

## Improving the match between feed supply and feed intake of beef cattle on the North-West Plains

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**Abstract.** Matching feed supply and feed intake is important to maximise beef production. Two simulation tools were used to model feed supply, feed demand and voluntary feed intake. The models used helped match feed supply to animal intake, but also highlighted limitations in accurately predicting intake response to protein supplementation.

### Introduction

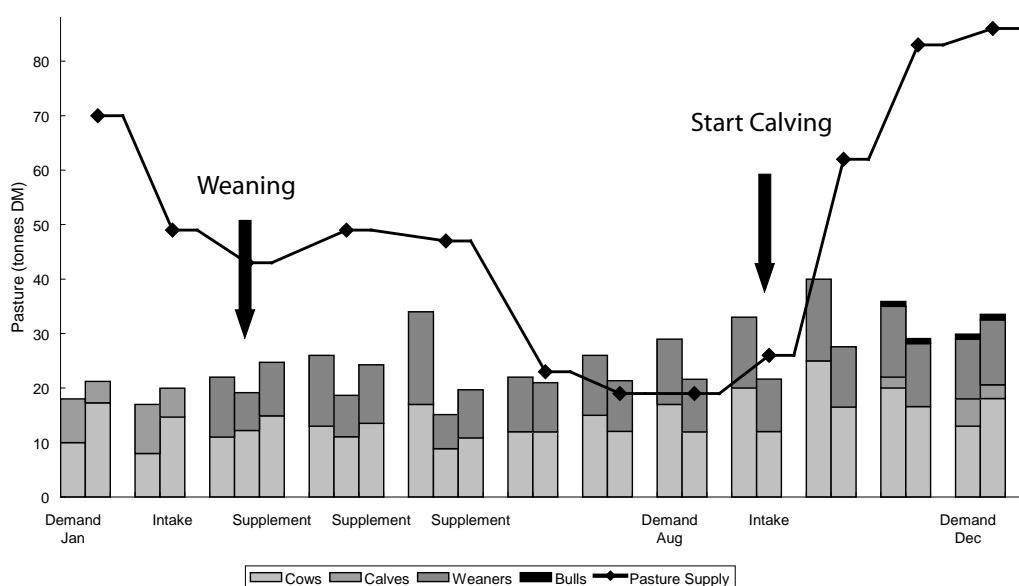
Through the use of tropical and native summer-growing grasses in north-west New South Wales (NSW), we have been able to improve the feed-year for beef cattle. However, feed intake for cattle remains limited due to the lack of pasture quality at certain times of the year. This issue will continue to be important as there are limited options for temperate perennial grasses in this region of NSW.

Protein supplementation has long been known to improve voluntary intake, and hence pasture utilisation. Better utilisation of the feed-base should in turn improve carrying capacity, and therefore increase production and profitability.

### Methods

Two simulation tools were used to model the match between feed requirements and supply throughout the year: the MLA Feed Demand Calculator (CSIRO 2008) and Grazfeed™ (CSIRO 2005).

1. Using the MLA Feed Demand Calculator, a native grass/legume pasture curve was derived for the NSW North-West Plains cropping belt (Bell 2003) for a 125 ha property. This was modelled against the monthly feed demands for a 50 cow (500 kg mature weight) British-breed herd (including calves and weaners), joined from 1 November to 16 December, weaned on 1 March and sold in December. Feed demand was calculated as energy required divided by energy concentration in the



**Figure 1.** Feed supply and feed demand, intake and supplemented intake for a 50 cow herd grazing 125 ha of native pasture on the North-West Plains of NSW. Pasture growth was modelled for a summer rainfall environment where average annual rainfall is 450 mm.

intake fraction, modified by a pre-determined loss or gain of body tissue.

2. The same inputs were used in Grazfeed™ by running it once for each month of the year for each stock class. In contrast to the MLA Feed Demand Calculator, Grazfeed™ predicted voluntary feed intake for each stock class rather than feed demand. The feed intakes predicted by Grazfeed™ were adjusted in the months where a response to protein supplementation was expected to be most beneficial; that is, those months where feed demand was much greater than voluntary feed intake, and when low protein pasture was in excess. For these months, intake figures were adjusted up by 22 per cent simulating protein supplementation with urea and by-pass protein (Hennessy *et al.* 2000).

### Results and discussion

Through the year, the Feed Demand Calculator generally over-estimated feed demand in comparison with the voluntary feed intake predicted by Grazfeed™ (Figure 1). March through to May was identified as the period when intake was most limited by the quality of the feed on offer. From June to October, the quantity of feed on offer was the greatest limiter of intake. Accordingly, protein supplementation should be most beneficial through March–May, when quality of feed on offer is low and the opportunity to increase intake is greatest.

Currently available simulation tools help match feed supply to animal intake, but still need fine-tuning to accurately predict intake response to protein supplementation. This especially applies to summer-growing pasture systems in north-west NSW. Moreover, climate change is likely to increase the use of tropical pastures in northern NSW, so there is a growing need to be better able to better define how grazing intake matches feed supply, so that carrying capacity and kilograms of beef produced per hectare can be improved, without compromising pasture production and ground-cover.

### References

- Bell AK (2003) *PROGRAZE® profitable, sustainable grazing*. NSW Agriculture and Meat and Livestock Australia. Sixth edition 2003, Orange.
- CSIRO (2005) *Grazfeed™ A Nutritional Management System for Grazing Animals*. Version 4.1.13. (Sydney: Horizon Technology)
- CSIRO (2008) *Feed Demand Calculator, version 12*. Meat and Livestock Australia, Sydney.
- Hennessy DW, Williamson PJ, Darnell RE (2000) Feed intake and liveweight responses to nitrogen and/or protein supplements by steers of *Bos taurus*, *Bos indicus* and *Bos taurus-Bos indicus* breed types offered a low quality grass hay. *Journal of Agricultural Science* **135**, 35–45.