

Does the Form of Diet and Method of Feeding Influence Milk CLA Content?

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Milk concentrations of CLA (Conjugated Linoleic Acid) were reported to be higher in milk from grazing animals than those fed the same grass zero-grazed (Offer, 2002). This raised considerable interest in understanding the physiological mechanisms underpinning the differences in milk fatty acid composition between grazing and zero-grazing. With this goal in mind, an experiment was designed to investigate the differences between Grazing (G), Zero Grazing (ZG) and Grass Silage (GS) feeding (harvested from the same stand of perennial rye grass) on fatty acid profiles in rumen fluid, plasma and milk with specific reference to transvaccenic acid (TVA) and 9, 11 CLA.

Six rumen cannulated Holstein Friesian cows, in early lactation, were randomly assigned to 3 treatments – G, ZG and GS in a replicated 3x3 Latin Square design with three periods of 3 weeks duration each. Paddock area was allocated daily to offer 20kg DM/cow/day. Indoor animals were offered grass or silage ad libitum. A concentrate containing ground barley and citrus pulp was offered to all cows at a rate of 3kg/d before the evening milking. Sampling was done in the third week. Data were analysed by analysis of variance.

Table 1. DMI, milk yield, composition, trans-vaccenic acid (TVA) and CLA.

	Grazing	Zero grazing	Grass silage	P-value
Dry matter intake (kg/d)	18.7 ^b	17.9 ^{ab}	15.6 ^a	P<0.05
Milk yield (L/d)	24.6 ^c	20.1 ^b	16.1 ^a	P<0.01
Milk fat (%)	3.8	4.0	3.5	NS
Milk protein (%)	3.4 ^b	3.2 ^b	2.8 ^a	P<0.01
Milk lactose (%)	4.6	4.5	4.2	NS
Intake 18:2 (g/d)	46.7 ^a	42.9 ^a	24.5 ^b	P<0.01
Intake 18:3 (g/d)	272.5 ^a	214.1 ^b	80.7 ^c	P<0.01
TVA (%)				
In rumen	15.89 ^a	13.04 ^{ab}	7.47 ^b	P<0.08
In blood	3.24 ^a	2.25 ^a	0.92 ^b	P<0.05
In milk	6.06 ^a	4.53 ^b	1.11 ^c	P<0.01
9, 11 CLA (%)				
In rumen	0.05	0.03	0.05	NS
In blood	0.40	0.23	0.00	NS
In milk	2.47 ^a	1.63 ^b	0.59 ^c	P<0.01

^{a,b}Values in the same row with different superscripts are significantly different from one another.

Conclusions : The higher concentrations of milk CLA in G compared to ZG could be partly due to higher intake of 18:3 fatty acid in G relative to ZG.