

## Conjugated linoleic acid content of milk from cows fed different diets

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**Introduction** Conjugated linoleic acid (CLA) is a mixture of positional and geometric isomers of linoleic acid (c-9, c-12 C<sub>18:2</sub>). Conjugated linoleic acid occurs naturally in foods, however the main dietary sources are dairy products and other foods derived from ruminants. Continuous interest in CLA is attributed to its potential health benefits such as anticarcinogenic, antiatherogenic, antidiabetic and antiadipogenic effects (Dhiman *et al.*, 1999, Staszak *et al.*, 2001). Typical consumption of CLA by humans is far lower than the dose that has been shown to be effective in reducing tumours in animal models (Dhiman *et al.*, 1999), so it is very important to increase the CLA content of ruminants edible products. The CLA concentration can be positively influenced by animal diet. Grazing cows on pasture, feeding fresh cut pasture, addition of fish oil etc demonstrate positive effects on CLA content in milk (Bessa *et al.*, 2000, Staszak *et al.*, 2001). The objective of this research was to determine the CLA content of milk from cows fed diets containing different proportions of conserved forages.

**Material and methods** The experiment was conducted from July 2003 to July 2004. Twenty primiparous Polish black and white cows were used. Cows which were randomly assigned to one of two groups consumed diets containing different proportions of conserved forages. Group S was fed diet based on maize silage (more than 50% of daily dry matter intake) and group H was offered diet based on grass hay (more than 50% of dry matter intake). Chemical composition and nutritive value of feeds were determined. Samples of milk from individual cows were collected monthly and analysed for chemical composition, including the CLA content (analysed every two months). Milk yield was recorded.

**Results** The average CLA content in milk analysed during experiment is shown in Table 1. The CLA content varied significantly between individual cows, which suggest animal related factors. Milk yield and composition was similar for both groups. Diets containing grass hay resulted in significantly ( $P<0.01$ ) larger CLA concentration in July, September, November 2003 and in July 2004. Slightly higher CLA content was observed in cows fed a maize silage-based diet in January, March (significant at  $P<0.01$ ) and May 2004. In summer months both diets contained 20% grass cut fresh, which resulted in an increase in CLA levels in milk. Green pasture may contain up to 3% fatty acids on a dry matter basis, of which about 90% will be unsaturated C<sub>18</sub> acids (Bessa *et al.*, 2000). Higher levels of CLA in cows fed grass hay-based diets may be explained by the fact that lipid composition of the preserved forage remains relatively unchanged from that prior to preservation unless there is gross deterioration (during normal drying and storing the C<sub>18:3</sub> content decreases and C<sub>16:0</sub> increases in forage) (Dhiman *et al.*, 1999).

**Table 1** The CLA concentration in milk

		The CLA content in milk (mg/kg of milk)						
		July	September	November	January	March	May	July
		2003	2003	2003	2004	2004	2004	2004
Group S	Mean	191.60 <sup>a</sup>	223.13 <sup>b</sup>	235.47 <sup>c</sup>	193.09	228.11 <sup>d</sup>	169.51	275.07 <sup>e</sup>
Pooled SD = 96.19	SD	61.74	120.48	80.93	48.81	112.63	82.46	134.29
Group H	Mean	310.99 <sup>a</sup>	290.78 <sup>b</sup>	295.35 <sup>c</sup>	187.71	170.41 <sup>d</sup>	145.12	429.76 <sup>e</sup>
Pooled SD = 141.60	SD	207.87	189.89	122.16	38.16	59.92	114.34	167.48

<sup>a, b, c, d, e</sup> means in the same column with the same superscripts differ significantly at  $P<0.01$

**Conclusion** Both crop type (maize silage vs grass hay) and conservation method altered the CLA content in bovine milk.

### References

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