

STUDY OF THE PRODUCTIVE CHARACTERISTICS OF YOUTH AND LAYING QUAILS IN THE “BALOTEȘTI” EGGS-MEAT POPULATION

Elena Popescu-Micloșanu, L. Ioniță

Universitatea de Științe Agronomice și Medicină Veterinară București, Facultatea de Zootehnie
e-mail: elenapopescu50@yahoo.com

Abstract

The research findings on the productive characteristics in the “Balotești” eggs-meat quail population raised and selected at „S. C. Nova Farm S.R.L.” Bucharest, upon an initial number of 2,000 quails, studied individually or on cage, in function of the productive characteristic, indicated that the average body weight at the age of 42 days was of 205.3 g and the daily average weight gain in the period of 1-6 weeks of raising was of 4.65 g, the daily average feed consumption and the specific consumption was of 15.63 g, respectively 3.46 g and the viability was of 90.5 %. In the first 48 weeks of the laying period of the quails raised for reproduction, it was obtained an average laying percent of 63.03, the daily average feed consumption and the average specific consumption being of 37.35 g, respectively 68.25. The daily consumption for the 1-6 weeks period of raising the youth quails was of 46.53 kcal ME and 3.30 g crude protein. In 48 weeks of laying the daily consumption was of 103.72 kcal ME and 7.32 g crude protein. The performances are superior to other populations in our country, raised in majority only for eggs, and similar to that exploited in others countries with tradition in quail raising, being suited to continue the selection in the direction of obtaining lines specialized for eggs or as broiler mother.

Key words: quail, productive characteristics, youth, laying quails.

INTRODUCTION

Japanese quail raised for eggs - meat production saw a great development during recent decades because quail eggs and meat are well-known on one hand for their qualities (high and well-balanced nutritive value, exquisite taste), and on the other hand because of the recommendations of naturalistic medicine to consume these dietetic products with peculiar therapeutically effects [4].

MATERIAL AND METHOD

To establish the productive characteristics in the youth of a Balotești eggs - meat quail population an experiment was organized upon an initial number of 2,000 quail chicks aged of 1 day from 5 series, in 6 weeks of growth. In the period of 0-3 weeks of growth, the chicks were raised on floor permanent laying bad (the 1st phase of growth), while in the 4-6 weeks of growth (the 2nd phase of growth), the chicks were raised in special cages batteries for the youth quails. The

determinations concern the individual body weight, the daily feed consumption on the cage and the mortality.

To determine the productive characteristics in the adult quails from a Balotești eggs – meat quail population there were studied the productive performances in an initial number of 905 adult quails of the same 5 series. The study data refer to: the egg production on the cage, the individual egg weight, the individual body weight, the feed consumption on the cage and the mortality during 48 weeks of egg production, taking into account that birds were exploited for reproduction. The utilized sex - ratio in the reproduction cage was of 1 male to 3 females.

The composition and the nutritive values of the compound feed used in the experiment are presented in Tables 1 and 2.

Depending on the determinations and the nutritive values of the mixed feed it was calculated the average metabolisable energy

and the nutritive substances consumption (crude protein, methionine and cistine, lysine, calcium, phosphorus, crude cellulose, microelements and vitamins).

The dates processing was done with the Micorsoft Windows Excel 2003 program.

Table 1
 The structure of the mixed feed used in the experiment (kg)

Specification	The 1 st phase of the youth growth (0-3 weeks)	The 2 nd phase of the youth growth (4-6 weeks)	Adult quails (over 6 weeks)
Corn	52.85	57.94	53.20
Soybean meal	34.50	28.70	28.00
Sunflower meal	-	5.50	5.5
Fish meal	6.90	-	-
Lyzyne-HCl	-	0.33	0.20
DL-methionine	0.15	0.18	0.20
Calcium carbonate	0.60	1.35	7.8
Dicalcic phosphate	1.40	1.60	1.5
Oil	2.30	3.1	2.8
Vitamin and mineral premix	1.00	1.00	0.50
Salt	0.30	0.30	0.30
Total	100.00	100.00	100.00

Table 2
 The nutritive composition of the mixed feed used in the experiment (calculated value)

Specification	The 1 st phase of the youth growth (0-3 weeks)	The 2 nd phase of the youth growth (4-6 weeks)	Laying quails (over 6 weeks)
Metabolisable Energy (kcal EM/kg feed)	2946	2990	2777
Crude Protein (%)	24	19.76	19.61
Lysine (%)	1.60	1.28	1.15
Methionine and cistine (%)	0.94	0,81	0.82
Calcium (%)	0.97	0.96	3.38
Phosphorus (%)	0.79	0.66	0.69
Rough cellulose (%)	2.96	3,87	3.82
Rough fat (%)	5.06	5,91	5.41
Vitamin A (UI/kg feed)	12501	12501	10752
Vitamin D3 (UI/kg feed)	3500	3500	2460
Vitamin E (mg/kg feed)	57,770	58,690	38,310
Vitamin B1 (mg/kg feed)	4,540	4,630	3,706
Vitamin B2 (mg/kg feed)	7,480	7,380	5,940
Vitamin B4 (choline) (mg/kg feed)	1566,000	1423,000	1796,780
Vitamin B6 (mg/kg feed)	3,200	3,200	2,000
Vitamin B12 (mg/kg feed)	2.010	2,010	2,010
Copper (mg/kg feed)	12,150	11,540	12,290
Manganese (mg/kg feed)	92,390	91,08	90,860
Selenium (mg/kg feed)	0,200	0,200	0,180
Zinc (mg/kg feed)	80,130	78,10	79,320
Energo-protein rate (kcal EM/PB %)	123	152	141
Lysine – methionine and cistine rate	1,730	1,590	1,430
Calcium – phosphorus rate	1,240	1,460	5,390

RESULTS AND DISCUSSIONS

Experimental research findings on growth and egg production performances of a

Balotești quail population are presented below.

1. The productive characteristics of the youth quails in 1 to 6 weeks period of growth

From the 8.86 g average body weight in the first day of age (Table 3) the quail chicks get 205.3 g after 6 weeks. The average body weight gain increased by the age until the 5-

th week of life, when achieved a maximum of 5.72 g/day. The daily feed consumption raised by the age from 4.3 g in the 1st week to 26.24 g in the 6-th week. The feed conversion ratio increased gradual, from the average of 2.16 after the first 3 weeks of growth to 4.5 in the next 3 weeks.

Table 3
 The productive characteristics in chicks of the Balotesti eggs-meat quail population

Age (weeks)	Body weight X ± sX (g)	Body weight gain (g)		Feed consumption (g/quail)		Feed conversion ratio	Mortality %
		Daily	Weekly	Daily	Weekly		
1 day	8,86 ± 0,07	-	-	-	-	-	0.5
I	31 ± 0,12	3,05	21,37 ± 0,88	4,3	30,10 ± 1,20	1,41	1,6
II	76,5 ± 0,77	6,5	45,5 ± 0,58	9,85	69,00 ± 1,15	1,52	1,6
III	105,54 ± 1,63	4,14	29 ± 0,67	15,5	108,00 ± 0,88	3,74	0,6
IV	136,45 ± 1,71	4,60	32,23 ± 1,24	17,64	123,5 ± 0,18	3,86	1,2
V	177,92 ± 2,15	5,72	40,10 ± 0,97	20,2	141,4 ± 0,35	3,52	2,8
VI	205,3 ± 2,29	3,90	27,36 ± 0,67	26,24	183,7 ± 0,79	6,71	1,2
Average I-VI week	-	4,65	32,59	15,63	109,2	3,46	1,4
1-21 days	-	4,56	95,85	9,86	207,1	3,2	4,3
21-42 days	-	4,74	99,69	21,41	449,6	4,5	5,2
Total 1-42 days	-	-	195,54	-	656,7	-	9,5

2. The productive characteristics of the adult quails in the 1 to 48 weeks period of egg production

The egg production of the studied population (Table 4) increased rapidly, so it achieved the peak of the egg yield in the weeks 7-8 of the egg output: 88.5-88.76 %. The plate has been maintained approximately 8 weeks, after which it has decreased at 38% in 48-th week of egg production. The average egg weight was of 10.77 g at the beginning of the egg production, has exceed 11 g in 3-th week, after which it has increased, coming at the maximum of 14.5 g in the 16-th week of egg production, unlike fowl, reducing slowly at of 9.12 g by the end of the analyzed period. The average body weight has increased slowly along the age, from 226.50 g at the beginning of the laying, to 274.15 g in the 48-th week of egg production. The feed consumption had an upward evolution, from 28.14 in the 1st week of laying to 41.31 g in the last week of the studied egg production. The feed conversion per egg was minimal in the peak of the laying, of 35.85 in the 7-th week, then increasing slowly to 108.71 in the 48-th week.

3. The energy and nutritive substances consumption of the youth and adult quails

In the 1st phase of youth growth (Table 5), the feed consumption per g of weight gain was of: 6.36 kcal ME, 0.518 g crude protein, 0.035 g lysine, 0.020 g methionine + cisthine, 0.005 g tryptophan, 0.021 g calcium, 0.017 g phosphorus, 0.109 g rough fat, 27 UI vitamin A and 7.56 UI vitamin D3. The other microelements and vitamins consumption are presented in the Table 5.

In the 2nd phase of youth growth, the specific consumption per g of weight gain was bigger: 13.46 kcal ME, 0.889 g crude protein, 0.057 g lysine, 0.036 g methionine + cisthine, 0.010 g tryptophan, 0.043 g calcium, 0.029 g phosphorus, 0.266 g rough fat, 56.25 UI vitamin A and 15.75 UI vitamin D3. The other microelements and vitamins consumption are presented in the Table 5.

In the adult quails from the Balotești population, the energy and nutritive substances per egg was: 189.53 kcal ME, 13.38 g crude protein, 0.784 g lysine, 0.546 g methionine + cisthine, 2.307 g calcium, 0.471 g phosphorus, 3.692 g brute fat, 733.82 UI vitamin A and 167.89 vitamin D3. The leftover of

microelement and vitamin consumption are presented in the table 5.

The productive performances characteristics of the Balotești quails

population are similar to those of the Faraon quails populations from Poland [11] and superior to those of the quail populations exploited in Turkey [5].

Table 4

The evolution of the productive performances of the egg production in the Balotești quails population during the weeks 1 - 48 of laying

Week of exploitation	Egg yield $\bar{X} \pm s_x$ (%)	Egg output per capita $\bar{X} \pm s_x$	Cumulated egg production /capita	Egg weight (g) $\bar{X} \pm s_x$	Body weight (g) $\bar{X} \pm s_x$	Daily feed consumption (g) $\bar{X} \pm s_x$	Feed conversion (g/egg)
1	4.34 ± 0.64	0.29 ± 0.07	-	10.77 ± 0.22	226.50 ± 1.57	28.14 ± 1.05	648.38
2	38.20 ± 2.41	2.66 ± 0.25	2.95	10.91 ± 0.18	229.34 ± 1.63	28.36 ± 1.31	74.24
3	66.07 ± 2.80	4.63 ± 0.25	7.58	11.11 ± 0.11	230.27 ± 1.55	28.73 ± 1.27	43.48
4	77.94 ± 3.48	5.52 ± 0.42	13.10	11.18 ± 0.10	235.32 ± 1.45	30.63 ± 0.63	39.29
5	83.87 ± 2.75	5.93 ± 0.32	19.03	11.22 ± 0.05	239.52 ± 1.29	31.05 ± 0.50	37.02
6	87.44 ± 2.44	6.17 ± 0.30	25.20	11.27 ± 0.05	240.31 ± 0.93	31.41 ± 0.32	35.92
7	88.50 ± 2.09	6.25 ± 0.19	31.45	11.36 ± 0.10	242.31 ± 0.91	31.73 ± 0.18	35.85
8	88.76 ± 1.95	6.26 ± 0.22	37.71	11.45 ± 0.09	245.19 ± 0.81	32.27 ± 0.18	36.35
9	88.59 ± 1.93	6.25 ± 0.25	43.96	11.52 ± 0.14	246.17 ± 0.95	32.30 ± 0.15	36.46
10	87.78 ± 2.16	6.17 ± 0.26	50.13	11.57 ± 0.18	246.57 ± 0.87	32.50 ± 0.50	37.02
11	87.22 ± 2.40	6.13 ± 0.30	56.26	11.64 ± 0.23	247.05 ± 0.91	33.18 ± 0.64	38.04
12	86.21 ± 2.32	6.05 ± 0.29	62.31	11.72 ± 0.18	248.09 ± 0.95	33.77 ± 0.37	39.17
13	85.04 ± 2.23	5.96 ± 0.27	68.27	12.18 ± 0.27	248.94 ± 1.10	33.81 ± 0.28	39.75
14	83.85 ± 2.20	5.89 ± 0.29	74.16	13.32 ± 0.05	249.88 ± 0.91	34.00 ± 0.18	40.54
15	83.18 ± 2.12	5.83 ± 0.33	79.99	13.55 ± 0.09	250.44 ± 0.94	34.32 ± 0.14	41.25
16	81.61 ± 2.23	5.73 ± 0.29	85.72	14.50 ± 0.14	251.88 ± 0.83	34.41 ± 0.41	42.16
17	79.55 ± 2.36	5.58 ± 0.33	91.30	13.14 ± 0.23	254.06 ± 0.51	34.77 ± 0.32	43.71
18	78.39 ± 2.36	5.48 ± 0.32	96.78	12.68 ± 0.05	254.68 ± 0.42	35.00 ± 0.45	44.64
19	76.59 ± 2.55	5.38 ± 0.34	102.16	12.40 ± 0.05	255.23 ± 0.51	35.14 ± 0.50	45.88
20	74.55 ± 2.81	5.26 ± 0.35	107.42	12.36 ± 0.04	255.81 ± 0.43	35.36 ± 0.36	47.43
21	73.29 ± 2.96	5.19 ± 0.38	112.61	12.31 ± 0.04	256.57 ± 0.58	35.54 ± 0.45	48.49
22	71.84 ± 2.84	5.10 ± 0.33	117.71	12.22 ± 0.05	257.08 ± 0.66	35.81 ± 0.45	49.84
23	70.02 ± 2.46	5.02 ± 0.36	122.73	12.05 ± 0.05	257.50 ± 0.76	35.95 ± 0.41	51.34
24	68.41 ± 2.56	4.91 ± 0.38	127.64	11.95 ± 0.05	258.26 ± 0.95	36.05 ± 0.41	52.69
25	66.75 ± 2.73	4.79 ± 0.41	132.43	11.91 ± 0.10	259.13 ± 0.93	36.27 ± 0.54	54.33
26	64.79 ± 2.63	4.65 ± 0.41	137.08	11.91 ± 0.07	260.25 ± 1.06	36.50 ± 0.50	56.33
27	62.73 ± 2.34	4.51 ± 0.39	141.59	11.85 ± 0.08	260.82 ± 0.98	36.54 ± 0.45	58.25
28	61.03 ± 2.18	4.39 ± 0.37	145.98	11.85 ± 0.05	261.05 ± 0.91	36.73 ± 0.55	60.18
29	59.23 ± 2.16	4.27 ± 0.37	150.25	11.74 ± 0.05	261.93 ± 0.84	36.82 ± 0.54	62.16
30	58.30 ± 2.19	4.08 ± 0.38	154.33	11.67 ± 0.04	263.36 ± 0.86	37.14 ± 0.59	63.70
31	57.62 ± 1.99	4.03 ± 0.37	158.36	11.59 ± 0.07	263.58 ± 0.70	37.41 ± 0.58	64.93
32	56.76 ± 1.87	3.97 ± 0.37	162.33	11.55 ± 0.05	263.00 ± 0.77	37.59 ± 0.50	66.23
33	55.24 ± 1.64	3.87 ± 0.33	166.20	11.42 ± 0.10	264.77 ± 0.70	37.60 ± 0.42	68.07
34	50.88 ± 1.57	3.56 ± 0.27	169.76	11.36 ± 0.09	266.45 ± 0.52	37.72 ± 0.72	74.14
35	49.68 ± 1.98	3.48 ± 0.29	173.24	11.23 ± 0.10	267.91 ± 0.45	38.05 ± 0.95	76.59
36	49.51 ± 2.19	3.46 ± 0.25	176.70	11.12 ± 0.08	267.91 ± 0.34	38.22 ± 0.64	77.19
37	48.00 ± 1.99	3.36 ± 0.42	180.06	11.05 ± 0.12	268.25 ± 0.51	38.41 ± 0.37	80.02
38	46.51 ± 1.87	3.26 ± 0.32	183.32	10.9 ± 0.11	268.74 ± 0.42	38.72 ± 0.28	83.25
39	46.23 ± 2.32	3.23 ± 0.30	186.55	10.6 ± 0.10	269.43 ± 0.54	38.83 ± 0.18	83.99
40	45.12 ± 2.23	3.16 ± 0.19	189.71	10.4 ± 0.07	269.52 ± 0.76	39.00 ± 0.14	86.43
41	44.80 ± 2.20	3.13 ± 0.37	192.84	10.3 ± 0.10	269.80 ± 0.55	39.14 ± 0.41	87.37
42	44.11 ± 2.12	3.08 ± 0.37	195.92	10.1 ± 0.05	270.00 ± 0.75	39.23 ± 0.55	88.93
43	43.00 ± 2.23	3.01 ± 0.33	198.93	10 ± 0.10	271.00 ± 0.65	39.32 ± 0.54	91.44
44	42.24 ± 2.36	2.97 ± 0.27	201.90	9.9 ± 0.11	271.52 ± 0.45	39.53 ± 0.59	±93.58
45	42.00 ± 2.36	2.94 ± 0.19	204.84	9.67 ± 0.08	272.21 ± 0.56	39.71 ± 0.55	94.54
46	40.50 ± 2.36	2.83 ± 0.37	207.67	9.45 ± 0.10	272.52 ± 0.67	40.00 ± 0.54	98.76
47	40.00 ± 2.55	2.80 ± 0.38	210.47	9.20 ± 0.05	273.23 ± 0.75	41.00 ± 0.59	102.50
48	38.00 ± 2.81	2.66 ± 0.26	213.14	9.12 ± 0.11	274.15 ± 0.55	41.31 ± 0.58	108.71
Average 1-48 weeks	63.03 ± 0.03	4.11 ± 0.19	-	11.42 ± 0.15	257.03 ± 1.81	37.35 ± 0.48	68.25 ± 3.12
Total	-	-	213.14	-	-	-	-

Table 5
 The energy and nutritive substances consumption in youth and adult quails

Specification	The 1 st phase of the youth growth (0-3 weeks)		The 2 nd phase of the youth growth (4-6 weeks)		The overall youth growth period (0-6 weeks)		Laying quails	
	Daily	Per g weight gain	Daily	Per g weight gain	Daily	Per g weight gain	Daily	Per egg
Metabolisable energy (kcal)	29.05	6.36	64.02	13.46	46.53	9.91	103.72	189.53
Crude protein (g)	2.37	0.518	4.23	0.889	3.30	0.704	7.320	13.383
Lysine (g)	0.158	0.035	0.274	0.057	0.216	0.046	0.420	0.784
Methionine+ cisthine (g)	0.092	0.020	0.173	0.036	0.134	0.028	0.290	0.546
Calcium (g)	0.096	0.021	0.206	0.043	0.151	0.032	1.260	2.307
Phosphorus (g)	0.078	0.017	0.141	0.029	0.110	0.023	0.257	0.471
Brute cellulose (g)	0.292	0.064	0.829	0.174	0.561	0.119	1.426	2.607
Rough fat (g)	0.499	0.109	1.265	0.266	0.882	0.188	2.020	3.692
Vitamin A (UI)	123.26	27	267.65	56.25	195.46	41.63	401.58	733.82
Vitamin D3 (UI)	34.51	7.56	74.94	15.75	54.73	11.66	91.88	167.89
Vitamin E (mg)	569	124.85	1257	264.11	913	194.48	1423.04	2600.33
Vitamin B1 (mg)*	44.76	98.06	99.13	20.84	71.95	59.45	138.19	252.53
Vitamin B2 (mg)*	73.75	16.15	158	33.21	115.88	24.68	220.37	402.68
Vitamin B4 (mg)*	15440	3382.6	30466	6403.5	22953	4893.05	67109	122630.24
Copper (mg)*	119.79	26.24	247.07	51.93	183.43	39.09	459.41	839.48
Manganese (mg)*	916.3	200.73	1950	409.86	1433.15	305.29	3393.62	6201.20
Selenium (mg)*	1.97	0.43	4.28	0.90	3.13	0.67	6.72	12.29
Zinc (mg)*	790.1	173.1	1672.2	351.45	1231.15	262.28	2962.61	5413.59

Note : the values marked with * must be divided by 10⁵.

CONCLUSIONS

The productive characteristics in youth of Balotești egg –meat quail population in the 1-6 weeks of growth. The average body weight at 42 days of age of Balotești quail was of 205.3 g, the average body weight gain in 1-6 weeks of growth was of 4.65 g and the feed conversion was of 3.46 kg compound feed /kg weight gain. In the same period, the viability was of 91.6 %.

The productive characteristics in the laying quails of Balotești egg –meat population in the 1-48 weeks of egg production. The average productive performances obtained at the analyzed quails were the following: the average egg production percent was of 63.03 %, the average egg production per capita and week was of 4.11 eggs. The cumulated egg production was 213.14 eggs /capita. The mortality percent was of 0.18 %. The average egg weight in the analyzed period was of 11.42 g. The determined average quail body weight in the 1-48 weeks of egg production was of 257.03 g per capita. The feed

consumption was of 37.35 g per capita and day and the feed conversion was of 68.25 g per egg.

The nutritive substances consumption in the youth quail. For the 1st phase (weeks 1- 3) of growth the consumption per capita/day was of : 29.05 kcal ME, 2.37 g crude protein, 0.158 g lysine, 0.092 g methionine + cisthine, 0.096 g calcium and 0.078 g phosphorus. For the 2nd phase (weeks 4-6 of growth) the consumption per capita/day was of: 64.02 kcal ME, 4.23 g crude protein, 0.274 g lysine, 0.173 g methionine + cisthine, 0.206 g calcium and 0.141 g phosphorus.

The nutritive substances consumption of the laying quails in the 1-48 weeks egg production was: 103.72 kcal ME, 7.32 g crude protein, 0.420 g lysine, 0.290 g methionine + cisthine, 2.307 g calcium and 0.471 g phosphorus.

As a general conclusion, it can be stated that the quails from the studied population have productive characteristics higher than other quail populations in Romania, which

are raised just for egg and similar with the quails raised in other countries with long tradition in the quail raising domain. These quails can be further selected for obtaining specialized quails only for eggs, as well as for hybridization on female line for broiler.

ACKNOWLEDGEMENTS

S.C. Nova Farm S.R.L. for its contributions to the promotion of scientific research in quail raising.

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