and retained were higher in the high compared with the low CP diets. Using the N-balance data obtained in this trial the CP requirements of a 60 kg goat, producing 1 kg milk of 4 p. 100 protein and maintaining N-equilibrium was estimated to 129 g.

In trial 3, 45 goats (90 to 120 days in milk) were divided into 5 groups. The 5 groups were allocated to 5 treatments : one with no N-supplement (8 p. 100 CP) and another 2 CP levels (12 or 16 p. 100) supplied either by S or SU. Increasing CP-intake did not alter MY or milk composition.

It is concluded that the lower level (10 p. 100) of CP used during the postweaning period did not affect MY, whereas CP levels higher than 10 p. 100 are required during the preweaning period.

Key words : Damascus goat, nitrogen intake, milk yield.

Effects of types of concentrates on digestibility and nitrogen utilization of a forage based diet in lactating goats

R. DACCORD

Swiss Federal Research Station for Animal Production
Grangeneuve, CH-1725 Posieux

During a balance trial, 15 lactating goats were assigned to three dietary treatments based on hay and concentrate, supplemented on a net energy basis with 25 p. 100 cereals (diet A), 25 p. 100 fodder beet (diet B) or 25 p. 100 animal fat (diet C). In a first experimental period, hay made up 30 p. 100, in the second one 60 p. 100 of the calculated net energy intake.

In both periods, goats ingested more hay with the cereals and fat supplements than with the beet supplement (kg DM/day, 1st period : $A = 1.058^{a}$; $B = 0.820^{a}$; $C = 0.910^{a}$; 2nd period : $A = 1.557^{ab}$; $B = 1.354^{a}$; $C = 1.790^{b}$; $P < 0.5$). The energy intake of the animals on the fat diet was larger only at the lower concentrate level. The beet and fat supplements increased the digestibility of organic matter (1st period : $A = 72.8^{a}$; $B = 78.2^{b}$; $C = 75.9^{ab}$; 2nd period : $A = 71.1^{ac}$; $B = 75.7^{b}$; $C = 73.3^{c}$; $P < 0.5$), nitrogen (1st period : $A = 60.7^{a}$; $B = 64.6^{b}$; $C = 73.8^{c}$; 2nd period : $A = 60.8^{a}$; $B = 67.7^{b}$; $C = 74.7^{c}$; $P < 0.5$) and crude fibre (1st period : $A = 55.3^{a}$; $B = 62.5^{b}$; $C = 58.5^{ab}$; 2nd period : $A = 61.8^{a}$; $B = 65.0^{ab}$; $C = 67.9^{b}$; $P < 0.5$) at both levels of concentrates. These supplements decreased the proportion of faecal N (g N/100 g N intake, 1st period : $A = 39.4^{a}$; $B = 35.4^{b}$; $C = 26.2^{c}$; 2nd period : $A = 39.2^{a}$; $B = 32.3^{b}$; $C = 25.3^{c}$; $P < 0.5$) and increased the proportion of urinary (1st period : $A = 23.7^{a}$; $B = 26.2^{a}$; $C = 36.0^{b}$; 2nd period : $A = 24.8^{a}$; $B = 32.3^{b}$; $C = 38.9^{c}$; $P < 0.5$). The proportion of N excreted in milk was about the same with the three diets at the high concentrate level, but was higher with the cereal supplement on the lower concentrate level ($A = 31.5^{a}$; $B = 27.5^{b}$; $C = 28.0^{ab}$; $P < 0.5$). Both beet and fat supplements increased the proportion of N retained (not significantly).

In blood, the fat supplement increased the concentration of urea, glucose, triglycerides and GLDH and decreased the concentration of β-hydroxybutyrate. The beet supplement decreased the concentration of triglycerides and increased the concentration of β-hydroxybutyrate at both concentrate levels ; furthermore it increased the glucose concentration only at the low level.

The fat supplement increased the production of 3.5 p. 100 fat corrected milk, increasing both the concentration the quantity of fat and lactose.

Key words : Goat, milk production, concentrates, digestibility, nitrogen utilization, cereals, fodder beet, animal fat.