

Toe treatment in turkeys: Impacts on production and welfare
K. Schwean-Lardner*, J. Fournier, S. Gomis, T. Knezacek and H.L. Classen
Karen.Schwean@usask.ca
University of Saskatchewan, Saskatoon, SK Canada

Introduction

Scratches on turkeys can negatively impact product value. In addition, if severe, scratches will reduce bird welfare by causing pain, and increasing the opportunity for infection. To aid in controlling the incidence of scratching in flocks, toe treatment, which removes the sharp claws on the anterior facing digits, is a common management practice for meat turkeys.

Little research has focused on the impact that toe treatment has on turkey production and welfare, and the majority of literature that is available is dated with respect to the technology tested. More recently, microwave energy using a Microwave Claw Processor machine (MCP) is passed over the claw area at the hatchery, killing the tissue and causing the tips to slough. This research was undertaken to determine the effects of this procedure on both toms and hens, with a focus on production traits, carcass damage and bird welfare.

Materials and Methods

A total of 306 Hybrid Converter male poults in experiment 1, or 576 Hybrid Converter female poults in experiment 2, were either treated (Males – MT; Females - FT) or sham treated (Males – MNT; Females - FNT) at a commercial hatchery. Birds were housed in pens with an estimated final (15 wk for hens and 20 wk for toms) density of 34 kg/m². Birds were exposed to 23 hr of light (including heat lamps) until 9 d of age, then light was reduced to 18L:6D (10 lux until d 19 then reduced to 5 lux for females, and down to approximately 1 lux for males by day 98 to aid in controlling injurious pecking). Commercial feed was provided ad libitum in a six-step gender-specific program that met or exceeded the recommended nutritional guidelines (Hybrid Turkeys, 2011). Body weights and feed intake were recorded at 0, 1, 3, 6, 9, 12 and 15 wks of age for hens, or 0, 7, 21, 42, 56, 70, 91, 126 and 140 d of age for toms, then feed efficiency calculated for the same periods. All dead or culled birds were submitted to an independent laboratory for determination of cause of death. Infrared video cameras were used to record behavior for 24-hr period at various periods throughout the experiments. The video data was then analyzed using scan sampling techniques at 15 min intervals. A total of 5 birds were per pen were identified with wing-bands at the end of each experiment, and carcasses were evaluated for scratches at a commercial processing plant.

Results

Toms

Growth and production traits

Treating the toes of toms impacted body weight at 91, 126 and 140 d of age (Table 1). In all cases, MT toms were lighter than MNT. The treatment did not impact overall feed consumption or feed efficiency, with the exception of consumption from 126-140 d of age (MT – 8.42 kg vs MNT 8.85 kg per bird).

Table 1. Effect of toe treatment on body weight of turkey toms (kg)

Age	MT	MNT	SEM
91	11.93 ^b	12.23 ^a	0.089
126	18.88 ^b	19.47 ^a	0.091
140	21.15 ^b	21.70 ^a	0.085

Mortality

Although overall mortality did not differ between treatments, we did note an increase in skeletal disorders in MT birds as compared to the MNT. This was primarily diagnosed as rotated tibia in the treated toms (Table 2).

Table 2. Effect of toe treatment on mortality plus culls, and cause of mortality of tom turkeys (0-20wk)

	MT	MNT	SEM
Total Mortality	16.99	13.07	0.137
Causes of mortality			
Skeletal	5.23 ^a	1.31 ^b	0.977
Metabolic	0.65	3.27	0.951
Infectious	5.23	1.96	0.968
Other	5.88	6.53	1.427

Behavior

Treatment of the male birds affected behavior early in life, and MT spent more time resting, and less standing, walking or at the feeder at 1 d of age (Table 3). By 3 d of age, the only differences noted was in the percent of time spent in walking, with MNT birds walking more (Table 4).

At 133 d of age (Table 5), MT spent more time standing and less time walking than did MNT. No other differences were noted in any behaviors, including comfort or nutritive behaviors. This might suggest that balance of treated birds was an issue in this experiment, which could relate to the amount of tissue initially treated.

Table 3. Effect of toe treatment on behavior at 1 d of age (% of time)

(%)	Treatment		SEM
	MT	MNT	
Inactive resting	81.4 ^a	56.5 ^b	4.33
Standing	1.8 ^b	10.4 ^a	1.45
Walking	1.4 ^b	7.3 ^a	1.06
At the feeder	0.4 ^b	10.4 ^a	1.89

Table 4. Effect of toe treatment on behavior at 3 d of age (% of time)

(%)	Treatment		SEM
	MT	MNT	
Inactive resting	53.4	48.3	3.28

Standing	11.1	12.7	1.08
Walking	4.8 ^b	8.9 ^a	0.87
At the feeder	5.5	9.2	1.16

Table 5. Effect of toe treatment on behavior at 133 d of age (% of time)

(%)	Treatment		SEM
	MT	MNT	
Inactive resting	30.4	30.7	1.21
Standing	27.1 ^a	24.1 ^b	0.72
Walking	4.6 ^b	5.6 ^a	0.24
At the feeder	3.7	3.3	0.19

Carcass scratching

The level of scratching on the male carcasses (20 wk of age) showed that, in this case, the treatment had no effect (Table 6). Similarly, breast blisters or buttons, which increase in incidence if birds spend more time resting on the litter, were not affected by toe treatment.

Table 6. Effect of toe treatment on carcass damage (%) (20 wk)

	Treated	Untreated	SEM
Scratching	13.33	15.56	3.154
Breast blisters/buttons	37.78	33.33	4.444`

Hens

The production characteristics of hens noted at all ages indicated that treatment had no effect on body weight. Table 7 shows the final 15 wk body weight, feed efficiency (with and without mortality correction), and overall flock mortality.

Table 7. Overall production results for turkey hens reared to 15 wk of age (kg)

Parameter	Treatment		SEM
	FT	FNT	
Body wt (kg)	10.33	10.43	0.036
F:G	2.599	2.553	0.0315
F:Gm	2.532	2.503	0.0277
Mortality (%)	5.21	3.13	1.011

Toe treatment in the hen flock had no effect on mortality, or on the causes of mortality (Table 8). Pendulous crop was higher than expected in both treatments. Injurious pecking, although not significantly, was higher in the FT hens.

Table 8. Effect of toe treatment on mortality plus culls and cause of mortality of hens (0-15 wk)

	FT	FNT	SEM
Total Mortality	5.21	3.13	1.011

Causes of mortality/culls			
Injurious pecking	1.39	0.35	0.423
Broken leg	0.35	0	0.174
No visible lesions	0.35	0.69	0.283
Round heart	0.35	0.35	0.238
Ascites	0.35	0	0.174
Enteritis	0.35	0	0.174
Hemorrhaged liver	0.35	0	0.174
Pendulous crop	1.39	1.39	0.724
Tenosynovitis	0	0.35	0.174
Osteomyelitis	0.35	0	0.174

Behavior of the hens, which gives an indication of how birds are coping in their environment, differed at 3 d of age, when trimmed birds were not as active as the untreated hens. However by 5 d of age, and beyond, no differences were noted (Table 9 – 5d; Table 10 – 7d; Table 11 – 13 wk)

Table 9. Impact of hen toe trimming on behavior at 5 d of age

(%)	Treatment		SEM
	FT	FNT	
Inactive resting	71.08	57.81	5.357
Standing	18.09	20.11	2.843
Walking	3.02	6.11	0.951
Feeding	3.71	6.87	1.401

Table 10. Impact of hen toe trimming on behavior at 7 wk of age

(%)	Treatment		SEM
	FT	FNT	
Inactive resting	61.79	59.51	1.093
Standing	21.26	22.65	1.603
Walking	3.15	3.16	0.232
At the feeder	2.62	3.64	0.3250

Table 11. Impact of toe trimming on turkey hen behavior at 13 wk of age.

(%)	Treatment		SEM
	FT	FNT	
Inactive resting	56.83	56.09	0.8829
Standing	23.28	23.44	0.6506
Walking	1.84	1.83	0.1029
At the feeder	3.11	3.69	0.1946

The ability of turkey hens to walk (mobility assessed by gait scoring, where a score of 5 means the bird cannot stand or walk) at 7 wk showed that the treatment did not have an impact on mobility (FT = 0.11, FNT = 0.18). All birds, including FT and FNT, scored very low, indicating good mobility.

A significant difference was noted in the percentage of carcasses with scratches noted at the slaughter plant (Table 12). For the hen population, almost 46% of carcasses examined were scratched, compared to only 12% for the treated birds. Scratches were more significant in the untreated birds, with 18% of scratches between 2.5 and 5 cm (compared to 5% in the treated birds) and 25% being over 5 cm in length (compared to 2.8% of the treated birds).

Table 12. Incidence and length of carcass scratches – hens at 15 wk of age (%)

(%)	Treatment		SEM
	FT	FNT	
Scratches	12.22^b	45.56^a	6.138
Scratch length			
< 2.5 cm	6.67	15.56	3.322
2.5 – 5.0 cm	5.00^b	18.33^a	3.430
> 5.0 cm	2.78^b	25.00^a	4.910

Conclusions

In conclusion, a different response to toe treatment was noted in the toms versus the hens in this study. Body weight later in life was negatively impacted in the toms, and the behavior data suggests that difficulty in balancing with the shorter toes might be more difficult to manage with heavier body weights. The treated males did behave differently than untreated males in the week after treatment, with less mobility and feeding suggesting some sensation was occurring in the toe tissue. Finally, the carcass scratch data did not improve in this work with the use of toe treatment.

In comparison, the hens did not show a reduction in body weight at any time during the production cycle. This may be because the lighter market weight did not cause the same balance issues as was noted in the toms. Behavioral analyses showed more inactivity at 3 d of age when birds were treated, but did not find a difference in the hen behavior of either treatment at 5 d of age or older, and mobility was not impacted by treatment. However, approximately three times more carcasses exhibited scratching when examined at the processing plant, citing both an economic and welfare concern.

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