



Effect of Feeding Cotton Gin Trash on the Linear Body Measurements in Mecheri Lambs

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ABSTRACT: Majority of the places in Karur and Tiruppur districts of Tamil Nadu, farmers are rearing Mecheri breed of sheep and using cotton gin trash as a roughage supplement feed to their sheep mainly during forage shortage in summer months. In this study, a trial was conducted with 32 weaned Mecheri lambs at the age of 3 months and formed into four groups of eight animals in each group to find out the effect of feeding cotton gin trash on linear body measurements in Mecheri lambs. In all four groups, the basal diet used for the experiment had roughage: concentrate in the ratio of 60:40 on dry matter basis depended on their body weight but in T₂, T₃, T₄ group the roughage diet was replaced with cotton gin trash at 25%, 50% and 75% inclusion level. The animals were reared up to 9 months of marketing age. Linear body measurements viz., height at withers, body length and chest girth of the animal were measured at fortnight interval during the study period. The lambs in T₄ group showed significantly (P<0.05) higher body length (cm) than T₁ animals at the end of 150th day of trial period. The lambs in T₄ group shown significantly (P<0.01) higher chest girth than T₂ and T₁ group but not significantly different from T₃ group from 135th day of trial period until the end of trial period. The lambs in T₄ group had shown significantly (P<0.01) higher height at withers (cm) than T₂ and T₁ but not significantly different from T₃ group. From the study, it could be conferred that the lambs fed with 75 per cent cotton gin trash in roughage portion, which increased the body weight gain along with linear body measurements mainly due to higher crude protein and gross energy in T₄ groups.

Keywords: Cotton gin trash, Mecheri lambs, linear body measurements.

INTRODUCTION

The by-products are generally cheaper than conventional feedstuffs. Therefore, farmers can include the by-products into diets of animals provided that the by-products support acceptable animal performance (Meglas *et al.*, 1991; Ghaffari *et al.*, 2014). As a result, farmers save money by using a less expensive by-product. Cotton gin trash is one such by-product from ginning industry and sheep farmers are using the cotton gin trash to meet the energy and protein requirements of their sheep as it has been used in ruminant diets in most parts of the world (Kennedy and Rankins 2008).

Although cotton gin trash is low in protein and energy content, it is a source of physically effective fiber and has the potential to be a more economical option for sheep farmers than traditional roughages (Warner *et al.*, Balaji *et al.*,

2020). However, the nutrient composition of cotton gin trash also varied widely (Myer, 2011). Gin trash has got the nutritive value that is comparable to other commonly used roughage sources.

Mecheri sheep are medium-sized animals with a compact body and are covered with short hairs. Mecheri Sheep are distributed in Salem, Namakkal, Erode, Karur, Tiruppur, Dindigul and Dharmapuri districts. The Sheep farmers in Karur and Tiruppur districts of Tamil Nadu started using this cotton gin trash as a roughage supplement feed to their sheep. There is no much scientific information about the feeding value of cotton gin trash available in these districts and its effect on the production performance of Mecheri lambs. Considering this, this study is taken

upto find out the effect of feeding cotton gin trash on linear body measurements in Mecheri lambs.

MATERIALS AND METHODS

A trial was conducted with 32 weaned Mecheri ram lambs at 3 months of age with uniform body weight and formed into four groups of eight animals in each group. All the group of animals were fed on dry matter requirement basis at 4 percent of their body weight and the feed requirement was calculated at every fortnightly

interval according to their body weight changes. In all four groups, the basal diet used for the experiment had roughage: concentrate in the ratio of 60:40 depended on their body weight. The T₁ was considered as control group and in T₂, T₃, T₄ group the roughage diet was replaced by cotton gin trash at 25%, 50% and 75% inclusion level respectively. The animals were reared up to nine months of marketing age. The ingredient composition of experimental diets is as follows:

Ingredient (%)	Treatment groups			
	T ₁ (Control)	T ₂	T ₃	T ₄
Sorghum stover	60	45	30	15
Cotton gin trash	0	15	30	45
Concentrate	40	40	40	40

Linear body measurements *viz.*, height at withers, body length and chest girth of the animal were measured using a flexible measuring tape after proper restraining of the animal and holding it in a unforced position at a flat surface and measured in centimetres at fortnight interval. The body length was measured at distance between the anterior edge of the shoulder to the point of pin bone. Chest girth (HG) was obtained as the smallest circumference around the chest of animal just behind the foreleg. Height at withers was measured as the vertical distance from the highest point of withers to the base of the hoof.

RESULTS AND DISCUSSION

Mean (\pm SE) fortnight body length and chest girth (cm) of Mecheri lambs as influenced by cotton gin trash are shown in the Table 1. It was observed that the fortnightly body length (cm) of T₄ and T₃ groups were higher than T₂ and T₁ treatment groups, but there was no significant difference among treatment groups until 135th day of the trial period. Whereas, the lambs in T₄ group showed significantly ($P < 0.05$) higher body length (cm) than T₁ group animals at the end of 150th day of trial period mainly due to higher body weight. It was consistent with the findings of Santhoskumar (2017). The body length observed in Mecheri sheep was in close agreement with the reports of Karunanithi *et al.* (2004) who recorded the body length of Mecheri sheep as 51.96 ± 0.25 , 55.16 ± 0.69 and 58.67 ± 0.27 cm at 3, 6 and 9 months of age, respectively.

There was no significant difference in chest girth (cm) among treatment groups until 75th day of the trial period. Whereas, the chest girth (cm) of lambs in T₄, T₃ and T₂ showed significantly ($P < 0.05$) higher values than

the lambs in T₁ group from 90th day to 120 day of trial period. Lambs in T₄ group shown significantly ($P < 0.01$) higher chest girth than T₂ and T₁ groups, but not significantly different from T₃ group from 135th day of trial period until the end of trial period. In the same period, T₃ was significantly higher than T₁ but not significantly different from T₂ group. Results of the present study indicated that chest girth (cm) of lambs increased correspondingly to the body weight of the animals. Chest girth recorded in this experiment are higher than the values reported by Karunanithi *et al.* (2004); Santhoskumar (2017) in Mecheri lambs at the same age mainly due to higher body weight recorded in the lambs of the present study.

Mean (\pm SE) fortnight height at withers (cm) of Mecheri lambs as influenced by cotton gin trash is shown in Table 2. There was no significant ($P < 0.05$) difference in height at withers (cm) among treatment groups until 105th days of the trial period except on 45th day where the height at withers of lambs in T₄ group was significantly ($P < 0.05$) higher than T₃, T₂ and T₁ groups. Lambs in T₄ group had shown significantly ($P < 0.01$) higher height at withers (cm) than T₂ and T₁ groups but not significantly different with T₃ group from 165th to 180th day of trial. Generally, the body weight of Mecheri lambs had very less correlation with height at withers. Whereas, there was a highly significant difference noticed in the height at withers (cm) of lambs in T₄ due to higher body weight than other treatment groups. Similar findings were reported by Sundaram *et al.* (2002) in Madras Red fattening lambs reared under intensive system of management and Rajkumar and Agnihotri (2005) in Muzaffarnagari lambs reared under intensive system of management.

Table 1: Mean (\pm SE) fortnight body length and chest girth (cm) of Mecheri lambs as influenced by cotton gin trash.

Period	Body length (cm)					Chest girth (cm)				
	Cotton gin trash inclusion levels in roughage					Cotton gin trash inclusion levels in roughage				
	T ₁ (0%)	T ₂ (25%)	T ₃ (50%)	T ₄ (75%)	P value	T ₁ (0%)	T ₂ (25%)	T ₃ (50%)	T ₄ (75%)	P value
Initial*	49.29 \pm 0.58	49.21 \pm 0.29	49.16 \pm 0.41	49.18 \pm 0.39	0.996	54.05 \pm 0.49	54.28 \pm 0.49	54.01 \pm 0.56	54.08 \pm 0.36	0.979
15 days	49.47 \pm 0.42	49.75 \pm 0.32	49.77 \pm 0.53	49.46 \pm 0.40	0.925	56.37 \pm 0.59	55.55 \pm 0.63	56.17 \pm 0.55	56.72 \pm 0.42	0.517
30 days	50.11 \pm 0.42	50.32 \pm 0.43	50.33 \pm 0.54	50.37 \pm 0.56	0.982	57.65 \pm 0.60	57.52 \pm 0.54	57.93 \pm 0.73	58.42 \pm 0.27	0.689
45 days	51.15 \pm 0.45	51.42 \pm 0.25	51.46 \pm 0.37	51.55 \pm 0.31	0.874	59.08 \pm 0.60	59.47 \pm 0.66	59.58 \pm 0.58	60.07 \pm 0.35	0.673
60 days	52.95 \pm 0.50	53.25 \pm 0.33	53.52 \pm 0.47	53.80 \pm 0.41	0.565	60.67 \pm 0.55	61.51 \pm 0.55	61.08 \pm 0.60	61.88 \pm 0.40	0.428
75 days	54.67 \pm 0.71	55.05 \pm 0.35	55.1 \pm 0.49	55.67 \pm 0.57	0.643	61.95 \pm 0.57	62.86 \pm 0.35	62.88 \pm 0.56	63.26 \pm 0.33	0.265
90 days	55.73 \pm 0.87	57.08 \pm 0.49	57.16 \pm 0.52	57.95 \pm 0.58	0.127	63.03 ^a \pm 0.59	64.65 ^b \pm 0.26	64.68 ^b \pm 0.45	64.77 ^b \pm 0.39	0.028
105 days	56.12 \pm 0.88	57.37 \pm 0.48	58.88 \pm 0.61	58.87 \pm 0.63	0.052	64.25 ^a \pm 0.64	65.86 ^b \pm 0.29	66.33 ^b \pm 0.48	66.41 ^b \pm 0.41	0.011
120 days	57.01 \pm 1.00	57.97 \pm 0.42	58.61 \pm 0.65	59.80 \pm 0.74	0.079	65.16 ^a \pm 0.59	66.63 ^b \pm 0.36	67.37 ^b \pm 0.52	67.90 ^b \pm 0.47	0.003
135 days	57.45 \pm 0.96	58.4 \pm 0.42	59.86 \pm 0.72	60.55 \pm 0.99	0.066	65.92 ^a \pm 0.56	67.18 ^{ab} \pm 0.42	68.07 ^{bc} \pm 0.56	69.21 ^c \pm 0.57	0.001
150 days	57.88 ^a \pm 0.98	58.95 ^{ab} \pm 0.34	60.27 ^{ab} \pm 0.84	61.17 ^b \pm 1.02	0.050	66.47 ^a \pm 0.52	67.67 ^{ab} \pm 0.42	68.77 ^{bc} \pm 0.63	70.26 ^c \pm 0.71	0.001
165 days	58.33 \pm 0.97	59.22 \pm 0.35	60.70 \pm 0.82	61.37 \pm 1.01	0.063	67.07 ^a \pm 0.50	68.11 ^{ab} \pm 0.44	69.26 ^{bc} \pm 0.60	70.90 ^c \pm 0.73	0.001
180 days	58.80 \pm 1.03	59.72 \pm 0.37	61.11 \pm 0.81	61.73 \pm 1.08	0.096	67.71 ^a \pm 0.54	68.67 ^{ab} \pm 0.50	70.11 ^{bc} \pm 0.69	71.73 ^c \pm 0.81	0.001

Means bearing different superscripts in the same row differ significantly (P<0.05)

Number of observations per cell = 8; *Initial body length and chest girth of lambs at 4 months of age

Table 2: Mean (\pm SE) fortnight height at withers (cm) of Mecheri lambs as influenced by cotton gin trash.

Period	Height at withers (cm)				
	Cotton gin trash inclusion levels in roughage				P value
	T ₁ (0%)	T ₂ (25%)	T ₃ (50%)	T ₄ (75%)	
Initial*	53.37 \pm 0.44	53.72 \pm 0.24	53.66 \pm 0.49	53.55 \pm 0.14	0.911
15 days	54.27 \pm 0.49	55.02 \pm 0.29	55.36 \pm 0.70	55.55 \pm 0.26	0.265
30 days	55.82 \pm 0.42	56.61 \pm 0.27	56.55 \pm 0.88	57.23 \pm 0.24	0.320
45 days	56.83 ^a \pm 0.41	57.82 ^{ab} \pm 0.23	58.18 ^{ab} \pm 0.73	58.81 ^b \pm 0.29	0.038
60 days	58.08 \pm 0.51	59.08 \pm 0.21	59.57 \pm 0.74	59.87 \pm 0.32	0.079
75 days	59.3 \pm 0.46	60.61 \pm 0.36	60.47 \pm 0.78	60.97 \pm 0.36	0.148
90 days	60.91 \pm 0.32	61.61 \pm 0.40	61.72 \pm 0.68	62.12 \pm 0.47	0.384
105 days	61.88 \pm 0.28	62.48 \pm 0.41	62.41 \pm 0.68	63.32 \pm 0.48	0.241
120 days	62.57 ^a \pm 0.32	63.05 ^{ab} \pm 0.39	63.38 ^{ab} \pm 0.61	64.41 ^b \pm 0.49	0.050
135 days	63.35 ^a \pm 0.27	63.58 ^a \pm 0.40	64.07 ^a \pm 0.57	65.46 ^b \pm 0.50	0.012
150 days	63.82 ^a \pm 0.34	64.16 ^a \pm 0.41	65.12 ^{ab} \pm 0.47	66.17 ^b \pm 0.51	0.004
165 days	64.11 ^a \pm 0.36	64.51 ^{ab} \pm 0.41	65.63 ^{bc} \pm 0.40	66.60 ^c \pm 0.50	0.001
180 days	64.71 ^a \pm 0.47	65.13 ^{ab} \pm 0.52	66.46 ^{bc} \pm 0.37	67.50 ^c \pm 0.49	0.001

Means bearing different superscripts in the same row differ significantly (P<0.05)

Number of observations per cell = 8; *Initial height at withers at 4 months of age.

CONCLUSIONS

From the study, it could be conferred that the lambs fed with 75 per cent cotton gin trash in roughage portion, which increased the body weight gain along with linear body measurements mainly due to higher crude protein and gross energy in T₄ groups. Further studies can be conducted to find out the effect of feeding cotton gin trash in Mecheri lambs beyond 75 per cent inclusion level.

FUTURE SCOPE

Further research can be done to determine the impact of feeding cotton gin trash over the 75% inclusion level in the roughage portion of diet in Mecheri lambs on linear body measurements.

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