The CLA Network

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Harvesting the health promise of conjugated linoleic acid

The TVA factor

New research from the CLA Network supports growing evidence that natural trans fat found in dairy and beef products is actually health promoting, not harmful.

It could be called "The TVA factor" – a rising tide of research knowledge that is reshaping the image of natural trans fat found in dairy and beef products.

TVA stands for "trans vaccenic acid," the main type of trans fat produced by ruminants and found in meat and milk products from these animals. Despite the public perception that all types of trans fat are bad, new research by members of the CLA Network indicates that TVA is not harmful and in fact may have potent health benefits.

"There is accumulating evidence that we can discriminate between natural trans fats, which appear to be beneficial, versus industrially processed, hydrogenated trans fats that have been shown to be detrimental," says Dr. Spencer Proctor, CLA Network science lead. "The new research findings on TVA offer strong confirmation of this distinction.

"Very recent studies have indicated that diets rich in TVA and/or other ruminant fatty acids may be beneficial. However, to our knowledge, our study is the first to demonstrate beneficial dyslipidemic properties solely due to TVA, as opposed to diets that often contain numerous bioactive lipids. This finding is a major achievement for this field."

New breakthrough results

The latest wave of encouraging findings come from two animal model feeding trials designed to examine the impact of natural TVA on blood lipid factors.

The trials were led by Proctor and colleague Dr. Catherine Field, both researchers at the University of Alberta and members of the CLA Network. They were conducted using a rat species bred to provide a model for metabolic syndrome – a human health condition associated with increased risk of cardiovascular disease, other diseases related to plaque buildup in artery walls, and type II diabetes.

In both trials – an initial, three week trial and a second, 16 week trial – the researchers compared the effects of feeding or not feeding natural TVA to a group of "lean" rats and a second group of rats with metabolic syndrome.

In both groups and both trials, the results indicated no negative effect of feeding TVA on blood lipid profiles. Among the group with metabolic syndrome, the results showed feeding TVA was associated with a major lowering of triglyceride levels and a modest lowering of both total and LDL (low density lipoprotein) cholesterol levels – all key risk factors for cardiovascular disease.

Triglyceride levels were lowered 30 percent in the short-term trial and by more than 50 percent in the longer-term trial. Total cholesterol was lowered 20 percent in the short-term trial and by approximately 30 percent in the longer-term trial. LDL cholesterol was lowered 20 percent in the short-term trial and 25 percent in the longer-term trial.

"These are all substantial trends that point to continued reductions in these risk factors over time," says Proctor. "With the results of these trials, we're very confident we're seeing clearly positive health effects related to TVA."

Moving to human trials

On the strength of these findings, the researchers are pursuing support for human clinical trials to further explore and confirm the health implications of TVA.

New health booster. *TVA is found naturally in dairy and beef products.*

"It may well be, that regular consumption of naturally occurring ruminant trans fat derived from dairy and beef products may be beneficial in reducing lipid risk factors associated with cardiovascular disease and other health threats," says Proctor.

Reshaping the image of trans fat

Though the TVA study results represent good news for dairy and beef consumers, as well as dairy and beef industries, they underscore that continued improved information and research is needed to present the public with a more accurate understanding of trans fat, he says.

Though trans fats have been widely regarded as a health risk, there has been little research or dialogue to distinguish between natural ruminant trans fat and industrially processed, hydrogenated trans fat.

"The public perception is that all trans fat is bad," says Proctor. "But we are finding this is not accurate in the case of TVA."

The significance of TVA's potential as a health promoter is tremendous for both human nutrition and the health image of dairy and beef products, he notes. TVA is by far the most prominent trans fat produced by ruminants and present in meat and milk. It is estimated to contribute 80 to 90 percent of ruminant-based trans fat in the North American diet.

"TVA would account for nearly all the trans fat content shown on nutrition labels of food products that contain milk, ground beef, beef cuts and other ruminant fats," says Proctor.

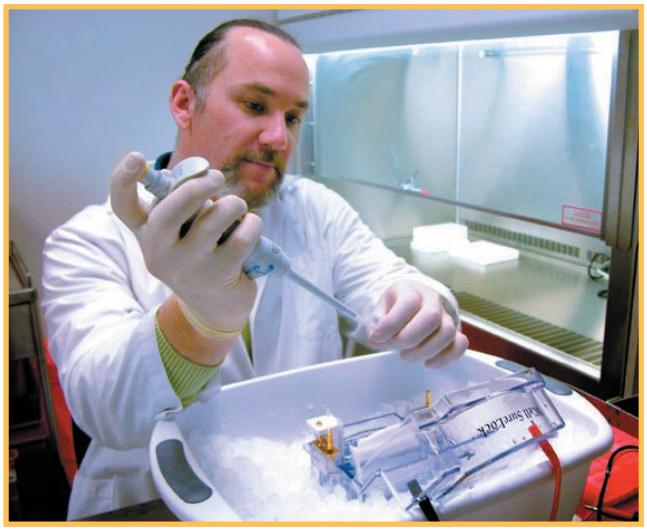
The CLA connection

The interest of Proctor and Field in exploring TVA effects was sparked through their work as researchers in the CLA Network. Founded in Canada, the CLA Network is a multi-institutional, multi-organizational network of researchers, food industry representatives, health professionals and communicators, devoted to "Harvesting the health promise of conjugated linoleic acid (CLA)."

Like TVA, CLA is a natural fatty acid produced by ruminants and found in dairy and beef products. Though more research is needed to confirm specific CLA health benefits for humans, early studies based largely on animal models indicated that CLA may help fight or prevent diseases such as cancer, heart disease, diabetes and kidney disease, as well as help battle obesity and improve bone density.

CLA Network researchers have been interested in TVA based on studies that have shown this trans fat can act as a "precursor" for CLA. Specifically, TVA has been shown to convert into a type of CLA – CLA 9,11 – once inside the human body, as a result of interaction with a particular human enzyme. CLA 9,11 is one of the major CLA isomers that has been linked to potential human health benefits.

In addition, dairy production studies by CLA Network members have shown that livestock feeding strategies used to increase CLA content in milk result in an even greater increase in TVA. One key study showed TVA increased at a rate more than fives times greater than CLA increased.



Science powers success. *Dr. Spencer Proctor in the lab.*

"When we learned of these disproportionate increases, we wanted to learn more about the health implications of TVA," says Proctor. "Our results to date have been very encouraging."

Because CLA increases are linked with TVA increases, this further strengthens the potential for human health opportunities, as well as dairy and beef marketing opportunities, related to CLA and natural bioactive lipids, he notes.

"The findings represent great news for consumers and producers of dairy and beef products"

Labeling implications

Ultimately, improved knowledge of TVA may lead to changes in trans fat labeling on food products, notes Proctor.

Currently, nutrition label laws in the U.S. and Canada do not differentiate between natural trans fat and industrially processed fat. In addition, increasingly common product claims featured on packaging, such as "trans fat free" reinforce the perception that all trans fat is bad.

In the case of CLA, at least in Canada, consideration of health implications has influenced the labeling requirements. Though CLA is not a "classic" trans fat, it is still technically scientifically classified as a type of

However, CLA is widely recognized by scientists and health professionals as a healthy type of fatty acid – one that does not share the potentially harmful properties associated with industrially processed trans fat. In recognition of this, Health Canada did not include CLA as part of the total trans fat value in the new nutrition label.

"Our recent trials are among the first to specifically examine the health implications of TVA," says Proctor. "As more research knowledge emerges, our hope is there will be improved health information, including labeling information, available to the consumer."

After TVA, CLA is the next most prevalent ruminant trans fat. Combined, they are a large portion of natural trans fat in dairy and beef, though other less well known types are present at trace levels.

CLA Network vaccenic acid research is supported by the Alberta Livestock Industry Development Fund (ALIDF), Dairy Farmers of Canada (DFC) and the Beef Information Centre (BIC).

Learn more

For more information on the CLA Network, visit www.CLAnetwork.com or email: CLAnetwork@gov.ab.ca.

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