

New fat, same old problem with an added twist?

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Last month, New York City outlawed the use of partially hydrogenated oils, known as trans fats, in restaurants, a ban now under consideration in other cities, including Boston and Chicago. But novel research conducted in Malaysia and at Brandeis University shows that a new method of modifying fat in commercial products to replace unhealthy trans fats raises blood glucose and depresses insulin in humans, common precursors to diabetes. Furthermore, like trans fat, it still adversely depressed the beneficial HDL-cholesterol.

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(<http://www.nutritionandmetabolism.com>), the study demonstrates that an interesterified fat--(a modified fat that includes hydrogenation followed by rearrangements of fats molecules by the process called interesterification) enriched with saturated stearic acid--adversely affected human metabolism of lipoproteins and glucose, compared to an unmodified, natural saturated fat. Interesterification to generate a stearic acid-rich fat is fast becoming the method of choice to modify fats in foods that require a longer shelf life because this process hardens fat similar to oils containing trans-fatty acids. The new study shows that interesterification, which unnaturally rearranges the position of individual fatty acids on the fat molecule, can alter metabolism in humans.

"One of the most interesting aspects of these findings is the implication that our time-honored focus on fat saturation may tell only part of the story," explained biologist and nutritionist K.C. Hayes, who collaborated

on the research with Dr. Kalyana Sundram, nutrition director for palm oil research at the Malaysian Palm Oil Board in Kuala Lumpur.

"Now it appears that the actual structure of the individual fat molecule is critical, that is, the specific location of individual fatty acids, particularly saturated fatty acids, on the glycerol molecule as consumed seems to make a difference on downstream metabolism of fat and glucose," said Hayes. Both Hayes and Sundram are experts on human lipid metabolism and were instrumental in the development of Smart Balance® Buttery Spreads, a blend of vegetable oils that improves the cholesterol ratio.

Trans-fatty acids, which became ubiquitous in baked goods, processed foods and restaurant cooking decades ago because of their shelf life and other properties, are now being abandoned by many producers of commercial products such as cookies, crackers, pies, doughnuts, and French fries because they raise LDL ("bad") cholesterol, lower HDL ("good") cholesterol and contribute to heart disease.

The Malaysian-Brandeis collaboration compared trans-rich and interesterified fats with an unmodified saturated fat, palm olein, for their relative impact on blood lipids and plasma glucose. Thirty human volunteers participated in the study, which strictly controlled total fat and fatty acid composition in the subjects' diet. Each subject consumed all three diets in random rotation during four-week diet periods. This study further confirmed previous studies in animals and humans, indicating once again that trans fats negatively affect LDL and HDL cholesterol. Surprisingly, the interesterified fat had a similar, though weaker impact on cholesterol.

"In this study we discovered that trans fat also has a weak negative influence on blood glucose. The newer replacement for trans, so-called interesterified fat, appears even worse in that regard, raising glucose 20 percent in a month," said Hayes.

"This is the first human study to examine simultaneously the metabolic effects of the two most common replacement fats for a natural saturated fat widely incorporated in foods. As such, it is somewhat alarming that both modified fats failed to pass the sniff test for metabolic performance relative to palm olein itself," noted Sundram.

"Whether this reflects the amount of test fat consumed, underlying genetics of the specific population examined, or some unknown factor, requires further study because the apparent adverse impact on insulin metabolism is a troubling finding," he added.

Source: Brandeis University

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