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FATTENING PERFORMANCE AND SLAUGHTER TRAITS IN MALE PHARAOH JAPANESE QUAILS

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Abstract

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The study was carried out with 72 growing male Japanese quails from the meat Pharaoh breed. Fattening performance of birds was monitored between 15 and 35 days of age. At 35 days of age, slaughter analysis was done as well as proximate analysis of breast and thigh muscles.

The analysis of results showed that during the experimental period, the average feed conversion ranged between 3.31 and 3.64 kg/kg weight gain, while 1 kg weight gain was achieved with 46.70 MJ metabolisable energy and 721 g crude protein. After 28 days of age, feed conversion decreased almost twice, making fattening ineffective. At 35 days of age the average birds' weight was 237.11 ± 2.826 g. The deskinned grill percentage varied from 55.5 – 62.4% of live body weight. The relative proportion of breast with bone was 44.5 – 50.5% of grill weight, and of thighs: 24.7 – 30.4%. The percentage of manually deboned breast meat from grill weight was from 38.7 and 44.7% while of thigh meat: 20.5 – 24.9%.

Key words: Japanese quails; fattening; slaughter characteristics; Pharaoh breed
List of abbreviations: ME – Metabolizable energy, CP – Crude Protein, Ca – Calcium, P – Phosphorus

Introduction

During the last years, the assortment of poultry products is continuously increasing along with the amount of produce. This is particularly noted for meat production. Quail farming is not a very popular branch of poultry farming, yet it comprises a worthy niche with respect to the diversity of retail products. The wide variety of breeds, lines and crosses of Japanese quails for fattening, often from different productive types, requires using various approaches in fattening technologies.

The valuable dietetic properties of quail meat are at the background of the increasing interest of consumers to this product. The relative proportion of breast meat of grill weight is 36.4 – 38.7%, that of thighs: 21.9 – 24.6%, and the back, neck and wings together make up 35.9 – 37.8% (Panda and Singh, 1990; Alkan et al., 2010). The percentage of edible Japanese quail meat is very high and comprises breast meat – 36% of carcass weight and thigh meat – 15% (Vaclovsky and Vejcik, 1999). The analysis of efficiency of quail meat production showed that it was the highest if slaughter was performed at 35 days of age (Kaytazov and Genchev, 2004). In the opinion of authors, the bratfertig is the most profitable followed by the grill.

The great variety of breeds, strains and productive type implemented in the world economic practice and used in experimentation work allowed more extensive investigation on fattening performance, physicochemical properties and quality of meat from quails of the specialised meat-type Pharaoh breed. To this end, we aimed to evaluate fattening performance and slaughter traits in a heavy Pharaoh quails line selected and reared in the Poultry unit at the Faculty of Agriculture, Trakia University, Bulgaria.

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Material and Methods

The study was carried out with 72 male Japanese quails from the heavy Pharaoh line, selected in the Poultry unit at the Faculty of Agriculture, Trakia University, from 14th until 35th day of age. The growing conditions were in compliance with the zoo-hygienic requirements for quails of the specific age category and productive type. Until the 14th day of age, they were fed a starter mash mixture containing 11.1 MJ/kg ME, 24% CP, 1.3% L-lysine, 0.52% methionine, 1.2% Ca and 0.5% available P. At 14 days of age, the birds were sexed. Males were weighed and divided into 6 groups with uniform weight, 12 birds in each. Each group was house in a separate cage. Between 15 and 21 days of age, the quails were fed grower mash diet with 12.1 MJ/kg ME, 21% CP, 1.1% L-lysine, 0.5% methionine, 1.1% Ca and 0.45% available P, and from 22 to 35 days of age: finisher mash mixture with 12.4 MJ/kg ME, 18% CP, 1.0% L-lysine, 0.43% methionine, 1.0% Ca and 0.4% available P.

Live weight of birds was determined individually at 14, 21, 28 and 35 days of age with accuracy 0.1 g on CB2000 analytical balance. Feed consumption was registered on a daily basis, and per groups. Feed conversion ratio was calculated on the basis of consumed feed and weekly weight gain.

The slaughter analysis was done as per the detailed protocol described by Genchev and Mihaylov (2008). Stunning and slaughter was done under production conditions and in compliance with European animal welfare legislation for slaughter. After the bleeding, the birds were pulled down from the conveyor line and processed manually by removing the skin with the plumage. The weight of carcass, visceral organs and different cuts was determined with accuracy 0.01 g on ACB*plus*-300 balance.

Statistical analysis

All data were analysed by Statistica 13.0 software (Statistica for Windows; Stat – Soft, 2015). Mean (x), standard error of mean (SEM) and coefficient of variation (CV, %) values were calculated.

Results

Table 1 presents the fattening traits of male Japanese quails from the investigated meat type population. During the period between 14 and 35 days of age, feed intake was from 489 to 523 g/bird that resulted in weight gain between 134.2 and 151.7 g. At 35 days of age the birds' weight attained 200 – 274 g. The detailed analysis of data taking into consideration the nutritional content of feeds showed that between 15 – 35 days of age, 1 kg weight gain corresponded to 46.70 MJ ME and 721 g CP. For this period, average feed conversion ranged from 3.31 to 3.64 kg/kg. This indicated that until 28 days of age, the feed conversion was good ensuring uniform growth rate and efficient meat production. After 28 days of age, feed conversion efficiency decreased almost twice to attain 6 to 8.9 kg feed per 1 kg weight gain.

Carcass percentage without the skin and edible offal (grill) ranged between 55.5 – 62.4% of live weight (Table 2). In general, edible offal (heart, liver, spleen and gizzard) weighed between 11.5 and 15.4 g, e.g. 5.3 – 6.4% of quail live weight. At that age, abdominal fat proportion was insignificant – 0.6 – 2.4 g, comprising 0.73% of grill weight. The relative proportion of cuts with high relative meat content (breast with bone and thighs with drumstick) varied between 73 and 75.8% of grill weight, breast with bone: 44.5 – 50.5%, and thighs – 24.7 – 30.4%. In our line of Pharaoh quails, manually deboned breast and thigh meat was 80.8 and 102.3

Table 1
Production traits in male Pharaoh Japanese quails

Traits	n	x±SEM	min	max	VC,%
Live weight, g					
14 days	72	93.21±0.028	83.4	101.6	4.6
21 days	72	158.73±1.771	134.2	174.0	4.9
28 days	72	208.38±1.685	174.0	236.0	5.8
35 days	72	237.11±2.826	200.0	274.0	7.1
Average daily weight gain, g					
15-21 days	72	9.36±0.253	8.49	10.08	6.1
22-28 days	72	7.09±0.393	5.69	8.06	12.4
29-35 days	72	5.99±0.379	4.52	7.80	20.6
Feed conversion, kg/kg					
15-21 days	72	2.539±0.102	2.31	2.90	5.2
22-28 days	72	3.727±0.155	3.41	4.31	5.4
29-35 days	72	7.20±0.559	5.96	8.90	15.8

g, respectively equal to 61.3 – 63.9% of carcass weight. The breast meat percentage was 38.7 – 44.7% of grill weight and thigh meat percentage: 20.5 – 24.9%.

Table 2
Slaughter traits in male Pharaoh Japanese quails

Traits	Weight, g	Yield, % of carcass weight
	x±SEM	x±SEM
Live weight, g	237.98±3.42	
Carcass weight after 24 h, g	141.17±2.49	
Slaughter yield *		59.31±0.50
Drip loss	1.18±0.06	0.86±0.04
Edible offal *	13.67±0.26	5.75±0.07
Abdominal fat	1.03±0.16	0.73±0.11
Breast with bone	66.46±1.42	47.05±0.39
including breast meat	57.83±1.28	40.94±0.39
Thigh and drumstick	39.02±0.82	27.65±0.34
including meat	32.33±0.53	22.94±0.27
Total meat from edible carcass parts	90.16±1.58	63.88±0.27

Note: Traits designated with * are calculated as per live body weight

Discussion

All control weighings showed that live weight of male Pharaoh quails varied within the normal values of the population reared in the Poultry Breeding unit to the Trakia University. The live weight at 35 days of age was significantly higher than that reported from Wilkanowska and Kokoszynski (2011) for birds of the same breed (139.4 g and 169.1 g at 33 and 42 days of age), closer to those reported from Genchev (2014) for birds of the same line. Our results were closer to those of Milvielle (2002) on Big French quails (281 g) and to the weight of a specialised broiler (cross – 195 and 272 g at 4 and 6 weeks of age respectively (Karthika and Chandirasekaran, 2016). This could be attributed to the longs years of purposeful selection work to improve meat traits of our population throughout many generations.

Slaughter analysis results showed a lower slaughter yield compared to data reported by Panda and Singh (1990) – 65%, by Tavaniello et al. (2014) – 69.5 and Alkan et al. (2010) – 70.5 – 72.5% in male quails and was comparable to the yield of 59.5% demonstrated by Zerehdaran et al. (2012). The probable reason was that in our slaughter analysis, carcasses were processed by removal of the skin with feathers that decreased the yield by 5 – 6%. In a similar carcass processing protocol, Karthika and Chandirasekaran (2016) obtained a slaughter yield of 62 – 63%.

The proportion of edible offal in our survey was similar to that obtained by Karthika and Chandirasekaran (2016) – 5.8 – 6.9%, whereas abdominal fat percentage (0.1 – 1.6% of carcass weight), corresponded to data reported by Zerehdaran et al. (2012) and Alkan et al. (2013). The share of breast with bone from live weight (26 – 31.3%) agreed with proportions published by Narinc et al. (2013) – 21 – 32.4% and Tavaniello et al. (2014) – 32.4 – 33.5%.

In our study, the amount of manually deboned breast and thigh meat was higher than that in the studies of Panda and Singh (1990) – 30.6 – 31.3% for breast and 17.8 – 18.1% for thigh meat, Vaclovsky and Vejcik (1999) – 29.7 – 31.9% for breast and 18.2 – 21.1% for thighs; and Wilkanowska and Kokoszynski (2011) – 30.8% for breast and 16.7% or thighs.

Author contributions

Conceived and designed the experiments: HL and AG. Performed the experiments: HL and AG. Analyzed the data: AG and HL. Contributed reagents/materials/analysis tools: AG and HL. Wrote the paper: AG and HL. Supervising the work: AG.

Conclusions

On the basis of results, it could be concluded that:

The live weight of Japanese quails was within the normal range for the Pharaoh population selected and reared in the Poultry breeding unit at the Trakia University. Between 15-35 days of age, average feed conversion ranged between 3.31 and 3.64 kg/kg weight gain, while 1 kg weight gain was achieved with 46.70 MJ metabolisable energy and 721 g crude protein. After 28 days of age, feed conversion decreased almost twice, making fattening ineffective.

The grill percentage varied from 55.5 – 62.4% of live body weight. The relative proportion of breast with bone was 44.5 – 50.5% of grill weight, and of thighs: 24.7 – 30.4%. The percentage of manually deboned breast meat from grill weight was from 38.7 and 44.7% while of thigh meat: 20.5 – 24.9%.

The selected and reared Japanese quails from the heavy line of the Phoraoh breed in the Poultry unit at the Faculty of Agriculture, Trakia University, Bulgaria have very good growth and meat characteristics, which are competitive with the modern meat lines and crosses.

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