

Effect of Sunflower Oil Delivery Method on Conjugated Linoleic Acid Content in Milk*

G. McGregor, A. Meszaros, Y. Parrott, S. Tam, M. Oba, and L. Doepel.

Dairy Technology and Research Centre, University of Alberta, Edmonton AB T6G 2P5.
E-mail: masahito.oba@ualberta.ca

Conjugated Linoleic Acids (CLA) are a group of unsaturated fatty acids found mainly in products of ruminant animals such as milk and meat, and associated with many potential health benefits: CLA decreases obesity and displays anti-cancer properties in rodent models. Milk is the main source of CLA in the human diet. The average CLA content in milk from cows fed standard dairy rations is between 0.3 - 0.6 %, but this can be increased dramatically through diet manipulation.

The objective of this experiment was to determine if the method of oil delivery would influence milk CLA concentrations. Four ruminally cannulated multiparous Holstein cows (127 ± 4.5 days in milk) were used. Sunflower oil (2.5% of dietary dry matter) was either dosed through rumen cannulas twice per day (RD) or fed once daily in a TMR (control). The same basal TMR was fed to both groups except the TMR for RD treatment was devoid of sunflower oil which was instead dosed ruminally in an amount based on each cow's feed intake the previous day. Dry matter intake (22.4 kg/d) and milk yield (31.2 kg/d) was not affected by treatment. Milk fat, protein and lactose content, and somatic cell count were also unaffected by treatment. However, concentration of vaccenic acid (the building block of CLA) was greater (5.39 vs. 3.33 %), and the CLA concentration tended to be greater (1.72 vs. 1.12 %) for RD cows. It is speculated that, compared to gradual consumption of sunflower oil supplemented within a TMR, infrequent large doses of sunflower oil suddenly increased the availability of unsaturated fatty acids in the rumen, thus exceeding the capacity of the rumen microbes to complete biohydrogenation. This might have allowed accumulation of vaccenic acid in the rumen resulting in increased absorption and subsequent conversion to CLA in the mammary gland.

Take Home Message: These results indicate feeding management affecting the frequency of lipid intake alters milk CLA concentrations. Production of CLA enriched milk could benefit the dairy industry because of the potential human health benefits, which would increase consumer demand for the product.

**This was an undergraduate student project supported by the Alberta Livestock Industry Development Fund*