

## **Carcass Composition of Shahabadi Sheep Reared on Natural Pastures in Hot and Humid Climate of Eastern India**

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**Abstract:** The study pertains to the carcass traits of thirty yearling Sahabadi ewes that were raised under the semi intensive conditions by farmers in Bardhamman district of West Bengal. Sahabadi is one of the least studied sheep and owes its origin to Sahabad district of Bihar. The sheep bears coarse wool and is leggy. The results indicate that the dressing percentage of the ewes were low (39%). The weights of the different edible and non edible offal's and important carcass cuts too have been described. The results indicate that there is ample scope of improving the carcass traits provided the sheep are well managed and provided proper nutrition and veterinary care.

**Key words:** Sahabadi ewes • Carcass traits • West bengal • India • Bardhamman

### **INTRODUCTION**

There are several factors viz. economic, social, cultural and market development that influence the household consumption pattern. It has been estimated that since the mid 1980's there has been rapid development in the economic sector and the middle class category of India now have enough disposable income which is resulting in higher consumption of livestock products including meat. Livestock rearing has been traditionally practiced in India as a mode of buffering income, the people living in the rural area usually take it as an investment especially when financial institutions were investment, especially lacking. Presently livestock rearing especially small ruminants are being promoted by the Government authorities as a source of income generation for the economically deprived members of the society and also as a way to step out of the vicious cycle of poverty by the members of various self help groups who receive financial assistance through microfinance organizations. The demand for mutton is ever increasing within the country, it is estimated that the demand for mutton and chevon is expected to grow at a rate of 8.42 percent, between 1993-2020, the highest for any livestock products within the country Dastagir [1]. It is also estimated that between 1993-2020 the weighted average growth rate for the demand for mutton and chevon is expected to grow at a rate of 13.68% again the highest

within the country, it has been observed that the demand of the mutton and chevon far exceeds the actual supply of the same between 1993-2010, however the gap is steadily narrowing and it is projected that the supply would exceed demand by 2020, [1]. Therefore in it is of prime importance to understand the carcass potential of the native ovine and caprine breeds and also develop strategies to improve upon the same, so that the gap between demand and supply of mutton and chevon can be bridged effectively. Sahabadi sheep is one of the least studied ovine breed of Eastern India, the breed is native of Shahabad district of Bihar (India), animals of this breed are also found in Patna and Gaya districts of the same state. These animals are of medium size and leggy. The animals provide very little wool of coarse grade. Acharya [2]. There is also seasonal migration of the Sahabadi sheep in some districts of West Bengal especially during the summers when the natural pasture gets dried up in the native tract. The Shahabadi sheep are also reared in certain districts of West Bengal, viz. Bardhamman (88° 48' to 88° 25' E. longitude and 22° 56' to 23° 53' N latitude covering an area of 7024 km<sup>2</sup>) and Murshidabad (88° 46' 00'' to 87° 49' 17'' E, longitude and 24° 50' 20'' to 23° 43' 30'' N, latitude, covering an area 5341 Km<sup>2</sup>) the districts are separated by river Ganges. The sheep are reared mostly for mutton and wool fetches very little value, the animals are reared mostly on natural pastures and on agricultural

byproducts. The present study was conducted to study the carcass quality of Shahabadi reared under natural pasture. The present estimated population of Sahabadi sheep in Burdhamman and Murshidabad district of West Bengal is estimated at 1408,295 and 1997,149 heads respectively Anonymous [3].

## MATERIALS AND METHODS

The data under investigation pertains to thirty yearling Shahabadi ewes, those were reared in and around villages of Katwa subdivision (88° 08' to 88° 13' E. longitude and 22° 39' to 23° 65'N latitude) of Bardhamman district, the ewes were reared under semi intensive management system and grazing land was limited to roadside grasses and stubbles left from the previous agricultural crop. The animals were slaughtered by severing the carotid artery and also the jugular vein the carcass cuts were obtained as per the methodology suggested by Anon. [4] 1995 (ICS 67.120.10). The traits studied were slaughter weight (WBS), weight after slaughter (WAS), weight of the skin (WS), non edible carcass (weight of the gastro intestinal tract (WGi), weight of the empty stomach (WSt), weight of the lungs (WL), weight of the heart (WH), weight of the tail (WT), weight of the feet (Wft), weight of the genital organs (WRO), weight of the head (WHd), weight of the dressed head (WHdd), weight of the tail (WTl), weight of the spleen (WSp), weight of the mammary organs (WMO), weight of the edible part of the carcass (weight of the kidney with empty bladder (WK), weight of the kidney fat (WKf), weight of the liver (WLi), weight of the whole carcass (WC). Later the carcass was cut up into different parts as suggested by Anon. [4]. The carcass was then divided into rump and hind legs region (WHL) (just behind the finger bones till last lumbar vertebrae) and both the hind legs), loin region (WLo) (behind the last thoracic vertebrae and last lumbar vertebrae), rack region (WR) (just behind the fourth rib and the first thoracic vertebrae), rib and shoulder (WRS) (region from the atlas vertebrae (first cervical) and the fourth rib (rib and shoulder), breast region (WBr) (area near the xiphoid cartilage and the fore shank (lower extremities of the radius and ulna). The age of the ewes was ascertained by their dentition as suggested by Charray *et al.* [5].

All the offal's and the carcass including the cuts were weighed on a digital balance with an error margin of 1 gram. The data generated were analyzed statistically for range mean and standard error using SPSS 12 for Windows.

## RESULTS AND DISCUSSION

The carcass parameters of Sahabadi ewes as obtained in the present study are presented in Table 1. The results from the present study indicates that the average slaughter weight of the ewes are lower than those reported for adult Sahabadi ewes as reported by Acharya [5]. This may be attributed to the ewes being yearlings and still at a growing stage. The average weight of the skin (in percentage basis) as obtained finds consonance with the observations of Mousa [6] in Awassi lambs reared on diets containing *Acacia sp* in Egypt. The result as obtained in the present study for the skin trait also finds consonance with the results obtained by. Momani Shaker *et al.* [7] in Awassi and Awassi X Romanov crosses reared in Jordan. The weight of the skin as obtained in the present study (in percentage terms) finds consonance with the results obtained by Gopal Krishna and Morleymohandas [8] for Nellore and Mandya rams and ewes of Southern India. The present study indicates that among the non edible offals the weight of the skin is the highest, the findings are in agreement with the observations of Pal *et al.* [9]. The weight of the intestines as obtained in the study finds an agreement with the results obtained by [8] for Nellore ewes, Mandya rams and ewes. The weight of the feet as obtained in the study is also in agreement with the results obtained for Nellore ewes as observed by [8].

The weight of the head (on percentage basis) as obtained in the study finds consonance with the observations of Mousa [6] in Awassi sheep, the weight of the dressed head as observed could not be compared due to lack of relevant information. The dressing percentage of Shahabadi ewes as observed in the study are comparable with the observations of Abdul Aziz *et al.* [10] and in Barki growing ram lambs of Egypt reared on natural forage, where as the authors reported higher dressing percentage in Barki rams reared on supplemented feeds. The observations as obtained in the present study can also be compared with the results obtained by Mioè *et al.* [11] in Pramenka (P) lambs reared on supplementation of olive cake (30%). It was estimated by Dani *et al.* [12] that the dressing percentage of sheep depends upon slaughter weight and may vary between 37-45%, the results as obtained in the study falls under the range. The dressing percentage as obtained in the study are also close to the results obtained by Gopalkrishnan and Morleymohanlal [8] for Madras Red and Coimbatore sheep and Bhat *et al.* [13] for Chokla sheep. Similar dressing percentages were also

Table 1: Carcass values of Sahabadi ewe (<sup>a</sup>indicates with respect to live weight; <sup>b</sup>indicates with respect to uneviscerated weight)

| WBS                      | WAS                       | WS                        | WFt                        | WHd                        | WHdd                      | WC (unevi)                | WC (evi)                  |
|--------------------------|---------------------------|---------------------------|----------------------------|----------------------------|---------------------------|---------------------------|---------------------------|
| Mean± SE                 | Mean± SE                  | Mean± SE                  | Mean± SE                   | Mean± SE                   | Mean± SE                  | Mean± SE                  | Mean± SE                  |
| (grams)                  | (grams)                   | (grams)                   | (grams)                    | (grams)                    | (grams)                   | (grams)                   | (grams)                   |
| 15458±650                | 14719±277                 | 1612 ±410                 | 483.5± 44.5                | 1090.5± 82.5               | 772± 22.5                 | 11535 ±277                | 6040.5±395                |
|                          | (95.22±1.55) <sup>a</sup> | (10.16±1.07) <sup>a</sup> | (3.127±0.55) <sup>a</sup>  | (7.054±1.1) <sup>a</sup>   | (4.99±0.1) <sup>a</sup>   | (74.62±1.55) <sup>a</sup> | (39.07±3.2) <sup>a</sup>  |
|                          |                           |                           |                            |                            |                           |                           | (52.36±2.0) <sup>b</sup>  |
| WDi                      | WSt                       | WLi                       | WL                         | WSp                        | WK                        | WKf                       | WRo                       |
| Mean± SE                 | Mean± SE                  | Mean± SE                  | Mean± SE                   | Mean± SE                   | Mean± SE                  | Mean± SE                  | Mean± SE                  |
| (grams)                  | (grams)                   | (grams)                   | (grams)                    | (grams)                    | (grams)                   | (grams)                   | (grams)                   |
| 1452.5±178               | 715.5±118                 | 339±58                    | 250±55                     | 33.5±5.5                   | 37.5±7.5                  | 2.5±.05                   | 63.5±3                    |
| (9.39±0.72) <sup>a</sup> | (4.62±0.33) <sup>a</sup>  | (2.198±0.22) <sup>a</sup> | (1.6176±0.33) <sup>a</sup> | (0.2160±0.01) <sup>a</sup> | (0.242±0.01) <sup>a</sup> | (0.067±.001) <sup>a</sup> | (.041±0.02) <sup>a</sup>  |
| WMo                      | WH                        | WTL                       | WHL                        | WLo                        | WR                        | WRs                       | WBr                       |
| Mean± SE                 | Mean± SE                  | Mean± SE                  | Mean± SE                   | Mean± SE                   | Mean± SE                  | Mean± SE                  | Mean± SE                  |
| (grams)                  | (grams)                   | (grams)                   | (grams)                    | (grams)                    | (grams)                   | (grams)                   | (grams)                   |
| 49.5± 10                 | 53±11                     | 65±4                      | 1479±55                    | 594.5±10                   | 1635.51±40.5              | 1120.5±21.5               | 1205±12.7                 |
| (0.32±0.01) <sup>a</sup> | (0.33±0.01) <sup>a</sup>  | (0.42±0.01) <sup>a</sup>  | (9.56±0.75) <sup>a</sup>   | (3.84±0.5) <sup>a</sup>    | (10.57±0.7) <sup>a</sup>  | (7.24±0.03) <sup>a</sup>  | (7.79±0.85) <sup>a</sup>  |
|                          |                           |                           | (24.48±0.55) <sup>c</sup>  | (9.84±0.4) <sup>c</sup>    | (27.07±0.21) <sup>c</sup> | (18.54±0.18) <sup>c</sup> | (19.94±0.10) <sup>c</sup> |

reported by Roque *et al.* [14] for Romanov sheep. The dressing percentage of different breeds differ and can however be improved to a certain extent by improvement of both feeding and managerial regime. Srivastava and Roy [15] opined that the carcass traits were severely retarded in grazing animals with greater proportion of offal's on empty weight basis. Gaili *et al.* [16] opined were in opinion that the unfattened animals showed lower dressing out percentage than those which have been fattened.

The weight of the liver (in percentage basis) as obtained in the study is higher than the results obtained by [7] for Awassi (A) X Charollais (C) crossbred lambs of Jordan. However, the values as obtained in the study are in consonance with the results obtained by [9] for Pramenka lambs. The present results too are in agreement with the findings of Momani Shaker *et al.* [17] for A lambs. The weight of the lungs as obtained in the study finds consonance with the results obtained by [17] for A lambs reared on non conventional feeds. The weight of the spleen as obtained in the present study are in consonance with the results obtained by [7] in A sheep, however the same authors obtained lower values for the trait in AXC and AXR crossbreds, similar observations were also reported by [10] in A lambs reared on three different nutritional regimes.

The weight of the spleen (on percent basis) as obtained in the study is in agreement with the results obtained by [7] for A breed, however the same authors obtained lower values for the same for AXC and AXR crosses. However, [17] also obtained lower values for the trait for A ram lambs. The results pertaining to the weight of the kidney indicates that the values as

obtained in the study are in consonance (in percentage terms) with those obtained by [17] for A ram lambs and also by [7] for A, AXC and AXR sheep. The values pertaining to weight of the reproductive organs, udder and tail could not be compared due to lack of available literature.

The weight of the carcass cuts also could not be compared as there are discrepancies in the methods carried out by different authors.

The results in the present study indicates that there is a scope for improvement of the carcass traits of Sahabadi sheep, provided they are reared on a balanced plane of nutrition and adequate measures are taken to minimize the load of the helminthes. However, further studies need to be carried out to ascertain the optimal slaughter weight and age of the Sahabadi sheep of both the sexes.

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## REFERENCES

1. Dastagir, M.B., 2004. Demand and supply projections of livestock products in India. Policy paper 21. National Centre for Agricultural Economics and Policy Research. ICAR. New Delhi, pp: 43.

2. Acharya, R.M., 1982. Sheep and goat breeds of India. Chapter-4. Eastern Region. FAO Technical paper, 30: 117.
3. Anonymous, 2007. 18<sup>th</sup> All India Livestock Census, West Bengal. Bardhaman and Murshidabad.
4. Anonymous, 1995. Mutton and Chevron (IOCS 67.120.10). first revision, Bureau of Indian Standards. New Delhi.
5. Charray, J., J.M. Humbert and J. Leif, 1992. Manual of sheepproduction in humid tropics of Africa. CAB International. U.K
6. Mousa, M.R.M., 2011 Effect of feeding Acacia as supplements on nutrient digestion, growth performance, carcass traits and some blood constituents of Awassi lambs under conditions of North Sinai. *Asian J. Anim. Sci.*, 5(2): 102-11.
7. Momani Shaker, M., A.Y. Abdullah, R.T. Kridi, J. Blaha, I. Šáda and R. Sovjak, 2002. Fattening performance and carcass value of Awassi ram lambs, F<sub>1</sub> crossbreeds of Romanov × Awassi and Charollais × Awassi in Jordan. *Czech J. Anim. Sci.*, 47(10): 429-38.
8. Gopalakrishnan, C.A. and G. Morleymohanlal, 1985. Livestock and Poultry enterprises for rural development. Vikas Publishing House Pvt. Ltd. New Delhi.
9. Pal, U.K., M.K. Agnihotri and N.K. Sinha, 1997. Carcass traits of Muzzaffarnagri lambs under intensive and semi intensive management systems. *Indian J. Anim. Sci.*, 67: 720-22.
10. Abdul-Aziz, G.M., H.M. El Shaer, A.A. Fahmy, A.S. Shalaby and A.M. El Gawad, 1999. Carcass quality of fattened sheep fed halophytic silage with non-conventional energy supplements in Egypt. *Proc.Small Ruminant Prod. Systems*. Molina de Segura, Murica, Spain.
11. Mioè, B., V. Paviæ, I. Vnuèec, Z. Prpić, A. Kostleć and V. Sušić, 2007. Effect of olive cake on daily gain, carcass characteristics and chemical composition of lamb meat. *Czech J. Anim. Sci.*, 52(2): 31-36.
12. Dani, N.P., D. Rajalakshmi, C.B. Indira, S. Dhanraj, D.N. Rao and N.S. Mahendrakar, 1985. Meat quality of Bannur rams lambs. *Indian J. Anim. Sci.*, 55: 1094-99.
13. Bhat, P.N., B.U. Khan, S.K. Koul and S.K. Bhadula, 1978. Breed characteristics of Muzaffarnagri Sheep. *Indian J. Anim. Sci.*, 48: 506-10.
14. Roque, A.P., S. Osorio, JC-da, P.O. Jardim, N.M. Oliveira De, M.T.M. Osorio, Da-S. Osorio, J. C. and N.M. De-Oliveira, 1999. Meat production in five lambs breeds 6. Relative development. *Ciencia-Rural*, 29(3): 549-53. (CAB. Abst. 1998/08-2000/07).
15. Srivastava, V.K. and A. Roy, 1971. The influence of season, birth, age and nutrition on the organ weights of Magra lambs. *Indian J. Anim. Sci.*, 41: 1060-65.
16. Gaili, E.S.E., Y.S. Ghanem and A.M.S. Mukhtar, 1972. A comparative study of some carcass characteristics of Sudan Desert Sheep and Goats. *J.Anim. Prod.*, 14: 351-57.
17. Momani Shaker, M., A.Y. Abdullah, R.T. Kridi, J. Blaha and I. Šáda, 2003. Influence of the nutrition level on fattening and carcass characteristics of Awassi ram lambs *Czech J. Anim. Sci.*, 48(11): 466-474.