

# A STUDY ON CARCASS CHARACTERISTICS AND MEAT QUALITY OF KANNI GOAT

P. Sivakumar<sup>1</sup>, Robinson J.J. Abraham<sup>2</sup> and V.V.Kulkarni<sup>3</sup>

Keywords: Kanni Goat – Carcass Characteristics – Physico – Chemical Properties – Sensory Evaluation

## INTRODUCTION

Small ruminants play a vital role in the livelihood of small and marginal farmers and landless labourers of our country. Their contribution to economy through production of milk, meat, fiber, skin and manure etc., is substantial constituting above 5.4% of GNP of Agricultural sector. According to FAO (2004) goat contributed about 0.475 million tonnes of meat worth Rs.4750 crores to the Indian Economy. The demand for goat meat is progressively increasing as Indian consumers prefer goat meat among all and there is no taboo against consumption of chevon. The number of goats available for slaughter is comparatively higher in India. However, the meat yield per animal is lower than the world average as with 11% of the world's livestock population it only contributes 2.13% to the total meat produced in the world. The evaluation of carcass characteristics of indigenous breeds of goat is necessary to know the meat yield. Kanni goat is the only recognized goat breed of Tamilnadu with the native tract at Sattur, South of Tamilnadu. Carcass characteristics of this breed have not been studied so far. Hence, the present study was conducted to collect information on carcass characteristics and meat quality of Kanni goat breed.

## MATERIALS AND METHODS

Twelve male Kanni goats were purchased from the native tract – Sattur, Tamilnadu. The goats were

divided into two weight groups (12-15 kg and 15 - 18 kg) and each group comprised of six animals. Before the slaughter, the animals were starved for 12 to 16 hours with supply of ad libitum water. The slaughter weight was recorded and animals were slaughtered by Halal method. Blood was collected and weighed. The head was removed at the atlanto – occipital joint and flaying was done by case-on method. All abdominal and thoracic organs were removed and weighed separately. The alimentary tract was weighed with and without ingesta. All data related to edible and inedible offals were expressed as percentage of live weight. The hot carcass weight was recorded immediately after dressing. Carcass length was measured from the anterior edge of the first rib to the anterior point of aitch bone. The measurement of loin eye area was recorded on the surface of muscle at the interface of 12<sup>th</sup> and 13<sup>th</sup> rib on either side of the carcass by using plastic grid provided by the National Livestock and Meat Board, Illinois 60603, USA.

The separation of primal cuts was made by using methods prescribed by the Bureau of Indian Standards (IS No 2536-1963), New Delhi.

The pH of *Longissimus dorsi* muscle was measured using portable pH meter with a combined glass probe electrode (MP 120, Mettler – Toledo GmbH, Switzerland). The water holding capacity (WHC) was determined by using the method recommended by Grau

---

\* Part of M.V.Sc., thesis submitted by the first author to the Tamilnadu Veterinary and Animal Sciences University, Chennai - 51.

1. Subject Matter Specialist (AH) Krishi Vigyan Kendra, Usilampatti, Thanjavur.

2. Prof. and Head, Madras Veterinary College, Vepery, Chennai-7.

3. Prof. and Head, Department of Meat Science and Technology, VC&RI, Namakkal-1.

and Hamm (1957). The shear force value was carried out by using Warner – Bratzler shear (GR Electric manufacturing company, Manhattan, USA Model 3000). The proximate composition such as moisture, protein, fat and total ash were determined on fresh *Longissimus dorsi* muscle samples according to A.O.A.C., (1995)

Meat Color was measured using a color chart provided by the National Livestock and Meat Board, Illinois 60603, USA.

The data obtained were subjected to analyses of variance (Snedecor and Cochran 1989) to determine the effect of slaughter weight on carcass characteristics and meat quality of male Kanni goat.

#### RESULTS AND DISCUSSION

The effect of slaughter weight on carcass characteristics of Kanni goat are presented in the Table-1. The dressing percentage of higher weight group (15-18 kg) were numerically higher than lower weight group (12-15 kg), even though they were not statistically significant. This is similar to the findings of Kamble *et al* (1989) in Osmanabadi goats, as the carcass weight increased the dressing percentage also increased. The carcass length was significantly higher in higher weight group (15 – 18 kg) than the lower weight groups (12 – 15 kg). Kamble *et al* (1989) observed a similar increase in carcass length as the weight increased in Osmanabadi male goats. The loin eye area recorded in the study was high significantly ( $P < 0.05$ ) higher in higher weight group than lower weight group (12 - 15 kg). This finding is in close agreement with that of Kamble *et al* (1989) in Osmanabadi male goats and Agnihotri and Pal (1997) in Barbari male goats. The result of the study revealed that the proportion of inedible offal viz., blood,

head, skin, feet and alimentary tract decreased with increase in bodyweight. Similar findings were also recorded by Singh (1997) and Agnihotri and Pal (1997) in Marvari goats.

Table-2 depicts the effect of slaughter weight on meat quality and physico-chemical properties of Kanni goat meat. The slaughter weight did not have any influence on pH and WHC. Similar observations were also recorded by Palanichamy (1980) in mutton. The meat from slaughter weight goats of 15 – 18 kgs had significantly ( $P < 0.01$ ) higher shear force value. When the slaughter weight increased the shear force value also increased. The reasons may be due to increased thickness of muscle fibre as the age and live weight increased. Similar results were also reported by Kesava Rao *et al* (1984) in Black Bengal goats and Johnson *et al* (1995) in Florida Sheep.

The analysis of variance on tenderness scores showed significant difference between these two weight groups ( $P < 0.05$ ). The tenderness of the meat was significantly ( $P < 0.05$ ) influenced by slaughter weight. The tenderness score decreased with higher slaughter weight which supported the findings of Kamble *et al* (1989), and Carlucci *et al* (1998).

The analysis of variance on proximate composition revealed there was no significant difference between the two weight groups. This was in agreement with the findings of Johnson *et al* (1995) in Florida native breeds, Agnihotri and Pal (1997) in Barbari male goats, Pal *et al* (1997) in Muzaffarnagri lambs, who reported that slaughter weight did not significantly influence the percentage of moisture, protein or fat in muscle of longissimus dorsi in respective breeds.

**Table 1**  
Effect of slaughter weight on carcass characteristics of Kanni goat

Parameters	Slaughter weight		't' value
	12 – 15 Kg	15 – 18 Kg	
Slaughter weight (Kg)	14.25 ± 0.39	16.92 ± 0.39	4.8950 **
Carcass weight (Kg)	6.11 ± 0.28	7.69 ± 0.15	4.9527 **
Dressing percentage	42.81 ± 1.12	45.00 ± 0.78	1.9730 NS
Carcass length (cm)	53.17 ± 0.60	57.00 ± 0.37	5.4515 **
Longissimus dorsi area (cm <sup>2</sup> )	7.35 ± 0.13	8.02 ± 0.09	4.3344 **
Liver (%)	1.98 ± 0.24	1.68 ± 0.04	1.2220 NS
Trachea (%)	1.54 ± 0.06	1.58 ± 0.06	0.4011 NS
Heart (%)	0.40 ± 0.04	0.39 ± 0.03	0.1068 NS
Head (%)	6.74 ± 0.21	6.29 ± 0.12	1.9776 NS
Skin (%)	7.50 ± 0.23	7.57 ± 0.38	0.1924 NS
Legs (%)	3.08 ± 0.07	2.94 ± 0.08	1.2536 NS
Stomach with contents (%)	20.88 ± 0.83	19.95 ± 0.50	1.1229 NS
Stomach without contents (%)	3.22 ± 0.15	3.00 ± 0.11	1.1766 NS
Intestine with contents (%)	7.35 ± 0.58	6.73 ± 0.61	0.9305 NS
Intestine without contents (%)	2.73 ± 0.24	2.02 ± 0.26	2.0514 NS

\*\* - P< 0.01      \* - P<0.05      and NS – Not Significant

**Table 2**  
Effect of slaughter weight on meat quality of Kanni goat

Parameters	Slaughter weight		't' value
	12 – 15 Kg	Above 15 – 18 Kg	
pH	6.64 ± 0.09	6.48 ± 0.11	1.0823 NS
WHC (cm <sup>3</sup> )	1.59 ± 0.12	1.65 ± 0.02	0.2265 NS
Shear force value (kg / cm <sup>2</sup> )	3.75 ± 0.06	4.41 ± 0.05	5.0659 **
Tenderness	8.17 ± 0.17	7.50 ± 0.22	2.3904 **
Moisture (%)	76.39 ± 0.15	75.86 ± 0.20	2.0757 NS
Crude Protein (%)	19.56 ± 0.09	19.68 ± 0.17	0.6431 NS
Crude fat (%)	2.30 ± 0.06	2.39 ± 0.11	0.71277 NS
Ash (%)	1.20 ± 0.01	1.27 ± 0.04	1.6456 NS

\*\* - P< 0.01      \* - P<0.05      and NS – Not Significant

### Summary

Twelve numbers of Kanni male goat purchased from the native tract of Tamilnadu was slaughtered by Halal Method. An comparison of the two weight groups (12-15 Kg and 15-18 Kg) on carcass characteristics and meat quality was done and it was found that weight groups significantly affected the slaughter weight, carcass weight, carcass length and loin eye area. Tenderness and shear force value of *Longissimus dorsi* muscle were significantly ( $P<0.01$ ) affected by weight groups where as other meat quality parameters remained unaffected.

### REFERENCES

- Agnihotri, M.K and Pal, U.K. (1997) Carcass characteristics and compositions of Barbari Male Goats. *Indian Vet. J.*, 74:403-406.
- A.O.A.C., 1995, Official methods of analysis 16<sup>th</sup> edn. Association of official analytical chemists, Washington, D.C.
- BIS (1963) Indian Standard Specification for mutton and goat flesh fresh, chilled, frozen IS 2536, BIS, New Delhi.
- Carlucci, A., A. Girolami, F. Napolitano and E. Monteleone, 1998. Sensory evaluation of young goat meat. *Meat Sci.*, 50(1): 131-136.
- FAO, 2004 production year book. Food and Agriculture Organization, Rome Italy.
- Grau, R., and Hamm, R., (1957) cited by Hamm R 1960 *Advances of Food (Res) Academic Press, Newyork and London* 10:356
- Johnson, D.D., C.H. Mc Gowan, GNurse, and M.R. Anous, 1995. Breed type and sex effects on carcass traits, composition and tenderness of young goats. *Small Rumin. Res.*, 17 : 57-63.
- Kamble, V.J., Bonde, H.S., Kulkarni, K.D. and Kulkarni, D.N. (1989) Quality aspect of Osmanabadi goat meat. *J.Fd.Sci.Technol.*, 26:99-101.
- Kesava Rao, V., A.S.R. Anjaneyulu, and V.Lakshman, 1984. A note on carcass and meat characteristics of Black Bengal male goats. *J. Fd. Sci. Technol.*, 21:183-184.
- Pal, U.K., M.K. Agnihotri, and N.K. Sinha, 1997. Carcass traits of Muzaffarnagari lambs under intensive and semi-intensive mangent systems. *Indian J. of Anim. Sci.*, 67 (8): 720-722.
- Palanichamy, T., 1980. Studies on the biochemical architecture of chevon. M.V.Sc. thesis submitted to Tamil Nadu Agricultural University, Coimbatore.
- Singh, N.P., 1997. Quality and Quality of chevon in Marwari goats. *Indian J. of Small Rumin* 3(2):76-80.
- Snedecor G.W., and Cocharan, W.G. (1989) *Statistical methods of analysis oxford abd IBH Pub Company, Kolkatta.*