

Northeast Iowa Resource Conservation and Development has pulled together a collaborative team of scientists, farmers, institutions, organizations and educators to exploring the benefits of conjugated linoleic acid, a unique fatty acid that is found in higher concentrations in meat and milk products from pastured animals.

The research is the second part of a two part study. The first part of the research gave Eastern Iowa and Southwest Wisconsin producers the opportunity to understand more about CLA and to understand which production systems would be most likely to result in high CLA levels in beef and milk products. It also raised awareness about the potential health benefits of this fatty acid to humans. The results of this study documented the variation in milk and beef CLA concentrations between farms with varied production systems.

Pasture feeding was the strongest management factor that results in high CLA.

Pasture feeding was identified as the strongest management factor that results in high CLA concentrations in the first part of the study. Our ongoing SARE-supported research clearly demonstrates that the CLA concentration in bovine milk and beef is elevated 2- to 10-fold by grazing cattle on pastures. Pasture is a rich source of linoleic acid which, upon ruminal biohydrogenation, can supply the precursor for additional CLA synthesis by the endogenous pathway. This information was disseminated to producers so they can utilize feedstuffs high in linoleic acid to sustain a high CLA concentration even during the non-grazing months of the year. It remains to be seen what impact on the market place this study will have. Although the results of this study will be more useful when the effects of human consumption of products with high CLA concentrations are more widely documented and distributed to the media, there are some impacts on local producers. Once the information was distributed to producers, the Natural Resource Conservation Service reported an interest from grazers wanting to incorporate more on grass time and reduce cement time for their animals. These producers were also interested in improving their grazing systems, incorporating higher forage and establishing niche marketing for their product.

Economic analysis conducted by ISU Extension shows initial start up for grass based systems that result in high CLA is less than confined systems.

Research related to this study was conducted by Iowa State Extension in the 1990's. The ISU Extension research found that initial start up cost for grass based systems is less than initial start up cost for a confined system. Grass based systems were found to be a less expensive way to produce milk on a family size farm of 100 or fewer cows. The grass based producer does not have to build a free stall barn or have the planting, harvest, chopping equipment that a confined system needs. If they can have someone provide a small amount of silage, then they can avoid the cost of a tractor. The grass based producer was also found to save on infrastructure cost, since they did not have to build a free stall barn.

The same systems that ISU Extension found to be more economical to start up and operate were also the systems that were found by this study to produce higher CLA concentrations. If further studies in human ingestion of high CLA products support the human benefits of CLA ingestion, then the lower cost production system may be found to produce a product that is ultimately worth, not only a greater market share, but also a greater profit within that market share.

The new grant funds will be used to gain a better understanding of the health benefits for humans eating meat and dairy products with high CLA.

At a recent discussion with several of the participating farmers, this question was asked: What is the most logical follow-up experiment to the current one? The resounding response was “We need to determine the health effects of our CLA-enriched milk and beef on humans.” Hence, the second part of the two part study is based on the hypothesis that eating the CLA-enriched foods will impact positively several measures of human health. Dairy and beef producers in Northeast Iowa who have demonstrated production of CLA-enriched milk and beef from grazing cattle will be selected for milk and beef food production. The farmers will use grazing systems to raise livestock and produce dairy products with high CLA content for the experiment. Milk and beef will be processed into several foods. These CLA-enriched foods and their commercial counterparts, that are much lower in CLA content, will be incorporated into typical U.S. diets for a human feeding study and fed to free living young adults at Iowa State University. Several measures of human health, including cholesterol, lipoproteins, CLA, glucose, insulin, glucagon in blood, bone density, body weight and composition, and glucose tolerance will be quantified.

The project will quantify the effects of CLA-enriched foods on measures of human health. It is expected to provide a better understanding of the link between sustainable grazing systems and human health and has the potential to increase the economic viability for dairy and beef producers that use sustainable high CLA pasture systems.

Each 400 cow dairy operation in the Northeast Iowa is estimated by Iowa State University to bring in over 16 jobs and nearly \$600,000 to local communities each year. The sustainability of these dairies, as well as cattle operations, is dependent on the value of the product they produce. This potential increased value makes this project important to the viability of the rural communities by sustaining the small and medium production systems that provide substantial cash flow.

Benefits of CLA

Conjugated linoleic acid is already a desired food component among many health-conscious consumers; it is already possible for consumers to purchase CLA in capsule form. Conjugated linoleic acids helps prevent cancer, prevent heart disease, decrease obesity, and improve bone health and glucose tolerance in laboratory animals and is speculated to have the same results in humans. As consumers increase consumption of CLA-enriched foods for improving the healthfulness of their diets, the economics and sustainability of livestock production based on grass in the Upper Midwest and beyond could benefit greatly. Consumption of typical diets results in intakes of about 150 mg of CLA daily. Replacing the dairy and beef foods with CLA-enriched foods from cattle grazing grass would provide 200 mg or more of additional CLA, which is hypothesized to provide noticeable health benefits to humans.

If grazers are attempting to eventually get paid bonuses for high-CLA milk and to direct-market high-CLA meats, they need to know the effects of consuming CLA-enriched dairy and

beef foods on measures of human health. This question is the principal focus of this proposed project. As a major participant in this project, the Cooperation Regions of Organic Producers Pools (CROPP-Organic Valley) will help the producers by processing the meat and dairy products into butter, ice cream, powdered milk, and cheeses and beefsteaks and hamburgers that have significantly greater CLA content (more than two times) than control foods.

The new grant funds will be used to gain a better understanding CLA, which has the potential to significantly improve the value and size of the market for animal products produced using sustainable, management intensive, grazing systems. The project is also expected to provide a better understanding of the link between sustainable grazing systems and human health. As we move forward with this project we anticipate greater profitability for farmers, and enhanced quality of life for society as a whole.



