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Lactational responses to postruminal infusions of amino acids in dairy cows fed maize silage, hay or grass silage

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Duodenal infusions of methionine and lysine have been shown to increase milk protein yield in dairy cows given a dehydrated maize diet (Rulquin, 1987). As duodenal amino acids (AA) profiles vary according to diet (Le Henaff, unpublished), a trial was undertaken to test the lactational responses of dairy cows to methionine and lysine infusions with 3 other diets based on either maize silage (M), perennial ryegrass hay (H) or silage (S).

Each diet was given to a different group of 6 fistulated *Holstein* cows in early lactation that received duodenal infusions of either 11 g of methionine and 24 g of lysine (ML) or 90 g of glutamic acid (control) in a double reversal design over 2 wk periods. Diets were calculated to be isoenergetic either with 'fibrous' concentrate (26% of the diet M) or a 'starchy' concentrate (43.6% of the diet H and 28% of the diet S) and to supply in theory the same level

of intestinal digestible proteins in order to meet 90% of the protein requirement.

The ML infusion significantly increased milk yield only with diet M (+ 3.9%) and protein yield with diets M (+ 8.8%) and S (+ 3.7%) (table I). The protein content was significantly increased by ML with diets M (+ 4.8%) and H (+ 2%) and casein content with diet M. The ML infusion decreased the fat content with diet M. These results, consistent with those of Schwab *et al* (1976) and of Rulquin (1987), indicate that methionine and lysine are not as clearly limiting factors with hay and grass silage as with maize silage diets.

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Rulquin H (1987) *Reprod Nutr Dév* 27, 229-230
Schwab CG, Satter LD, Clay AB (1976) *J Dairy Sci* 59, 1254-1270

Table I. Effect of ML on lactating cows fed 3 different diets.

	Maize silage		Hay		Grass silage	
	control	ML	control	ML	control	ML
Milk yield (kg/d)	30.4	31.6 *	27.9	28.2	29.5	30.2
Protein (g/kg)	28.0	29.4 **	28.9	29.5 *	27.8	28.0
Fat (g/kg)	40.5	38.9 *	36.2	36.5	34.3	34.2
Casein (g/kg)	23.3	24.7 **	24.3	24.8	23.5	23.8

ML : methionine lysine; within a diet: * $P < 0.05$; ** $P < 0.01$.