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FEED EVALUATION: RECENT DEVELOPMENTS

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INTRODUCTION

Seasonal feed scarcities and low feed quality are major constraints to livestock production in many less developed countries. Opportunities to alleviate these constraints include the increased and improved use of tree fodders and supplementation of poor quality roughages. To service such interventions farmers, extension workers and plant breeders need advice on the relative quality of tree fodders (ranking or categorisation), information of how much of which supplement to feed with different basal diets (including the use of tree fodders as supplements). Conventional feed evaluation techniques do not directly assess the effect of antinutritive factors, common in tree fodders, neither are interactive effects between feeds allowed for.

IN VITRO FERMENTATION

The NRI in-house project on nutritive value estimation has focused on the use of an *in vitro* fermentation method at the core of a suite of methods. The method uses rumen microbes to ferment feeds or feed mixtures, using the gas production as a measure of the rate and extent of degradation. There are several approaches to interpreting the gas production curves. For simplicity and robustness emphasis has been give to using cumulative gas production data at different times of incubation in preference to curve fitting.

By processing two identical subsamples of cassava leaves to yield high and low cyanide substrates, it was demonstrated that *in vitro* fermentation is inhibited by cyanide. Tannins also inhibit fermentation. The technique is therefore sensitive to anti-nutritive factors. Tree fodders can be ranked according to their gas production characteristics as differences between species are generally larger than differences within species. Fermentation CAN also respond to supplements to give significant interactive effects. These have been obseved with glucose or straw supplemented with nitrogen, finger millet straw supplemented with various concentrates, and poor quality veld hay supplemented with good quality Napier or groundnut hay. **Therefore the *in vitro* fermentation technique appears to be a suitable core method for investigating the types of interventions intended to alleviate production constraints.**

FUTURE WORK

A strategy of simultaneously increasing our understanding of the processes occuring during *in vitro* fermentation and making comparisons with *in vivo* situations has been adopted. Work has been initiated on investigating the fate of fodder tree proteins during fermentation, a largely unresearched area. We are collaborating on a ring test aimed at standardising the method. Comparisons will be made between fermentation and feeding trials on five gliricidia provenances being grown at five sites. Nutritive value assessment methods will be applied to selected samples from Nepal and, using a recently developed indigenous knowledge data base, it is intended to build up a coherent picture of what factors are important to fodder quality. In the longer term it may be possible to use *in vitro* techniques to investigate manure quality. The *in vitro* fermentation method may also be able to use sources of inoculum other that fresh rumen fluid, thus making it possible to avoid the use of fistulated animals in feed evaluation.