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Beak-Trimming Methods and their Effect on the Performance of Japanese Quail Pullets *(Coturnix japonica)*

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ABSTRACT

This study aimed at verifying if beak-trimming methods in Japanese quail pullets could optimize production by decreasing stress caused by cannibalism. A total number of 816 day-old Japanese quails was distributed in a completely randomized experimental design in a 2 x 3 factorial arrangement, with two beak-trimming ages (14 and 21 days of age) and three beak-trimming sizes (not trimmed, 1/3 trimmed, or 1/2 trimmed), and 4 replicates of 34 birds per replicate. Birds were submitted to the same management and feeding conditions. Weight gain, feed intake, feed conversion ratio, and mortality were evaluated. There was no significant effect of age at beak trimming on the evaluated parameters ($P>0.05$), as well as no significant interaction between age at beak trimming, and beak-trimming method. There was a significant effect ($P<0.01$) of trimming size on performance, with the best performance observed in birds not submitted to beak trimming or had 1/2 of the beak trimmed. When the beak was more aggressively trimmed (1/2), parameters were worse. According to the obtained results, it is recommended to trim 1/3 of the beaks, which can be performed either at 14 or 21 days of age.

INTRODUCTION

Commercial quail production seeks at reducing production costs, and some of the commonly used management practices have raised concern in terms of bird welfare. Many of these practices may have a negative effect on the birds, interfering with the expression of their full genetic potential (Faria, 1998).

Quails, as turkeys and chickens, are prone to aggressive reactions, such as feather pecking and cannibalism, which are more evident when birds are housed in high densities.

According to Cloutier *et al.* (2000), beak trimming is the main method used to prevent feather pecking and cannibalism in the poultry industry, and it is commonly used in chicken and Japanese quail egg production aiming at reducing aggressive behavior, mortality, and improving productive performance. However, the real need for beak trimming quails has been questioned, and an adequate beak-trimming method for Japanese quails still needs to be determined.

On the other hand, there is consensus as to the stress caused by beak trimming (Struwe *et al.*, 1992). An increasing number of organizations advocate that this practice should no longer be used, as it is considered cruel. However, under practical production conditions, non-trimmed birds may cause severe injuries in other birds, with consequent reduction in productivity, and increase in the mortality rate.

Beak trimming should considered as a management practice that has direct impact on flock performance and on the economic return of

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quail production, as it causes immediate and persistent effects on behavior, feed intake, and body weight. Beak-trimmed birds are usually less active, show less pecking behavior, eat less, and grow more slowly. These changes are primarily a consequence of sensorial loss. Oliveira (2002) observed that properly beak-trimmed quails presented better flock uniformity, lower feed waste, and good feathering, and the author recommends two trimming in the pullet phase, being the first at 12 days of age, and the second at 30 to 35 days of age. Due to the need of information on the optimal age, trimming method, and necessary care to obtain good results with the practice of beak trimming in quails, the present study aimed at evaluating the effect of age and beak-trimming method on the performance of Japanese quail pullets.

MATERIAL AND METHODS

A total number of 816 day-old female Japanese quails was housed in a masonry house. The house was 4.0-m high, 12.0-m long, and the sides had 1.50-m walls and 1.5-m high galvanized iron mesh, and clay-tiled roof. The house contained 24 pens, specific for the starter phase. Pens measured 1.0 m^2, and were equipped with feeders and pressure cup drinkers. In order to provide thermal comfort to the birds, house sides were equipped with curtains. The lighting program used was 23 h light, one hour dark during the first week, and natural light until 35 days of age.

Birds were submitted to the same management and feeding conditions. Water and feed were available *ad libitum*. The diet was based on corn and soybean meal, and formulated according to the NRC (1994) recommendations, and the ingredient composition followed Rostagno *et al.* (2000). Feed is shown in Table 1.

A completely randomized experimental design was used, with a 2 x 3 factorial arrangement (two beak-trimming ages and three beak-trimming sizes) of four replicates of 34 quails each (Table 2 and Figures 1 and 2).

At the end of the experimental period, when quails were 35 days of age, the following parameters were evaluated: weight gain (WG), feed intake (FI), feed conversion ratio (FCR), and mortality. Mortality data, in percentage, were transformed to arcsine (root (x/100 + 0.05), according to Steel & Torrie (1980). The results were submitted to analysis of variance using the GLM (General Linear Models) procedure of the SAS software (SAS Institute, 1999). Means were compared using the test of Tukey at 5% significance.

Table 1 - Ingredient and calculated composition of the experimental diet.

Ingredients	Starter diet
Corn	52,037
Soybean meal	28,454
Wheat	15,614
Dicalcium phosphate	1,670
Limestone	1,091
Methionine	0,194
Vitamin[1] and Mineral[2] supplementation	0,20
Salt	0,350
Lysine	0,39
Total	100,00
Calculted composition	
Protein (%)	20
ME (kcal/kg)	2800
Calcium (%)	0,96
Methionine + cystine (%)	0,829
Methionine (%)	0,50
Available phosphorus (%)	0,45
Lysine (%)	1,30

1 - Composition per kg of complete feed: vitamin A: 7,000 IU; vitamin D3: 2,000 IU; vitamin E: 5 mg; vitamin K3: 1,6 mg; vitamin B2: 3 mg; vitamin B12: 8 mcg; Niacin: 20 mg; Pantothenic acid: 5 mg; Antioxidant: 15 mg; Vehicle QSP: 1.000 g. 2 - Composition per kg of complete feed: copper: 8 mg; iron: 50 mg; manganese: 70 mg; zinc: 50 mg; iodine: 1.2 mg; selenium:0.2 mg; vehicle QSP: 1.000 g.

RESULTS AND DISCUSSION

Maximal and minimal environmental temperatures in the house during the experimental period were 19.5 and 27.9 °C, respectively.

The obtained results are presented in Table 3.

There was no effect of age at beak trimming on the analyzed parameters (P>0.05). Also, there was no

Table 2 - Treatments.

Treatments	Quail age(days)	Beak-trimming size	Diameter of the beak-trimming orifice (mm)
1	14	Not trimmed	-
2	14	1/3 trimmed	(2.778 mm)
3	14	1/2 trimmed	(3.54 mm)
4	21	Not trimmed	-
5	21	1/3 trimmed	(3.54 mm)
6	21	1/2 trimmed	(3.90 mm)

*Beak trimming was performed using a Lyon® debeaker, and both the inferior and the superior part of the beaks were simultaneously trimmed.


Figura 1. Debicado 1/2


Figura 2. Debicado 1/3


Figura 3. Não debicada

ignificant interaction between age at beak trimming and trimmed beak size.

Analysis of variance showed significant effects only of beak trimming size (P<0.01) on weight gain and feed intake. Birds submitted to more severe beak trimming (1/2 beak) had lower feed intake, and consequently lower weight gain, as compared to those that were not submitted to beak trimming or only 1/3 of the beak was trimmed. Kuo *et al.* (1991), studying the effect of beak trimming on welfare and cannibalism in white layers, also observed lower feed intake and weight gain decreased in beak-trimmed birds. The authors justify these losses by the stress caused by beak trimming, which probably causes pain, and impairs feed apprehension.

Sandilands & Savory (2002) did not observe body weight differences between layers submitted or not to beak trimming, and the authors relate these results to the fact that only 1/4 of the beak was trimmed in their study, which would be much less as compared to other studies trimming 1/3 or even half of the beaks. However, most studies involving beak trimming in layers, such as those of Lee & Craig (1990) and Carrey & Lassiter (1995), showed a reduction in body weight in the period immediately after beak trimming, but the birds recovered during the following periods.

In the present experiment, feed conversion ratio was not influenced by the treatments, because the lower feed intake led to consequently lower weight gain. Conversely, Leandro *et al.* (2005) found worse feed conversion ratio in quails submitted to light and severe beak trimming (trimming and cauterization of 1/3 and 2/3 of the beak, respectively) as compared to non-trimmed birds.

CONCLUSIONS

According to the obtained results, it is recommended to trim 1/3 of the beaks, which can be performed either at 14 or 21 days of age.

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Table 3 - Weight gain (WG), feed intake (FI), feed conversion ratio (FCR), and mortality means of 1-35 day-old Japanese quails.

Treatments		Parameters			
		WG (g)	FI (g)	FCR	Mort (%)
Age at beak trimming	14	2,90	6,15	2,13	2,47
	21	2,84	6,05	2,14	1,47
Beak-trimming size	NT*	2,96[a]	6,32[a]	2,14	1,49
	1/3	2,89[a]	6,12[a]	2,13	2,57
	1/2	2,75[b]	5,86[b]	2,13	1,84
General means		2,87	6,10	2,13	1,97
CV (%)		3,21	3,22	0,73	131,92

Means followed by different letters in the same column are significantly different (P<0.05) by the test of Tukey.*NT Not trimmed.

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