

## EFFECTS OF SOURCE OF FIBRE ON FAT COMPOSITION AND FAT RECYCLING WITH CAECOTROPHES

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### ABSTRACT

An experiment was conducted to determine the effects of dietary source of fibre on feed intake, soft faeces excretion, and fat content and fatty acid composition of caecotrophes. Three isofibrous (NDF) diets were formulated by substituting 15% of alfalfa hay (diet AH) with oat hulls (diet OH) or a mixture (3:1) of beet and apple pulp (diet P). Dietary soluble fibre content varied from 7.9 (diet OH) to 10.3 (diet AH) and 13.1% (diet P). Eighteen New Zealand x Californian rabbits were assigned in a randomised block (litter) design to the experimental diets (6 rabbits per treatment).

Animals were weaned at 25 days of age and fed *ad libitum* in individual cages during five weeks, up to an average body weight of 2.5 kg. Soft faeces excretion was individually determined throughout 24 h after putting animals a wooden collar at the neck.

Ether extract content in soft faeces ground samples was determined using Soxhlet extraction with diethyl ether. All lipid samples were methylated in the presence of sulphuric acid. Fatty acid methyl esters were then analyzed using a Hewlett Packard HP-6890 gas chromatograph equipped with flame ionisation detection and a 30 m x 0.32 mm x 0.25 mm cross linked polyethylene glycol capillary column (HP-Innowax). Analyses were performed with a temperature program from 170 to 240°C at a rate of 1°C.min<sup>-1</sup>. Injector and FID detector were maintained at 250°C. Carrier gas was helium at a flow rate of 3 ml.min<sup>-1</sup>.

Type of diet affected ( $P = 0.02$  and  $0.04$ , respectively) daily DM and ether extract recycling with caecotrophes, which increased from 13.6 and 0.35 (diet OH) to 15.3 and 0.43 (diet P) and 17.7 and 0.44 g (diet AH), respectively. Treatments also affected composition of fat content of caecotrophes. Ether extract concentrations of total odd-numbered and branched fatty acids, which are characteristic of microbial fat, increased ( $P = 0.04$ ) respectively from 7.2 and 6.7% (diet OH) to 9.5 and 8.8% (diet AH) and 11.4 and 9.7% (diet P). Proportion of conjugated linoleic acid, which is known to be produced in the rumen through bacterial hydrogenation of dietary linoleic acid, appeared in caecotrophes fat content in appreciable amounts ( $6.7 \pm 0.5$  g/kg), which tended to be slightly higher ( $8.2 \pm 0.9$  g/kg) in diet P.

From this data it can be concluded that fat ingested with caecotrophes depends on the amount of energy substrate reaching the fermentative area and accounts for about 12% of total fat ingested, which leads to a significant recycling of bacterial fatty acids and linoleic conjugated acid (up to 20 mg/d in diet P).

**Key words:** caecotrophes, fat, dietary fibre, CLA