

## DEPOT FAT METABOLISM IN CATTLE

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A study of the accumulation, retention and mobilization of linoleic acid in the meat (skeletal muscle + adipose tissue) of cattle gaining, maintaining and losing liveweight is in progress.

A group of 16 Hereford steers, each approximately 18 months of age and with an average weight of 234 kg, were offered ad libitum a diet of 30% formaldehyde-treated sunflower seed (FTSS), 5% dried molasses, 32½% crushed barley and 32½% lucerne chaff for 63 days. During this period the steers gained an average of 66 kg liveweight, of which 6.6 kg was meat fat. The percentage linoleate in the subcutaneous adipose tissue, biopsied from over the rump, rose from 1.5% to 20% and the calculated amount of linoleate in the meat rose from 150 g to 3340 g. Each steer consumed approximately 30 kg of linoleate in the 63 days which indicates that some 10% of the dietary linoleate was retained in the meat fat.

On day 64 the steers were divided into two groups of 8. The FTSS was deleted from the diet and the steers were offered a diet of 50% crushed barley and 50% lucerne chaff. One group was permitted to continue gaining liveweight (186 kg in 286 days). The other group was maintained at 295 kg for 110 days then, by restricting feed, allowed to lose an average of 66 kg in 245 days.

The decline of % linoleate in the subcutaneous fat was followed in both groups of steers by analysis of biopsy samples taken at 2-6 week intervals. Steers were selected at approximately 2 month intervals on the basis of liveweight change and % linoleate in the subcutaneous fat being closest to the group means. These animals were slaughtered, the carcasses boned and the meat weighed and ground. Ground meat samples were analysed for total fat and % linoleate. These analyses and those of the biopsies allowed calculation of the amount of linoleate in the meat at each time of biopsy.

Steers which gained liveweight (186 kg) and meat fat (48.6 kg) showed a decline in the % linoleate of subcutaneous fat from 20% to 6%. However, the amount of linoleate in the meat (3600 kg) remained relatively constant over the entire period (286 days). In steers which maintained their liveweight (295 kg for 110 days) the % linoleate in subcutaneous fat remained at 19% and the amount of linoleate in the meat remained at approximately 3000 kg. When these steers lost liveweight (66 kg) and meat fat (5.6 kg) the percentage linoleate in the subcutaneous fat declined from 19% to 12% and the weight of linoleate in the meat from 3000 kg to 1200 kg.

Since there is no endogenous synthesis of linoleate and since it is evident that linoleate can be oxidised these findings raise questions on the turnover of linoleate in adipose tissue and the mobilization of storage lipid reserves in cattle.

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