

Khejri-A boon for goat rearing in arid and semi-arid regions of Rajasthan

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Indian agriculture is largely a mixed farming economy, wherein agriculture is practiced along with livestock. Among the livestock goat rearing is most common in small and marginal farmers. Goats can adapt themselves in almost all types of agro-climatic conditions arid western part of Rajasthan. It requires less space and maintenance and is mainly a browser on leaf and twigs of certain tree species grown in arid and semi-arid areas of Rajasthan. Khejri is one of most preferred tree species used as a fodder for goat because it provides nutritious fodder during acute shortage of green forage. Inclusion of Khejri in feeding will reduce the cost on feed and make the goat rearing a more profitable option. Beside fodder values Khejri also acts as shelter and protector of the goats, therefore, it can rightly be said about Khejri that it is a boon for goat rearing in arid and semi-arid regions of Rajasthan.

Introduction : Indian agriculture in true sense can be considered as a mixed farming economy, wherein agricultural activities are carried out in conjunction with livestock. The livestock sector plays a dynamic role in supporting the Indian economy with a significant contribution of about 4.11 per cent in gross domestic product (GDP). Among the different components of livestock, the goat population stands at 135.17 million (19th Livestock Census of India), which constitutes about 26.40% of the total livestock population of India (DAHD and F, 2012). Goat rearing is one of the most lucrative activities among the small and marginal farmers of the arid and semi-arid regions of India, particularly in Rajasthan. In our country its rearing on commercial scale is becoming very popular day by day due to its proven high profitability. It starts to yield milk and meat in early age and hence, a good source of income for the farming community. In terms of meat production it contributes 16% of total meat production of India (DAHD&F, 2015). Goats are mainly a browsing animal rather than grazer, therefore, the success depends on good quality feed and fodder.

Fodder trees and legume shrubs are the cheapest sources to meet the nutritional requirement of goats as compared to the costlier concentrate feed. The commercial meat production from goats largely depends on the early weight gain of the animal, which can be achieved by supplying high quality forage.

Khejri [*Prosopis cineraria* (L.)] also called as *Kalpavriksha* of Rajasthan, is one such tree which contains high nutrient content in the fodder. It is a multipurpose tree used for fodder, timber, fuelwood and as a vegetable besides; it is worshipped in Rajasthan by a large number of people due to its religious significance among various communities such as Bishnoi community. It is the only leguminous tree which grows well against all the climatic odds of the desert and supply green forage even during the driest period of May-June when other fodders become scarce, leafless and dormant. Hence, inclusion of such versatile fodder tree in massive afforestation programme would definitely meet out the present forage crisis particularly in arid and semi arid regions of India. Its fodder specially the leaves and pods are the most preferred parts browsed by the goats therefore, it will be a boon to the goat rearing in arid and semi-arid areas of Rajasthan particularly under marginal and small land holding conditions to augment profit from such a least maintenance requiring animal known as poor man's cow (Goat). Under conditions of declining per capita land availability, adverse climate and fodder scarcity, it is a challenge before the researcher, policy planners and entrepreneurs to diversify the present farming systems in such a way that the maximum profit could be achieved to sustain the farmers of arid and semi-arid regions. Rearing of goats could provide an opportunity for such climatically harsh regions due to its ability to sustain on wasteland and adverse agro climatic conditions even in a very less space, less feed and fodders and other facilities compared to cow and other livestock.

Khejri- the tree of deserts : Khejri [*Prosopis cineraria*

(L)] belongs to leguminosae family. It is a small moderate sized evergreen thorny tree, with slender branches armed with conical thorns and with light bluish-green foliage. It grows successfully in dry and arid regions of India (Fig.1) mainly Rajasthan, Haryana, Punjab, Gujarat, Western Uttar Pradesh and drier parts of Deccan. It is frost and drought resistant tree and can withstand temperature extremes ranging from 104-114 degrees Fahrenheit in the summer to less than 50 degrees Fahrenheit in the winter. It requires minimum rainfall.



Fig. 1 : Khejri plantation in Desert region

Source of nutritious quality fodder : The foliage of Khejri is used as a nutritive fodder while, pods are rich in protein and minerals. Its leaves and pods are locally called as *loong* and *sangar* or *sangria*, respectively. The dried pods (Fig. 2) are locally called as *Kho kha* is considered as rich animal feed (Rani *et al.*, 2014). Almost every part of the tree is useful but leaves are considered as high quality livestock feed (Patnayak, 1980) and rich in proteins and other nutrients (Bhandari *et al.*, 1979). The composition of Khejri leaves and pods as fodder tree is

Table 1 : Nutrient content in leaf and pod of khejri tree

| Nutrients (%) | Leaves | Pods |
|-----------------------|--------|------|
| Crude protein | 11.9 | 18.0 |
| Crude fibre | 17.5 | 26.0 |
| Ether extract | 2.9 | - |
| Carbohydrate | - | 56.0 |
| Fat | - | 2.0 |
| Nitrogen free extract | 43.5 | - |
| Ash | 8.1 | - |
| Phosphorus | 0.4 | 0.4 |
| Calcium | 2.1 | 0.4 |
| Iron | - | 0.2 |

Source: Khan *et al.* (2006)



Fig. 2 : Pods of Khejri

given in Table 1.

Role in growth and maintenance : Khejri tree provides enriched fodder in terms of various elements required for growth and development of the animals. Singh and Bhatia (1982) reported in a feeding trial conducted over goats that the growth rate of the goat kid increased at the rate of 46 g day⁻¹ when fed on Khejri leaves at the rate of 672 g day⁻¹ for 50 days.

Means of shelter : Since in arid regions, this is the only tree species which provides much needed shade and shelter to the farmers and their cattle during the summer months.

Source of medicine : It has also got some medicinal values to cure human as well as animal diseases due to this it is also called as *Kalp taru* and *Wonder tree*. Besides, all parts of the tree are useful for human and animals.

Role in ecosystem service : It is the golden tree of Indian deserts and plays a vital role in preserving the ecosystem of arid and semi-arid areas. It provides a favourable atmosphere the animals by moderating the local climate of the area.

Protective role : Khejri tree stabilize the shifting sand dunes and acts as windbreak and shelterbelt in dry areas. This sort of function helps in protecting the animals from the hot and cold winds and shifting dunes.

Conclusion : In the arid and semi arid regions of India, there is acute shortage of green forage for the animals (cows, buffalo etc.) but few animals like goat can survive even on the leaves and twigs of the trees. Goats can adapt themselves in almost all types of agro-climatic conditions including the harsh arid regions of Rajasthan. It is a multipurpose animal which can produce milk, meat and

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