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Effect of beak trimming at different ages on cost economics of Kadaknath chickens under intensive rearing system

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Abstract

The present study was conducted to evaluate the effect of beak trimming at different ages on the cost economics of Kadaknath chickens under intensive management conditions. A total of 300 day-old Kadaknath chicks were randomly distributed into five treatment groups with three replicates of 20 birds each. The treatments consisted of control (T_0 , untrimmed), beak trimming at day 1 (T_1), day 7 (T_2), day 49 (T_3), and day 84 (T_4). Birds were reared up to 20 weeks of age under uniform management and feeding conditions. Feed consumption and feed cost per kilogram live body weight were recorded and analyzed. Although feed consumption differed non-significantly among treatment groups, beak-trimmed birds consumed comparatively less feed than untrimmed birds. The lowest feed cost per kilogram live body weight was observed in birds trimmed at 49 days of age (₹390.21), followed by T_4 (₹401.24), T_2 (₹419.61), T_0 (₹424.17), and T_1 (₹445.38). The findings indicate that beak trimming at 49 days of age significantly improves economic efficiency through reduced feed wastage and better feed utilization. Therefore, beak trimming at 49 days of age can be recommended for economical intensive rearing of Kadaknath chickens.

Keywords: Kadaknath chicken, beak trimming, feed consumption, cost economics, indigenous poultry, profitability

Introduction

Indigenous poultry farming plays an important role in the socioeconomic development of rural communities due to its low input requirement, adaptability, and high consumer preference. Among indigenous breeds, Kadaknath chicken is recognized for its unique black meat, disease resistance, and superior nutritional quality. However, managerial factors such as feed wastage adversely affect productivity and profitability in intensive production systems (Rao and Thomas) [1].

Beak trimming is a widely accepted management practice employed to reduce feed wastage and improve economic efficiency in poultry production. Several investigators have reported that beak trimming reduces feed spillage, improves feed utilization, and enhances economic returns without adversely affecting long-term production performance. Gentle *et al.* (1986) [2] observed that beak trimming resulted in a temporary reduction in feed intake due to reduced feed wastage. Blokhuis *et al.* (1987) [3] reported a 13.3% reduction in feed consumption in beak-trimmed birds compared with untrimmed birds. Similarly, Craig *et al.* (1992) [4] observed that intact birds wasted more feed, resulting in poorer economic efficiency.

Several studies have demonstrated that age and severity of beak trimming influence feed intake and production economics. Honaker and Ruszler (2004) [5] reported lower feed consumption in birds trimmed at hatch compared with birds trimmed at seven days of age and untrimmed controls. Likewise, Damme and Urselmans (2013) [6] concluded that beak trimming significantly reduces feed wastage and improves feed utilization efficiency. Recent studies by Vieira Filho *et al.* (2018) [7] and Pelicia *et al.* (2019) [8] further confirmed that beak trimming improves economic returns through reduction in feed expenditure.

Although several studies have been conducted on commercial poultry strains, information regarding the economics of beak trimming in indigenous breeds such as Kadaknath remains limited.

Therefore, the present investigation was undertaken to evaluate the effect of beak trimming at different ages on the cost economics of Kadaknath chickens under intensive rearing conditions.

2. Materials and Methods

2.1 Experimental location

The 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 design

A total of 300 day-old Kadaknath chicks were randomly allotted into five treatment groups with three replicates of 20 birds each. The birds were reared under identical management and feeding conditions up to 20 weeks of age. Treatment groups are given as below:

1. T₀: Control (no beak trimming)
2. T₁: Beak trimming at day 1
3. T₂: Beak trimming at day 7
4. T₃: Beak trimming at day 49
5. T₄: Beak trimming at day 84

2.3 Economic analysis: Economic analysis is an essential component of animal nutrition studies because it evaluates the financial feasibility and efficiency of different dietary treatments. In the present study, the economic performance of each treatment was assessed by determining the feed cost per kilogram of live body weight. This parameter provides a practical measure of the cost incurred in producing one kilogram of live weight and enables comparison of the cost-effectiveness of the experimental diets. The feed cost per kilogram of live body weight was calculated using the following formula:

Feed cost per kg live weight = Total feed consumed × Cost of feed / Live body weight

2.4 Statistical analysis

The experimental data were analyzed by one-way analysis of variance under a completely randomized design (CRD). Treatment means were compared using Duncan's multiple range test and significance was tested at $P < 0.05$.

3. Results and Discussion

3.1 Effect of beak trimming on feed consumption

The cumulative feed consumption of birds in T₀, T₁, T₂, T₃, and T₄ was 4.032, 3.669, 3.563, 3.744, and 3.725 kg, respectively. Although the differences among treatment groups were statistically non-significant ($P > 0.05$), the feed consumption of beak-trimmed birds was comparatively lower than that of the control group.

The reduced feed consumption observed in beak-trimmed birds may be attributed primarily to reduced feed wastage rather than reduced nutrient intake. Similar findings were reported by Blokhuis *et al.* (1987) [3], who observed a 13.3% reduction in feed consumption among beak-trimmed pullets. Deaton *et al.* (1987) [9] also reported significantly lower feed intake in beak-trimmed birds, particularly when fed pelleted diets. Craig *et al.* (1992) [4] concluded that intact birds wasted considerably more feed than trimmed birds, resulting in poor economic efficiency.

Similarly, Davis *et al.* (2004) [10] reported significantly lower feed consumption in beak-trimmed White Leghorn hens compared with non-trimmed controls until 16 weeks of

age. Honaker and Ruszler (2004) [5] observed that birds subjected to beak trimming at hatch consumed less feed than birds trimmed at seven days and untrimmed controls. Marchant-Forde and Cheng (2010) [11] reported that feed intake was highest in control birds and lowest in hot-blade beak-trimmed birds during the initial weeks following trimming.

The findings of the present study also agree with those of Damme and Urselmans (2013) [6], who reported that beak trimming reduced feed wastage and altered feeding behavior, thereby improving feed utilization efficiency. Similarly, Vieira Filho *et al.* (2018) [7], Garcia *et al.* (2019) [12] and Pelicia *et al.* (2019) [8] reported lower feed consumption in beak-trimmed birds compared with untrimmed controls.

3.2 Effect of beak trimming on cost economics

The economic analysis revealed significant differences among treatment groups. The feed cost per kilogram live body weight was highest in birds trimmed at day 1 and lowest in birds trimmed at 49 days of age. Effect of beak trimming on cost economics of Kadaknath chickens is presented in Table 1.

The lowest feed cost per kilogram live body weight recorded in birds trimmed at 49 days of age indicates superior economic efficiency (Figure 1). The improvement in economics may be attributed to reduced feed wastage and more efficient utilization of feed resources.

Craig *et al.* (1992) [4] reported that feed wastage in intact birds substantially increased the cost of production. Honaker and Ruszler (2004) [5] observed poorer economic performance in untrimmed birds due to increased feed loss. Damme and Urselmans (2013) [6] also concluded that beak trimming significantly reduced feed wastage and improved economic efficiency. Vieira Filho *et al.* (2018) [7] demonstrated that birds subjected to beak trimming exhibited better feed utilization and lower production costs. Pelicia *et al.* (2019) [8] reported that beak trimming significantly improved production efficiency by reducing feed expenditure. Baggio *et al.* (2020) [13] also observed improved economic performance in beak-trimmed birds compared with non-trimmed controls. The superior economic performance observed in birds trimmed at 49 days of age in the present study may be attributed to optimum reduction in feed wastage without adversely affecting feed consumption or growth performance. Similar observations have been reported by several workers who concluded that proper timing of beak trimming significantly improves the economics of poultry production (Honaker and Ruszler, 2004; Damme and Urselmans, 2013 and Vieira Filho *et al.*, 2018) [5-7].

Pelicia *et al.* (2019) [8] reported that beak trimming significantly improved production efficiency by reducing feed expenditure. Baggio *et al.* (2020) [13] also observed improved economic performance in beak-trimmed birds compared with non-trimmed controls. The superior economic performance observed in birds trimmed at 49 days of age in the present study may be attributed to optimum reduction in feed wastage without adversely affecting feed consumption or growth performance. Similar observations have been reported by several workers who concluded that proper timing of beak trimming significantly improves the economics of poultry production (Honaker and Ruszler, 2004; Damme and Urselmans, 2013 and Vieira Filho *et al.*, 2018) [5-7].

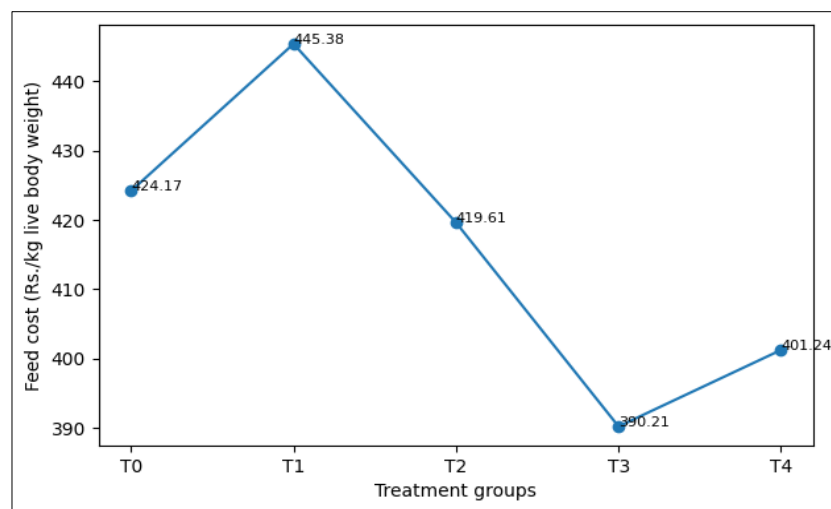


Fig 1: Effect of Beak Trimming Age on Cost Economics of Kadaknath Chickens

Table 1: Effect of beak trimming on cost economics of Kadaknath chickens

Treatment	Feed consumption (kg)	Feed cost (Rs./kg feed)	Body weight (kg)	Feed cost (Rs.)/kg live weight
T ₀ (Control)	4.032	27.50	0.641	424.17
T ₁ (1 day)	3.669	27.50	0.576	445.38
T ₂ (7 days)	3.563	27.50	0.600	419.61
T ₃ (49 days)	3.744	27.50	0.580	390.21
T ₄ (84 days)	3.725	27.50	0.567	401.24

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Conflict of interest

Not available

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