



Short Communication

Comparative Analysis of Carcass Traits of Two Meat Quail Breeds (*Coturnix coturnix*)

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ABSTRACT

The purpose of this study is to compare and analyze the carcass traits of french giant meat quail and savimant meat quail in order to provide reference for breeding and improvement of meat quail. The results show that french giant meat quail shows far higher body weight, carcass weight, carcass net weight, breast muscle weight (total), leg muscle weight (single) and leg muscles rate compared to savimant meat quail ($P < 0.05$). Moreover, heart weight, liver weight, slaughter rate, whole net carcass rate, heart rate and breast muscle rate of french giant meat quail are slightly higher than those of savimant meat quail ($P > 0.05$). For savimant meat quail, carcass weight shows extremely significantly positive correlations with carcass net weight, heart weight, liver weight, breast muscle weight (total), leg muscle weight (single), slaughter rate and whole net carcass rate ($P < 0.01$), the correlation coefficients are 0.988, 0.596, 0.557, 0.926, 0.899, 0.467 and 0.706, respectively. For the french giant quail, carcass weight shows extremely significantly positive correlations with carcass net weight, liver weight, breast muscle weight (total), leg muscle weight (single) and slaughter rate ($P < 0.01$), the correlation coefficients are 0.949, 0.410, 0.863, 0.590 and 0.395, respectively.

Article Information

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Authors' Contribution

JYB conceived and designed the study and conducted the lab work. YL and SJZ analyzed the data and wrote the article. ZHD and YBY helped in sampling. KPS and HC helped in analysis of data.

Key words

Coturnix coturnix, French giant meat quail, Savimant meat quail, Carcass traits, Breast muscle weight

Quail (*Coturnix coturnix*) cultivation is characteristic of small investment, small scale, short growth period and short earning cycle. Hence, it is highly appreciated by farmers and enjoys a promising market development prospect. According to comparative analysis of Beijing Food Research Institute on nutrients between 100g quail meat and 100g chicken, quail meat contains 22.2% proteins, which is higher than that in chicken (21.5%). Besides, quail meat contains 20.4mg Ca, 277.1mg P, 6.2mg Fe which are significantly higher than those in chicken (11.0mg, 190.0mg and 1.5mg, respectively). Besides, quail which has smaller size than other poultries can be used as a good new type of test animal. Quail also can be used as experimental animals in multiple subjects, such as poultry propagation, histology, nutriology, hemadenology, embryology, physiology and pharmacology (Li *et al.*, 2019; Bai *et al.*, 2016a, b, c, d, 2017, 2020a). The purpose of this study is to compare and analyze the carcass traits of french giant meat quail and savimant meat quail in order to provide reference for breeding and improvement of meat quail.

Materials and methods

60 samples of french giant meat quail and savimant

meat quail were collected, respectively. The culture room was provided with 24h lights and quail were allowed to drink water and eat freely throughout the experiment. Fodders were supplemented artificially on the morning and evening every day. The culture temperature and humidity were determined according to culture management requirements.

At the end of culture experiment (5 weeks old), quail samples were killed by jugular vein bleeding, removed hairs and then dissected. Weights of all parts were measured by an electronic scale. The carcass traits measured included body weight, carcass weight, carcass net weight, heart weight, liver weight, breast muscle weight (total) and leg muscle weight (single).

Results and discussion

As can be seen from Figure 1, the results show that french giant meat quail shows far higher body weight, carcass weight, carcass net weight, breast muscle weight (total), leg muscle weight (single) and leg muscles rate compared to savimant meat quail ($P < 0.05$). Moreover, heart weight, liver weight, slaughter rate, whole net carcass rate, heart rate and breast muscle rate of french giant meat quail are slightly higher than those of savimant meat quail ($P > 0.05$). Bai *et al.* (2020b) showed that the body weight of 3-5 week old french giant meat quail

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was significantly higher than that of savimalt meat quail ($P < 0.05$). The results of this study were similar to those of Bai *et al.* (2020b). Wei *et al.* (2011) demonstrated that body weight of Fengxian line of french giant meat quail reached 141.67g at the 4th week, while body weight of Wuxi line reached 177.63g. In the present study, body weight of French giant meat quail at the 5th week reached 146.13g, which is slightly lower than that reported by Wei *et al.* (2011).

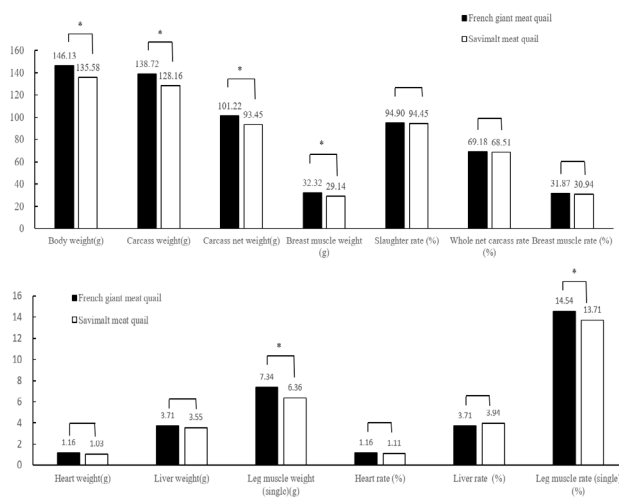


Fig. 1. Comparative analysis of 5-week-old carcass traits of french giant meat quail and savimalt meat quail.

* indicates significant difference ($P < 0.05$), while others indicate no significant difference ($P > 0.05$).

Body weight of savimalt meat quail has extremely significantly positive correlations with carcass weight, carcass net weight, heart weight, liver weight, breast muscle weight (total), leg muscle weight (single) and whole net carcass rate ($P < 0.01$), the correlation coefficients are 0.998, 0.988, 0.600, 0.564, 0.926, 0.906 and 0.701, respectively (Supplementary Table I). Carcass weight also has extremely significantly positive correlations with carcass net weight, heart weight, liver weight, breast muscle weight (total), leg muscle weight (single), slaughter rate and whole net carcass rate ($P < 0.01$), the correlation coefficients are 0.988, 0.596, 0.557, 0.926, 0.899, 0.467 and 0.706. Carcass net weight has extremely significantly positive correlations with heart weight, liver weight, breast muscle weight (total), leg muscle weight (single), slaughter rate and whole net carcass rate ($P < 0.01$), the correlation coefficients are 0.609, 0.516, 0.954, 0.895, 0.436 and 0.798, respectively.

Body weight of french giant meat quail shows extremely significantly positive correlations with carcass weight, carcass net weight, liver weight, breast muscle

weight (total) and leg muscle weight (single) ($P < 0.01$), with correlation coefficients amounted to 0.996, 0.947, 0.395, 0.865 and 0.593. Besides, carcass weight shows extremely significantly positive correlations with carcass net weight, liver weight, breast muscle weight (total), leg muscle weight (single) and slaughter rate ($P < 0.01$), with correlation coefficients amounted to 0.949, 0.410, 0.863, 0.590 and 0.395. Carcass net weight has extremely significantly positive correlations with breast muscle weight (total), leg muscle weight (single), slaughter rate and whole net carcass rate ($P < 0.01$), with correlation coefficients amounted to 0.892, 0.578, 0.364 and 0.547.

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Supplementary material

There is supplementary material associated with this article. Access the material online at: <https://dx.doi.org/10.17582/journal.pjz/20200401090428>

Statement of conflict of interest

The authors have declared no conflict of interest.

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Supplementary Material

Comparative Analysis of Carcass Traits of Two Meat Quail Breeds (*Coturnix coturnix*)

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Supplementary Table I. Correlation coefficient of carcass traits of meat quail.

Carcass traits	Body weight	Car- cass weight	Carcass net weight	Heart weight	Liver weight	Breast muscle weight (total)	Leg muscle weight (single)	Slaugh- ter rate	Whole net carcass rate	Heart rate	Liver rate	Breast muscle rate (total)	Leg muscle rate (single)
Body weight	1	0.998**	0.988**	0.600**	0.564**	0.926**	0.906**	0.417*	0.701**	-0.095	-0.714**	0.394*	-0.317
Carcass weight	0.996**	1	0.988*	0.596**	0.557**	0.926**	0.899**	0.467**	0.706**	-0.098	-0.717**	0.391*	-0.328
Carcass net weight	0.947**	0.949**	1	0.609**	0.516**	0.954**	0.895**	0.436**	0.798**	-0.088	-0.763**	0.444**	-0.357*
Heart weight	0.320*	0.310*	0.306*	1	0.351*	0.571**	0.635**	0.214	0.506**	0.716**	-0.460**	0.234	-0.010
Liver weight	0.395**	0.410**	0.300*	-0.105	1	0.428**	0.486**	0.165	0.212	-0.040	0.109	0.036	-0.140
Breast muscle weight (total)	0.865**	0.863**	0.892**	0.293*	0.150	1	0.814**	0.389*	0.808**	-0.095	-0.763**	0.685**	-0.419*
Leg muscle weight (single)	0.593**	0.590**	0.578**	0.275*	0.248	0.584**	1	0.284	0.622**	0.034	-0.641**	0.252	0.084
Slaughter rate	0.313*	0.395**	0.364**	0.018	0.296*	0.289*	0.184	1	0.418*	-0.065	-0.375*	0.107	-0.362*
Whole net carcass rate	0.250	0.266	0.547**	0.081	-0.157	0.446**	0.193	0.259	1	-0.008	-0.811**	0.498**	-0.460**
Heart rate	-0.179	-0.188	-0.214	0.853**	-0.235	-0.190	-0.039	-0.144	-0.195	1	0.032	-0.075	0.295
Liver rate	-0.384**	-0.370**	-0.503**	-0.303*	0.659**	-0.561**	-0.218	0.018	-0.555**	-0.002	1	-0.463**	0.374*
Breast muscle rate (total)	0.262	0.252	0.237	0.086	-0.201	0.647**	0.291*	-0.005	0.063	-0.088	-0.392**	1	-0.477**
Leg muscle rate (single)	-0.110	-0.115	-0.177	0.054	0.071	-0.081	0.694**	-0.075	-0.253	0.135	0.213	0.126	1

Note: the lower triangle is the correlation coefficient of french giant meat quail, and the upper triangle is the correlation coefficient of savimalt meat quail. **It means that the correlation coefficient is extremely significant ($P < 0.01$), * means that the correlation coefficient is significant ($P < 0.05$), and the other is that the correlation coefficient is not significant ($P > 0.05$).

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