

# Predicting the nutritive value of tree fodder: consistency and complementarity between assessments made by Nepalese, smallholder farmers and by laboratory techniques

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**Introduction** Tree fodder is a vital dry season feed resource, used to supplement crop residues, on smallholdings in Nepal and other parts of the Himalaya. Farmers have a detailed and effective knowledge of the nutritive value of different types of tree fodder and the factors affecting this (Rusten and Gold, 1991; Thapa *et al.*, in review). However, the implications of this knowledge for planning research to develop fodder resources and feeding strategies or for the effective delivery of research results to farmers are unclear. The study described here assessed the consistency between analytical indicators and farmers' perceptions of the nutritive value of tree fodder. The potential for using information from these two sources, in a complementary manner, to improve the focus of nutritive value assessment on farmers' needs was also examined.

**Materials and Methods** Representative samples of fodder were taken from 12 examples of each of six botanically-differentiated tree species or varieties and two landraces recognised only by farmers. A group of sixty farmers were asked, individually, to rank the eight fodders in accordance with their *obano* (palatable and voraciously consumed but sometimes causing constipation) and *posilo* (palatable and production-enhancing) classification systems (as described by Thapa *et al.*, in review). Mean ranks were calculated and correlated with a suite of analytical variables determined for the samples. Ranks for nutritive value were also solicited from a panel of nutritionists presented with detailed analyses of the eight fodders. Correlated variables were compared graphically to examine complementarity between the laboratory analyses and the farmers' rankings for discriminating the fodders on the basis of nutritive value.

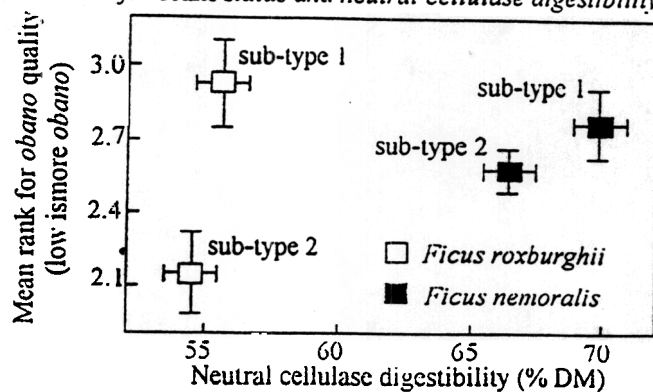
**Results** Correlations (Table 1) of *obano* status were observed with neutral cellulase digestibility (NCD;  $P < 0.05$ ) and the nutritionists' rankings ( $P < 0.05$ ), which were, generally, weighted on the *in vitro* digestibility data. *Posilo* status correlated with a calculated index of duodenal protein supply ( $P < 0.05$ ) suggesting that it might be more directly related to the role of tree fodder as a protein supplement. In some instances (e.g. the sub-types of *Ficus roxburghii*) farmers' indicators of nutritive value appeared to be more effective in discriminating different fodders whilst, in others (e.g. the sub-types of *Ficus nemoralis*), laboratory analyses were more useful for this purpose (Figure 1).

**Table 1: Correlations (*r*) of farmers' rankings with laboratory indicators and expert nutritionists' assessments of nutritive value**

	<i>obano</i>	<i>posilo</i>
Neutral cellulase digestibility	-0.84	0.34
Duodenal protein supply index *	-0.34	0.80
Expert rankings	-0.87	0.25

\* - based on crude protein and tannin contents and *in vitro* digestibility.

**Figure 1: Complementarity of farmers' rankings for *obano* status and neutral cellulase digestibility.**



**Conclusions** Laboratory indicators of nutritive value appear to be able to address smallholder farmers' needs for information on fodder quality. However, as the negative relationship observed between *obano* quality and NCD illustrates, they should be calibrated to account for farmers' multiple objectives. Farmers also recognise differences in plant material that scientists may be unaware of. Thus, there is clearly scope for using farmers' knowledge and laboratory assessments together to improve sensitivity where information on the biological bases of the former allows a systematic approach.

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## References

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