Beak Trimming of Turkeys. 2. Effects of Arc Beak Trimming on Weight Gain, Feed Intake, Feed Wastage, and Feed Conversion

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ABSTRACT An experiment was conducted to study the effects of arc beak trimming on feed consumption, weight gain, and feed wastage in males and females from two large-bodied strains and one medium-bodied strain of turkeys. Birds were placed in wire-floored battery cages from 3 to 8 wk of age and feed intake, weight gains, and feed spilled into dropping pans were recorded for each of the 5 wk of each trial. Feed conversion was calculated as feed consumed divided by weight gained. Sex by beak trimming interactions were not found. Beak trimming reduced feed wastage of the two large-bodied strains, but did not affect feed wastage of the medium-bodied strain, which did not consume as much feed as the large-bodied strains. The results of this study support the hypothesis that beak trimming reduces feed wastage of large-bodied turkeys.

(Key words: turkey, beak trimming, growth, feed wastage, feed intake)

INTRODUCTION

Cunningham et al. (1992) reported that feed conversion of beak-trimmed Nicholas male turkeys was lower than that of intact males, but feed conversion of beak-trimmed females did not differ from that of females with intact beaks, and that males consumed more feed than females. Noble et al. (1994) found that beak-trimmed male turkeys from two commercial strains had lower feed conversion ratios than intact controls. Both the aforementioned studies hypothesized that beak trimming improves feed conversion by reducing feed wastage. The purpose of the current study was to measure the effect of beak trimming on weight gain, feed intake, feed wastage, and feed conversion in males and females from three strains of turkeys differing in BW.

MATERIALS AND METHODS

Three trials were used in this experiment. Trial 1 used a commercial strain of Large White turkeys (Strain B; Noble et al., 1994) from a major turkey breeding company. Trial 2 used a large-bodied randombred control line (RBC3) developed in 1986 (Noble et al., 1995). Trial 3 used a medium-bodied randombred control line (RBC2) developed in 1966 (Nestor, 1977; Noble et al., 1995). Growth, reproduction, and behavior traits of the RBC2 and RBC3 lines have been discussed by Noble et al. (1995, 1996a,b).

In all trials, poults were wing-banded and sexed at hatching and assigned to beak treatments. Equal numbers of poults from each sex were assigned to be arc beak trimmed 1.5 mm from the nostril (Renner et al., 1989) or left with beaks intact. Birds were placed in a floor pen with pine shavings litter with sexes and beak treatments intermingled. Feed and water were provided for ad libitum consumption. The feed was in crumble form throughout the experiment. The ration from hatching to 3 wk of age was calculated to contain at least 2,800 kcal ME/kg and 28% CP, and the diet from 3 to 8 wk of age was calculated to contain at least 2,900 kcal ME/kg of diet and 26% CP.

Previous experience with beak trimming in this laboratory indicated that beaks of birds that were arc trimmed had generally healed by 3 wk of age. Thus, starting at 3 wk of age, 12 birds were placed (1 bird per cage) in a wire floor battery cage measuring 68 × 68 cm. Feed and water were located at opposite ends of each cage, which provided 62 linear cm of feeder and waterer space.

An equal number of poults were randomly chosen from each sex and beak treatment combination (three poults), weighed, and placed in the cages on each Monday morning and then removed from the cages and

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weighed each Friday. Different poults were used each week in Trial 1, whereas the same poults were used each week in Trials 2 and 3. A measured amount of feed was placed in the feeders each Monday. This amount of feed generally provided a depth of 4 cm of feed in a 6-cm-deep feeder. The feed remaining in the feeders on each Friday morning of the trial was weighed. Feed spilled into the dropping pans was carefully separated from the droppings (using a small putty knife) and weighed. Because feed and water were located on opposite ends of the cage, feed in the dropping pans remained dry and feed transferred into the waterers was minimal. The trials ended when the birds were 8 wk of age. The amounts of weight gained, feed consumed, and feed wasted were converted to common logarithms prior to analysis. Feed conversion data were not transformed. Data within each trial were analyzed by analysis of variance with week, sex, beak treatment (intact vs trimmed), and the sex by beak treatment interaction as sources of variation.

**RESULTS AND DISCUSSION**

The effect of week was significant for every trait in all trials except feed wastage of Trial 3, in which little feed was wasted, and feed conversion in Trial 2 (Table 1). Week was treated as a block effect, so the presence of weekly differences was expected.

Sex by beak trimming interactions were not found in these three trials (Table 1). This is in contrast to results obtained by Cunningham *et al.* (1992), who reported that sex by beak trimming interactions were common in Nicholas turkeys, especially at older ages (12 to 18 wk of age). The present study ended when the birds were 8 wk of age. Differences between the large-bodied strains used in Trials 1 and 2 and the medium-bodied line used in Trial 3 are apparent for weight gain, feed consumption, and feed wastage.

Sex effects were present for weight gain only in the medium-bodied line and not the two large-bodied lines (Table 1). In all three strains used in this experiment, males consumed more feed than did females. In Trial 1, males wasted more feed than did females. Sex by line interactions are common in turkey studies (Noble *et al*., 1996a,b).

The only trait in the present study that was affected by beak trimming was feed wastage in Trials 1 and 2 (Table 1). It is known that the two strains used in Trials 2 and 3 differ in body weight, leg traits, walking ability (Noble *et al*., 1996b), fear response, walking behavior, and eating behavior, with the RBC3 spending more time eating than the medium-bodied RBC2 strain (Noble *et al*., 1996a). In the study of Noble *et al.* (1996a), birds were considered to be eating when at the feeder manipulating feed with their beaks; thus, some of the increased time spent eating by the RBC3 strain may have been nonconsummatory feeding behavior. The study of Cunningham *et al.* (1992) showed no effect of beak
trimming on feed usage to 6 wk of age in either males or females from the Nicholas strain. Weight gains from 4 to 6 wk were greater in the beak-trimmed Nicholas males used by Cunningham et al. (1992), and their feed conversion was lower from 0 to 6 wk of age than that of control males with intact beaks. These results differ somewhat from those of Noble et al. (1994), who found that beak trimming reduced feed intake in two strains of male turkeys at 4 and at 8 wk of age and that beak trimming improved feed conversion (lowered feed conversion ratios) in these two strains of males from 4 to 8 wk of age. The present study showed no beak trimming effect on feed consumption, weight gains, or feed conversion in any trial.

Another factor that may contribute to the differences in feed wastage between large- and medium-bodied turkeys seen in the present study may be a genotype by environment interaction. Beak trimming of turkeys is a standard management practice in today's commercial turkey industry. Major improvements in BW were made between 1966 and 1986 in a line selected for increased 16-wk BW (Line F; Nestor, 1984) and in the commercial sire line of turkeys (Emmerson et al., 1991) that was used to form the RBC3 line. The improvements in BW and other traits made between 1966 and the present were made when beak trimming was part of the selection environment; thus large-bodied turkeys have been selected for maximum performance with trimmed beaks. The results of this study support the hypothesis that beak trimming reduces feed wastage of large-bodied turkeys.

REFERENCES


