

COMPARATIVE STUDY ON THE RESULTS OF SLAUGHTERING SEPARATELY BY SEX IN QUAILS OF THE BROWN JUMBO MEAT POPULATION AND IN QUAILS OF THE MIXED EGGS - MEAT POPULATION BALOTEȘTI AT THE AGE OF 42 DAY

Cornel Octavian PANĂ¹, Lucian IONIȚĂ², Elena POPESCU-MICLOȘANU¹,
Ioan CUSTURĂ¹, Minodora TUDORACHE¹

¹University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Engineering and Management of Animal Products, Bucharest, Romania

²Ioniță T. Lucian Individual Enterprise, Gherghița, Prahova, Romania

Corresponding author email: panacorneloctavian@yahoo.ca

Abstract

The purpose of the research was to determine comparatively the results of slaughter separately by sex, in the case of two populations of quails (meat and mixed), at the age of 6 weeks. The average weight of the eviscerated carcass for meat quails was 205.00 ± 8.82 g/head in females, while in mixed eggs-meat female quails it was 135.20 ± 3.29 g/head (34.05% higher as in females in the mixed population) and 173.80 ± 6.37 g/head in males of the meat population (26.24% higher than in males of the mixed population, 128.20 ± 3.98 g/head). Studied Jumbo meat quails can be used with good results in meat production, chickens being raised for meat production, while quails from the Balotești mixed egg population can also be used in the direction of meat production, if desired of smaller carcasses compared to those of meat quails. For both populations, the breeding for meat is conditioned by a high performing breeding lot and without directing the females to egg production.

Key words: quails, slaughtering, meat, egg.

INTRODUCTION

Currently, quail raising in Romania is an activity with an upward development, in the market of the quail egg products, appearing several producers that have farms with tens of thousands of quails, millions of eggs and tens tons of meat, who also accessed European funds of hundreds of thousands of euros (Ioniță et. al., 2019). However, under the conditions of this development, there is a need to know the interaction of these birds with environmental factors, rigorous programming of productions in close correlation with the preferences of consumers and the market of these products (Popescu Micloșanu, 2007). In general, farms are mixed, in the sense that they produce eggs and meat also, which means that the growth performance of the quail population, its direction of specialization and its interaction with environmental factors must be known very well (Almeida et al., 2002).

The purpose of the experiment was to determine the results of slaughter in quails from a meat population (brown Jumbo) and a mixed

population (Balotești) and to establish comparative data that can be useful to both researchers and quail of 42 days aged producers, considering that in most quail meat production systems the age of slaughter is between 40 and 45 days (Sari et al., 2011; Silva et al., 2013). Also, the sex of birds is particularly important in obtaining superior results when sacrificing quails (Perez and Slaes, 1997; Okamoto et al., 1989).

MATERIAL AND METHOD

The investigations were carried out within the quails exploitation Ioniță T. Lucian Individual Enterprise in Gherghița Commune, Jud. Prahova and a total number of 300 quails were investigated, of which 150 quails (females and males) from the brown Jumbo meat population and 150 quails (females and males) from the mixed egg-meat population "Balotești". The environmental conditions in which the birds grew up were within the limits provided by the specialized literature (Ioniță, 2014). During the experiment, two combined feed recipes were administered, namely quail starter (1 - 3 weeks)

and quail grower (4 - 6 weeks). The quail starter compound feed recipe had the following calculated nutritional value: 3010 kcal metabolizable energy/kg compound feed, 24.80% crude protein, 5.10% crude fat, 0.97% methionine, 1.58% lysine, 0.96% calcium and 0.75% phosphorus. The compound feed specific for the second growth phase of the quail youth had the following calculated nutritional value: 3140 kcal metabolizable energy/kg compound feed, 22.50% crude protein, 6.10% crude fat, 0.98% methionine, 1.33% lysine, 0.86% calcium and 0.70 % phosphorus (source: <https://www.ibna.ro/pdf/Furaje-pentru-curci-prepelite-si-fazani.pdf> (Compounds feeds-for-turkey-quail-and-pheasant), Institute of Biology and Animal Nutrition, Balotești, Romania).

The birds were weighed at the age of one day and, after individualization, at 42 days. After slaughter, the weight of the after bleeding carcass, the plucked carcass and the eviscerated carcass were determined. The average data were calculated for both the male and female carcasses. The same has been done for the component parts of the housing. Finally, the proportions were established for the different components of the carcass.

In order to establish the significance of the differences between the averages, the Student test was used.

RESULTS AND DISCUSSIONS

At the age of 1 day, the average weight of chicks (weight valid for both males and females, since at this age sexing is not done) in the meat population was 9.47 ± 0.07 g/head, while in the chickens from the mixed population was 8.76 ± 0.33 g/head, 7.5% lower.

In a study conducted in Romania (Popescu-Micloșanu et al., 2006) on two batches of mixed and meat quail in which the determination of the growth parameters up to the age of 42 days was sought, in the chicken lot of meat quail is mentioned at the age of 42 days an average weight of 244.9 g/head (as average for males and females), while in the present study the average weight determined in females and males is 8.55% higher (267.80 g/head).

Also, the same authors determined in the quails of the mixed population an average weight for females and males at 42 days of 205.30 g/head, 3.46% lower than that determined in the present experiment in the mixed quails (198.20 g/head). Stoica et al. (2001) mentions an average living weight in the Balotești quails at 42 days of 208.00 g / head in females and 202.00 g/head in males.

Table 1. Average live weight at 1 day and 42 days in females and males of quail from the mixed eggs-meat population of Balotești and brown Jumbo meat quail (g)

Specification	Meat quails		Eggs-meat mixed quails	
	Females	Males	Females	Males
Live weight at 1 day of age	9.47 ± 0.07		8.76 ± 0.33	
Live weight at 42 days of age	290.60 ± 8.38***	245.00 ± 7.90***	206.60 ± 3.95***	189.80 ± 6.85***

Note. Between the values noted *** the differences are very significant at the same age

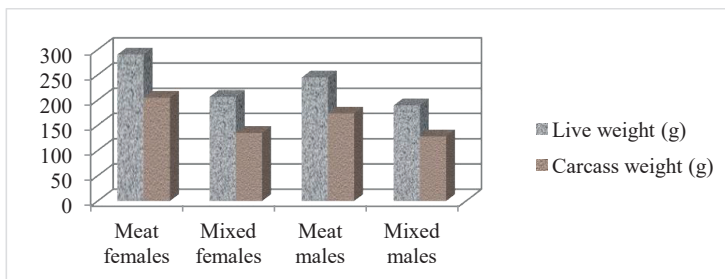


Figure 1. Average live weight and average carcass weight in females and males in the two populations aged 42 days

Table 2. Average results at slaughter at age 42 days in females and males of brown Jumbo meat quails and mixed eggs - meat Balotești quails (g)

Specification	Meat quails		Eggs-meat mixed quails	
	Females	Males	Females	Males
ALW (g)	290.60 ± 8.38 aaabbb	245.00 ± 7.90 aaaddd	206.60 ± 3.95 bbbcc	189.80 ± 6.85 ccddd
CBW (g)	279.80 ± 8.14 aaabbb	235.80 ± 8.41 aaaddd	199.40 ± 4.37 bbbcc	183.80 ± 6.25 ccddd
PCW (g)	260.20 ± 6.38 aaabbb	220.00 ± 7.34 aaaddd	176.00 ± 3.51 bbbcns	164.80 ± 6.02 cnsddd
ECW (g)	205.00 ± 8.82 aaabbb	173.80 ± 6.37 aaaddd	135.20 ± 3.29 bbbcns	128.20 ± 3.98 cnsddd
SY (%)	70.45 ± 1.46 ansbb	70.98 ± 1.89 ansdns	65.55 ± 0.70 bbcc	67.60 ± 0.58 ccdns
BW (g)	10.80 ± 0.58 ansbbb	9.20 ± 0.80 ansdns	6.80 ± 0.49 bbbcns	6.00 ± 0.84 cnsdns
FW (g)	30.40 ± 3.38 ansbns	25.00 ± 5.76 ansdns	30.20 ± 1.53 bnscc	25.00 ± 1.05 ccdns
OIW (g)	44.40 ± 1.94 aaab	30.20 ± 2.89 aadns	39.30 ± 0.97 bccc	27.80 ± 1.02 cccdns
BP (%)	3.72 ± 0.18 ansbbb	3.79 ± 0.41 ansdns	3.32 ± 0.28 bbbcns	3.13 ± 0.42 cnsdns
FP (%)	10.40 ± 0.98 ansb	10.11 ± 2.35 ansdns	14.64 ± 0.67 bcns	13.17 ± 0.32 cnsdns
OIP (%)	15.30 ± 0.63 aaab	12.24 ± 0.80 aadns	19.02 ± 0.41 aaab	14.71 ± 0.69 cccdns
Statistical significance Student values	t calculated < 1.994 – insignificant differences- ns t calculated = 1.994 – 2.648 – significant differences * (t0.05 = 1.994) t calculated = 2.648 – 3.416 – distinct significant differences ** (t0.010 = 2.648) t calculated > t 0.001 = 3.416 – very significant differences *** (t0.001 = 3.416)			

Note: ALW-average live weight; CBW- carcass after bleeding weight; PCW-plucked carcass weight; ECW - eviscerated carcass weight; SY – slaughter yield; BW - blood weight; FW – flakes weight; OIW – organs and intestines weight; BP – blood proportion; FP – flakes proportion, OIP - organs and intestines proportion. Significance of differences: a - meat females vs. meat males; b - meat females vs. mixed females; c - mixed females vs mixed males; d - meat males vs. mixed males.

The results of slaughter at the age of 42 days in the quails of the two populations

In the current experiment, the mean live weight at 42 days of age in the quail in the meat population was 15.70% significantly higher in females (290.60 ± 8.38 g/head) compared to males (245.00 ± 7.90 g/head). In the case of quail in the mixed population, the difference between the weight of females (206.60 ± 3.95 g/head) and of males (189.80 ± 6.85 g/head) was smaller, of 8.13%, but distinctly significant. The body weight of females in the meat population was 28.91% higher compared to that recorded in females in the mixed population, the difference being statistically very significant. The live weight of males in the meat population was 22.53% higher compared to that of males in the mixed population, the difference being statistically very significant.

The weight of the after bleeding carcass in the quails in the meat population was 15.73% higher

in females (279.80 ± 8.14 g/carcass) compared to males (235.80 ± 8.41 g/carcass). In the case of quails in the mixed population, the difference between the weight of females (199.40 ± 4.37 g/carcass) and of males (183.80 ± 6.25 g/carcass) was smaller, of 7.82%.

The weight of the plumaged carcass in the meat quail was 15.45% higher in females (260.20 ± 6.38 g/carcass) compared to males (220.00 ± 7.34 g/carcass). In the case of quail in the mixed population, the difference between the weight of females (176.00 ± 3.51 g/carcass) and of males (164.80 ± 6.02 g/carcass) was smaller, of 6.36%. The weight of the eviscerated carcass in the quails of the meat population was 15.22% higher in females (205.00 ± 8.82 g/carcass) compared to males (173.80 ± 6.37 g/carcass). In the case of quail in the mixed population, the difference between the weight of females (135.20 ± 3.29 g/carcass) and of males (128.20 ± 3.98 g/carcass) was smaller, by 5.18%. The average

weight of the eviscerated carcass was 34.05% higher in females in the meat population compared to females in the mixed population, the difference being statistically very significant. The average weight of the eviscerated carcass of males in the meat population was 26.24% higher compared to that of males in the mixed population, the difference being very significant statistically.

In a study conducted in Brazil on a quail flock from a meat population (Dumont et al., 2017), the authors mention an average weight of the eviscerated carcass between 171.00 g and 182.00 g, similar to those recorded in carcasses from males in the meat population of this experiment.

Carcass yield in females from the meat population, of $70.45 \pm 1.46\%$, was 4.90% distinctly significant higher compared to females in the mixed population. Also, the carcass yield in males in the meat population, of $70.98 \pm 1.89\%$, was higher by 3.38% compared to that of males in the mixed population, the difference being statistically insignificant.

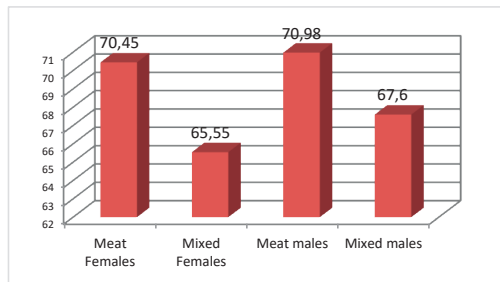


Figure 2. Carcass yield (%) in females and males in the two populations aged 42 days

The average proportion of blood was approximately the same in both females ($3.72 \pm 0.18\%$) and males ($3.79 \pm 0.41\%$) in the meat population, as well as in females ($3.32 \pm 0.28\%$) and males ($3.13 \pm 0.42\%$) in mixed population.

The average proportion of flakes recorded in the case of the meat population was $10.40 \pm 0.98\%$ in females and $10.11 \pm 2.35\%$ in males, while in the quail of the mixed egg-meat population it was $14.64 \pm 0.67\%$ in females and $13.17 \pm 0.32\%$ in males.

The average proportion of organs and intestines was higher for females both in the meat population ($15.30 \pm 0.63\%$) and in the mixed population ($14.64 \pm 0.67\%$) compared to that of males ($12.24 \pm 0.80\%$ in males from the meat population and $14.71 \pm 0.69\%$ in males from the mixed egg-meat population).

The average breast weight in females of the meat population was 116.80 ± 6.11 g/chest, while in males it was 82.40 ± 4.65 g/chest, 29.11% higher in females, the difference between sexes being statistically very significant. In the case of quails in the mixed population, this was 69.60 ± 2.01 g/chest in females and 64.60 ± 2.75 g / chest in males, 7.18% higher in females, the difference being statistically insignificant.

In the same study from Brazil, the authors mention an average chest weight of 76.00 g, a weight that is closer to that recorded in the males in this experiment.

The average chest weight in females from the meat population was very significant, 40.41%, higher compared to that recorded in females from the mixed population. Also in males from the meat population the chest weight was distinctly significantly higher, by 20.60%, compared to that of males from the mixed population.

The average thighs weight was higher in females (49.40 ± 2.50 g/thighs) in the meat population by 17.00% compared to males (41.00 ± 1.22 g/thighs). In the case of quails in the mixed population, the average weight of the thighs was approximately the same in both sexes (33.40 ± 0.75 g/thighs in females and 32.80 ± 1.02 g/thighs in males).

Table 3. Weight and proportion of the component parts of the eviscerated carcass at the age of 42 days in females and males of mixed Balotești egg-meat quail and brown Jumbo meat quail

Specification	Meat quails		Eggs-meat mixed quails	
	Females	Males	Females	Males
ABW (g)	116.80 ± 6.11 aaabbb	82.40 ± 4.65 aaadd	69.60 ± 2.01 bbbcns	64.60 ± 2.75 ddcns
ALW (g)	49.40 ± 2.50 aabbb	41.00 ± 1.22 aadd	33.40 ± 0.75 bbbcns	32.80 ± 1.02 ddcns
ABW (g)	41.40 ± 1.17 aaabbb	29.20 ± 1.74 aad	26.00 ± 0.77 bbbcns	25.20 ± 0.80 dcns
ABW (g)	12.60 ± 0.51 ansbbb	11.60 ± 0.55 ansddd	8.00 ± 0.31 bbbcns	8.60 ± 0.51 ddcns
ABP (%)	57.05 ± 2.20 aabbb	47.42 ± 2.00 aadns	51.54 ± 1.47 bbbcns	50.60 ± 2.75 ddcns
ALP (%)	24.12 ± 0.79 ansbns	23.64 ± 0.50 ansdns	24.73 ± 0.53 bnsbns	25.70 ± 1.23 dncns
ALP (%)	20.26 ± 0.46 aaabbb	16.78 ± 0.56 aaadd	19.30 ± 0.88 bnsbns	19.70 ± 0.65 ddcns
ABP (%)	6.19 ± 0.39 ansbns	6.68 ± 0.19 ansdns	5.92 ± 0.17 bnsbns	6.71 ± 0.35 dncs
Statistical significance Student values	t calculated < 1.994 – insignificant differences- ns t calculated = 1.994 - 2.648 – significant differences * (t0.05 = 1,994) t calculated = 2.648 – 3.416 – distinctly significant differences ** (t0.010 = 2.648) t calculated > t 0.001 = 3.416 – very significant differences *** (t0.001 = 3.416)			

Note: ABW-average breast weight; ALW-average legs weight; ABW-average back weight; AWW-average wings weight; ABP-average breast proportion; ALP-average legs proportion; ABP-average back proportion; AWP-average wings proportion. Significance of differences: a - meat females vs. meat males; b - meat females vs. mixed females; c - mixed females vs mixed males; d - meat males vs. mixed males.

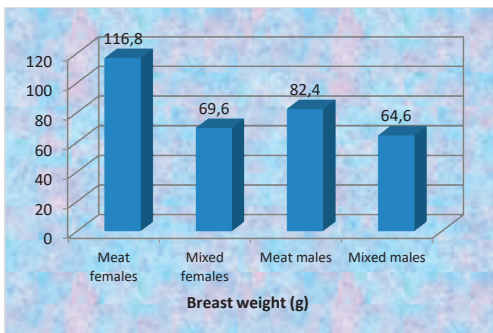


Figure 3. Average weight of the breast (g) in females and males from the two populations at the age of 42 days

The average weight of the back was 29.47% higher in females (41.40 ± 1.17 g/back) compared to that of males (29.20 ± 1.74 g/back) in the quails of the meat population, the differences being very significant statistically, while in the case of quails from the mixed population this was approximately the same in both females (26.00 ± 0.77 g/back) and in males (25.20 ± 0.80 g), the difference being statistically insignificant.

The average weight of the wings was approximately the same in both females (12.60 ± 0.51 g/wings) and the males (11.60 ± 0.55 g)

of the meat population, as well as in the females (8.00 ± 0.31 g/wings) and males (8.60 ± 0.51 g) from the mixed population, the difference being statistically insignificant.

The average proportion of the breast registered significant differences in the case of quails from the meat population, which was 9.63% higher in females (57.05 ± 2.20%) compared to that of males (47.42 ± 2.00%). In the quails of the mixed population, the average proportion of the breast was approximately the same in both females (51.54 ± 1.47%) and males (50.60 ± 2.75%).

The average proportion of the thighs was approximately the same in the case of quails in the meat population (24.12 ± 0.79% in females and 23.64 ± 0.50% in males) and in the case of quails in the mixed population (24.73 ± 0.53% in females and 25.70 ± 1.23% in males), the differences being statistically insignificant.

The average proportion of the back was higher in females (20.26 ± 0.46%) by 3.48% than in males (16.78 ± 0.56%) in the meat population, while in the quails in the mixed population it was approximately the same in both females (19.30 ± 0.88%), as well as in males (19.70 ± 0.65%).

The average proportion of wings was higher in males ($6.68 \pm 0.19\%$) than in females ($6.19 \pm 0.39\%$) in both the meat quails and mixed quails population ($6.71 \pm 0.35\%$ in males and $5.92 \pm 0.17\%$ in females), the difference being statistically significant.

CONCLUSIONS

The present paper aims to determine the results of slaughter in quails from a meat population (brown Jumbo) and a mixed population (Balotești) and their comparison.

The average live weight was 290.60 ± 8.38 g in females of the meat population and 206.60 ± 3.95 g in females of the mixed population, 28.91% higher in females in the meat population, the differences being statistically very significant.

The average live weight of males in the meat population was 245.00 ± 7.90 g/head, 22.53% higher compared to that of males in the mixed population (189.80 ± 6.85 g/head), the difference being statistically very significant.

The average live weight at 42 days of age in the quails of the meat population was 15.70% very significantly higher in females compared to males. In the quails of the mixed population the difference between the weight of females and males was smaller, of 8.13%, but distinctly significant.

The average weight of the eviscerated carcass was 205.00 ± 8.82 g/carcass, 34.05% higher in females in the meat population compared to females in the mixed population (135.20 ± 3.29 g), the differences being very significant statistically.

The average weight of the eviscerated carcass of males in the meat population was 173.80 ± 6.37 g / carcass, 26.24% higher compared to that of males in the mixed population (128.20 ± 3.98 g), the differences being statistically very significant.

The weight of the eviscerated carcass in the quails of the meat population was 15.22% higher in females compared to that of males. In the case of quails in the mixed population, the difference between the weight of females and males was smaller, of 5.18%.

Carcass yield in females from the meat population was $70.45 \pm 1.46\%$, with 4.90% distinctly significant higher compared to that of

females in the mixed population (65.55 ± 0.70 %).

Also, the carcass yield registered in the males of the meat population, of 70.98 ± 1.89 %, was higher by 3.38 % compared to that of the males in the mixed population (67.60 ± 0.58 %), the differences registered being statistically insignificant.

The average breast weight in females from the meat population was 116.80 ± 6.11 g, 40.41% higher compared to that recorded in females in the mixed population (69.60 ± 2.01 g). Also in males from the meat population the breast weight was 82.40 ± 4.65 g, higher by 20.60% compared to that of males in the mixed population. The average breast weight in females of the meat population was 29.11% higher than in males, and in the case of quails in the mixed population, it was only 7.18% higher in females.

The slaughter results at 42 days were higher in the meat population compared to the mixed egg population, in females compared to males in the same population and among females in both populations than in males from these, regarding the weight of the carcass, the cutting yield, the weight of the chest and of the other component parts of the carcass.

Following the researches carried out, it is recommended to use in the meat production the quails from the brown Jumbo meat population, specifying that a breeding lot should be formed that is specially raised for this direction, and the eggs from this lot incubated and the chickens raised for meat, without directing the females to egg production. This will result in superior production and high quality carcasses. You can also opt for breeding separately by sex, the carcasses from females being larger and more attractive.

The quails from the mixed eggs - meat population of Balotești can also be used in the direction of meat production, if it is desired to obtain smaller carcasses compared to those from meat quails, depending on the preferences of consumers and the logistics of producers (breeding areas, types of compound feed, lighting programs, etc.).

In the future, the growth parameters for meat quails should be studied in correlation with the growth factors, as being bigger, a smaller density should be applied to the unit area

compared to that of mixed quails and other nutritional parameters of the combined food recipes should be applied.

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