

The Organic Dairy Advantages: Part 2. Organic Milk Has Higher CLA Content

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What is CLA?

Conjugated linoleic acid (CLA) (also called rumenic acid) is the only naturally occurring substance that has been shown to unequivocally prevent cancer **(1)**. It is a fatty acid that is made by the team of the rumen bacteria and the cows' tissues. During its change, it transforms from an omega-6 fatty acid (linoleic acid) that we already have too much of in our typical American diet (*see part 1 of this series*) to a powerful fatty acid that prevents and even helps cure cancer, helps prevent obesity, helps prevent atherosclerosis, and helps prevent diabetes mellitus! Want to learn more?

Our American diet provides CLA to each of us mainly from dairy (~70% of CLA) and beef fat (~25% of CLA). Milk fat is considered the richest natural source of CLA. CLA is only available in products from ruminants, which includes cows, goats, sheep, deer, elk, moose, antelope, etc. CLA (CLA and vaccenic acid) is made by the bacteria living in the rumen. Vegans have NO source of CLA in their diets. Because CLA is a fat we will get no CLA from any product that has no fat in it. We will get less CLA from any food that is lower in fat than normal (think 2% or skim milk, low fat cheese). Fortunately for us, our taste buds desire full fat dairy and beef products; low fat just does not taste nor feel good in our mouths!

Vaccenic acid is the precursor to CLA that is also available to us through ruminant products in our diet. Vaccenic acid can be transformed into CLA by cow tissues AND by we humans. The formula for estimating the effective CLA activity available in ruminant products to us as humans is to multiply the CLA level by 1.4 to account for the conversion of vaccenic acid into CLA. **(2,3,4)**

First discovered in 1987 in fried ground beef, CLA is unique in its animal origin, and in its ability to inhibit cancer at intake levels that are only slightly above our American diet levels! It has been calculated that average Americans need to triple their intake of dairy fat or beef fat to approximate the dietary levels that experimental animals have received in cancer trials. CLA content of milk fat is very stable and not influenced by storage or processing. CLA has been researched for over 20 years now, in both cell line and animal cancer model studies, and has been shown to inhibit the development of many types of cancer at a rate of 30-60% reduction compared to control diets!

Mammary gland cancer (breast cancer) is especially sensitive to prevention by CLA. Breast cancer is diagnosed in a woman every 16 minutes in the USA. A

woman dies from breast cancer in the USA every 12.5 minutes. It is the number one cancer killer of women in the USA and the world. One of every 7 women alive in the U.S. either has or will have breast cancer (5).

CLA Cancer Research Examples

An example of the exquisite sensitivity of mammary gland cancer to the wonderful effects of CLA is a study done by Thompson and Ip (6) in prepuberal rat kits. The rat kits were fed either a control diet level of zero CLA or a 1.0% level CLA diet *only* between the ages of weaning and puberty. This is when the mammary glands were undergoing their maturation. This is a period of 4-5 weeks in rats! The rats that had the advantage of a CLA enhanced diet for five weeks had a 34-39% reduction in tumor development from chemically induced mammary gland cancer! This was after only being fed the CLA for a few weeks, and having no CLA in the diet after the administration of the chemicals for cancer induction! CLA is a very potent cancer fighter. Would you want your daughters to have enough of this cancer fighter in their diets? Do you think every parent would want their daughters to get enough CLA? We know of no deleterious effects of the main isomers (geometric forms) of ruminant origin CLA at any dosage.

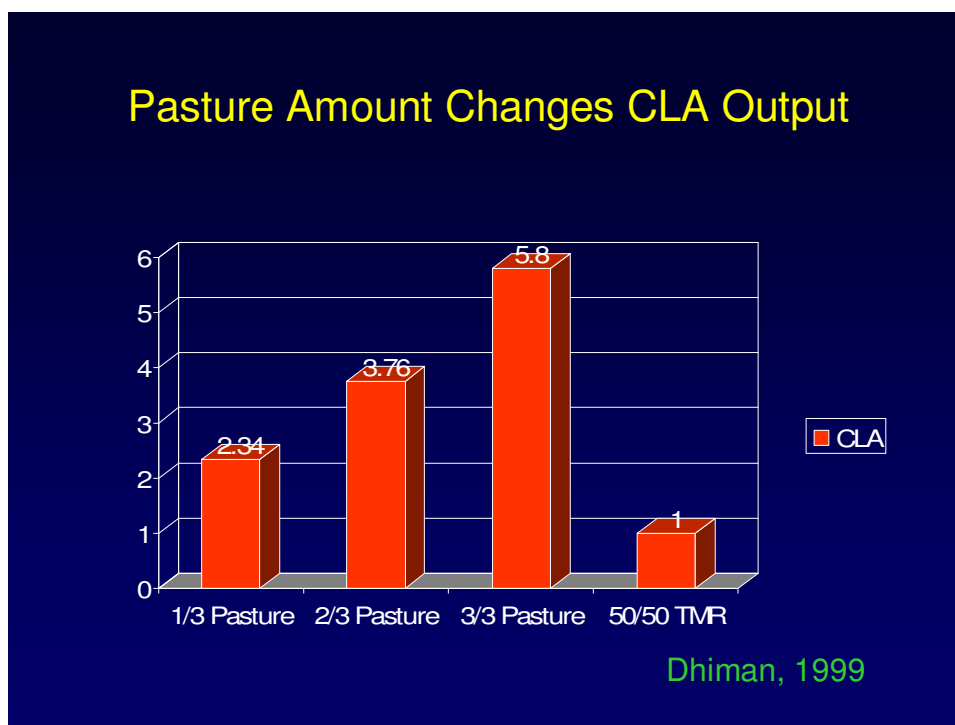
A Finnish project (7), demonstrated a 3-5 fold lower risk of breast Cancer in postmenopausal women that had the highest quintile of dietary CLA intake and blood levels of CLA.

The cows, their diet, and CLA production

Variation in CLA output in milk depends mainly on the diet cows eat and secondarily on the individual cows themselves. Differences due to milk yield, milk fat yield, stage of lactation or age of cows has very little relationship with CLA output. Differences in CLA levels in milk between herds have been as high as 8 fold, with diet being the major cause of differences (8). Fresh pasture creates a rumen environment that will increase CLA output by 2-5 fold, but as pasture matures, the difference will diminish (9). A multi-country study (Denmark, Finland, Iceland, Norway, and Sweden) Showed that summer milk was 41% higher in CLA content on average across the countries than winter milk (10). Individual cow variation hierarchy remains among cows on sequential diet changes, and individual differences within breeds (up to 3 fold) are greater than differences between breeds. Differences due to breed of cows is minimal, but two studies show that Jerseys make less CLA than Holsteins as a percent of total fat (11,12). Dietary manipulation that provides extra vegetable origin oil (linoleic acid) results in higher CLA output as a percent of the fat output, but lush pasture is the most natural and reliable method of increasing CLA production in cows. CLA or linoleic acid in the diet can directly contribute to the CLA in milk, but pasture diets, high in linolenic not linoleic acid, consistently produce CLA that is

over 91% endogenous (de novo) synthesis (13). The cows' rumen bacteria made the new fatty acid; it was not in the diet to begin with.

In a multi-part feeding experiment, Dhiman and colleagues showed that CLA output is very responsive to pasture feeding (14). In the experiment where pasture made up either 1/3, 2/3 or total dry matter intake, the CLA concentration output levels were 2.34x, 3.76x, and 5.8x higher compared to a typical 50/50 forage/concentrate TMR! Pasture makes the difference, probably most of the difference, between organic and conventional milk CLA levels. If we feed more pasture, as well as less grain, we will magnify the CLA output difference.



In a trial by Kelly (15), Holstein cows that were on pasture only (10.9 mg/g fat) produced twice as much CLA as control cows on a TMR (4.6 mg/g fat).

In a study where the pasture cows received up to 12 pounds of grain mix (11), Holstein and Jersey pastured cows produced 83% more CLA (.36 vs .66 mg/g fat) than the control TMR fed cows.

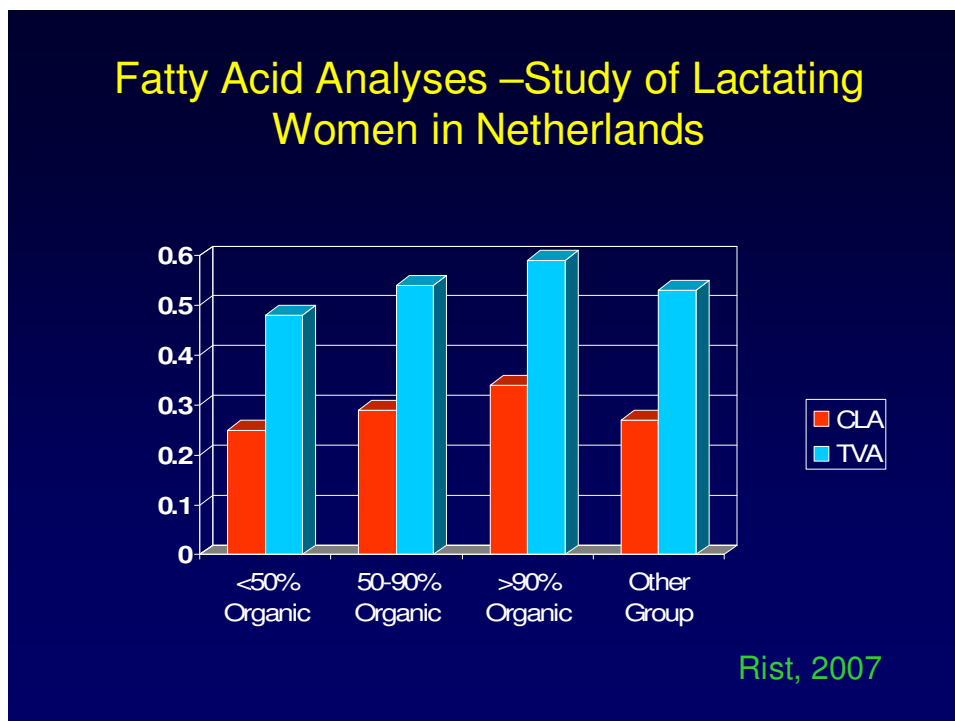
Is organic milk higher in CLA than conventional milk?

Since grain feeding inhibits the production of CLA by ruminant bacteria, and since organic dairy cows typically are fed less grain, and since organic cows graze pasture, organic milk would be expected to be higher in CLA, and it is indeed higher in CLA on average, than conventional milk.

Five different research teams concluded that European organic milk is higher in CLA than European conventional milk: Jahries 1997(16), Bergamo 2003(17), Gedek 1980(18), Dewhurst 2003(19), and Adriaansen-Tenakes 2005(20).

Much CLA research has been done in animal model studies, e.g. cancer studies. But a really significant direct human species question was asked by Lukas Rist and colleagues in a study of lactating women in the Netherlands (21). *Do organic or conventional diet differences affect CLA levels in human breast milk?* A total of 312 breast milk samples were collected and analyzed for fatty acids. Four nutrition intake groups were formed using nutrition questionnaires. These four groups were based on intakes of organic dairy and beef fats: Group 1 was less than 50% organic dairy and organic beef intake, Group 2 was 50-90% organic dairy and organic beef intake, Group 3 was >90% organic dairy and organic beef intake, and Group 4 was any mixture of fat intake from organic or conventional dairy and beef intake that did not fit well into the other 3 nutrition intake groups.

Results showed that the higher organic dairy and organic beef intake yielded human breast milk that was higher in CLA and TVA (trans vaccenic acid – the precursor to CLA).



The added factor of interest to organic dairy folks is that the intake of fat from dairy origin was 5-20 times higher than fat from beef in this study. Our organic milk is important to these nursing mothers and their babies!

Ellis and coworkers compared the fatty acid composition of organic and conventional cows' milk from cows in herds found in the United Kingdom (22). Even though statistical differences were not found between the conventional and organic producers in this trial, the CLA was higher numerically in organic milk 10 of 12 months during the year. Percentage of the diet that was grass from pasture was the determining factor in the CLA levels in this study.

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