

## Allocation of Local Feed Resources for Ruminants by Crop/Livestock Farmers in Nepal

Farmers in resource-poor communities in the middle hills of Eastern Nepal have considerable knowledge of the utilisation of local feed resources for ruminants both during the dry season and the monsoon. Wider use and interpretation of this knowledge would lead to better livestock productivity. This will assist farmers and/or their advisers to make best-bet decisions on feed allocation for different classes of livestock.

### Background

The limited availability of livestock feeds in resource-poor countries forces farmers to make decisions on how they allocate feed to the various types of livestock in their holdings. They must first ensure that essential functions such as survival and the provision of draught power and manure are fulfilled. Feed allocation decisions are taken in the context of seasonally varying amounts and quality of feeds, with different costs or labour implications, and with regard to short-term production trade-offs. There is, however, little information on the farmers' decision-making in these areas and there are no appropriate tools for evaluating the consequences of different feed allocation strategies.

### Research highlights

The project identified seasonal patterns and nutrient demands from

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mixed-species herds and farmers' approaches to prioritising feed allocation in a smallholder crop/livestock system.

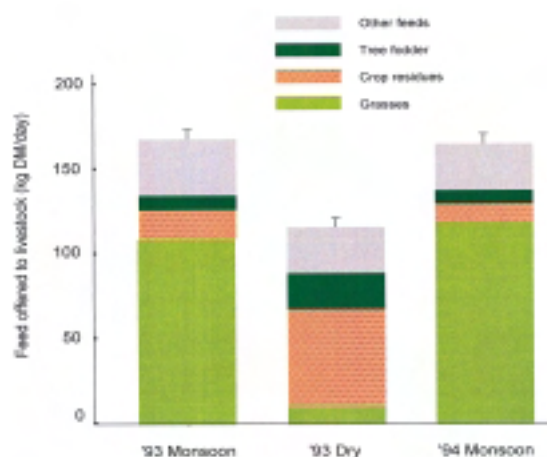
Participating farmers were selected from four villages on the basis of key factors influencing feed supplies to livestock – season, site and ethnic group of the farmer. Data describing the utilisation of feed resources by buffalo, cattle, draught oxen and goats, collected on 29 crop/livestock farms during a 15-month monitoring study, showed that the relative extent of tree fodder utilisation during the dry season differed by more than 100 per cent across the



Typical terraced land used by crop/livestock farmers in Nepal.



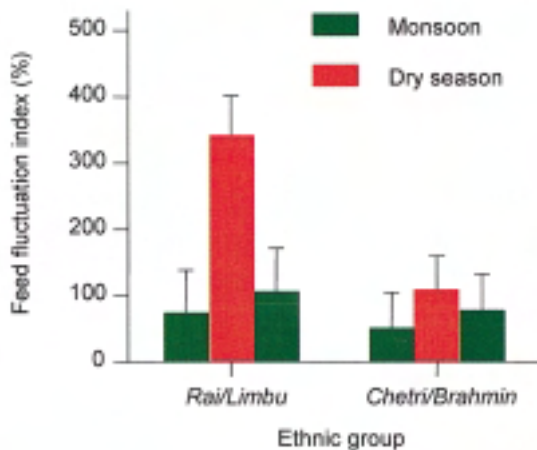
Stall-fed cattle, fed on a variety of local forages and stovers in fodder utilisation studies, in the middle hills of Eastern Nepal (near Pakhribas).



Seasonal feeding patterns of fodder utilisation by livestock in Eastern Nepal (DM = dry matter).

study sites (see chart). Distinct seasonal patterns in feed utilisation were observed, with monsoon season diets based on grasses giving way to crop residue-based diets during the dry season. However, clear site effects were observed in the composition of diets during the different seasons.

Values of feed fluctuation index (FFI), an indicator of the extent of change of composition of the feed, were generally high in the monsoon and dry season



Short-term variation in feeding practices in the two main ethnic groups in Nepal. A feed fluctuation index (FFI) value of 100% is equivalent to the total replacement of one feed between successive observations.

for both main ethnic groups in Nepal (see chart). Whilst a marked seasonal difference in FFIs was evident, there was a threefold difference in the extent to which the farmers of one ethnic group (*Rai/Limbu*) changed the composition of the feed offered to livestock in the dry season compared with the other major ethnic group (*Chetri/Brahmin*). The observed level of short-term variation in the composition of feed suggests that controlled feeding trials, in which diet compositions are kept constant, may not be relevant to the smallholder's situation.

The project also provided information on the constraints and opportunities that apply to farmers in a typical crop/livestock system in Nepal.

### Uptake

These findings allow the planning of appropriate research and extension activities aimed at improving the feed resources base in this and similar

systems. The results illustrate the need for local planning of optimum feeding systems. They also emphasise the need to collect and interpret background information on categories of feed and their utilisation for developing and promoting the uptake of improved feeding strategies on individual farms.

### Linkages

The results were used to support the development of a simulation modelling approach to the evaluation of feeding constraints and options in mixed-species livestock holdings. Livestock Production Programme (LPP) Project R5183: An aid to decision-making by smallholder livestock keepers in the developing world developed an active simulation model (FRAME) to describe the consequences for productive outputs of different feed allocation strategies across animal types in mixed-species livestock holdings. The data also form part of methodological studies carried out under LPP Project R7459 on the development of seasonal nutritional and resource management strategies for smallholder dairy systems.

### Relevance to sustainable livelihoods

Resource-poor farmers in the middle hills of Eastern Nepal have a local knowledge system for the utilisation of various indigenous feed items in livestock diets. The feeds are used as

dietary supplements for ruminant livestock both for the dry season and monsoon periods. However, significant site differences exist based on the availability of various local supplements and on the traditional feed practices of individual ethnic groups. The FFI findings, however, emphasise the need to consider the circumstances and requirements of individual farmers in any formulation of dry season feeding strategies.

### Selected project publications

- Thorne, P.J. and Herrero, M. (1998) The role of livestock in natural resources management. pp. 87–94. In: *Foods, Lands and Livelihoods. Proceedings of an International Conference, KARI Conference Centre, Nairobi, Kenya, 27–30 January 1988*. BSAS Occasional Publication no. 21. British Society of Animal Science, Edinburgh, UK.
- Thorne, P.J., Tanner, J.C. and Gurung, H.B. (1998) Patterns in the provision of feed resources for stall-fed ruminant livestock in the Nepal Himalaya. pp. 153–154. In: *Food, Lands and Livelihoods: Setting Research Agendas for Animal Science. Proceedings of an International Conference, KARI Conference Centre, Nairobi, Kenya, 27–30 January 1998*. BSAS Occasional Publication no. 21. British Society of Animal Science, Edinburgh, UK.

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