

Vitamin A status of heifers fed a diet deficient in β carotene

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Introduction

Ruminants derive their retinol (vitamin A) requirements from β -carotene and generally have sufficient liver reserves to maintain healthy function through dry periods, but clinical vitamin A deficiency has been reported in cattle during prolonged drought (Hill *et al.* 2009). The level of endogenous reserves at which animals become symptomatic are unclear and manifestation of the disease seems highly variable (Jones *et al.* 1943). We characterised blood and liver retinol levels in growing heifers from a common background, systematically deprived of dietary β -carotene.

Material and Methods

Yearling Brahm heifers (n=30) were fed a β -carotene deficient diet consisting of wheaten straw *ad. lib* and a wheat-based pellet, throughout the trial. Blood was collected monthly, liver tissue biopsied every 90d and weight recorded weekly. Retinol concentrations were determined by HPLC.

Results and Discussion

LW increased from 179kg (SEM 2.66 kg) at 0d to 306kg (SEM 4.15kg) at 176d. Initial serum and liver retinol concentrations decreased by 29% and 91% respectively, over the corresponding period (Fig. 1). No animals displayed signs of vitamin A deficiency during the depletion period.

Decline in liver retinol over ~180d agreed with Kohlmeier and Burroughs (1970) for cattle fed dry-forage, but observed poor correlation between blood and liver retinol, except when critically low, suggesting serum retinol levels are not reliable indicators of Vitamin A reserves in young cattle.

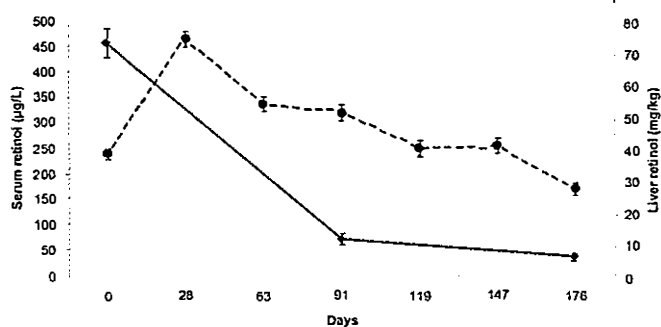


Fig. 1. Serum (---●---) and liver (—◆—) retinol in heifers systematically deprived of β -carotene.

References

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