CSIRO PUBLISHING
www.publish.csiro.au/journals/trj *The Rangeland Journal*, 2007, **29**, 51–63

Faecal near infrared reflectance spectroscopy (F.NIRS) measurements of non-grass proportions in the diet of cattle grazing tropical rangelands

D. B. Coates[A,C] *and R. M. Dixon*[B]

[A]Davies Laboratory, CSIRO, PMB, PO, Aitkenvale, Townsville, Qld 4814, Australia.
[B]Department of Primary Industries & Fisheries, PO Box 6014, Rockhampton, Qld 4702, Australia.
[C]Corresponding author. Email: david.coates@csiro.au

Abstract. Frequent faecal near infrared reflectance spectroscopy (F.NIRS) analyses of faeces from cattle grazing a range of tropical pastures were used to measure the non-grass component, and other aspects, of their diets. Seasonal profiles of non-grass and crude protein in the diet are presented for nine sites from the speargrass, *Aristida–Bothriochloa*, and Mitchell grass dominated pasture regions, and for three shrubland sites where browse was plentiful. In grass-dominated native pastures of the speargrass and *Aristida–Bothriochloa* pasture regions of Queensland where little browse was available, non-grass was usually only 5–15% of the diet. Diet non-grass was even lower for a buffel grass pasture. In uncleared eucalypt woodland in the speargrass region, browse may have contributed up to 20% of the diet in the late dry season when grasses were senesced. In regions with abundant browse (e.g. mulga lands and desert upland systems) cattle preferentially selected actively growing grasses and forbs when they were available. With diminishing availability or declining quality of the forbs and grass due to grazing selection and dry conditions, browse increasingly contributed to intake. In Mitchell grass dominated pastures forbs often comprised more than 50% of the diet, and there appeared to be strong selection for forbs during the dry season. Where browse was available in association with Mitchell grass dominated pastures, it appeared to contribute to intake only in the late dry season. Dry season sampling in monsoonal tallgrass and Mitchell grass dominated pastures indicated dietary crude protein to be linearly correlated with diet non-grass, demonstrating the importance of non-grass in the prevention or alleviation of dry season protein deficiency in cattle. Changes in diet selected by cattle in relation to season and rainfall were generally in accord with the previous limited information, largely with sheep, in comparable vegetation systems. The results demonstrate the value of F.NIRS technology to assist understanding of diet selection by grazing cattle in northern Australia.

 10.1071/RJ07011 1036-9872/07/010051