PLASMA AND LIVER VITAMIN B_{12} CONCENTRATIONS IN CATTLE

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Plasma vitamin B_{12} has been used in sheep to assess current cobalt intake, although it cannot be used to predict liver B_{12} reserves (Sutherland 1980; Millar and Albyt 1984). In cattle, few data are available regarding plasma B_{12} concentrations as indicators of B_{12} status.

The aim of this study was to examine the relationship between plasma and liver B_{12} concentrations in cattle.

Hereford cross heifers of about 4 months of age were housed in individual pens and fed a diet of pelleted hay and barley (50:50, cobalt 0.04 mg/kg DM). Animals were allocated to one of 3 treatment groups (5 per group) based on liveweight and liver B_{12} concentration.

The treatments were:

Control (no added cobalt)

Supplemented (0.5 mg cobalt daily) pair-fed to control

Supplemented, with *ad libitum* diet

Samples of blood and liver were taken at intervals over an 8-month period. Vitamin B_{12} in blood and liver was determined using a radioisotope dilution method (Judson *et al.* 1988).

There was no difference in feed intakes or liveweights (mean increase 420 g/day) between groups during the experimental period.

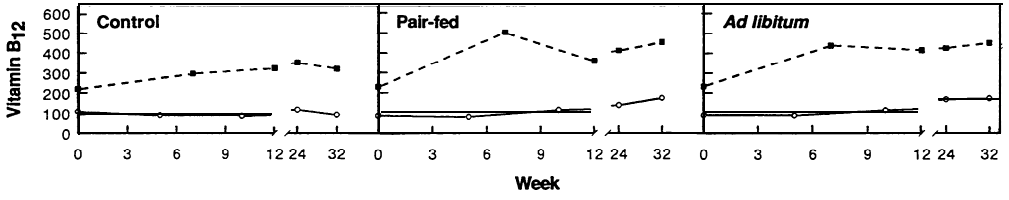

Fig. 1. Liver (■, nmol/kg) and plasma (0, pmol/L) vitamin B_{12} concentrations in cattle fed diets without cobalt supplement (control) or supplemented and either pair-fed to control or fed *ad Zibitum*.

Analysis of variance showed a time x treatment interaction ($P < 0.05$) for plasma B_{12} and a time effect ($P < 0.001$) for liver B_{12}. Tukey's test indicated that mean plasma B_{12} of pair-fed animals was significantly greater ($P < 0.05$) than controls at week 32. Regression analysis demonstrated a parallel response in the pair-fed ($P < 0.001$) and *ad libitum* ($P < 0.001$) animals for liver and plasma B_{12} but different intercepts and slopes ($P < 0.001$) for the control animals. Plasma B_{12} in cattle was not very responsive to cobalt supplementation but increased at the sarne rate as liver B_{12} (Fig. 1). Clarke *et al.* (1986) found similar trends in cattle at pasture with adequate liver B_{12}. In controls there was no relationship between the 2 variables. These results cast doubt on plasma B_{12} as a reliable guide to cobalt intake in cattle. It also appears that 0.04 mg/kg cobalt in the diet was not sufficiently low to induce a clinical B_{12} deficiency.

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