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A STUDY ON THE EFFECT OF PRESLAUGHTER WEIGHT ON CARCASS TRAITS AND MEAT QUALITY AND PROXIMATE COMPOSITION OF KANNI GOAT MEAT

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Abstract: Twelve numbers of intact Kanni male goats were purchased from the native tract Sattur, Virudhunagar District of South Tamilnadu to study the effect of preslaughter weight on carcass traits, meat quality and proximate composition of kanni goat meat. The experimented animals were divided into two weight group basis on their pre-slaughter weight. The Group-I consisting of six goats with the pre slaughter weight ranging from 12 to 15 kg and Group-II having a pre slaughter weight of above 15 kg and up to 18 kg. The study revealed that dressing percentage, carcass length, *Longimus dorsi* area significantly ($P < 0.05$) increased with increased in pre slaughter weight. The result of the study also revealed that the proportion of inedible offal viz., blood, head, skin, feet and alimentary tract decreased with increase in bodyweight. The slaughter weight did not have any influence on pH, water holding capacity and proximate composition values of its meat however the shear force value and tenderness value of the same significantly ($P < 0.01$) increased as the pre slaughter weight increased.

Keywords: Kanni Goat, pre slaughter weight, Carcass traits, meat quality, proximate composition.

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 475 MT 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 livestock it only contributes 2.13% of the total meat produced. The evaluation of carcass

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characteristics of indigenous breeds of goats is necessary to know the meat yield. Kanni goat is the only recognized goat breed of Tamilnadu and the native tract of 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 numbers of male Kanni goats were purchased from the native tract – Sattur, Tamilnadu. The goats were divided into two weight groups (12-15 kg and 15 kg to 18 kg) and each group comprised of 6 animals. A day before the slaughter, the animals were starved for 12 to 16 hours with adlibitum water only. The slaughter weight was recorded and animals were slaughtered by Halal method. The blood was collected and weighed. The head was removed at the atlanto – occipital joint and the flaying was done by case-on method. All abdominal and thoracic organs were removed and weighed. The lungs, trachea, heart and liver were weighed separately. The alimentary tract was weighed with and without ingesta. The hot carcass weight was recorded immediately after dressing. Carcass length was measured from the anterior edge of the first rip to the anterior point of aitch bone ('H' bone). The measurement of longissimus dorsi area was carried out by using plastic grid provided by the National Livestock and Meat Board, Illnosis 60603, USA.

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

The pH of L.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 and Hamm (1957). The muscle fiber diameter, sarcomere lengths were determined by using the method prescribed by Jeremiah and Martin (1977) and Cross *et al* (1981), respectively. The shear force value was carried out by using Warner – Bratzler shear (GR Electric manufacturing company, Manhatten, 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, Illnosis 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 effects of slaughter weight on carcass traits of kanni goat are presented in the Table-1. The dressing percentage was significantly ($P < 0.05$) higher in higher weight groups (15 to 18 kg) than lower ones (12 – 15 kg). This was in agreement with Prasad and Agnihotri (1992) and who also reported a similar dressing percentage in Barbari goats. The carcass length was significantly higher in higher weight groups (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, and vice versa in Osmanabadi male goats. The longissimus dorsi area recorded in the study was highly significant ($P<0.05$) than lower weight groups (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. Similar observations were also made by Palanichamy (1980) and in sheep. There was no significant difference in water holding capacity between these two weight groups. The reason for this might be due to very narrowing weight groups selected. Even though the shear force value was not significantly influenced by slaughter weight, shear force value for higher weight groups recorded numerically higher values. The meat from slaughter weight goats of 15 – 18 kgs had 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 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 P*al (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 respective breeds.

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).

Table 1
Effect of preslaughter weight on carcass traits 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^2)	7.35 ± 0.13	8.02 ± 0.09	4.3344 **
Percent value of liver	1.98 ± 0.24	1.68 ± 0.04	1.2220 NS
Percent value of trachea	1.54 ± 0.06	1.58 ± 0.06	0.4011 NS
Percent value of heart	0.40 ± 0.04	0.39 ± 0.03	0.1068 NS
Percent value of head	6.74 ± 0.21	6.29 ± 0.12	1.9776 NS
Percent value of skin	7.50 ± 0.23	7.57 ± 0.38	0.1924 NS
Percent value of legs	3.08 ± 0.07	2.94 ± 0.08	1.2536 NS
Percent value of stomach with contents	20.88 ± 0.83	19.95 ± 0.50	1.1229 NS
Percent value of stomach without contents	3.22 ± 0.15	3.00 ± 0.11	1.1766 NS
Percent value intestine with contents	7.35 ± 0.58	6.73 ± 0.61	0.9305 NS
Percent value 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 pre 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^2)	1.59 ± 0.12	1.65 ± 0.02	0.2265 ^{NS}
Shear force value (kg / cm^2)	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. A comparison of the two weight groups 12-15 Kg and 15-18 Kg, it was found that they were highly significant in the slaughter weight, carcass weight, carcass length, *longissimus dorsi* muscle area. The quality of meat except in the tenderness and shear force value was not significantly different in other parameters.

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