

EFFECT OF MANAGEMENT SYSTEM ON BODY WEIGHT AND BODY WEIGHT GAIN OF JAPANESE QUAILS

^{1*}Ekom, M. A., ²Adua, M. M., ²Gambo, D., ¹Agbu, C.S. and ³Abimiku, R.T.

¹Ministry of Agriculture, Nasarawa State P.M.B. 056, Lafia, Nigeria.

²Department of Animal Science, Faculty of Agriculture, Nasarawa State University, Keffi, Shabu-Lafia Campus, Nigeria.

³Department of Agriculture College of Education, Akwanga, Nasarawa State, Nigeria.

*Corresponding author: ekomalxexander2@gmail.com

ABSTRACT

This study investigated the effects of management systems on body weight and body weight gain. A total of 150-day-old Japanese quails were allocated to two management systems of battery cage (BC) and deep litter (DL). Each experimental treatment was replicated three times with twenty-five birds per replicate. The study employed completely randomized design. Data were collected on body weight and body weight gain. Data collected were analysed using one-way analysis of variance. Results indicated that management systems had significant (<0.05) effect on body weight gain of Japanese quails at week 6. Quails reared on deep litter demonstrated significantly higher body weight gain than those reared in battery cage. However, no significant ($P>0.05$) effects of management system on body weight and body weight gain of Japanese quails. At other weeks of study. From the findings of this study, it was concluded either battery cage or deep litter system of management is suitable for commercial quail production.

Keywords: Battery cage, Deep litter, Housing system, Growth performance

INTRODUCTION

The Japanese quails are generally used for both meat purpose and egg production. Japanese quails and its products are one of the cheapest and easily affordable animal protein sources for the teeming population thus could play very significant socio-cultural and economic roles in our societies (Abbasi *et al.*, 2015). Housing system is the most important factor affecting poultry production; therefore, many researchers studied the effect of housing systems on behavioral, productive and reproductive traits of poultry (Buragohain *et al.*, 2009) most of which were in temperate region. Housing system is one of the most important factors affecting poultry performance (Buragohain *et al.*, 2009). The significant role of housing system in other poultry species is well documented particularly in chicken, whereas similar information is meager in the emerging area of Japanese quail production. The objective of the study was therefore to investigate the effects of management systems on the body weight and body weight gain of Japanese quails.

MATERIALS AND METHODS

The experiment was carried out at the Livestock Teaching and Research Farm of the Faculty of Agriculture, Shabu-Lafia Campus, Nasarawa State University, Keffi, Nasarawa State. Nasarawa State falls within the Southern Guinea Savannah Zone of Nigeria. Lafia lies between Latitude 7° and 9° North and Longitude 7° and 10° East. It has a climate typical of the tropical zone because of its location. It has a temperature ranging from 20°C in October to 36°C in March while rainfall varies from 13.73 cm in some places to 14.00 cm in others (Faculty Weather Station 2023).

Experimental Procedure and Management

The total of 150 day-old Japanese quails were procured from National Veterinary Research Institute, Vom and use for the experiments. On arrival the chicks were weighed, vaccinated using Gumboro and Lasota. Seventy five (75) quails each were housed separately in battery cage and deep litter. The birds were allocated to each treatment and replicate randomly in a completely randomized design. Each treatment was replicated three times with twenty-five birds per replicate. The same pens and cages were used for both brooding and rearing. They were thoroughly cleaned, scrubbed and disinfected using Vinkokil and allowed to dry for two weeks before the arrival of the chicks. Brooding was carried out for additional period of 14 days using stoves and electric bulbs as sources of heat and illumination. Wood shavings were used as litter materials in the deep litter while plain sheets were used in the battery cage. Litter material was spread at a 5cm depth in the deep litter pens. The chicks were brooded at a temperature of 35°C with adequate drinker and feeder spaces provided. The temperature was monitored using clinical thermometer and reduced gradually at the rate of 3.5°C on weekly basis as brooding progresses. Light was provided for 24 hours during brooding to avoid pilling and death. Stone pebbles were disinfected and place in the drinking water to avoid drowning.

The chick's phase of the study lasted for 3 weeks. During this phase, the birds were fed chick mash which contained 18% crude protein (CP) and 2800 Kcal/kg metabolizable energy. The grower's phase equally lasted for 3 weeks. During this phase, the birds were fed growers' mash containing 17% CP and 2,600 kcal/kg metabolizable energy.

Parameters Measured

Body Weight: Live body weights was measured on arrival using sensitive electronic scale and then at weekly interval until maturity (6 weeks of age).

Body Weight Gain: Average daily gain (ADG) was estimated using the formula

$$\text{Body weight gain} = \frac{W_2 - W_1}{N}$$

Where W_2 is the present weight, W_1 is the initial weight and N is the number of days taken from initial weight to the present weight.

Data Analysis

Data collected were analysed using T-test of the SPSS statistical software (version 21) to test the effect of management system on body weight and body weight gain of Japanese quails. Where significant differences existed, Duncan's Multiple Range Test was used to separate the means at 5% level of probability.

RESULTS

Effects of management system on body weight of Japanese quails are presented in Table 1. Body weights were not significantly ($P>0.05$) different between battery cage and deep litter system across all weeks of study. Table 2 present the effect of management system on body weight gain of Japanese quails. As in body weight, management system had no significant ($P>0.05$) effect on body weight gain across weeks except at week 6 where quails in deep litter system showed significantly ($P<0.05$) higher body weight gain compared to birds in battery cage.

Table 1: Effect of management system on body weight of Japanese quails feed graded level of sweet orange peel meal-based diet

Body weight	Management System1 (Battery Cage)	Management System 2 (Deep Litter)	P-value
Week 1	5.76±0.12	5.66±0.11	0.576 ^{NS}
Week 2	10.91±0.40	10.69±0.35	0.693 ^{NS}
Week 3	23.70±0.68	24.50±0.59	0.412 ^{NS}
Week 4	34.75±1.22	35.18±1.06	0.802 ^{NS}
Week 5	55.45±1.66	55.08±1.43	0.872 ^{NS}
Week 6	75.94±1.62	76.12±1.41	0.937 ^{NS}

NS= Not significant

Table 2: Effect of management system on body weight gain of Japanese quails feed graded level of sweet orange peel meal-based diet

Body weight Gain	Management System1 (Battery Cage)	Management System 2 (Deep Litter)	P-value
Week 1	5.15±0.44	5.03±0.38	0.839 ^{NS}
Week 2	12.79±0.74	13.81±0.64	0.340 ^{NS}
Week 3	11.06±0.89	10.68±0.77	0.763 ^{NS}
Week 4	20.70±0.63	19.90±0.55	0.385 ^{NS}
Week 5	20.49±0.37	21.04±0.32	0.310 ^{NS}
Week 6	14.06±0.47 ^b	16.17±0.41 ^a	0.020*

NS= Not significant, *= Significant at 5% level of probability

DISCUSSION

Management systems had no effect on body weight of Japanese quails. This results indicate that Japanese quail can thrive very well in both the battery cage and deep litter housing system. This finding agreed with the report of Olawumi *et al.* (2022), who noted that the influence of management systems on poultry growth was not significant on growth and physiological parameters of poultry. As in body weight, management system had no effect on body weight gain of Japanese quail except at week 6 in which quails reared on deep litter system perform significantly better than those in battery cages. These findings is in agreement with the report of Buragohain *et al.* (2009). These findings implied that Japanese quails can perform fairly well in both battery cage and deep litter system. Values

obtained in this study for the body weight and body weight gain agrees with the report of Gambo *et al.* (2014) who worked on growth, production and reproductive performance in Japanese Quails (*Coturnixcoturnix japonica*) reared in Humid Environment.

CONCLUSION

From the findings of this study, it was concluded management system had no effect on the body weight and body weight gain of Japanese quails except at week 6 were quails reared on deep litter demonstrated significantly higher body weight gain than those reared in battery cage.

REFERENCES

- Abbasi, H., Seidavi, A., Liu, W., and Asadpour, L. (2015). Investigation on the effect of different level off dried sweet orange (*Citrus sinensis*) pulp on performance, carcass characteristics and physiological and biochemical parameters in broiler chicken. *Saudi Journal of Biological Science*, 22(2): 139-146.
- Abdel-Hafeez, H. M., Saleh, E. S. E., Tawfeek, S. S., Yousef, I. M. I., and Abdel-Daim, A. S. A. (2018). Utilization of potato peels and sugar beet pulp with and without enzyme supplementation in broiler chicken diets: Effects on performance, serum biochemical indices and carcass traits. *Journal of Animal Physiology and Animal Nutrition*, 102: 56–66.
- Buragohain, R., Kalita, G., Sarma, K. and Hazarika, P. (2009). Effect of management system on performance and economy of growing Japanese quails. *Indian Journal of Animal Sciences*. 79(11): 1180-1182.
- Gambo, D., Momoh, O. M., Dim N. I. and Ogah, D. M. (2014). Growth, Production and Reproductive Performance in Japanese Quails (*Coturnixcoturnix japonica*) reared in Humid Environment. *Egyptian Poultry Science* 34(2): 381-395. Retrieved from <http://www.epsaegypt.com>.
- Olawumi, S. O., Adeyemo, A. I., and Adesiyun, T. F. (2022). Effect of management systems on poultry growth performance. *International Journal of Poultry Science*, 21(4), 233-240.