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Carcass Quality And Sensory Evaluation Of Indigenous *Khari* And Boer Crossbred Goats In The Mid-Hills Of Nepal

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Abstract:
Background*: The quality of animal source food (ASF) including goat meat is of great concern among the consumers globally. Carcass characteristics, chemical composition, and sensory characteristics are the basic indicators of carcass quality. This study aimed at comparing the carcass composition and sensory characteristics of two different genetic groups including Khari and Khari×Boer crossbred goats reared at the National Goat Research Program (NGRP), Bandipur, Nepal.*
Materials and Methods*: For this, a total of six adult castrated goats, three each from Khari and Khari×Boer crossbred were selected and slaughtered accordingly. Analysis of carcass characters, edible and non-edible offal components, chemical composition, cooking loss, drip loss and sensory characteristics was performed following a standard protocol. Data obtained for live body weight, hot carcass weight, offal measurements, biochemical characteristics were subjected to t-Test (unpaired, two-sided) using GenSTATv.19 with 5% level of significance.*
Results*: Statistically significant difference was found between the meat samples of two genetic groups of goat ($p<0.05$) only in case of large intestine and cooking loss percentage. Whereas, almost all parameters including carcass characteristics, edible and non-edible offal components, drip loss and biochemical composition were not affected ($p>0.05$) by the genetic group indicating the similarity in the meat quality of Khari and Khari×Boer crossbred goats. Sensory evaluation of meat samples was done by a group of panelists using standard formats. There was no any distinguishable difference in the meat color of the two genetic groups under examination, whereas, tenderness, juiciness and flavor were differentiated to some extent. Accordingly, meat of Khari goats was considered superior with respect to flavor and that of Khari×Boer crossbred goats was superior with respect to tenderness and juiciness by the panelists.*
Conclusion: *Results of this study primarily suggested that the two genetic groups were not an important source of variation with respect to the major parameters of carcass composition, biochemical properties and sensory characteristics of meat. Hence, an appropriate cross breeding plan in order to increase productive growth performance of genetic group such as Boer to that of Khari is essential to maintain different blood level. However, further in-depth study is suggested by covering several other factors affecting quality parameters of goat meat.*
Key Word: *Live weight; carcass; dressing percent; cooking and drip loss.*

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I. Introduction

Goats contribute significantly in the household income and nutrition security of rural communities in Nepal. There are about 13.99 million heads of goats contributing 14.48 percent to the total meat production in the country[1]. However, Nepal has imported Animal Source Foods (ASF) worth 3.65 billion Rupees including live animals against the import equivalent to 8.55 million Rupees with the trade loss of 3.56 billion Rupees[1]. Per capita meat consumption in Nepal has been reported to be 15 kg[2]. This indicates the ample scope and needs of livestock sector development including goat sub-sector. Goat meat is the most demanded and widely accepted commodity across cross-sections of cast, ethnicity and religion in Nepal. Goat meat is so popular that the department of Livestock Services had estimated around more than million goats are slaughtered in the country during Dashain.

Khari is the most prominent breed of indigenous goats comprising highest population in Nepal with 56% of the total indigenous goats[3] and is distributed from the very east to the far-west region across the mid-hill areas of the country. This is popular among the four indigenous breeds of goats viz. Chyangra, Sinhal, Khari and Terai, and even than the exotic breeds in the country mainly because of hardiness, low input requirement, high prolificacy and high consumer preference of its meat[4]. Likewise Boer goat has taken market among the commercial goat entrepreneurs mainly because of its higher average daily gain[5]. Enhancing productivity of indigenous Khari goats by introducing Boer bucks is becoming popular cross-breeding practice among the farming communities.

Assessment of carcass quality is crucial for various reasons, including food safety, consumer satisfaction, economic viability, efficiency, and sustainability in the agriculture and food industries. It helps ensure that meat products are safe, high-quality, and meet consumer and regulatory expectations. Carcass quality is of great concern among the consumers in Nepal. However, very limited works have been done regarding the assessment of carcass quality of Khari and Boer crossbred goats in Nepal. Taking this fact into account this study has been carried out to evaluate the Khari and Boer crossbred goats in terms of carcass quality and sensory characteristics at the National Goat Research Program (NGRP), NARC, Bandipur, Tanahun, Nepal.

II. Material And Methods

This study was done in the National Goat Research Program (NGRP), Bandipur, Tanahun, Nepal from January 2019 to August, 2021. NGRP is located in the mid-hill agroecological domain of Gandaki Province of Nepal having an altitude range of 850 - 900 masl, with an average annual minimum temperature of 11.8^{0}C, maximum temperature of 25.5^{0}C relative humidity 79.9% and precipitation 207 mm.

Management of experimental animals: NGRP has been conducting various crossbreeding researches mainly aiming at evaluating the most compatible bloodline of Boer goat with the Nepalese indigenous Khari goats with respect to growth performance of castrated male kids. Accordingly, a total of 30 kids including 15 pure Khari breed and 15 Khari×Boer (50%) crossbred born at a time were reared under the uniform husbandry management system at NGRP. Entire experimental animals were supplemented with concentrate feed mix containing 18% crude protein (CP) and 77.5% total digestible nutrients (TDN). During the experimental period, all the animals were regularly de-wormed with a broad spectrum anthelmintic (Albendazole) in every 3 months, dipped into the 0.5% solution of Malathion 50 EC twice a year, and vaccinated against PPR, FMD and enterotoxaemia once a year.

Detail information on feeding management of the experimental animals is presented in **Table no1 and 2.**

Table no1. Formulation of the concentrate feed for the experimental animals. 2019-2021. NGRP, Bandipur[6]

SN	Ingredients	CP	CF	OM	DM	EE	Ca	P	Ash	Inclusion %
1	Yellow maize	10.2	3.8	98.1	88.9	1.4	0.16	0.42	1.9	33.5
2	Wheat bran	12.72	9.8	93.4	88.2	2.2	0.32	0.58	6.6	20.0
3	Rice polish	10.4	10.6	88.6	89.1	6.8	0.24	0.71	11.4	18.7
4	Mustard cake	31.8	11.8	91.2	89.7	8.8	0.72	0.93	8.8	10.0
5	Soybean cake	39.4	6.8	92.4	90.1	-	1.30	0.65	7.6	16.2
6	Common salt									0.5
7	Mineral mixture									1.0
	Total									**100**

Composite lots of locally available fodder and forage species were provided *ad lib* to the experimental animals. The major local fodder/forages included Rai khanyo (*Ficus semicordata*), Ipil-ipil (*Leucaena leucocephala*), Dhalne Kattus (*Castonopsis indica*), Kabro (*Ficus lacor*), Kimbu kafal (*Morus alba*), Nimaro (*Ficus roxburghii*), Bakaino (*Melia azaderach*), Saal (*Sorea robusta*), Kutmiro (*Litsea monopetala*), Dabdabe (*Garuga pinnata*), Tanki (*Bauhinia purpurea*), Super Napier (*Pennisettum purpurium*), Oat grass (*Avena sativa*), Signal (*Brachiaria decumbens*), Koiralo (*Bauhinia variegata*), Bhimsen pati (*Buddleja asiatica*), Khasru (*Quercus semicarpifolia*), Pakhuri (*Ficus globerrima*) etc.

Table no2. Nutrient contents (%) of concentrate feed and fodder used for the experimental animals. 2019-2021. NGRP, Bandipur

Nutrients	Concentrate mix (%)	Composite fodder (%)
CP	20.81	11.78
Moisture	12.76	66.87
TDN	77.5	
Fat	4.29	
Fiber	8.92	
NDF		68.77
ADF		44.55
ADL		24.72
DM	87.24	33.13
Ash	1.59	5.41

Silica	0.59	

Source: Lab Report (2022)

Animal preparation and slaughter: Out of the 30 experimental animals under growth performance evaluation of pure *Khari* and *Khari×Boer* crossbred (50%), 6 castrated male kids including 3 of each genetic group were selected for carcass quality and sensory evaluation at the age of 15 months. The experimental goats were fasted overnight, taken the live weight, and slaughtered[7].

Carcass analysis: Immediately after slaughter of experimental animals, the blood was drained into a bucket and taken its fresh weight. All the hair removed, dried and taken the dried-hair weight accordingly. De-skinning was done and weighed the skin (hide). All external and internal organs were separated and weighed accordingly. For the carcass components, the parameters such as live/slaughter weight, hot carcass weight, fore-left quarter, fore-right quarter, rear-left quarter, rear-right quarter, dressing percentage, abdominal fat percent were measured. Dressing percentage was calculated as proportion of hot carcass weight over the body weight at slaughter as follows:

$$\text{Dressing \%} = \frac{Weight\ of\ hot\ carcass}{Live\ weight\ taken\ immediately\ before\ slaughter} \times 100\%$$

Whereas, edible offal characteristics measured were blood, head with tongue, heart, liver, kidney, lungs, heart, digestive tract without ingesta, oesophagus, rumen, reticulum, omasum, abomasums, small intestine, large intestine, pancreas with fatty layer, abdominal fat, fore-legs, hind-legs and tail. Similarly, the components measured for the non-edible offal components were hair, hide, spleen, testicle with prepuce, urethra, gut contents.

Biochemical analysis: Long-leg meat samples of 0.5 kg from each genetic group were taken to the National Food Research Center's laboratory, Khumaltar, Lalitpur for biochemical (proximate) analysis. Parameters such as moisture, crude fat, total ash, crude protein, connective tissue, iron, phosphorous, and calcium were determined during the biochemical analysis.

Sensory analysis: A total of 12 experts from Nepal Agricultural Research Council and Agriculture and Forestry University were invited as the panelists who have very good experience of sensory evaluation of goat meat. Meat samples of 2.5 cm3 size were taken from the muscles of long-legs of each experimental goat for comparative sensory examination[7]. The sample meat cuts were conventionally boiled in 150-170^{0}C for 15 minutes. In the beginning, the panelists were made aware on the sensory expressions to avoid doubt about the meaning of attributes. A profile protocol was developed relating to meat color, tenderness, juiciness and flavor (largely different, moderately different, slightly different and no difference) of the meat samples was used for the evaluation. Every panelist assessed the meat samples prepared for the 4 different attributes (meat color, meat tenderness, meat juiciness and meat flavor). The sensory test was performed based on paired comparison to assess the quality difference between the meat of two genetic groups i.e. Khari and Khari×Boer. In first case we presented the four replicates including two replicates of same sample (i.e. Khari and Khari) and another two different samples (Khari and Khari×Boer).

Statistical Analysis: Data collected about the carcass components, edible and non-edible offal, and chemical composition of Khari and Khari×Boer crossbred goats were subjected to two-sample t-Test (unpaired) using GenSTATv.19[8]. Significant thresholds of 0.05, 0.01, and 0.001 were used to observe the difference in the values of these parameters between two genetic groups. Chi-square test was applied to evaluate if genetic group of goats affected the frequency distribution of the data related to sensory evaluation.

III. Result

Carcass components

Results of carcass component analysis reflected that there was no significant difference between eight carcass parameters of Khari and Khari×Boer crossbred goats **(Table no3)**. However, higher value of live (slaughter) weight, hot carcass weight, weight of four quarters (i.e. fore-left, rear-left, fore-right, rear-right) was observed in case of Khari×Boer crossbred goats. Whereas, indigenous Khari goats were superior with respect to dressing percentage based on hot carcass weight and abdominal/omental fat percentage. **Table no3** illustrates the variation in carcass characteristics of Khari and Khari×Boer crossbred goats slaughtered at 15 months age.

Table no3. Carcass characteristics of Khari and Khari×Boer crossbred goats at 15 months age.
2019-2021. NGRP, Bandipur

Parameters	Khari	Khari×Boer	t-Statistic	Probability	Significance
Live (slaughter) weight (kg)	34.24±3.66	41.23±5.43	1.06	0.357	NS
Hot carcass weight (kg)	17.97±1.90	21.26±2.64	1.01	0.369	NS
Fore-left quarter (kg)	3.82±0.39	4.89±0.79	1.21	0.293	NS
Fore-right quarter (kg)	3.89±0.58	4.33±0.69	0.49	0.650	NS
Rear-left quarter (kg)	3.48±0.64	3.85±0.54	0.44	0.684	NS

Rear-right quarter (kg)	2.02±0.76	2.68±0.91	0.55	0.610	NS
Dressing % based on hot carcass weight	52.45±0.42	51.78±2.09	0.32	0.767	NS
Abdominal fat %	6.68±1.22	5.33±1.32	-0.75	0.495	NS

Offal components

Among the Nepalese consumers, offal is categorized into edible and non-edible components on the basis of their preference to consume different offal parts of the goat carcass. Accordingly, blood, head with tongue, liver, kidney, lungs, heart, digestive tract without ingesta, oesophagus, rumen, reticulum, omasum, abomasums, small intestine, large intestine, pancreas with fatty layer, abdominal fat, fore legs, hind legs and tail were considered under edible offal components in this study. Whereas, hair, hide, gall bladder, spleen, testicles with prepuce, urethra and gut contents were considered as non-edible offal.

Edible offal

Analysis of edible offal components revealed that there was a significant difference ($p<0.05$) between the two genetic groups under evaluation for large intestine **(Table no4)** large intestine Accordingly, heavier large intestine was observed in *Khari*×Boer crossbred goats as compared to that in *Khari*. On the other hand, rest of the parameters regarding edible offal were statistically similar ($p<0.05$) between the two genetic groups. Detail quantitative characteristics of edible offal of *Khari* and *Khari*×Boer is presented in **Table no4**.

Table no4. Quantitative variation in carcass characteristics of edible offal of *Khari* and *Khari*×Boer crossbred goats slaughtered at 15 months age, 2019-2021, NGRP, Bandipur

Parameters	Khari	Khari×Boer	t-Statistic	Probability	Significance
Blood (Kg)	1.05±0.12	1.17±0.14	0.65	0.551	NS
Head with tongue (Kg)	2.66±0.40	3.33±0.42	1.16	0.311	NS
Liver (Kg)	0.56±0.12	0.73±0.16	0.82	0.457	NS
Kidney (Kg)	0.11±0.02	0.12±0.02	0.54	0.620	NS
Lungs (Kg)	0.44±0.08	0.44±0.08	0.01	0.994	NS
Heart (Kg)	0.15±0.03	0.20±0.04	0.89	0.425	NS
Digestive tract without ingesta	2.79±0.59	3.28±0.67	-0.55	0.61	NS
Oesophagus (Kg)	0.38±0.34	0.44±0.39	0.11	0.918	NS
Rumen (Kg)	0.53±0.14	0.62±0.24	0.33	0.756	NS
Reticulum (Kg)	0.11±0.01	0.13±0.02	0.60	0.580	NS
Omasum (Kg)	0.14±0.04	0.19±0.06	0.70	0.523	NS
Abomasum (Kg)	0.24±0.14	0.30±0.12	0.32	0.763	NS
Small intestine (Kg)	0.78±0.17	0.85±0.30	0.19	0.859	NS
Large intestine (Kg)	0.58±0.04	0.77±0.02	4.45	0.011	*
Pancreas with fatty layer	1.78±1.42	2.06±1.70	0.13	0.905	NS
Abdominal fat	2.38±0.67	2.33±0.79	0.05	0.965	NS
Fore legs (Kg)	0.48±0.03	0.66±0.16	1.14	0.318	NS
Hind legs (Kg)	0.36±0.11	0.41±0.13	0.25	0.818	NS
Tail	0.073±0.033	0.096±0.014	0.62	0.569	NS

Non edible offal

Results of this study showed that non-edible offal percentage in the Khari and Khari×Boer crossbred goats was not significantly different ($p>0.05$) between the genetic groups **(Table no5)**. However, higher quantity of hair, hide and gut content was observed in Khari×Boer crossbred goats. Similarly, Khari×Boer crossbred goats had bigger sized gall bladder, spleen, and testicles with prepuce as compared to that of Khari breed. Likewise, urethral size was found almost equal in the slaughtered goats of both genotypes. The proportion of non-edible offal components of *Khari* and *Khari*×Boer is presented in **Table no5**.

Table no5. Variation in non-edible offal characteristics of *Khari* and *Khari*×Boer crossbred goats slaughtered at 15 months age

Parameters	Khari	Khari×Boer	t-Statistic	Probability	Significance
Hair (Kg.)	0.49±0.01	0.54±0.05	1.16	0.310	NS
Hide (Kg.)	1.75±0.18	2.39±0.24	2.12	0.102	NS
Gall bladder (Kg.)	20.0±0.90	0.014±0.006	0.46	0.672	NS
Spleen (Kg.)	46.0±0.009	0.078±0.026	1.11	0.331	NS
Testicles with prepuce (Kg.)	0.19±0.09	0.23±0.08	0.31	0.774	NS
Urethra (Kg.)	0.04±0.01	0.04±0.01	-0.01	0.993	NS
Gut content (Kg.)	4.89±0.92	5.08±1.24	-0.12	0.920	NS

Chemical components

Nutritional parameters such as moisture, crude fat, total ash, crude protein, connective tissue, iron, phosphorous and calcium, phosphorus were observed **(Table no6)**. The results on the mean values for these chemical compositions are not significantly varied (p>0.05) according to the genetic groups involved in this study. However, moisture, crude fat, total ash, connective tissue and phosphorous content was observed higher in Khari goat meat. Whereas, crude protein, iron and calcium content was higher in the meat of Khari×Boer crossbred goats as presented in **Table no6**.

Table no6. Chemical composition of carcass samples of Khari and Khari×Boer crossbred goats at 15 months age. 2019-2021. NGRP. Bandipur

Parameters	Khari	Khari×Boer	t-Statistic	Probability	Significance
Moisture (%)	70.34±3.24	69.51±1.23	-0.24	0.822	NS
Crude fat (%)	10.36±3.29	10.31±1.93	-0.01	0.991	NS
Total ash (%)	1.21±0.24	1.15±0.22	-0.16	0.877	NS
Crude protein (%)	18.55±0.77	18.78±0.62	0.02	0.833	NS
Connective tissue (%)	1.72±0.19	1.5±0.44	-0.46	0.672	NS
Iron (mg/100g)	2.07±0.21	2.95±0.36	2.08	0.11	NS
Phosphorous (mg/100g)	111.9±15.3	110.9±20.51	-0.04	0.968	NS
Calcium (mg/100g)	158.8±32.13	188.7±46.52	0.53	0.625	NS

Cooking and drip loss analysis

Cooking loss is considered as one of the measures of water holding capacity of meat (Gorkhali et al., 2021). Results of this research revealed that cooking loss percent differed significantly (p<0.05) with respect to the genetic groups involved (i.e. Khari and Khari×Boer). Accordingly, 15.25% lesser cooking loss was observed for Khari goat meat as compared to that of Khari×Boer crossbred goats in (**Table no7**). In contrast to the results of cooking loss in this experiment, drip or thawing loss was not significantly influenced (p>0.05) by the genetic groups. However, Khari goat meat showed 53.76% lesser drip loss than that of Khari×Boer crossbred goats. **(Table no7)**.

Table no7. Cooking and drip loss of carcass samples of Khari and Khari×Boer crossbred goats at 15 months age. 2019-2021. NGRP. Bandipur

Parameters	Khari	Khari×Boer	t-Statistic	Probability	Significance
Cooking loss (%) of thigh muscle	28.45±0.45	32.79±1.12	3.58	0.023	*
Drip loss (%) of thigh muscle	15.42±0.17	23.71±3.68	2.25	0.087	NS

Sensory evaluation

The results of sensory evaluation showed that the color of two samples presented for the test was slightly different in 68% cases, moderately different in 9% and no difference (p>0.05) in 22% cases. The results of overall preference indicated that Khari was superior with respect to flavor of cooked meat. Whereas, meat of Khari×Boer crossbred goats showed superiority with respect to its tenderness and juiciness. Detail information on the variation in other sensory characteristics including tenderness, juiciness and flavor between two meat-samples of different genetic group and overall preference among the panelist is presented in **Table no8**.

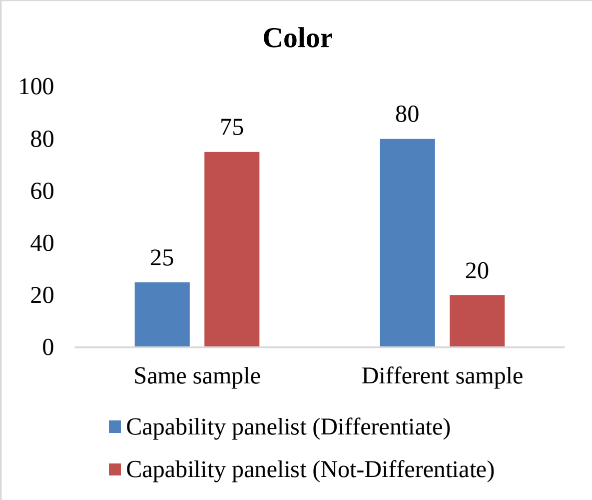
Table no8. Sensory variation in carcass characteristics of Khari and Khari×Boer crossbred goats at 15 months age. 2019-2021. NGRP. Bandipur

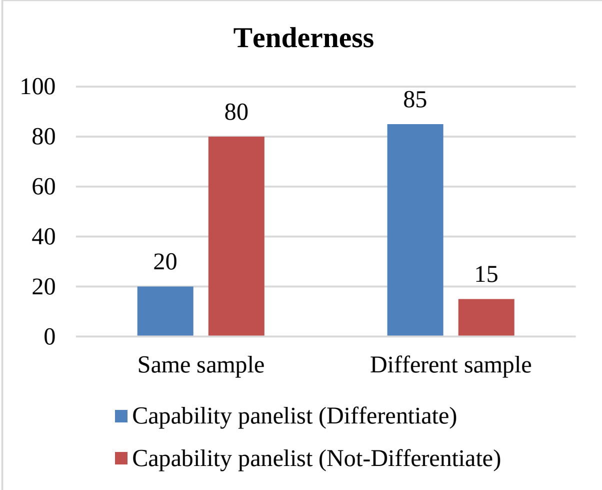
Parameters	**Largely different**	**Moderately different**	**Slightly different**	**No difference**	**Overall preference**
Color	-	9	68	23	K ~ K×B
Tenderness	-	8	74	18	K×B > K
Juiciness	-	67	5	28	K×B > K
Flavor	-	-	48	52	K > K×B
Average difference		**28**	**48.8**	**30.3**	**K×B > K**

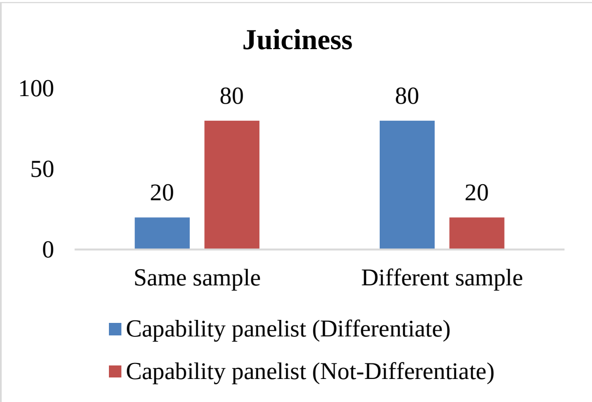
Note: ~- 'similar', >- 'superior than', K-'Khari', B-'Boer'

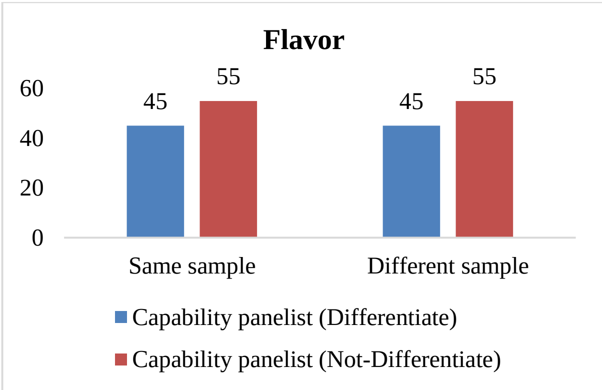
Panelist ability to differentiate the sensory quality of meat

The paired comparison test was done to observe the quality difference between meat of two genotypes namely Khari and Khari×Boer. In this case the capability of panelist was assessed to differentiate the quality when same and different sample are presented for sensory evaluation. The final results of pair-wise comparison of sensory characteristics including color, tenderness, juiciness and flavor are presented in the Figures hereunder.









IV. Discussion

Carcass characteristics

In contrast to the findings of present study, some studies reported the significant difference in carcass characteristics of the goats of different genotypes[9,10,11,12,13]. The dressing percent of the two genotypes in present study is comparable Sidama goat with dressing percentage of 47.7–55.5%[14] and Boer goat with the dressing percentage of 50-54%[10]. Whereas the genetic groups seemed to be less efficient in carcass composition compared to the overall average dressing percent of 56-63% of Khari and Boer crossbred goats[15] and Somali goat breed having 56.99–57.7 dressing percentage[16]. Panayotov[17], in contrast to the findings of this study, reported significantly lower dressing percentage (42-48%) of Boer goat kids in Bulgaria.

Edible and non-edible offal components

Edible offal is considered as high value carcass by-product particularly in the Nepalese communities where these components highly preferred by the consumers culturally and traditionally. As all the edible offal components were not differed with respect to the two genetic groups taken into account in this study which was in line with the findings of Tewodros et al[7] that further confirms the non-significant effect of different genetic groups on the edible offal components of goats.

On the other hand in contrast to the findings of present study, pure and cross breed goats breeds showed significant difference in relation to non-edible offal components including the weight of fore-legs, hind legs and gut contents[7].

Chemical components

Moisture content recorded in this study was within the range of the moisture content reported by Sebsibe[18] i.e. from 67% for Ethiopian goats to 69.4% for Boer goats and 75.2% for Australian Capretto goats. Similarly, moisture content of goat meat was reported as 70.65%[19]. Protein content in this study was found comparable to that of Australian Capretto goats (18.9%) and significantly lower than that of South African indigenous goats (24.8%) as reported by Sebsibe[18]. Fat percent of the goats in this study was similar to that of Boer goat (10.5%) and lower than that of Ethiopian goats (12.6%). Ash content was in this study was found in line with that of Ethiopian goats (1.19%) and higher than that of Boer goats (0.95%). In contrast to the findings of this study, Shija et al.[19] reported extremely higher ash content (4.40%) in indigenous Tanzanian goats. Higher fat and total ash content in the indigenous goat breeds than in improved Boer goats contributes in enhancing the taste and mineral contents in meat, respectively. These information thus further confirms results of our study that variation in genetic group of goats are not to be worried in terms of these important parameters considered for chemical analysis.

Cooking and drip loss

Results of this study was comparable for cooking and drip loss to the findings of Madruga et al[20] as the authors had reported 26.5-29.2% cooking loss in Moxoto and Caninde goats in Brazil. Significantly higher cooking loss was reported by Sebsibe[18] as 34.1 to 39% for Capretto gots and 62.2% for Nanjiang yellow goats. On the other hand, Sebsibe[18] reported similar proportion of cooking loss (29%) for Ethopian indigenous goats that was in line to the findings of present study. Shija et al.[19] reported lower proportion of cooking loss 18.79% and thawing 3.23% in indigenous goats of Tanjania than the results of present study. Similarly, Nagya et al.[21] reported lower percentage of drip loss i.e. 3.18% for Boer goat and 7.72 for indigenous goats in the Philippines. Thus, results of this study further confirms that Khari breed has lower cooking and drip loss than Khari×Boer crossbred goats.

Lee et al[22] reported low cooking loss (16.95%) of Boer×Spanish crossbred goat meat as compared to the findings of this study. Interestingly, cooking loss of the Khari and Boer crossbred goats in this study was found comparable to that of wild boar (29.12%) as reported by Gorkhali et al[23] as the authors reported significantly lower thawing/drip loss of 6.54% in wild boar of Nepal. Cooking loss is associated to the juiciness of the meat indicating that lower the cooking loss, better would be the juiciness of the meat[18]. Meat having good water holding capacity has less cooking loss and vice versa[24]. However, the amount of cooking loss depends on pH, geometry, and surface area of the meat, and heat treatment conditions such as temperature, speed of heating, time etc.[25]. Water released from meat and meat products can be described as drip, purge, or cooking loss, and they are inversely related to water holding capacity[26]. Cooking losses are due to the denaturation of proteins, which results in structural changes that cause fluid to be expelled out[27].

Sensory evaluation

Goat meat has a species-specific flavor and aroma, which differ from that of sheep meat[28] however, limited literature are available about comparison of breed specific sensory characteristics. Color, tenderness, juiciness and flavor are the important sensory parameters with respect to in consumer attitudes[29]. Meat color is greatly influenced by species, breed, age and sex of the animal and so on[18]. Since, the sensory parameters such as tenderness and juiciness were superior in case of Khari×Boer crossbred goat meat; it is in contrast with the farmer belief that meat of local Khari goat has superior sensory qualities as compared to that of Khari×Boer crossbred with respect to tenderness and juiciness of the meat. In line to the findings of this study, meat of upgraded Anglo-Nubian goats had the highest acceptability score than that of purebred Boer in terms of color and flavor[21]. Thus, the main attributes of consumers' preference over the meat are color, tenderness, juiciness and flavor that is also associated to marbling quality and water-holding capacity of meat[30] (Andersen et al., 2005).

V. Conclusion

Results of the research suggested that the meat samples of two genetic groups of Khari and Khari×Boer differed significantly with respect to the large intestine and cooking loss percentage. Whereas, almost all carcass characteristics, edible and non-edible offal components, drip loss and biochemical composition were not affected by the genetic group indicating the similarity in the carcass quality of Khari and Khari×Boer crossbred goats. On the other hand, the sensory quality of meat of Khari×Boer and Khari were almost similar with very little differences in their tenderness, juiciness and flavor suggesting acceptable sensory quality of meat regardless of difference in genetic groups of goats. The difference in growth behavior of Boer did not seem to affect the taste and quality of meat in comparison to most widely used Khari goats.

Conflict of interest

There is no and will not be any conflict of interest in the publication of this article.

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