

SUPPLEMENTARY FEEDING OF GOATS DURING TRANSITION PERIOD FOR IMPROVING PRODUCTIVITY



An integrated and participatory extension approaches is very critical in improving goat productivity through supplementary feeding during transition period. Dr Prakashkumar Rathod, Dr Veeranna K C, Dr Ramachandra B and Dr Ravindra D share their experiences of supplementary feeding of goats during transition period for improving productivity under Sujala-III project implementation in Karnataka (India).

CONTEXT

Goats, whose meat (chevon) is one of the choicest meats, are among the main meat-producing animals in India and have huge domestic demand. Besides meat, goats provide other products like milk, skin, fibre and manure. With a population of over 135 million, goats account for more than 9,43,000 tonnes (13%) of the total meat production in India (GoI, 2017). They provide food and nutritional security to millions of marginal and small farmers and agricultural labourers. However, the productivity of goats under the prevailing traditional production system is very low (Singh and Kumar, 2007) since they are maintained under the extensive system on natural vegetation on degraded common grazing lands and tree lopping. Moreover, adoption of improved production technologies/management practices in the farmers' flock is very low (Tekale *et al.*, 2013). Therefore, rearing of goats requires adoption of scientific technologies or practices for improving the production and also to meet the increasing demand in the domestic as well as international markets.



In this context, various attempts are made to introduce scientific and superior technologies for mass adoption and create necessary facilities for adoption of improved management practices in goat keeping. Further, implementation of any improved scientific practices and its adoption in practical field conditions depends on various factors and adoption behaviour of the individuals. Among various issues, supplementary feeding of goats during transition period is the major drive for improving the productivity through reproductive performance of goats. It helps in improving

the kidding rate, weaning rate, kidding interval, live weight of kids born or weaned, milk yield of does (goat mother), health status of doe and kids etc.

Box 1. Supplementary Feeding of Goats during Transition Period

With the time between weaning and mating, ewes should nutritionally replenish losses from the previous kidding. It is advisable to increase level of nutrition before and after mating, resulting in higher ovulation and conception rates, and to make provision for the additional nutritional needs in late pregnancy and early lactation. The transition period is considered by many nutritionists and academicians as the time period of late pregnancy to very early lactation. It is often a varying period, which depends on the species of livestock. However, the authors have followed 60 days pre-kidding to 30 days post-kidding period. Over this very short period, the animal is forced to deal with radical changes such as: difficulties of gestation, parturition, onset of lactation, appetite fluctuations (from a gestation diet to a lactation diet), and fluctuations in hormone levels. The critical points to remember are nutrient compositions and feed formulation of supplementary feed (concentrate mixture) used for feeding. Approximately the concentrate mixture consists of 15% crude protein (CP) and 65% total digestible nutrients (TDN) as per book values which can be prepared using the ingredients like maize (30 %), groundnut cake (5 %), soya bean (5 %), green gram chuni (10 %), rice polish (5 %), wheat bran (40 %), limestone (2 %), mineral mixture (1%) and salt (2 %). The supplementary feeding composition can be varied depending on the availability of inputs and socio-economic status of the farmers at field conditions.

Considering the vitality of above stated facts, we therefore emphasised supplementary feeding of goats during transition period for improving productivity and focused on adoption and diffusion of scientific practices for the benefit of other farmers in the project villages. Further, this project has also addressed the constraints faced by the project staff and farmers in this activity.

THE INITIATIVE



The good practices discussed in this note are from the project villages of the World Bank-funded, Karnataka Watershed Development Department (KWDP)-sponsored Sujala-III project. This project has been implemented by Veterinary College, Bidar, which is under the aegis of the Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU), Bidar (Karnataka), from December 2014. However, this particular activity was undertaken during the year 2016-17. The development objectives of Sujala-III project are to demonstrate more effective watershed management through greater integration of programmes related to rainfed agriculture, innovative and science-based

approaches, and to strengthen institutions and their capacities with the involvement of individual farmers and member farmers of producer organisations (for example: Karnataka Milk federation, private milk societies etc.). We undertook a study on this initiative mainly to understand the process and impact of this initiative (Box 2).

Box 2. Methodology of the study

- Purposive sampling technique was used for selecting Bidar district since Sujala-III project was implemented in this district by Veterinary College, Bidar.
- A baseline survey was conducted of about 790 farmers from 14 project villages identified by the Government of Karnataka (India) and various meetings/awareness programmes in the project villages. Further, about 220 goat-rearing households were contacted for this activity, out of which a total of 96 pregnant does were selected for this study.
- Awareness programmes, trainings and demonstrations about supplementary feeding of pregnant goats (does) and its importance were conducted by multi-disciplinary teams for the beneficiaries. A before-after research design was followed with participatory research to know the impact of these programmes in the project villages.
- Pre-exposure and post-exposure attitude tests, knowledge tests and adoption studies were conducted in the project villages, focusing on the objectives of the scheme, before and after conducting the awareness and demonstration programme.

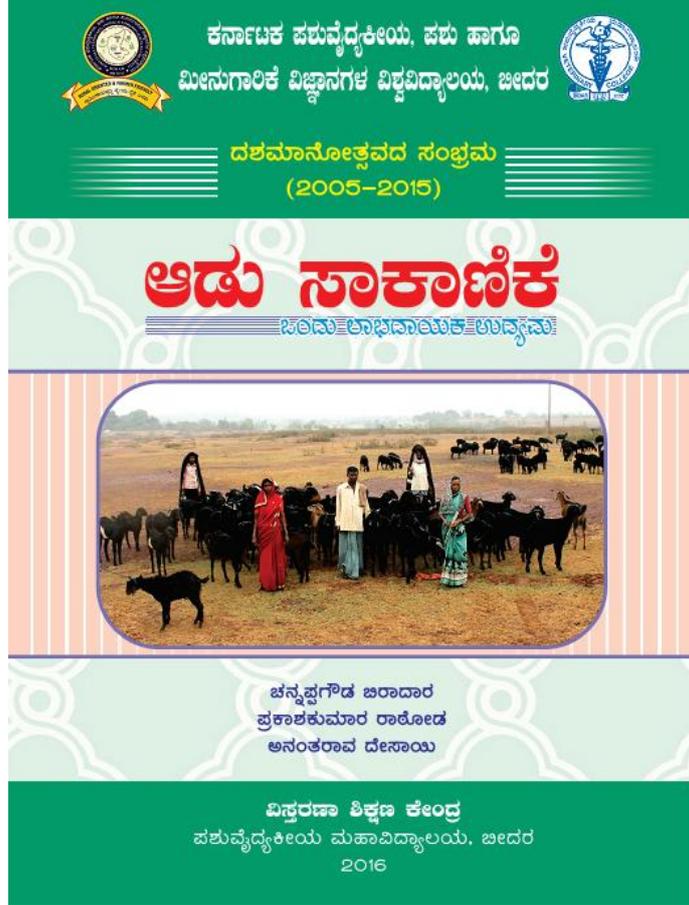
GOOD PRACTICES

Awareness programmes, advisory services and demonstrations: Multi-disciplinary teams conducted awareness programmes and trainings on scientific goat farming, supplementary feeding of goats during transition period and its benefits for the beneficiaries. The experts also conducted demonstrations for the farmers about preparation of supplementary feeds at field conditions. Further, the beneficiaries also participated in focus group discussions about different practices and issues under the guidance of experts or project staff. The project involved technical staff for creating awareness about the project activities, supplementary feeding and its importance. Timely advisory services by the technical staff helped the beneficiaries know the scientific practices and improve their knowledge to a great extent.

Access to inputs: Inputs such as supplementary feeds, dewormers and vaccines were distributed to the beneficiaries on a timely basis. The project beneficiaries identified for this practice received a 250-g feed packet prepared at the feed processing unit of Veterinary College, Bidar, for each doe per day. With this rate, the beneficiaries received the feeds as per the available does in their flock. Further, the project team also trained the farmers for preparation of supplementary feeds with the available resources at field conditions.



Farm literature: Farm literature and reading material were prepared in the local language and distributed to all beneficiaries. This literature improved the knowledge level of scientific goat production practices, apart from supplementary feeding of goats during transition period.



Convergence of multiple stakeholders/actors: Multifarious agencies such as the World Bank; Karnataka Watershed Development Department; Veterinary College, Bidar; Livestock Research and Information Centre (Deoni), Bidar, under Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar; State Department of Animal Husbandry and Veterinary Services and individual farmers were involved in the project. The animal nutrition experts and management experts of the veterinary college technically assisted the project staff in preparation of supplementary feed and scientific goat management. The field veterinarian in the project area assisted the project team in identification of pregnant does and also helped in carrying out deworming and vaccination of goats. Animal health problems or diseases were treated by project staff with the help of veterinarians at the earliest to prevent economic losses and followed up with post treatment also.

Participatory action research: The project team adopted participatory action- oriented approach for promoting scientific goat rearing practices among goat farmers. The local nondescript pregnant goats in their last trimester were taken as the experimental animals. Local goats of the area are unimproved indigenous medium-sized goats with variable coat colours ranging from black, brown and white to a combination of the three colours. This investigation was undertaken to assess the

effect of strategically supplemented feed during different phases of gestation on the performance of goats using the parameters like weight of the pregnant goat, previous year mortality rate, kid



birth rate, kid birth weight, feeding habit, etc. in the identified project villages. The data were collected over a period of five months after an initial acclimatization period of 2-3 weeks. Field visits to monitor the intake of feed and to record body weights, health of the goats, abortions, kid birth weights etc. were carried out once in fifteen days. The information was collected by personal interview, participant observation, key informant technique and focused group discussion method.

BENEFITS AND IMPACT

- **Improved knowledge level of beneficiaries and adoption:** Overall knowledge level of the beneficiaries had increased after imparting trainings on various goat practices through the



project including supplementary feeding during transition period. Further, the retention level was found to be about 68% 30 days after the trainings and demonstrations. The supplementary feeding practice in the project villages has motivated other farmers to adopt this practice, resulting in overall increased awareness in farmers about the importance of supplementary

feeding. Further, a few farmers have purchased this feed from private commercial distributors also.

- **Improved productivity:** Despite many challenges at the field level, the project team was successful in improving productivity and creating interest for the beneficiaries over a period of time. Mean body weight of does (kg) which were fed supplementary diet two months before and one month after kidding increased significantly (800 g to 2300 g) at all days of feeding as compared to control group. The supplemented does weighed heavier since it is a critical period during pregnancy which helped to gain more weight than the others. The feeding of additional ration during phase of gestation can increase energy status in goats around kidding and the kids from these dams are born with higher body weight. Further, it was found that kidding percentage (40-50%), milk yield (200 g to 600 g), mean birth weight of kids (300 g to 900 g), mean kid weight at 30, 45 and 60 days after birth, and twinning and triplet percentage (40-50%) improved over a period of time due to supplementary feeding. Also, the mortality percentage of kids reduced due to supplementary feeding in the project area. The beneficiaries expressed that productivity of goats improved to greater extent as compared to previous years due to supplementary feeding.
- **Improved economic returns:** Interventions carried out in this project aimed at improved productivity, thereby resulting in increased economic returns to goat rearers. Initially, the farmers considered this practice non-profitable and difficult to adopt at field condition due to non-availability of inputs and lack of scientific knowledge. At present, due to demonstrations and awareness programmes, a good number of farmers in the project area have shown an inclination towards supplementary feeding in goats. The farmers at the beginning thought this practice as not relevant to follow at field condition, but later they perceived it as relevant to



follow and practice after on-farm trials and awareness programmes. Major characteristics of the interventions were low cost of feed preparation and relatively short wait for observable benefits. The farmers had average net income of INR 6,300 to INR 11,500 for one kidding through supplementary feeding. Furthermore, the farmers have saved the money that they would have spent for poor management practices, health issues and from other sources.

- **Prevention of economic losses:** It is very difficult to generalise and assess the losses across farms due to lack of scientific practices followed and poor feeding to the does. The economic consequences were measured in terms of kid mortality and death of pregnant does during

kidding. Supplementary feeding maintains the good health of both kid and doe, ultimately preventing economic losses. Depending on the condition of the animal, the losses were assessed to be in the range of INR 2,500 to INR 8,500 for one kidding in the absence of supplementary feeding. This was a notable loss for the farming community and hence, the farmers responded positively by following the practice very diligently.

- **Improved management practices:** Since the farmers have realised the importance of scientific feeding practices, they have started supplementary feeding especially for pregnant does. They have started consulting the veterinarian for deworming and vaccination of their goats periodically. Further, the farmers have realised that supplementary feeding was better than other methods and have adopted the practice accordingly.

LESSONS LEARNT AND CHALLENGES FACED

The project clearly revealed that an integrated approach of extension activities viz. training, demonstration, on-farm testing, farm literature etc. can promote adoption of scientific practices by sensitisation and improving the knowledge level of farmers. The programme has achieved the expected target and has convincingly demonstrated the importance of supplementary feeding of goats during transition period. There is an increase in income generation through improved kidding percentage, kid birth weight, kid growth, doe health condition, multiple births etc. Further, the authors have observed decrease in economic losses due to kid mortality and problems during kidding. The project initiative was also found to be unique since it has witnessed the convergence of multiple stakeholders for achieving a common objective of improving productivity and hence, this experience of convergence can be applied at a larger scale.

During the initial phase, this project faced various problems and challenges; the project beneficiaries were not aware about the importance of supplementary feeding and hence, realised the importance of this practice very late. The project team also made efforts to motivate the beneficiaries, to strengthen their scientific knowledge and to make them adopt scientific practices in the form of supplementary feeding, deworming, vaccination etc. Although farmers were informed about the objective of the activity, they required regular follow-up visits and field-level observations with regards to scientific feeding, weighing, advisory services etc. The beneficiaries have also responded that it is highly expensive to procure inputs or supplementary feed at home, and hence, have emphasised on the need for supplementary feed preparation using the locally available resources or inputs.

POLICY IMPLICATIONS

Though the project received poor response from farmers initially, integrated extension approaches helped the project team in improving the knowledge level of farmers and adoption of supplementary feeding during transition period. This practice is likely to continue even after the termination of the project as farmers currently have adequate knowledge and a positive attitude towards this scientific practice with very negligible financial and technical support from the government.

- There is a need to focus on promotion of supplementary feed preparation using region-specific and locally available inputs or resources so that farmers can prepare the feeds on their own with low investment. On the same lines, commercialisation or entrepreneurship in

supplementary feed preparation can also be developed to meet feed and fodder requirements in the project area.

- Although this project has achieved success to some extent, there is a need to emphasise on supplementary feed production to a larger extent by supporting farmers through inputs delivery and need-based extension approaches, since farmers have limited understanding about its production and its importance.
- Nearby farmers have also made an attempt to contact the concerned farmers or institutions to adopt this practice since it is essential for enhancing profits in goat farming. Further, this interest of farmers and adoption of supplementary feeding practice is expected to continue even after the completion of this particular project in the project villages.

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References

- GoI (Government of India) (2017). Annual Report 2016-17, Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, New Delhi.
- Singh, N.P. and Shalander Kumar (2007). An alternative approach to research for harnessing production potential of goats. Proceedings of 4th National Extension Congress, Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur, 9-11 March.
- Tekale, M., Deshmukh, D.S., Rathod, P and Bhuktar T.B. (2013). Adoption of Scientific Goat Management Practices and Constraints faced by Goat Farmers in Jalna District of Maharashtra. *Indian Journal of Dairy Science*, 66 (2):183-189.

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