Effect of beak trimming on cannibalism and mortality of Kadaknath chickens

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ABSTRACT

An experimental trial was conducted to evaluate the effect of beak trimming on cannibalism and mortality of Kadaknath chickens at the College of Veterinary Science and Animal Husbandry, Anjora, Durg, Madhya Pradesh in completely randomized block design. A total of 300 Kadaknath chickens were allocated to 5 equal groups with 3 replicates in each group viz control with no beak treatment (T_0), beak trimmed at 1 day (T_1), at 7 days (T_2), at 49 days (T_3) and at 84 days (T_4). Beak trimming was done by hot blade method. Cannibalism level was significantly ($P<0.05$) lower in the beak-trimmed birds than control birds. Beak trimming performed at 49 days of age reduced cannibalism at the most. The total mortality and birds dying or culled due to cannibalism was higher in control in comparison to all other treatments. Four birds from the control group (T_0), two birds each from T_1 and T_2 and 3 birds each from T_3 and T_4 groups died during the experimental period.

Keywords: Kadaknath; beak trimming; mortality; cannibalism

INTRODUCTION

Poultry industry plays an important role in the Indian economy and is an important sub-sector of livestock production. The total poultry and backyard poultry have increased by 16.81and 45.78 per cent with a population of 851.81 and 317.07 million respectively (Singh 2022). Kadaknath chickens are mostly preferred for backyard poultry production due to their tropical adaptability, disease resistance and good foraging ability in its habitat in freerange in many parts of our country. In general, a flock's welfare can be accessed by the incidence of cannibalism, mortality, feathering and flock behaviour such as fearfulness or nervousness. Cannibalism is defined as the act of consuming tissue of other members of the same species, living or dead, during any period of the life cycle (Newberry 2004). Aggressive and cannibalistic pecking is more prevalent, easily spread and more difficult to control in freerange housing systems, which is largely practiced in India. It deteriorates production performance and thus negatively affects sustainability. Beak trimming is one of the primary management tools preferred to control feather and vent pecking that can escalate into cannibalism and it improves the long-term welfare of the bird (Glatz 2000). Earlier studies reported reduction in cannibalism in broilers and turkeys (Gentle et al 1995) and reduction in mortality after beak trimming in chickens (Craig and Lee 1990). Beak trimming is commonly practiced at the hatchery where it is appropriate and relatively cheap before delivery of the chicks. In India, beak trimming conducted either by infra-red or hot blade remains the main method of controlling cannibalism (Dennis et al 2009). The actual age at which pullets are beak-trimmed ranges from day old to just before laying phase at about 18 weeks of age. Research on beak trimming on commercial line has been performed but there is no literature pertaining to it regarding indigenous birds, therefore, this requires further experimentation to

evaluate its effect to minimize damage imposed by aggressive pecking, feather pecking and cannibalism. Present study was designed to assess the effect of beak trimming on cannibalism and mortality of Kadaknath chickens.

MATERIAL and METHODS

The present investigations were undertaken on 300 Kadaknath chickens in 20 weeks trial period to study the effect of beak trimming on their cannibalism and mortality at poultry demonstrational and experimental unit of the College of Veterinary Science and Animal Husbandry, Anjora, Durg, Madhya Pradesh. The chickens were divided into 5 treatment groups with 3 replications in each treatment viz T_0 [Control (no beak treatment)], T_1 (Beak trimmed at 1 day), T_2 (Beak trimmed at 7 days), T_3 (Beak trimmed at 49 days) and T_4 (Beak trimmed at 84 days) under completely randomized block design. Beak trimming was performed with the help of a hot blade beak trimming machine (Gargo Technologies Pvt Ltd). This machine turns red hot at a temperature of 650-750°C which is suitable for trimming with a contact time of 2-3 seconds. Beak trimming of both upper and lower beaks was performed using straight cut. It involved the removal of an equal portion of beak tissue in one operation. In one day old and 7 days chicks, touching of the tip of the beak, while in 49 days and 84 days treatment, trimming of 2 mm from upper and lower beak were performed. Cannibalism was assessed by observing feather and vent pecking. Mortality, as and when occurred, was duly recorded and calculated in each treatment group.

RESULTS and DISCUSSION

The incidence of cannibalism was more in intact beak birds as compared to beak-trimmed birds (Table 1). Control group was having more incidence of cannibalism (23.33%) and showed gentle feather pecking, while those birds trimmed at day 1, had 8.33 per cent pecking inflicted birds. Similarly, the birds, whose beaks were trimmed at 7, 49 and 84 days, had 13.33, 10.00 and 13.33 per cent cannibalism inflicted birds respectively. These results suggest that beak trimming may reduce cannibalistic behavior resulting in less fearfulness behavior and feather loss, thereby,

Table 1. Effect of beak trimming on cannibalism of Kadaknath chickens

Weeks after Treatment	Number of cannibalism affected chickens under different treatments				
	T_0 (n = 60)	T_1 (n = 60)	T_2 (n = 60)	T_3 (n = 60)	T_4 (n = 60)
1	-	-	-	-	-
2	-	-	-	-	-
3	-	-	-	-	-
4	2	-	-	1	-
5	1	-	-	-	-
6	-	-	-	-	2
7	-	-	1	-	-
8	-	-	-	1	-
9	-	3	2	2	1
10	-	-	-	-	-
11	2	-	-	-	-
12	3	-	2	-	2
13	-	2	-	-	-
14	2	-	2	-	-
15	3	-	1	-	-
16	1	-	-	-	2
17	-	-	-	1	-
18	-	-	-	-	1
19	-	-	-	1	-
20	-	-	-	-	-
Total	14	5	8	6	8

T_0: Control (no beak treatment), T_1: Beak trimmed at 1 day, T_2: Beak trimmed at 7 days, T_3: Beak trimmed at 49 days, T_4: Beak trimmed at 84 days

reducing mortality. Cannibalism is caused by a combination of genetic and environmental components. Although the exact cause is unknown, many management conditions and genetics can predispose a flock to an outbreak. The findings are supported by the results of Oka et al (2017) and Riber and Hinrichsen (2017). Damme and Urselmans (2013) reported that the cannibalism index was null because any form of beak trimming greatly reduces the rate of cannibalism when observed in the non-debeaked birds. Cannibalism was the most significant cause of mortality; the findings demonstrated that beak trimming was effective in reducing this major bird welfare concern. Lee and Craig (1991) also reported non-beak-trimmed poultry exhibiting aggressive feather pecking and cannibalism. Gabrush (2011) and Pelicia et al (2019) observed that moderate infra-red beak-trimmed birds had longer beaks and higher absence of cannibalism and livability as compared to those severely beak-trimmed. The absence of beak trimming treatment effect on pullet mortality is consistent with earlier report of Carey (1990). Blokhuis and Van der Haar (1989) stated that feather pecking may even be enhanced by beak trimming when almost complete regrowth of the beak and recovery of its efficiency occurs; the risk for serious plumage damage and cannibalism is as high or even higher in beak-trimmed birds.

The mortality of birds during the entire study period from 0 to 20 weeks remained 4.8 per cent which was well within the normal range (Table 2). The total mortality and birds dying were higher in control than treatment groups. Four birds (6.66%) in the control group, two (3.33%) each in T_1 and T_2 and 3 (5.00%) each in T_3 and T_4 groups died during the experimental period. Treated hens in all of the treatments showed a decrease in total mortality from additional birds kept on different replications of treatment provided. The incidence of cannibalism was significantly higher in non-trimmed birds as compared to beak-trimmed birds. Beak trimming significantly ($P \leq 0.05$) reduced the plumage damage inflicted upon the birds. Harter-Dennis and Pescatore (1986) reported no significant differences in mortality because of beak trimming regimen on broiler performance. Deaton et al (1987) observed mortality at 89 to 102 days of age after beak

Table 2. Effect of beak trimming on mortality of Kadaknath chickens

Weeks after treatment	Number of deaths of chickens under different treatments				
	T_0 (n = 60)	T_1 (n = 60)	T_2 (n = 60)	T_3 (n = 60)	T_4 (n = 60)
1	1	-	-	-	-
2	-	-	-	-	-
3	-	-	-	-	-
4	-	-	-	1	-
5	1	-	-	-	-
6	-	-	-	-	-
7	-	-	-	-	-
8	2	-	-	1	-
9	-	1	1	1	1
10	-	-	-	-	-
11	1	1	-	-	-
12	-	-	-	-	1
13	-	-	-	-	-
14	-	-	-	-	-
15	-	-	1	-	-
16	-	-	-	-	1
17	-	-	-	-	-
18	-	-	-	-	-
19	-	-	-	-	-
20	-	-	-	-	-
Total	4	2	2	3	3

T_0: Control (no beak treatment), T_1: Beak trimmed at 1 day, T_2: Beak trimmed at 7 days, T_3: Beak trimmed at 49 days, T_4: Beak trimmed at 84 days

trimming at 70 days. Craig and Lee (1990) observed no beak-inflicted deaths prior to 20 weeks. Carey and Lassiter (1995) observed that pullet mortality was not significantly influenced by beak trimming treatments. In contrast, earlier studies revealed that there were no significant differences in untrimmed and trimmed bird groups, because of mortality from cannibalistic pecking, irrespective of beak treatment (Schwean-Lardner et al 2016, Filho et al 2018).

CONCLUSION

In the present study, cannibalism incidence was most common in age group of 9-20 weeks and was not found in 0-8 weeks of age in Kadaknath chickens. Significantly, reduced cannibalism was reported when beak trimming was done on day 49. It successfully reduced feather and vent pecking in beak-trimmed birds. The mortality rate due to cannibalism was reduced in beak-trimmed birds as compared to control groups without beak trimming. Therefore, beak trimming in indigenous birds may be beneficial in reducing cannibalism and thus emphasizing the long-term beneficial impact of beak treatment.

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