EFFECT OF PHOSPHORUS SUPPLY ON DIET COMPOSITION OF CATTLE GRAZING NATIVE PASTURE AND NATIVE PASTURB OVERSOWN WITH STYLO

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Animal production from native pasture in the dry tropics is often limited by an inadequate supply of nutrients. Oversown legumes, native legumes and forbs [Calvin pathway species (C3)] often contain higher concentrations of nutrients than native grasses and their main contribution to the pasture mixture lies in their potential to improve the nutritive value of the diet. Cattle preferentially graze stylo from oversown pastures with growth rate liearly related to the percentage in the diet except under phosphorus (P) deficient conditions (Hendricksen and Punter 1988). In contrast, native legumes and forbs are seldom considered significant pasture components and estimates of diet composition from oesophageal extrusa samples suggest they are not preferentially grazed (Hendricksen and Punter unpublished data).

Here we *report* the effect of both P fertiliser and P supplement *on* the percentage of C3 species in the diet of twelve groups of three Brahman cross steers [average liveweight 302 ± 3.7 kg(s.e.)] continuously grazing pasture at a stocking rate of one steer/4ha. Four pastures were unsown and unfertilised and had a soil P level of 2 ppm. Eight pastures were oversown and fertilised with superphosphate to produce and maintain soil P levels of 4 and 10 ppm. A monoammonium phosphate supplement was fed to give a daily intake of 5g P/hd. The measurements reported were obtained from 3 levels of soil P each with and without a supplement and replicated twice. The C3 percentage of the diet was estimated from the ratio of natural 12C and 13C isotopes (Jones *et al.* 1979)' in faecal samples collected every four weeks from May 1988 to May 1989.

The C3 content of the diet increased ($P<0.01$) from 16 ± 2.9% to 60 ± 2.9% as soil P increased from 2 to 10 ppm. The effect of increasing P supply via the soil increased pasture C3 content (mainly legume) and as previously shown by Hendricksen *et al.* (1987), this in turn lead to an increase in diet legume.

Results also show the diet of supplemented animals contained 45 ± 2.4% C3 plants compared with the diet of unsupplemented animals at 37 ± 2.4%. This effect was similar for both wet and dry seasons with no significant supplement-soil P interaction. Generally, responses to P supplements are attributed to increases in dry matter intake. However, these preliminary results show that part of the response may be due to a different botanical composition of the diet.

Interestingly the diet of control animals averaged 16 ± 2.9% C3 plants while grazing a pasture containing 7.7 ± 2.5% C3 plants suggesting resident animals do prefer native legumes and forbs.

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