/capita)	225.99 ± 3.11***	250.58 ± 3.37***
Average weekly death rate (%)	0.37 ± 0.10**	0.47 ± 0.12**

The average egg weight in the studied interval for the Balotesti lot was 12.08 ± 0.15 g/egg, and for the Pharaoh batch it was 12.85 ± 0.17 g/egg, by 6% higher for the Pharaoh quails, the differences between the two lots being very significantly assured.

The average egg weight for the Balotesti quails population is similar to the one found by [14] (11.98 g/egg) and by [10] (12.10 g/egg).

The data referring to the feed consumption and the specific consumption (32.85 g/capita/day and, respectively 42.60 g/egg) as well as those referring to the average egg weight (11.96 g) recorded for the Balotesti quails population is in accordance with those determined by [9].

Average body weight in the interval of the laying weeks 1 – 35 for the Balotesti batch of quails was of 225.99 ± 3.11 g/capita, while for the Pharaoh lot it was 250.58 ± 3.37 g/capita, by 9.81 % higher, the difference between the two lots being very significant.

Average weekly death rate in the analyzed interval was of 0.37 ± 0.10 % for the Balotesti batch, while for the Pharaoh it was of 0.47 ± 0.12 %, by 21.28 % smaller for the Balotesti quails.

In another study the researchers [5] have determined an average feed consumption of 37.59 g/capita/day and a specific consumption of 57 g/ egg, values similar to the ones determined for the Pharaoh population and higher than the ones determined for the Balotesti population. The same researchers have determined an average egg weight of 10.50 g, a value that is smaller than the one determined for

both analyzed populations. The average death rate determined by the same researchers is significantly higher compared to the determined percentages for the two populations of quails analyzed in this study (0.93 %).

CONCLUSIONS

Present research reached the following conclusions:

The Balotesti quails are more precocious, the average egg laying percentage in the first week being by 7.58 % higher for the Balotesti quails compared to the Pharaoh quails.

In the laying point (8th laying week), the average egg laying percentage is by 7.10 % higher for the Balotesti quails.

Overall, the average egg laying percentage in the interval of weeks 1-35 is by 13.05 % higher for the Balotesti quails compared to the Pharaoh ones, while the specific consumption per egg is by 5.65 % higher for the Pharaoh compared to the Balotesti quails. The death rate is by 21.28 % lower for the Balotesti quails compared to the Pharaoh population.

Given the presented findings, it can be affirmed that the Balotesti egg laying quails population can be used for egg production, but also in a scheme of improvement as maternal population, and the Pharaoh population can be used directly for meat or as paternal population for obtaining a meat hybrid.

BIBLIOGRAPHY

[1] Adeogun I.O., Adeoye A.A.: Heritabilities and phenotypic correlations of growth performance traits in Japanese quails, Animal Science Department, Obafemi Awolowo University, Ile-Ife, Nigeria, 2004.

[2] Arrington, L. C., Wilson, H. Abplanalp and W. 0. (1962): Experimental modifications of the laying pattern in Japanese quail. British Poultry Sci. 3(2): lO5-113

[3] Baumgartner J.: Japanese quail production, breeding and genetics, Proceedings of the 10th international symposium on current problems of Avian Genetics, pp.101-103, Nitra, Slovakia, 1993.

[4] Charappa, V., Sabo, V. and Bod´a, K.: Recycling of quail excrements with different energy contents in feed mixtures for Japanese quails, 1993 [Nutrition Abstr. and Rev. (1994), 64: 3036].

[5] Faitarone A.B.G., Pavan A.C., Mori C., Batista L.S.: Economic traits and performance of Italian quails reared of different cage stocking densities, Revista Brasiliera de Ciencia Avicola, no. 1, Jan./Mar. 2005, Brazil.

[6] Gildersleeve, R. P., Parkhurst, D., Sugg, C. R. and McRee, D. I.: Egg production in four generations of paired Japanese quail. Poultry Sci., 1987, 66:227-230.

[7] Ioniţă L.: Study about the productive performances of the "Baloteşti" mixt quail population during 35 weeks of egg production, Animal Science and Biotehnologies Scientific Papers, Bulletin of University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania, 2008, Vol. 65 (1-2) : 169 – 174.

[8] Kobayashi, S., Itoh, R., Okamoto, S. and Matsuo, T.: Influence of light intensity on egg production in Japanese quail under 14L : 10D and continuous lighting. Japanese Poultry Sci., 1989, 26:235-244.

[9] Ragab S. Mona. Aly M.M.M., Hattaba N. A.H., Omar, E.M.: Performance of growing and laying Japanese quail fed sorghum grains, Poultry Production Department, Cairo University, Egypt, 2002.

[10] Okan, F.: Effects of dietary supplemental sodium bicarbonate on some egg characteristics and blood parameters in Japanese Quail reared under high environmental temperature, Turkey Journal Veterinary Animal Science, 1999, 23, 139-143.

[11] Panda B., Singh R.P.: Development in processing quail, World's Poultry Science Journal, 1990, 46, pp. 219 – 234.

[12] Paul, D. C., Huque, M. E. and Uddin, M. S.: Performance of laying quail in Bangladesh, Bangladesh Journal of Scientific and Industrial Res., 1995, 30:23-30 [Anim. Breed. Abstr. 1996, 64: 5073].

[13] Popescu-Micloşanu, Elena, Ioniţă L.: Study of the productive characteristics of youth and laying quails in the "Balotesti" eggs-meat population, Scientific Papers, Animal Science Series, University of Agricultral Sciences and Veterinary Medicine Iasi, Romania, 2009, Vol. 52 : 254 – 259.

[14] Sathishkumar A., Prabakaran R.: Recycling of Japanese quail hatchery waste on egg production performance of quail breeders, Department of Poultry Science, Madras Veterinary College, Chennai, India, 2008.

[15] Sreenivasaiah, P. V. and Joshi, H. B.: Influence of hatching season on egg production characteristics in Japanese quail (Coturnix coturnix japonica). Indian Journal of Poultry Sci., 1988, 23:62-65.

[16] Woodard, A. E. and Abplanalp, H.: The effects of mating ratio and age on fertility and hatchability in Japanese quail. Poultry Sci., 1967, 46:383-388.

[17] Tarasewicz, Zofia, Szczerbinska, Danuta, Ligocki Marek, Monika, Majewska Danuta, Romaniszyn Krystyna: The effect of differentiated dietary protein level on the performance of breeder quails, Depart. Of Poultry and Ornamental Birds Breeding, Agr. Univ. Szczecin, Poland, 2006.

[18] ***: Code of practice for the housing of animals in designated breeding and supplying establishments /Part. 2 / Quail breeding, http://scienceandresearch.homeoffice.gov.uk/animal-research, 2005.