

# Producing CLA-Enriched Milk Using Dairy Nutrition: Research Summary

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Conjugated linoleic acid (CLA) refers to a mixture of conjugated octadecadienoic acids of predominantly ruminant origin. The main isomer in bovine milk fat is the cis-9, trans-11 18:2. Interest in CLA increased after the discovery of its health promoting properties, including potent anticarcinogenic activity. Because of the potential health benefits of CLA, intense interest has been shown in increasing the level of CLA in bovine milk. We have carried out a number of studies at the DRTC evaluating potential to enhance milk fat CLA through manipulation of the dairy diet.

Our studies have shown that supplementing oilseeds to the dairy diet is an effective method for increasing CLA in milk fat. We have tested a range of oilseed types including canola, soy, sunflower, safflower, linola, and flaxseed. We have tested the oilseeds at various levels of dietary inclusion, and compared the effectiveness of the processed seed verses the extracted oil. Overall, we have found that oilseeds that are characteristically high in linoleic acid (18:2 n-6), such as sunflower, safflower, and linola, are the most effective at increasing CLA. Availability of the oil to rumen digestion appears to be important and feeding the extracted oil tended to be more effective than the same amount of oil in the form of the processed seed. Further research is planned to determine the processing conditions required to achieve similar results from the seed and oil. We found that the CLA levels in milk increased relatively quickly, reaching a plateau by 7-10 days after initiation of test feeding. CLA levels also remained consistent over a period of more than two months. Oilseeds provide the substrate for CLA synthesis in the cow but other dairy supplements may have an effect on the oilseed digestion resulting in even greater milk CLA than oilseed alone. Rumensin® is an example of one such ingredient that we have tested. We found that Rumensin® alone had no effect on milk CLA levels but in combination with oilseed it increased milk CLA to a greater extent than the oilseed alone.

**Implications:** Using practical dairy feeding strategies it is possible to increase the concentration of CLA in bovine milk by as much as ten fold. This technology has been developed to a point where we are now working on a plan for commercial production of CLA-enriched dairy products.