

Sheep Rearing for Enhanced Nutritional Security and Income Generation in Rural Rainfed Area of Telangana

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ABSTRACT: Sheep farming is the strength of South India where chevon is preferred species for meat, but in some of the areas of Telangana, its farming has been discontinued due to forage unavailability. Rural masses are already suffering from food and nutritional deficiencies. In order to improve nutrient availability of poor households in rural areas of Vikarabad district, Telangana, low input technology sheep farming coupled with improved forage production has been introduced under farmers FIRST project for supplementing the earnings of poor farmer. Deccani and Nellore sheep breeds each five ewes and one doe were given to geo-tagged, pre-trained six small farmers from Gangupalle village (17.30° N, 77.98° E), Pudur Mandal, Vikarabad District, Telangana, India for rearing. For comparison, the performance of 14 non-descript goats were also monitored. The nutritional status pre-and post-intervention was assessed and as per the revenue generated from selling of sheep, 70% of money were allocated for egg, chicken and chevon purchases for family consumption. On adult unit basis, diet was deficient in energy as well as protein and it had too low energy levels to meet their Basal Metabolic Rate (BMR) requirements. After the intervention, the energy deficiency in diet was reduced to meet out BMR requirement in all categories of people in the family. The diet chart revealed that females and children were more deficient in diet than males in an ideal family of six people. After the intervention, the diet was excess in protein to the tune of 14.27, 3.73 and 63.02% in the male, female and children, respectively. The study revealed significant higher production performances of indigenous sheep (76.4% better body weight) over the non-descript goat has a better support system to livelihood and nutritional security in the dryland region.

Key words: Deccani, livelihoods, nellore, protein, profitability and rural

Introduction

The total sheep (*Ovis aries*) population in India is 66 Million, out of which 40% are non-descript animals and rest comprise of pure/graded, crossbred or exotic animals (19th Livestock Census, 2012) with Southern Peninsular region of India harbouring the largest sheep population of the country. Sheep breeding and rearing has the potential to offer employment to the landless labour, small and marginal farmers', nomadic and semi nomadic people etc. with little investments and with a potential of generation of quick returns.

Around 30% of our rural children are suffering with protein malnutrition (Swaminathan *et al.*, 2012). However, majority of population being non-vegetarian with preference towards mutton in Telangana, an opportunity of improving protein nutrition as well as profitability through locally adapted sheep was felt. Thus, the present intervention of improving agrarian economy through adapted indigenous sheep breed, Deccani and Nellore to the farmers of Gangupalle village, Pudur Mandal, Vikarabad district, Telangana was taken up under Farmers FIRST Project. This intervention has been visualized with a great potential for women empowerment as sheep being docile animal, its management is basically done by women and can play a vital role in livelihood generation. While carrying out

the PRA analysis, it was observed that farmers are willing to have the sheep units if fodder supply to the area is ensured, thus fodder cultivation in terms of Co-4 variety of Hybrid Napier was promoted in the village. Sheep was preferred over goat in the village owing to ease in management, liking for taste and potential forage resources.

The Deccani and Nellore breed of sheep is spread over the greater part of the central peninsular region, comprising the semi-arid areas of Maharashtra, Andhra Pradesh and Karnataka (Shinde and Singh, 1995). Very scanty information is available on introducing the locally adapted sheep breeds to the area where farmers are not rearing it. Keeping these views in mind, the purpose of this study was to compare and evaluate the potential of Deccani and Nellore sheep breeds with that of non-descript goats under extensive system of rearing for improved profitability as well as improved protein nutrition.

Materials and Methods

Six small farmers (less than 1 ha of landholding) having prior experience of goat farming from Gangupalle village (17.30° N, 77.98° E), Pudur Mandal, Vikarabad District, Telangana, India were selected, geo-tagged and were given 5 numbers of 240±10 days old ewes and one number of 2 years old ram of Deccani and Nellore breed. The average annual rainfall of the

area is 781.5 mm and average temperature during summer is 32.8°C and during winter is 23.1°C. The criteria of selection of farmer in participatory mode was that they should have prior experience of small ruminant rearing, will have to construct small enclosure for keeping sheep and willingness. Three farmers (Mr. Sazida Begum, Mr. Janghaiiah and Mr. M. Laxmaiah) were given five ewes and one doe each of Deccani breed and three farmers (Mr. Bandaiah, Mr. Mallesham and Mr. G. Laxmaiah) were given five ewes and one doe each of Nellore breed on 6th October, 2018.

The farmers were trained for good rearing practices for sheep under semi-intensive system before the sheep distribution in the village. The sheep were kept in the enclosure of 10 x 10 ft² with enough roaming area of 150 ft². Sufficient clean drinking water, maize grain - red gram concentrate mix @ 250 gms each with dry fodder @ 1 kg each and kutti made up of green fodder @ 1 kg each was made available to all the groups of sheep by all the participating farmers. Mineral mixture @ 5 gm daily and one pint of salt to each sheep was added to concentrate mix during group feeding in the enclosure. Apart from this, the animals were let loose for grazing in nearby area from 10:00 AM to 4:00 PM daily. The participating farmers were given Hybrid Napier fodder slips (Co-4 variety) to be grown in their fields to meet out the green fodder requirement of their animals on 7th July, 2018 so that they will have fodder available at their fields when they receive sheep.

Monthly body weight of sheep was monitored at the nearby weighing centre, whereas, weekly kid growth rate was monitored using portable weighing balance. For economics, all the data pertaining to different inputs like concentrate, dry forage, veterinary cost, etc. was collected. Since, own grown green fodder was used for sheep, the data pertaining to their yield at every harvest was taken. Apart from this, the monthly body weight was collected from one farmer having 14 non-descript goat kids of either sex for making comparison for the present experiment.

All the cost-economics was calculated based on actual and as perceived by selected farmers, 70% of the income generated from this activity was used for purchase of eggs, chicken meat and chevon in equally divided monetary value for household consumption. The prevailing market rate of egg was ₹ 5 per egg, chicken was ₹ 160 per kg and chevon was ₹ 500 per kg in Manneguda market, Pudur Mandal. Males were used for breeding own herd. Kids born were sold after 9 months of rearing and breeding herd will be kept for 5 year

Dietary habit of the area

The average family type of the area comprised of 3-4 adults (mother/father + husband and wife) and 2 children. The basic

dietary habit consisted of a cup of tea made up of 200-250 g of milk in the morning and 250 g of milk daily for children. Then, they cook rice of 750 g daily which is used for the whole day (breakfast and lunch). They cook dal of 150 g every 3 days and other days of the week, curry of leafy vegetables 500 g is cooked. Thus, each day, they either consume only curry or dal. Daily one big jowar roti for adult and small for child (150 g daily in total) member will be cooked which they consume during lunch time. Most of the families will consume chicken meat (500 g) every week and one egg each once in a fortnight. During night, they will again cook 300 g of rice and eat with curry/ dal which was prepared during the day time. Each family use a curd pack of 500 g every 3 days. Ghee (butter) was consumed occasionally, however, small quantities of vegetable oil like ground nut oil, sunflower oil are used in small quantities 10-15 ml per day for frying purposes. Fruits such as mangoes, guava, papaya and oranges were consumed seasonally and occasionally in negligible quantity only. Tea is popular in the area as beverage apart from local liquor.

Assessment of nutritional impact

The average body weight of adult male, female and child were 52.1, 37.8 and 14.2 kg, respectively in the Gangupalle village. Adult Unit for converting to standard units were made taking 60 kg for male and 50 kg for female. The BMR was calculated based on the body weight and average height of the people, energy and protein requirement was calculated as per their average body weight as per NIN (1997). Basic diet plan was considered for existing energy and protein levels in the diet and final diet was considered assuming the egg, chicken and mutton purchased from the profit and consumed at the household level. The nutrient supplied by egg, chicken and chevon was calculated as per NIN (2011).

Means and standard errors of various production and quality traits were calculated using standard statistical procedures (Snedecor and Cochran, 1989). Analysis of data was done by using IBM SPSS Statistics (Ver. 21.0) software.

Results and Discussion

Forage yield

Each farmer was growing fodder at 10 guntha of land (equivalent to 0.1 ha). Hybrid Napier fodder of Co-4 variety distributed to the above-mentioned farmers was able to provide a yield of 35 t green fodder in a total land area of 0.6 ha over a period of one year by taking 7 cuttings. This yield is in similar line as reported by Venugopalan *et al.* (2016) and Pankaj *et al.* (2018). This fodder even if given @ 2 kg per animal can support 50 small ruminants for a period of one year and can sustain their growth rate if given apart from 5-6 hours of grazing.

Body weights

The mean body weight of both sex at different ages for local non-descript goat and indigenous sheep (Figure 1) suggested that body weights of Deccani and Nellore breeds of sheep are superior at all stages of life and able to provide more flesh to the farmers. Nellore breed of sheep were having superior growth rate (91.7-180.0 g day⁻¹) as compared to Deccani (65.0-130.0 g day⁻¹) and local goats (36.7-131.7 g day⁻¹). At the end of 9 months (selling age), Nellore sheep (35.5 kg) were able to achieve 28.2% higher body weight as compared to Deccani sheep (27.7 kg) and 76.4% higher body weight than that of local goat (20.1 kg). These body weight achievements are in conformity with those reported by Suresh *et al.* (2008), Yadav and Tailor (2010), Rao *et al.* (2013) and Venkatraju *et al.* (2015).

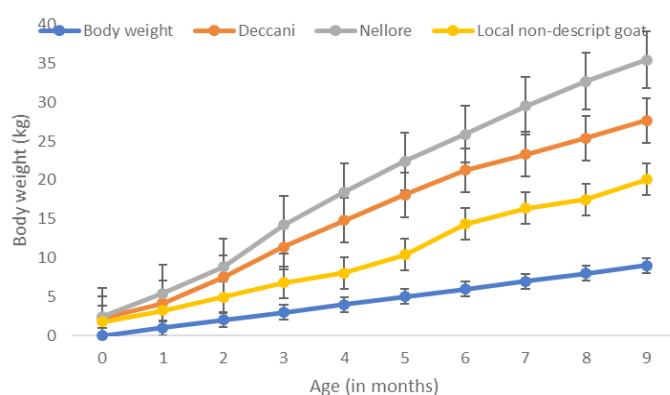


Fig. 1 : Body weight of Deccani and Nellore sheep as compared to local non-descript goat at different age intervals in Gangupalle village

Economics of the sheep rearing

At the end of the year, total expenses made for rearing of sheep were ₹ 63,610.00 without including the contributions of family labour (Table 1). Through the sale of animals, when they were not been consumed at household level, the project has the potential to raise ₹ 11,315.00 net profit from each household. In the similar lines, Mishra *et al.* (2006) in a study carried out in Anantapur and Mahaboobnagar of Telangana reported gross profit of ₹ 4000.00 per year only from lamb rearing as subsidiary livelihood interventions.

Nutritional impact of sheep-based intervention

Based on net profit per household, ₹ 2382.50 was spend for the family needs, ₹ 1715.00 on purchase of eggs, ₹ 2000.00 on purchase of poultry birds and ₹ 2000.00 on the purchase of chevon, a decision made on a participatory mode as a part of participatory action research. Thus, farmer was able to supplement his family nutrition using this additional revenue generated out of this intervention. The farmer was able to get 343 eggs, 13.3 kg of chicken and 4.0 kg of chevon for his family nutrition. The basal metabolic rate (BMR) requirement per adult unit in the village was 1264.20 K cal as per NIN (2011) even this was not fulfilled with the prevailing diet (Figure 2). The energy levels in the diet of people was deficient to the tune of 8.73% as compared to BMR in the pre-intervention period, however, the condition was improved by broiler, chevon and egg-based diet created from the intervention energy sufficient

Table 1 : Economics of sheep rearing in the Gangupalle village

| Particulars | Total (₹) |
|---|--------------------|
| Cost of sheep (₹ 200 per kg for male ₹ 135 per kg body weight for female) - total 30 females and 6 males in number | 1,25000.00 |
| Since, the animals will be kept for 5 years, annualized cost will be | 25,000.00 |
| However, since the animals were given from the FFP project, this cost was not considered. | - |
| Cost of feed for 9 months (₹ 18 per kg) home-made feed only for breeding | 43,740.00 |
| Sheep (36 nos.) with maize @ ₹ 15 per kg and Red gram @ ₹ 40 per kg | |
| Cost of feed for 9 months (₹ 18 per kg) home-made feed only for kids and grower sheep (9 Deccani & 11 Nellore) | 14,175.00 |
| Since, sheep were put on grazing, however, kutti 1 kg and dry fodder @ 1 kg was offered to them in the enclosure which was available from own farm, so cost of fodder was not considered. | - |
| Labour – only family labour and no hiring of labour | - |
| Total expenditure in 9 months | 57,915.00 |
| Income from sale of Deccani 4 Rams and 5 Ewes (@ ₹ 3500.00 per Ewe and ₹ 5500 per Ram) | 39,500.00 |
| Income from sale of Nellore 7 Rams and 4 Ewes (@ ₹ 4500.00 per Ewe and ₹ 7000 per Ram) | 67,000.00 |
| Gross income | 1,06,500.00 |
| Net profit | 23,585.00 |
| Since, sheep was provided by the project, the net income realized by farmers were | 48,585.00 |
| Net profit per HH | 8,097.5 |

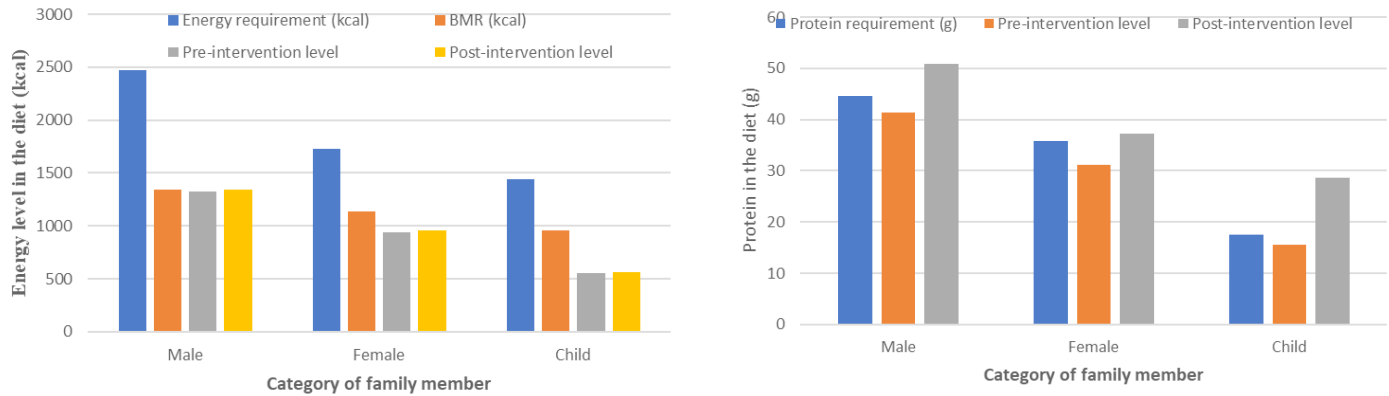


Fig. 2 : Per capita nutritional impact of sheep-based intervention on different categories of people in Gangupalle village BMR = Basal Metabolic Rate in K cal

as compared to BMR by 1.83%. This calls for improving the energy level in the diet of people by incorporating some cereal as well as fruits. However, the intervention was able to make the population protein sufficient which was otherwise deficient by 11.23% and after the intervention, the protein sufficiency was in excess of 19.17% as compared to their requirement. Swaminathan *et al.* (2012) also reported similar energy-protein malnutrition in rural India.

When the analysis was carried out across different family members (Figure 2), it was found that the children’s diet was more deficient in energy (25.47%) as compared to adult male (0.90%) and adult female (9.99%). On actual body weight and height basis, the diet was not even able to satisfy BMR requirement, however, existing diet was unable to meet the BMR requirement in all categories of people in the family in excess of 3.64% in males, 0.24% in females and 0.69% in children.

In the pre-intervention stage, protein was deficient in the diet of male by 7.92%, adult female by 14.92% and in the diet of children by 12.60%. This deficiency in the diet of all categories of people in the family was overcome with the sheep intervention when the diet of males become excess in protein as compared to their requirement by 14.27%, female by 3.73% and in the diet of children by 63.02%. Since, the children require excess protein for their growth, this intervention was able to provide 63.02% excess of protein in diet to provide enough growth opportunities in children. This intervention was able to create protein piling in the village; however, it should be supported with some cropping system to follow the energy sufficiency at the household level in the village.

Future recommendations

Introduction of new species as sheep with improved forage production has improved profitability (₹ 8097.50 per household), nutrition level (energy intake as well as protein

sufficiency) and improvement in women and children nutrition. This intervention has been found to tackle malnutrition through ensured availability of nutritious diet. For promoting the sheep rearing, it is necessary to give the much-needed infrastructural support (in form of improved / adapted breed at subsidized rate, fodder units, training etc.) to the targeted beneficiaries in order to get optimum production from this sector.

Conclusion

In order to improve nutrient availability and profitability of poor households in rural areas of Vikarabad district, Telangana, low input technology sheep farming was introduced under Farmers FIRST project for supplementing the earnings of poor farmers. The study revealed significant higher production performances of Indigenous breeds of sheep over the non-descript goat which can support a better way of livelihood and nutritional security under backyard poultry production in dryland region.

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