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Effect of beak trimming at different ages on growth performance of Kadaknath chickens under intensive rearing system

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Abstract

The present investigation was undertaken to evaluate the effect of beak trimming at different ages on the growth performance of Kadaknath chickens under intensive rearing conditions. A total of 300 day-old Kadaknath chicks were randomly distributed into five treatment groups comprising three replicates of 20 birds each. The treatment groups included control (T_0), beak trimming at day 1 (T_1), day 7 (T_2), day 49 (T_3), and day 84 (T_4). Growth performance was evaluated in terms of body weight gain, feed intake, and feed conversion ratio (FCR) up to 20 weeks of age. The overall body weight gain recorded in T_0 , T_1 , T_2 , T_3 , and T_4 was 793, 707, 722, 735, and 714 g, respectively. The cumulative feed intake was 4042, 3677, 3574, 3752, and 3736 g, respectively. The overall feed conversion ratio ranged from 4.84 to 5.18 among treatment groups. The findings revealed that beak trimming reduced feed intake and improved feed utilization efficiency without adversely affecting overall growth performance. Birds subjected to beak trimming at 49 days of age exhibited comparatively better feed conversion efficiency. Therefore, beak trimming at 49 days of age may be recommended for improving productivity and feed utilization efficiency of Kadaknath chickens under intensive rearing conditions.

Keywords: Kadaknath chicken, beak trimming, body weight gain, feed intake, feed conversion ratio, growth performance

Introduction

Kadaknath chicken is an important indigenous breed of India known for its adaptability, disease resistance, and superior meat quality. Under intensive management conditions, various behavioral and managemental factors influence the productive performance of birds. Beak trimming is a widely adopted management practice used to reduce feed wastage and improve productive efficiency in poultry production systems (Acharya and Kumar) ^[1].

Previous studies have demonstrated that beak trimming influences body weight, feed intake, and feed conversion efficiency. Gentle (1986) ^[2] reported temporary reductions in feed intake following beak trimming due to behavioral adaptation. Blokhuis *et al.* (1987) ^[3] observed significantly lower feed consumption and body weight in beak-trimmed birds, whereas Deaton *et al.* (1987) ^[4] reported reduced feed intake and improved feed utilization efficiency in trimmed pullets. Craig and Lee (1990) ^[5] further reported improved productive efficiency in beak-trimmed birds due to reduced feed wastage.

The age at which beak trimming is performed has also been shown to influence productive performance. Bell and Kuney (1991) ^[6] observed that the age of beak trimming significantly affected subsequent growth and feed utilization. Carey (1990) ^[7] and Carey and Lassister (1995) ^[8] reported that beak trimming at different ages influenced body weight and feed efficiency during the growing and laying periods. Similarly, Honaker and Ruszler (2004) ^[9] observed improved feed utilization efficiency in birds trimmed at hatch compared with intact birds. Recent investigations have demonstrated that beak trimming positively influences feed conversion efficiency and productive performance. Damme and Urselmans (2013) ^[10] reported that beak trimming reduced feed wastage and improved feed efficiency. Vieira Oka *et al.* (2017) ^[11], Pelicia *et al.* (2019) ^[12], Petrolli *et al.* (2017) ^[13], and Baggio *et al.* (2020) ^[14] also observed improved productive performance and feed utilization efficiency in beak-trimmed birds.

However, information regarding the effect of beak trimming on the growth performance of indigenous Kadaknath chickens remains limited. Therefore, the present study was undertaken to evaluate the effect of beak trimming at different ages on body weight gain, feed intake, and feed conversion ratio of Kadaknath chickens under intensive rearing conditions.

2. Materials and Methods

2.1 Location of experiment

The present experiment was conducted at the Poultry Demonstration and Experimental Unit, College of Veterinary Science and Animal Husbandry, Anjora, Durg, Chhattisgarh.

2.2 Experimental birds and management

A total of 300 day-old Kadaknath chicks were randomly distributed into five treatment groups comprising three replicates of 20 birds each under a completely randomized design. The birds were reared under intensive management conditions up to 20 weeks of age. Feed and water were provided ad libitum throughout the experimental period.

2.3 Experimental treatments

The experimental birds were randomly assigned to five treatment groups. Birds in the control group (T_0) were maintained without beak trimming, whereas birds in the treatment groups were subjected to beak trimming at different ages, namely day 1 (T_1), day 7 (T_2), day 49 (T_3), and day 84 (T_4). Beak trimming was performed using a hot-blade debeaker operated at a temperature range of 650–750 °C. In chicks subjected to beak trimming at day 1 and day 7, only the tip of the beak was cauterized, whereas in birds trimmed at day 49 and day 84, approximately 2 mm of both the upper and lower beaks were removed (Fig. 1 and 2).

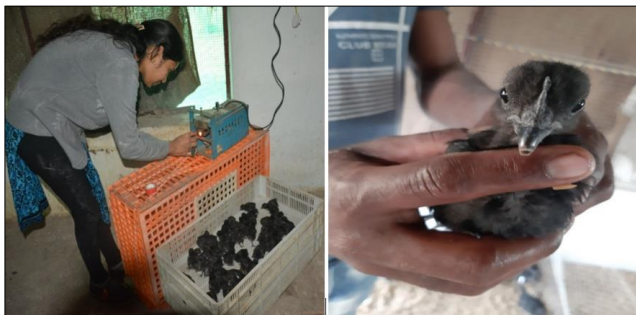


Fig 1: (a) Beak trimming of day old chicks (b) Beak trimmed chick

2.4 Growth performance parameters

Growth performance of Kadaknath chickens was evaluated by recording body weight gain, feed intake, and feed conversion ratio throughout the experimental period. Body weight gain was calculated by recording individual body weight at weekly intervals. Feed intake was determined by measuring feed offered and subtracting feed residue and wastage. Feed conversion ratio (FCR) was calculated as the ratio of feed consumed to body weight gain and was expressed as grams of feed consumed per gram of body weight gain.

2.5 Statistical analysis

The experimental data were analyzed using one-way analysis of variance under a completely randomized design.

The significance of differences among treatment means was tested using Duncan's multiple range test at $P < 0.05$.

3. Results and Discussion

3.1 Effect of beak trimming on body weight gain

The overall body weight gain recorded in T_0 , T_1 , T_2 , T_3 , and T_4 was 793, 707, 722, 735, and 714 g, respectively. Although weekly variations were observed, the overall body weight gain among treatment groups was statistically non-significant. The reduction in body weight gain observed in beak-trimmed birds may be attributed to temporary stress and altered feeding behavior immediately after trimming. Similar observations have been reported earlier (Gentle, 1986; Blokhuis *et al.*, 1987; Deaton *et al.*, 1987; Angevaere *et al.*, 2012) [2, 3, 4, 15], who observed reduced body weight gain in beak-trimmed birds during the early growth period.

3.2 Effect of beak trimming on feed intake

The cumulative feed intake of birds in T_0 , T_1 , T_2 , T_3 , and T_4 was 4042, 3677, 3574, 3752, and 3736 g, respectively. Feed intake was comparatively higher in control birds than in beak-trimmed birds. The reduced feed intake observed in beak-trimmed birds may be attributed primarily to reduced feed wastage rather than reduced nutrient consumption. Blokhuis *et al.* (1987) [3] reported approximately 13.3% lower feed consumption in beak-trimmed birds compared with intact birds. Deaton *et al.* (1987) [4] also observed significantly lower feed intake in beak-trimmed pullets. Similar findings were reported by Honaker and Ruzsler (2004) [9], Petrolli *et al.* (2017) [13], Oka *et al.* (2017) [11] and Pelicia *et al.* (2019) [12].

3.3 Effect of beak trimming on feed conversion ratio

The overall feed conversion ratio was 5.03, 5.27, 4.96, 5.00, and 5.30 in T_0 , T_1 , T_2 , T_3 , and T_4 , respectively. Birds subjected to beak trimming at seven and forty-nine days of age exhibited comparatively better feed conversion efficiency.

The improved feed conversion ratio observed in beak-trimmed birds may be attributed to reduced feed wastage and improved feed utilization efficiency. Similar findings were reported earlier (Blokhuis *et al.*, 1987; Craig and Lee, 1990; Honaker and Ruzsler, 2004; Damme and Urselmans, 2013; Oka *et al.*, 2017; Pelicia *et al.*, 2019 and Baggio *et al.*, 2020) [3, 5, 9, 10, 11, 12, 13].

4. Conclusion

The present investigation demonstrated that beak trimming influenced growth performance and feed utilization efficiency of Kadaknath chickens under intensive rearing conditions. Although body weight gain was numerically lower in beak-trimmed birds, the overall differences were non-significant. Beak trimming reduced feed intake and improved feed conversion efficiency. Birds subjected to beak trimming at 49 days of age exhibited comparatively superior growth performance and feed utilization efficiency. Therefore, beak trimming at 49 days of age may be recommended as an effective management practice for intensive rearing of Kadaknath chickens.

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6. Conflict of Interest

The authors declare that there is no conflict of interest.

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