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Economic Traits and Production Performance of Nandanam Quail Reared at Different Cage Stocking Densities

C. Pandian*, A. Sundaresan, S. Ezhil Valavan and A.V.Omprakash

Poultry Research Station

Tamil Nadu Veterinary and Animal Sciences University, Chennai – 51, India.

Corresponding Author: chinnaduraipandian75@gmail.com

Abstract

This study was carried out to assess the effect of different cage stocking densities on the production performance of Nandanam quail III reared up to 42 days. Three hundred day old Nandanam quail III were randomly assigned to 2.5 x 1.5 ft cages and distributed with 3 treatments (20, 25 and 30 quails per cage or 0.17, 0.14 and 0.11 sq. ft per quail, respectively) and 4 replicates. There were significant differences among treatments for bi-weekly body weight, feed consumption, feed conversion ratio and net profit per bird. There was a reduction ($P \leq 0.05$) in body weight with the increase in stocking density and the 4^{th} and 6^{th} week body weight were 144.17±3.84, 128.55±3.63 and 108.03±2.69 g; and 216.86±5.95, 207.76±4.01 and 197.27±3.81 g, respectively. The feed consumption per bird (g) up to 42 days were 665.69±0.01, 532.19±0.01 and 443.23±0.01 respectively. Better feed conversion ratio (2.57 and 2.25) and net profit per bird (Rs. 4.48 and 7.15) were observed where the birds reared at the cage stocking density of 0.14 sq.ft and 0.11 sq.ft per bird, respectively. This study concluded that the cage stocking density between 0.11 and 0.14 sq.ft per bird will be more economical for rearing Nandanam quail III in cage system of rearing up to 42 days of age.

Keywords: Cage stocking density, Nandanam quail III, Production performance.

Introduction

Japanese quail production is a good alternative to other animal protein production because less housing cost, requirement of less floor space, fast growth rate and less susceptibility to diseases. Generally quails are reared in multi-tier cages both during brooding and growing periods. The convenience in handling and conservation of space and energy are major advantages with this system. However, the excessive reduction in the available cage area per bird, as well as feeder and drinker space per bird may have negative effects on growth and performance at later stage due to reduction in feed intake and consequently live weight and muscular and bone development (Anderson & Adams, 1992). Nandanam quail III is a much improved high yielding dual type Japanese quail most popular among farmers which has been developed by Poultry Research Station, Tamil Nadu Veterinary and Animal Sciences University during the year 2004. Since, very scanty literature is available on cage stocking densities on Japanese quail production, the present

study was carried out to evaluate the effect of cage density on growth performance of Nandanam quail III reared in cages to suggest the optimum cage space to elicit the maximum response.

Materials and Methods

Three hundred day old Nandanam quail III were used to assess the effect of different cage stocking densities up to 42 days. Birds were randomly assigned to 2.5 x 1.5 ft cages and distributed with 3 treatments (20, 25 and 30 quails per cage or 0.17, 0.14 and 0.11 sq. ft per quail, respectively) and 4 replicates. Birds were given with *ad libitum* feed and water and allowed to the same experimental conditions. The experimental diet was formulated as per the standard recommendations. Bi-weekly body weight, feed consumption, feed conversion ratio, livability and net profit per bird were the major traits considered for evaluation. The data were analysed as per standard statistical procedure (Snedecor and Cochran, 1994).

Results and Discussion

Results of bi-weekly body weight, feed consumption, feed conversion ratio, livability and net profit per bird are shown in Table 1.

Cage stocking density had significant effect ($P<0.05$) on body weight, feed consumption, feed conversion ratio, livability and net profit per bird. Reduction ($p\leq0.05$) in body weight with the increase in cage stocking density were observed at 4th and 6th week of age. The 4th and 6th week body weight (g) of T1 (0.17 sq.ft / bird), T2 (0.14 sq.ft / bird) and T2 (0.11 sq.ft / bird) were 144.17, 128.55 and 108.03; and 216.86, 207.76 and 197.27, respectively. Lower body weight in T3 is probably due to the stress caused by lesser cage space per bird and competition for food due to lesser feeder space per bird. Viswanathan (1992) had similar findings with respect to body weight.

The feed consumption per bird (g) up to 42 days in T1, T2 and T3 were 665.69±0.01 532.19±0.01 and 443.23±0.01, respectively. Similarly, Waheda *et al.* (1999) reported that the feed consumption in Japanese quail housed at density of 175 cm^2 per bird was higher than at density of 150 cm^2 per bird. Studies that have evaluated several factors may be associated with poultry stocking density reveal that broilers raised at higher densities consumed less feed (Dozier *et al.*, 2005; Han *et al.,* 2005) when compared with birds raised at lower densities. However, Ahuja *et al.* (1992) found that feed intake was not influenced by density when two cage housing densities (100 and 125 cm^2 per bird) were evaluated.

Table 1. Effect of different cage stocking densities on production performance of Nandanam quail III.

Parameters	Cage stocking density		
	T1 (0.17 sq.ft/bird)	T2 (0.14 sq.ft/bird)	T3 (0.11 sq. ft/bird)
Hatch weight (g) NS	8.83±0.29	8.51±0.17	8.21±0.13
2nd week body weight (g) NS	35.98±1.07	35.14±1.84	37.22±1.65
4th week body weight (g) **	144.17^{a}±3.84	128.55^{b}±3.63	108.03^{c}±2.69
6th week body weight (g) *	216.86^{a}±5.95	207.76^{b}±4.01	197.27^{c}±3.81
Livability up to 42 days (%) NS	97.00	96 .00	96.00
Feed consumed up to 42 days (g) *	665.69^{a}±0.01	532.19^{b}±0.01	443.23^{c}±0.01
Feed conversion ratio*	3.07^{a}	2.57^{b}	2.25^{c}
Net profit/bird (Rs.)*	1.38^{c}	4.48^{b}	7.15^{a}

Means bearing different superscript within the same row differed significantly.

**Highly significant ($P\leq0.01$); * Significant ($P\leq 0.05$); NS- Not significant.

Nandanam quail III housed at 0.11 sq.ft / bird had better feed conversion ratio (2.25) than 0.14 sq.ft / bird (2.57) and 0.17 sq.ft / bird (3.07). Our findings are comparable with Nagarajan *et al.* (1991), who evaluated cage densities of 150, 180, 210 and 240 cm^2 per bird and concluded that feed conversion was improved with decreasing housing density. In contrary, Waheda *et al.* (1999) concluded that feed conversion ratio was not influenced by stocking densities of 150,175 and 200 cm^2 per bird in an experiment using Japanese quails. Net profit per bird was affected ($P \leq 0.05$) by cage stocking density. There was a linear increase in net profit with decrease in cage density from 0.17 sq.ft / bird to 0.11 sq.ft / bird. Better feed conversion and less feed consumption were responsible for higher net profit observed in birds reared in cage density of 0.11 sq.ft / bird. The observation of Faitarone *et al*. (2005) is comparable with the present study. Cage densities allowances have failed to exert and significant influence on the livability percent in this study. Padmakumar *et al.* (2000) was also of the opinion that cage densities had little effect on the livability per cent in Japanese quails. Assessing the overall results obtained, it is concluded that the stocking density between 0.11 and 0.14 sq.ft per bird will be more economical for rearing Nandanam quail III in cage system of rearing up to 42 days of age.

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Conflict of Interest: All authors declare no conflict of interest.

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