EFFECT OF DRY FODDER BASED COMPLETE FEED ON CARCASS COMPOSITION AND SERUM PROFILE OF MADRAS RED SHEEP

P. Vasan*[1] and T. Sivakumar[2]
Institute of Animal Nutrition
Post Graduate Research Institute in Animal Sciences
Tamil Nadu Veterinary and Animal Sciences University
Kattupakkam, Tamil Nadu, India

ABSTRACT

The present study was carried out to investigate the effect of complete feed regimen on the carcass composition and serum profile of Madras Red sheep. Sixteen numbers of Madras Red lambs (90 d old) were dewormed and maintained on a dry fodder based complete feed regimen (14.25 % crude protein and 61.07 % TDN) for a period of 180 days. The animals were provided with ad libitum water and feed at all times. During third month of trial, blood samples were collected from individual animals via jugular vein for serum mineral and enzyme profile. At the end of 270 d the animals were slaughtered and the carcass parameters recorded. The average final body weight was 18.03 ± 0.89 kg and the mean daily body weight gain was 57.58 ± 4.65 g/day. The dry matter intake was 0.93 ± 0.08 kg/day. the carcass traits including those of edible and non edible portions and serum profile of Madras Red sheep maintained under intensive management system fed dry fodder based complete feed were found to be superior to those of Nellore and Garole sheep breeds..

Key words: Carcass traits, Complete feed, Mecheri sheep, Serum profile.

Small ruminants such as sheep and goats play important role in the livestock subsector of the Indian agricultural economy. India ranks 3rd in sheep population, next to China and Australia and is placed 7th among the top 10 countries of the world in terms of meat and wool production, the total sheep in the country is 65.06 million numbers. Madras Red is a prolific sheep breed found in North eastern districts of Tamilnadu. In the present context, the concept of rearing small ruminants under intensive system of management is gaining momentum due to acute shortage of grazing and browsing lands and diversion

*Corresponding author, email: drpvasan@yahoo.com

1Professor, Dept. of Animal Nutrition, Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University, Namakkal, Tamil Nadu, India

2Dean, Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University, Orathanadu, Tamil Nadu, India.

of existing natural pasture lands to other commercial purposes. Good healthy animals are said to have good breed characteristics and specifications, in addition to optimum blood parameters. Serum biochemical parameters are known to be realistic indicators of the vital organ functions and the physiological status of animals. Hematological and serum biochemical tests are widely used for the diagnosis of serious animal diseases which can lead to economic losses in animals (Bani *et al.,* 2008). There are very limited data available on the normal biochemical parameters of this breed, considering the geographical importance of this breed and in order to undertake the prophylactic measures to safeguard this sheep breed the present work was conducted to analyze and establish the baseline value for serum biochemical parameters in healthy herd. Moreover, it would be appreciated by the farming community if the effect of intensive management on the carcass and serum profile of sheep is explored. Hence the present study was designed to investigate the effect of complete feed regimen on the carcass composition and serum profile of Madras Red sheep.

Sixteen numbers of Madras Red lambs, 90 d old (mean initial weight: 8.72 ± 0.35 kg) were obtained from a single flock. The animals were dewormed and maintained on a dry fodder based complete feed regimen (14.25 % crude protein and 61.07 % TDN) for a period of 180 days. The animals were housed in individual cages provided with separate waterer and feeder. The animals were provided with ad libitum water and feed at all times. During third month of trial, blood samples were collected from individual animals via jugular vein for serum mineral and enzyme profile. At the end of 270 d the animals were slaughtered and the carcass parameters recorded. The carcass parameters recorded were: live weight, circumference of neck, height, length, heart girth, skin weight, deskinned weight, carcass weight, weights of head, neck, blood, foot, pluck, lungs + trachea, liver, spleen, kidney, heart, stomach and intestine (with and with out contents), loin, thighs, shoulder, tail, ribs, pelvis and hind and meat: bone ratio. The serum profile analyzed were calcium, phosphorus and activities of alkaline phosphatase (Kind and King, 1954), SGOT and SGPT (Reitman and Frankel, 1957).

The ingredient composition (kg/100 kg) of the experimental diet is as follows: sorghum stover 60; maize 5; groundnut oil cake 10; soybean cake 15; molasses 4; DORB 4; mineral mixture 1 and salt 1. The crude protein and TDN content of the diet was 14.25 and 61.07 per cent respectively. The cost of diet was (Rs/kg) 4.58. The roughage: concentrate ratio was kept at 60:40. The results pertaining to serum minerals and enzyme activities are presented in Table 1. The serum calcium concentration was lying in the minimum level of the normal range (normal 8 to 12 mg/dl). The phosphorus level was within normal range. No major variation was observed for the serum enzyme activities. The average final body weight was 18.03 ± 0.89 kg and the mean daily body weight gain (ADG) was 57.58 ± 4.65 g/day. The dry matter intake was 0.93 ± 0.08 kg/day.

Table 1. Serum profile of Madras Red rams

Sl. No.	Attributes	Units
1	Calcium (mg/dl)	8.59 ± 1.11
2	Phosphorus (mg/dl)	7.09 ± 0.28
3	Total Protein (g/dl)	6.52 ± 0.54
4	Albumin (g/dl)	3.12 ± 0.09
5	Glucose (mg/dl)	54.62 ± 2.85
6	Cholesterol (mg/dl)	67.80 ± 3.22
7	ALP activity (KA units)	26.09 ± 1.96
8	SGOT (IU/L)	9.89 ± 0.53
9	SGPT (IU/L)	5.23 ± 0.15

Table 2. Carcass traits of Madras Red rams

Attributes	Units
Live wt. before slaughter (kg)	18.05 ± 0.97
Length (cm)	77.00 ±1.58
Height (cm)	62.50 ± 0.65
Heart girth (cm)	64.25 ± 1.89
Skin wt. (kg)	2.01 ± 0.14
Deskinned sheep wt. (kg)	14.45 ± 0.87
Carcass wt. (kg)	8.25 ± 0.48
Neck wt. (kg)	0.54 ± 0.04
Head wt. (kg)	1.32 ± 0.05
Foot wt. (kg)	0.54 ± 0.02
Blood wt. (kg)	0.63 ± 0.04
Dressing percentage (%)	46.01 ± 0.01
Pluck wt. (kg)	0.75 ± 0.04
Neck circumference (cm)	29.50 ± 3.57
Lungs + trachea (kg)	0.30 ± 0.01
Liver (kg)	0.33 ± 0.02
Spleen (gm)	70.00 ± 5.77
Kidney (gm)	80.00 ± 4.08
Heart (gm)	97.50 ± 4.79
Stomach + intestine with contents (kg)	5.42 ± 0.26
Empty stomach + int. (kg)	1.58 ± 0.05
Thighs (kg)	1.89 ± 0.08
Shoulder (kg)	1.66 ± 0.08
Tail (gm)	37.50 ± 8.54
Meat: bone ratio	60.79 ± 0.83

The carcass traits of experimental animals are presented in Table 2. The live weight before slaughter was higher than those values reported by Krishnan and Mohanlal (1985) for Nellore breed sheep and by Banerjee (2003) for Garole breed sheep at 12 months age. The dressing percentage was agreeable with the results obtained by Banerjee (2003) for Garole breed sheep. The liver weight was lower (330 vs. 575 g), while that of spleen was higher (70 vs. 20 g) in Madras Red rams when compared to Garole rams (Banerjee, 2003). Overall, the differences in carcass traits would be attributable to both the genetic and environmental factors.

The values of serum glucose are in similarity with that of the values reported by earlier studies on Mecheri sheep (Selvaraj *et al.,* 2004) and Hassan sheep (Ramesh *et al.,* 2019). The total serum protein level in the present study was similar to that of earlier findings (Devendran *et al.,* 2009 and Latimer, 2011). Furthermore, study on serum total protein, albumin and globulin by Javed *et al.* (2010) in Punjab sheep were also in comparable to the present study. The values of major serum enzymes like SGPT, SGOT and ALP were found to be similar as reported in recent studies (Das *et al.,* 2017) in local non-descript sheep of Assam.

The present investigation revealed that the carcass traits including those of edible and non edible portions and serum profile of

Madras Red sheep maintained under intensive management system fed dry fodder based complete feed were found to be superior to those of Nellore and Garole sheep breeds.

ACKNOWLEDGEMENT

The author acknowledges the assistance provided by the state government sponsored fodder crops scheme and the Tamilnadu Veterinary and Animal Sciences University for providing necessary facility to conduct the research work.

REFERENCES

Banerjee, (2003). Studies on some economic traits of Garole sheep of West Bengal. Ph.D. thesis submitted to the Department of Animal Science. Bidhan Chandra Krishi Viswavidyalaya. Mohanpur, West Bengal, India.

Bani, I.Z.A., Al-Majali A.M., Amireh, F. and Al-Rawashreh (2008). Metabolic profile in goat does in late pregnancy with and without subclinical pregnancy toxemia. *Veterinary Clinical Pathology*, **37**: 434-437.

Das, H., Ali, M.A., Devi, L.I., Kirthika, P., Gali J.M.R. and Behera, P. (2017). Studies on some important enzymes of non-descript sheep of Assam. *Journal of Livestock Science* (ISSN online 2277-6214) **8**: 59-62.

Devendran P., Jayachandran S., Visha P., Nanjappan K. and Panneerselvam, S. (2009). Hematological and blood biochemical profile of Coimbatore sheep. *The Indian Journal of Small Ruminants,* **15**(1): 98-101.

Javed, L.T., Ahmad, M., Irfan, I., Ali A., Khan, M., Wasiq, F. A., Farooqi, A., Latif Shahid and Cagiola, M. (2010). Haematological and Serum Protein Values in Tuberculin Reactor and Non-Reactor Water Buffaloes, Cattle, Sheep and Goats. *Pakistan Veterinary Journal*. ISSN: 0253-8318 (PRINT), 2074-7764 (ONLINE) Accessible at: www.pvj.com.pk.

Kind, P.R.M. and King, E.J. (1954). Estimation of plasma phosphatase by determination of hydrolysed phenol with amino-antipyrine. *Journal of Clinical Pathology,* **7**(4)**:** 322–326.

Krishnan, C.A.G. and Mohanlal, G.M. (1985). Livestock and poultry enterprises for rural development. Vikas Publishing house Pvt., New Delhi.

Latimer K.S. (2011). Duncan & Prasse's Veterinary Laboratory Medicine: Clinical Pathology, 5th Ed., Wiley-Blackwell.

Ramesh D., Aswathanarayanappa, V., Naveen Kumar, G.S., Vinuthan, M.K., Veena, M.P. and Shivakumar, M.C. (2019). Study on serum biochemical profile in Hassan sheep of Karnataka. International Journal of Livestock Research, **8**(5): 98-105

Reitman, S and Frankel, S.E. (1957). A colorimetric method for the determination of serum glutamic oxalacetic and glutamic pyruvic transaminases. *American Journal of Clinical Pathology,* **28**(1): 56-63.

Selvaraj, P., Mathivanan, R. and Nanjappan, K. (2004). Haematological and biochemical profile of Mecheri sheep during winter and summer. *Indian Journal of Animal Sciences,* **74**(7): 718-720.