

Carcass Characteristics of off Season Mecheri Lambs under Concentrate and Urea Molasses Mineral Block Supplementation

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Abstract

A study was undertaken to assess the effect supplementation on the carcass characteristics of Mecheri ram lambs. In the growth trial, off season lambs (24 animals in three groups of eight lambs each) were reared under grazing (T1 -control, T2 -concentrate and T3 -urea molasses mineral block supplementation) for a period of 180 days and two animals from each group were slaughtered. Hot carcass weights were in accordance with the pre slaughter body weights and ranged from 6.69 kg to 9.74 kg. Dressing percentage based on pre slaughter weight was highest (46.63) for the T2 group. Lean percentage was higher in the supplemented groups than the unsupplemented group and bone percentage followed the reverse trend. Meat bone ratio was higher in T2 group (2.30:1) followed by T3 (2.27:1) and lower in T1 group (2.15:1). This reflects better quality of carcass from T2 and T3 groups. Loin eye area (LEA) values were higher in T2 group. Fabrication loss was similar in the groups with T2 group having the lowest value. T2 group also had the highest carcass length and larger loin eye area followed by T3 group indicating the beneficial effect of supplementation in these characters. From the results it could be concluded that supplementation had beneficial effect on carcass and meat quality of Mecheri lambs.

Key words: Mecheri lambs, Carcass characteristics, concentrate and UMMB supplementation

Introduction

Mecheri breed is a drought tolerant meat type sheep commonly found in Salem, Namakkal, Erode and parts of Dharmapuri and Karur districts of Tamil Nadu. Most of the sheep farmers rear their animals mostly by grazing with very little or no supplementation. Because of the low carcass weight and poor muscling; the carcasses obtained from these animals are generally below satisfactory level (6-8 kg). The beneficial effect of feed supplementation on carcass quality has been documented earlier Haddad and Husein (2004). In our country most of the works on these lines have been conducted with concentrate supplementation. The work on the effect of UMMB supplementation on the carcass quality is limited. Hence this was taken up to study the effect of UMMB supplementation on the carcass characteristics of off season Mecheri ram lambs.

Materials and Methods

A growth trial was conducted with 24 Mecheri ram lambs born in off season. Animals were divided into three groups of eight animals each, distributing them according to their body weight.

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Animals were in the age group of 2 to 4 months and average body weight was 9.8 kg. The treatment groups were as follows.

T1 - Grazing alone

T2-Grazing with concentrate supplementation

T3 - Grazing with UMMB supplementation

The experiment was conducted up to the marketable age (six months) : At the end of growing period, two animals from each of the three groups were slaughtered. The parameters like carcass weight, dressing percentage, bone meat ratio, wholesale cuts were recorded. In addition, sensory evaluation of cooked meat, shear force value and meat cholesterol estimations were carried out. Slaughter of animals was done by a trained butcher by Halal method.

The loin eye area was measured with a help of parchment paper by taking the impression of loin muscles on it and drawing the outline by using a marker pen. Then the outline was superimposed on a graph sheet and the area was measured in square centimeters.

Fascia was removed from the loin and *Longissimus dorsi* muscle was separated from its attachments to take samples for estimation of meat cholesterol and shear force value. Meat cholesterol estimation was done by subjecting the meat piece to overnight digestion and lipid extraction (Folch *et al.*, 1957) and cholesterol level was estimated as per the method of Allain *et al.* (1974). Shear force value was taken by subjecting 1cm x 1cm thick cooked meat sample to Warner Bratzler Shear and taking the average of three values.

Results and Discussion

Slaughter parameters

Means of carcass characteristics of off season lambs are presented in Table 1.

Table 1: Mean of carcass characteristics of off season Mecheri ram lambs

Parameter	Grazing only (T1)	Grazing with concentrate (T2)	Grazing with UMMB (T3)
Pre slaughter weight (PSW) (kg)	14.88	20.89	16.86
Empty live weight (ELW) (kg)	11.59	16.56	13.03
Hot carcass weight(kg)	6.69	9.74	7.65
Dressing % on PSW	44.97	46.63	45.38
Dressing % on ELW	57.79	58.83	58.72
Wholesale cuts (%)			
Fore quarter	55.12	53.74	54.38
Neck & shoulder	27.22	26.22	25.76
Breast & fore shank	14.50	14.00	15.08
Rack	13.20	13.24	13.04
Hind quarter	44.88	46.26	45.65
Loin	13.20	13.42	12.95
Legs	31.47	32.61	32.45
Carcass composition			
Lean (kg)	4.34	6.61	5.13
Lean %	64.87	67.86	67.06
Bone (kg)	2.02	2.88	2.26
Bone %	31.69	29.57	29.54
Meat bone ratio	2.15 : 1	2.30 : 1	2.27 : 1
Fabrication loss (%)	2.24	2.05	2.37
Carcass length (cm)	60.00	63.00	60.50
Loin eye area (cm²)	9.31	10.46	9.81
Shear force value (kg/cm ²)	5.94	5.07	5.39
Muscle cholesterol (mg/100g)	50.85	61.28	56.03
Edible organs (kg)			
Liver	0.248	0.355	0.324
Heart	0.078	0.111	0.107
Kidney	0.049	0.069	0.060
Spleen	0.050	0.066	0.047
Testicles	0.111	0.200	0.172
Pluck (kg)			
Trachea and lungs	0.26	0.31	0.27
Fat (%)	1.86	2.27	2.04

Pre-slaughter weights of the off season Mecheri ram lambs reflected the body weights of the animals of the corresponding groups. Animals were selected for slaughter as far as possible closer to their group average body weight.

Empty live weight was arrived by deducting the weight of digestive tract contents from the pre slaughter weight.

Hot carcass weights were in accordance with the pre slaughter body weights and ranged from 6.69 kg to 9.74 kg. Dressing percentage based on pre slaughter weight was highest in T2 group followed by T3 group and lowest in T1 group. Dressing percentage based on empty live weight also followed the same trend. Percentage of wholesale cuts was similar between the groups, and they were in the range of average values as reported by Shinde *et al.* (2008). Percentage of forequarters was in the range of 53.74 to 55.12 and percentage of hindquarters ranged from 44.88 to 46.26. Neck and shoulders ranged from 25.76 to 27.22 per cent with the highest value in T1 group. Highest value for breast and foreshank was observed in T3 group and the values ranged from 14.00 to 15.08. Rack values ranged from 13.04 to 13.24 and T2 group had slightly higher value. Loin values were in the range of 12.95 to 13.42 per cent with highest value in T2 group. Highest percentage of legs was observed in T2 group and the values ranged from 31.47 to 32.61 per cent.

Lean and bone weights were corresponding to the hot carcass weights of the animals. Lean values were in the range from 4.34 kg to 6.61 kg and bone

weight ranged between 2.02 to 2.88 kg. T2 group and T1 group had the highest and lowest lean percentages respectively. Bone percentage was lowest in T3 group (29.54) and highest in T1 group (31.69). Lean percentage was higher in the supplemented groups than the unsupplemented group and bone percentage followed the reverse trend. This is in accordance with the findings of Petit and Castonguay (1994), and Haddad and Husein (2004). Meat bone ratio was higher in T2 group (2.30:1) followed by T3 (2.27:1) and lower in T1 group (2.15:1). This reflects better quality of carcass from T2 and T3 groups.

Loin eye area (LEA) values were in the range of 9.31 to 10.46 sq.cm. T2 group had the highest and T1 group had the lowest values. In general, carcass length and LEA values were higher for the group T2 compared to T1 group and T3 group had the intermediate value. Weights of the edible organs were in the range of average values. Fat value was highest in T2 group followed by T3 and least in T1 group. Some works done in the developed countries indicate that supplemented animals had higher proportion of fat than lean (Joy *et al.*, 2008). But in this work fat percentage was negligible compared to the reported values. Slaughter of animals at ideal stage of growth and season might be the reasons.

Fabrication loss ranged between 2.05 and 2.27. It was minimum in the T2 group and maximum in T3 group. T2 group also had the highest carcass length and larger loin eye area followed by T3 group indicating the beneficial effect of supplementation in these characters.

Fluharty *et al.* (1999) reported similar results in lambs.

Shear force value

Shear force value (5.94 kg/cm²) was higher for T1 group, followed by T3 and T2 had the lowest value (5.07 kg/cm²). It denotes the tenderness of the meat was more for supplemented groups. Kirton *et al.* (1981) reported a similar trend.

Muscle cholesterol

Muscle cholesterol levels were higher in T2 group. T3 group had next higher value and the lowest value was reported for T1 group. Supplementation increases the fat deposition in muscle and hence the values are high for supplemented groups. But Solomon *et al.* (1992) could not find any difference in cholesterol content of lean tissue by type of diet. The muscle cholesterol levels are in agreement with the values reported for lambs by Solomon *et al.* (1990) and Solomon *et al.* (1992).

Though there were appreciable differences in the weights of edible organs, it was mainly due to the difference in slaughter weights. Fat percentage was more in T2 group and least in T1 group. The nutritional treatments apparently had no additional effect on carcass composition other than that normally associated with carcass weight (Kirton *et al.*, 1981). The effect of different supplementation on carcass traits and meat quality were minimal (Fahmy *et al.*, 1992). But good muscling and grades of carcasses were achieved through supplementation (Petit and Castonguay, 1994).

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