Carcass Characteristics of Pattanam Sheep of Tamil Nadu, India

A. Paramasivam[1]*, A. Kalaikannan[2], D. Santhi[1] and R. Ilavarasan[2]

[1]Livestock Farm Complex, [2]Department of Livestock Products Technology, Veterinary College and Research Institute, Orathanadu, Tamil Nadu Veterinary and Animal Sciences University, Chennai, India

*Corresponding author

A B S T R A C T

A study was conducted to study the carcass characteristics of the Pattanam sheep breed of Tamil Nadu. Two groups each consisting of six male lambs with 5 to 6 months age in one group and 8 to 9 months age in the other group were subjected to humane slaughter and the carcass characteristics were assessed. The parameters viz., carcass weight, dressing percentage, weight of organs and fabrication loss were recorded. The live weight, the dressed weight and the meat for retail sale were significantly ($P \leq 0.01$) higher in 7 to 8 months aged lambs. Fabrication loss was found to be significantly ($P \leq 0.01$) higher in the 5 to 6 months aged Pattanam lambs. But there was no significant difference in the dressing percentage between the two age groups. The weight of blood, head, stomach & intestine, liver, heart, trachea and lungs, kidney, spleen and skin were significantly ($P \leq 0.05$) higher in 7 to 8 months aged lambs. There was no significant difference between the of feet weight between the two age groups. In conclusion, it is recommended that the Pattanam male lambs can be slaughtered at the age of 7 to 8 months of age to obtain a substantially higher weight carcasses and edible offals.

Introduction

Sheep farming is one of the most important and prevalent livelihood for the farming community in India. Sheep rearing does not require high cost infrastructure for housing and also needs less labour for the management, compared to other livestock. According to the 20th livestock census report (2019) of the Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal husbandry and Dairying, Government of India, the total sheep population in the country was 74.26 million

during 2019 where 13.8% of the total livestock was contributed by sheep. Compared to the previous census in 2012, there had been an increase by 14.13% of the total sheep population with 13.25% increase in rural areas and 57.28% in urban areas. Tamil Nadu occupies 5th place in the country with 4.5 million sheep population and there had been a decrease by 5.98% compared to the year 2012.

In the tropical regions, sheep are mainly reared for mutton production and there are no social and religious taboos for the

consumption of mutton, compared to some other meat types. Sheep are the species with the highest number of recorded breeds contributing 25 percent to the global total for mammals and very few sheep breeds from Asia have spread outside their home ranges – despite the fact that Asia has around 40 percent of the world's sheep (FAO, 2007).

Pattanam is an important mutton-breed sheep and is popular among the farmers for its heavy body weight (Ravimurugan, *et al.,*2010a; Ravimurugan *et al.,* 2010b) and the preference of farmers towards Pattanam sheep is growing higher and higher (Ravimurugan and Pavithra, 2020). Pattanam sheep is a large-sized animal with a compact body. They are uniformly creamy white in colour with black colour in the ventral region from the inner side of the jowl extending up to the inguinal region. Pattanam sheep were distributed in Paramakudi, Mudukulathur and Kamuthi taluks of Ramanathapuram district, and part of Karaikudi, Sivangangai, Manamadurai and Ilaiyankudi taluks of Sivagangai district and Aruppukottai and Thiruchuli taluks of Virudhunagar district (Ravimurugan *et al.,* 2012).

Breed characteristics of Pattanam sheep had been established through a few studies the carried out in the last decade (Ravimurugan *et al.,* 2012, Ramachandran, 2012).It had been recorded that the mature weight of Pattanam sheep was higher than other sheep breeds of southern Tamil Nadu and had better adaptability with the migratory system of management. In spite of its economic and managemental benefits, Pattanam sheep breed is not included in the list of notified breeds of the Indian States (Ministry of Agriculture and Farmers Welfare, India, 2019), since sufficient research works need to be carried out to completely establish the identity of the breed. Hence the present study has been carried out to study the carcass characteristics of the Pattanam sheep breed at different ages.

Materials and Methods

Pattanam lambs which were reared under semi-intensive system at the Livestock Farm Complex of Veterinary College and Research Institute, Orathanadu were divided into two groups consisting of male lambs with 5 to 6 months age in one group and 8 to 9 months age in the other group. Six lambs in each group were subjected to humane slaughter at the Department of Livestock products Technology and the the carcass characteristics were assessed. The parameters viz., carcass weight, dressing percentage, weight of organs and fabrication loss were recorded. About 12 hours prior to slaughter feeding was withheld and the lambs were given access to adlibitum water for drinking. Animals were weighed on electronic weighing scale prior to slaughter. Animals were slaughtered following standard slaughter procedure using over head rail system. Flaying was done and skin was weighed. The carcass was then eviscerated and the weights of head, blood, skin and all edible organs and were noted. The data thus collected were analysed statistically by using independent sample 't' test as proposed by Snedecor and Cochran (1996).

Results and Discussion

The carcass characteristics of the Pattanam lambs are presented in Table 1. The live weight, the dressed weight and the meat for retail sale were significantly (P≤0.01) higher in 7 to 8 months aged lambs. Selvakkumar *et al.,* (2020) had carried out similar studies in Vembur Sheep of Tamil Nadu in which the male lambs attained a live weight of 17.68±0.47 at 9 months of age and 21.67±0.30 at 12 months of age. They have recorded a significantly (P≤0.01) better hot carcass weight in the higher age group animals similar to the findings of the present study. In another study, Skapetas *et al.,* (2006) evaluated the effect of age at slaughter on carcass characteristics in lambs of

mountain Greek breeds at the age of 30, 45, 60, 75 and 90 days and confirmed that the slaughter of lambs might be carried out at higher ages (75 or 90 days) in order to produce heavier carcasses that are acceptable for consumers. Fabrication loss was found to be significantly (P≤0.01) higher in the 5 to 6 months aged Pattanam lambs. But there was no significant difference in the dressing percentage between the two age groups.

Shinde *et al.,* (2018) recorded similar dressing percent values during the slaughter studies of 6 to 8.8 months old Malpura ram lambs. As in the present study, Selvakkumar *et al.,* (2020) had also recorded a decrease in the fabrication loss in 12 months old sheep and no significant difference in the dressing yield on live weight between the two age group (9 and 12 months) of animals.

Table.1 Carcass characteristics of Pattanam lambs of different age groups

Carcass Characteristics	Age of the animal		Significance
	5 to 6 months (n=6)	7 to 8 months (n=6)	
Live Weight (Kg)	13.53±0.48	19.95±0.65	**
Dressed weight (Kg)	6.69±0.24	10.14±0.59	**
Dressing Percentage (%)	49.55±1.47	50.69±1.32	NS
Fabrication Loss (Kg)	0.24±0.01	0.09±0.01	**
Total Meat for Retail Sale (Kg)	6.45±0.24	10.05±0.58	**

** - (P≤0.01)
NS - Not significant

Table.2 Yield of head, blood, skin and edible organs of pattanam lambs of different age groups

Carcass Characteristics	Age of the animal		Significance
	5 to 6 months (n=6)	7 to 8 months (n=6)	
Weight of Blood (Kg)	0.65±0.14	1.13±0.02	*
Weight of Head (Kg)	1.14±0.10	1.40±0.08	**
Weight of Feet (Kg)	0.54±0.04	0.65±0.04	NS
Weight of Stomach and Intestine (Kg)	0.84±0.09	1.10±0.03	**
Weight of Liver (Kg)	0.22±0.02	0.59±0.23	**
Weight of Heart (Kg)	0.07±0.00	0.11±0.00	**
Weight of Trachea and Lungs (Kg)	0.23±0.02	0.30±0.01	*
Weight of Kidney (Kg)	0.05±0.00	0.09±0.01	**
Weight of Spleen (Kg)	0.05±0.00	0.07±0.00	**
Weight of Skin (Kg)	1.72±0.06	1.98±0.10	*

** - (P≤0.01)
* - (P≤0.05)
NS - Not significant

The yield of head, blood, skin and edible organs of Pattanam lambs of different age groups are presented in Table 2. The weight of blood, head, stomach and intestine, liver, heart, trachea and lungs, kidney, spleen and skin were significantly (P≤0.05) higher in 7 to 8 months aged lambs. There was no significant difference between the feet weight of two age groups. Similar to this, Abdullah and Qudsieh (2008) studied the effects of slaughter weight on carcass characteristics of Awassi ram lambs and found that the edible offals weight were significantly higher in higher weight group lambs. In Malpura ram lambs, which were slaughtered at three different ages of 6.0, 7.5 and 8.8 months, Shinde *et al*., (2018) recorded significantly higher yield of the edible offals weight, as observed in the present study.

In conclusion the pattanam type male lambs attains a live body weight of around 19.95 kg in 7 to 8 months of age with a dressing percentage of around 50.69 percent and a saleable meat yield of 10.05 kg along with a higher yield of edible offals and skin which would fetch higher economical returns to the producer and the processor. In conclusion, it is recommended that the pattanam male lambs can be slaughtered at the age of 7 to 8 months of age to obtain a substantially higher weight carcasses and edible offals.

Acknowledgement

References

Abdullah, A. Y., and Qudsieh, R. I. (2008). Carcass characteristics of Awassi ram lambs slaughtered at different weights. *Livestock Science*, 117(2-3): 165-175.

FAO. 2007. *The State of the World's Animal Genetic Resources for Food and Agriculture*, edited by Barbara Rischkowsky & Dafydd Pilling. Rome.

Ministry of Agriculture and Farmers Welfare, India (2019) Department of Agricultural Research and Education, The Gazette of India, No 3364.

Ministry of Fisheries, Animal Husbandry and Dairying (2019) 20th livestock census 2019 All India Report http://dahd.gov.in/sites/default/filess/20th%20Livestock%20census-2019%20All%20India%20Report_0.pdf

Ramachandran, A. *Molecular Characterization of Pattanam and Nellore Sheep Breeds of South India* (Doctoral dissertation, TANUVAS).

Ravimurugan, T. and Pavithra, P. (2020). Characterization and Evaluation of Pattanam Sheep of Tamilnadu. *Int. J. Curr. Microbiol. App. Sci*, *9*(6): 2845-2849.

Ravimurugan, T., Devendran, P. and Joshi, B.K. 2010a. Distribution and characterization of Kilakarsal (Keezhakaraisal) sheep. Ind. J. Small Ruminants, 16: 122–124.

Ravimurugan, T., Kumaravelu, N., Devendran, P. and Chellapandian, M. 2010b. Population status, management and morphological characteristics of Ramnad White sheep. J. Livest. Biodivers., 2: 42–44.

Ravimurugan, T., Thiruvenkadan, A. K., Sudhakar, K., Elango, A., and Panneerselvam, S. (2012). Breed characteristics of Pattanam sheep of Tamil Nadu, India. *Animal Genetic Resources*, 51, 99-104.

Selvakkumar, R., Sivakumar, T., and Meenakshi Sundaram, S. (2020). Carcass characteristics of vembur sheep of Tamil Nadu. Indian Journal of Small

Ruminants, 26(2): 284-286.

Shinde, A. K., Gadekar, Y. P., and Jairath, G. (2018). Effect of slaughter age on carcass traits of Malpura lambs. *Indian Journal of Small Ruminants*, 24(2): 308-314.

Skapetas, B., Sinapis, E., Hatziminaouglou, J., Karalazos, A., and Katanos, J. (2006). Effect of age at slaughter on carcass characteristics and carcass composition in lambs of mountain Greek breeds. *Czech Journal of Animal Science*, 51(7): 311.

Snedecor, G.W. and W.G. Cochran, (1996). Statistical Methods. 8th Edition. The Iowa state University press, Ames, Iowa, USA.

How to cite this article: