

## **Producing Conjugated Linoleic Acid Enriched Milk Through Practical Dairy Nutrition.**

J.A. Bell and J.J. Kennelly

4-10 Agriculture/Forestry Centre, Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada, T6G 2P5  
Email: [jbelle@afns.ualberta.ca](mailto:jbelle@afns.ualberta.ca) Email: [john.kennelly@ualberta.ca](mailto:john.kennelly@ualberta.ca)

Conjugated linoleic acid (CLA) refers to a group of geometrical and positional isomers of linoleic acid that has been shown to have potent anticarcinogenic properties. Ruminant animals produce CLA (mainly cis-9, trans-11 18:2) through the biohydrogenation of dietary fat in the rumen and also by desaturation of trans-11 18:1 in the mammary gland.

In view of the potential health benefits to be gained from consuming CLA in milk, our objective was to determine if we could significantly increase the concentration of CLA in bovine milk through manipulation of the animal's diet. Twenty-eight lactating Holstein cows received one of four dietary treatments for 15 days: (1) control (CTL), (2) low fat diet (LF); (3) high fat diet A (HFA), (4) high fat diet B (HFB). Milk was sampled on the last two days of the treatment period and analyzed for fatty acid composition. The CTL diet, representative of diets fed in Alberta, Canada resulted in milk fat with a CLA concentration of 0.49%, similar to that typically reported for whole milk. Cows fed the HFB diet produced milk fat with 5.63%, approximately 12 times greater than the CTL diet. The HFA and HFB diets also resulted in a significant increase in trans-11 18:1 compared to CTL or LF. Although there are concerns about the level of trans fatty acids in the human diet, there is evidence that trans-11 18:1 can be desaturated to cis-9, trans-11 CLA in human tissues. The HFA and HFB milk compared to CTL or LF had approximately 45% lower C16:0 and approximately 50% higher cis-9 18:1. Consumption of milk with lower C14:0 and C16:0 and higher cis-9 18:1 as in HFA and HFB could have a positive effect on plasma cholesterol levels compared to CTL milk.

These results demonstrate the feasibility of producing CLA enriched milk. Furthermore, the same treatments that increased CLA also produced the additional benefit of an overall reduction in saturated fatty acids.

