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Phantom Fat: An Invisible Killer

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How can eating a Starbuck's Cholesterol Free Blueberry Scone be the same as eating six strips of bacon? Does one's arteries benefit more by eating a serving of Nabisco Wheat Thins or a tablespoon of Country Crock Margarine? For either case, the answer cannot be found by looking at the amount of saturated fat each food contains. The amount of a "phantom fat" must also be found. This fat is very difficult to find, and seems to be hidden behind food labels. It takes an experienced chemist to find the actual amount. This introduces the problem of "Phantom" fat, otherwise known as trans fatty acids.

Trans fatty acids are created by the hydrogenation of vegetable oils to make stick margarines, shortening products, and other partially hydrogenated oils.(1) Hydrogenation is a process in which unsaturated fatty acids are converted under extreme temperatures and pressure to more hydrogenated forms, creating relatively unnaturally occurring trans fatty acids.\* This process makes highly unsaturated oils into more viscous or semisolid forms. These forms stay fresh longer, have better texture, and are a sneaky substitute for solid fats. Semi-solid (partially hydrogenated) fats are often listed on products stating, "70% Vegetable Oil," "Containing No Cholesterol," or "Made with Pure Vegetable Oil," similar to Figure 1.(2)



Figure 1. An example of a partially hydrogenated oil advertisement

If not on the marketing portion of the product casing, partially hydrogenated oil will be listed in the ingredient labels (Fig. 2). This is only somewhat informative. The problem with only listing partially hydrogenated oil, is that there is no way to distinguish between highly hydrogenated oil (with lots of trans fat) and slightly hydrogenated oil (with a little trans fat). Thus, very high amounts of trans fatty acids can be invisible. This is a problem, especially for consumers watching their artery-clogging fat consumption.



Figure 2. An ingredient label with a listing of partially hydrogenated oil.

"Nutrition facts" and "ingredients" labels seem to show no real evidence of trans fats, but our arteries do. Clinical studies suggest that trans fat raises the blood LDL/HDL cholesterol ratio by raising LDL levels as does saturated fats.(3,4) Increasing blood LDL cholesterol levels to high concentrations greatly increases one's risk for coronary heart disease (CHD).(5,6) Similarly, trans fatty acid intake has been shown to be directly related to the risk for coronary heart disease in women ( $P < 0.001$ ).(9) Some studies suggest that trans fat is worse than saturated fat by more significantly decreasing HDL cholesterol.(7,8,9,10) A low level of HDL cholesterol is considered a risk factor for coronary heart disease.(11,12) Therefore, trans fatty acids may have a dual effect towards increasing one's risk for CHD.

The FDA does not require labeling of trans fats on food labels or placing its amount (grams) into the saturated fat number, but requires it to be in the total fat number.(13) This becomes a serious issue, especially when polyunsaturated and monounsaturated fats are not listed on the package.

Consumers must then guess how much trans fatty acids a product contains. The truth is, anyone's guess is a good guess. There is no way to know without chemical analysis.

In the late 1980's consumer groups forced the major fast food hamburger chains to stop frying their potatoes, fish and chicken in beef tallow. It was thought to be a huge victory for public health. For this reason, it became popular for companies like McDonald's to claim their french fries to be cooked in 100% vegetable oil. True, they were not using beef tallow anymore, but it may have been better for people's arteries if they did. They were initially beginning with 100% vegetable oil, but then hydrogenating it. Half of the arterial clogging fat became invisible to the public. People's biggest mistake after the change, was to eat more french fries in the false belief that they were less damaging to one's health. Please see the following Table 1 for total fat, saturated fat, trans fat, and total artery clogging fat in these and other various foods.

Table 1. Fat Data for Some Common Foods

(Artery Clogging Fat = Saturated Fat plus Trans Fat) (2,13)

Food	Total Fat	Saturated Fat	Trans Fat	Artery Clogging FAT !
Lard (tablespoon)	13	5	0	5
Butter (tablespoon)	11	7	0	7
Beef Tallow(tablespoon)	13	6	0	6
Chicken Fat(tablespoon)	13	4	0	4
McD's Fries (L)	19	4	4	8
B.King Fries(L)	22	6	6	12
Starbucks Scone (Blueberry-Chol. Free)	15	3	4	7
Promise (marg. Stick)	10	2	2	4
Parkay (marg. Stick)	10	2	2	4
Country Crock ( margTub )	7	1	1	2
Chips Ahoy	7	2	2	4
Nilla Wafers	4	1	1	2
Wheat Thins	5	1	2	3

Margarine companies like Parkay and Promise brandish on their margarine labels, "70 Percent Less Saturated Fat Than Butter," as in Figure 3. What does this imply to the public? Does this mean that the product is 70% healthier than butter? It is truly an exaggeration of the health of the product, because it only has 43% less artery-clogging fat (calculated from Table 1). With the potential dual effect trans fatty acids have on the risks for coronary heart disease, the health of the product conceivably could be equal to, or worse than butter.



Figure 3. Parkay's advertisement of 70% less saturated fat than butter.

## WHICH MARGARINES ARE SAFER?

Generally, the harder the margarine, the more trans fat the margarine contains. A good saying to remember this is, "the harder they are, the harder you fall." In the marketplace, margarine in squeeze bottles is generally better than tubs, which are generally better than sticks (examples Fig. 4). The rationale behind this follows that squeeze bottles are generally more liquid-like (less hydrogenated, thus less trans fat) than tubs, which are more liquid-like than sticks, respectively. This is only a start to figuring out which margarine is safer. Emphasizing the complexity of this issue, companies tend to mix various types of oils in attempt to keep the consistency of the product, and maintain similar total fat values. This way, looking at product labels, a stick of Parkay margarine actually looks better than a tub. It has the same amount of total fat, and even 0.5 grams less saturated fat. When subtracting all of the unsaturated fats, one realizes (though not sure) there may be 3.5 grams of trans fat hiding in the stick, and only 2.5 grams of trans fat hiding in the tub. Adding this to the saturated fat, the stick (harder, thus more trans fat) really would be worse for the arteries than the tub. In Parkay's case, the squeeze bottle is clearly better than the others, with lower numbers in all cases.(14,15,16,17)

Squeeze Bottle Tub Stick



Figure 4. Examples of the different containers for Parkay margarine, a squeeze bottle, tub and stick. All are on different levels in terms of one's health. The stick and tub are both made from 70% vegetable oil, and the squeeze bottle is made from 64%.

## HOW TO AVOID EATING PHANTOM FAT

Foods that are "cholesterol-free," "low Cholesterol or "low in saturated fat," are not necessarily low in trans fat. Products with "saturated fat-free" labels, usually are low in trans fat. Foods that say "fat-free" have no trans fat. Products with "trans fat free" labels may have trans fat! ((figure 5) Avoiding foods with partially hydrogenated oils is the right way to avoid trans fatty acids, but unfortunately may not be practical. There are thousands of foods with partially hydrogenated oils. Looking for the ones with the least total fat and closest gap between the addition of saturated and unsaturated fat to total fat is probably most feasible method.\* \* (17) Some Companies have been responding to the new research on trans fats and claim to be producing products with no trans fatty acids. Unfortunately, there are still some trans fatty acids in many of these products, but little enough that the companies decide to round down to zero.(18) Eating more than one serving of these products can bring the amount of ingested trans fatty acids up to a few grams. Hence, these products can still be bad for one's arteries.



Figure 5. Smart Beat's Claim of No trans Fat. Smart Beat has rounded down to zero trans fat for one serving. This may be further phantomizing phantom fat.

## CONCLUSION

There may be some progress towards healthier margarines, but what will come next is only a guess. Without the listing of actual amounts of trans fatty acids on product labels, the amount consumers are ingesting is difficult to assess. Listing amounts is especially important for consumers who want to watch their arterial clogging fat consumption. This will assist physicians in helping patients with high risk for coronary heart disease, as well as other health conscious people wanting to better manage their diets. Therefore, efforts still need to be made to reveal the phantom behind phantom fat.

\* \* only possible if listed

## REFERENCES

1. Nutritional diseases, Chapter 192 Bennett and Plum, Nutrition's Influence on Mortality and Morbidity. Cecil Textbook of Medicine, 20th Edition. Part XVI Nutrition's Interface With Health and Disease, W.B. Saunders Company (1998).
2. Litin, L., and Sacks, F., Trans-Fatty-Acid Content of Common Foods. The New England Journal of Medicine. Vol. 329, Number 6, pp. 1969-1970 (1993).
3. Mensink RP, Zock PL, Katan MB, Hornstra G. Effect of dietary cis and trans fatty acids on serum lipoprotein[a] levels in humans. J Lipid Res 1992;33:1493-501.
4. Nestel P, Noakes M, Belling B, et al. Plasma lipoprotein lipid and Lp[a] changes with substitution of elaidic acid for oleic acid in the diet. J Lipid Res 1992;33:1029-36.
5. Willett WC, Stampfer MJ, Manson JE, et al. Intake of trans fatty acids and risk of coronary heart disease among women. Lancet 1993;341:581-5.
6. National Cholesterol Education Program, Second Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (ATP II). National Institutes of Health, National Heart, Lung, and Blood Institute, pp. O-1, September 1993.
7. Khosla, P; Hajri, T; Pronczuk, A; Hayes, KC. Replacing dietary palmitic acid with elaidic acid(t-C18:1 delta9) depresses HDL and increases CETP activity in cebus monkeys. Journal of Nutrition, 1997 Mar, 127(3):531S-536S.
8. Mensink RP, Katan MB. Effect of dietary trans fatty acids on high-density and low-density lipoprotein cholesterol levels in healthy subjects. N Engl J Med 1990;323:439-45.

9. Aro A, Jauhiainen M, Partanen R, Salminen I, Mutanen M, Stearic acid, trans fatty acids, and diary fat: effects on serum and lipoprotein lipids, apolipoproteins, lipoprotein (a), and lipid transfer proteins in healthy subjects. *American Journal of Clinical Nutrition*, 1997, May; 65(5): pp. 1419-1426.
10. Judd Jt, Clevidence BA, Muesing RA, Wittes J, Sunkin ME, Podczasy JJ, Dietary trans fatty acids: effects on plasma lipids and lipoproteins of healthy men and women. *American Journal of Clinical Nutrition*, 1994, April; 59(4): pp. 861-868.
11. Edmond, J., Rome, L., van der Bliet, A., Lee, E.U., Kurtzman, F.D., Human Biochemistry And Nutrition, The Laboratory Manual. Publication of the Department of Biological Chemistry, UCLA School of Medicine, 10th Ed., pp. V-8, 1998.
12. Michael H. Criqui, Gerardo Heiss, Richard Cohn, Linda D. Cowan, Chirayath M. Suchindran, Shrikant Bangdiwala, Steven Kritchevsky, David R. Jacobs, Jr., Haesook Kim O'Grady, C.E. Davis, Plasma Triglyceride Level and Mortality from Coronary Heart Disease. *New England Journal of Medicine*, April 29, 1993, Vol. 328, Number 17, pp. 1220-1225.
13. Wootan, M., Liebman, B. Rosofsky, W., Trans: The Phantom Fat. *Nutrition Action Health Letter*, a publication of the Center For Science In The Public Interest, Vol 23., Number 7, pp. 10-13 (Sept. 1996).
14. Numbers taken from Parkay Squeeze, "Nutrition Facts." Nabisco, Inc., East Hanover, N.J. 07936 USA.
15. Numbers taken from Parkay Soft, "Nutrition Facts." Nabisco, Inc., East Hanover, N.J. 07936 USA.
16. Numbers taken from Parkay, "Nutrition Facts." Nabisco, Inc., East Hanover, N.J. 07936 USA.
17. Answer by the Editors, Ask The Expert. University of California at Berkley Wellness Letter, a publication by the UC Berkley School of Public Health, Issue 1., Volume 12, October 1995.
18. Smart Beat Trans Fat Free! Super Light Margarine, Trans Fat Free -How?. Product by Heart Beat Foods, Div. of GFA BRANDS, INC., Cresskill, N.J.
19. Willet WC, Ascherio A, Trans Fatty Acids: are the effects only marginal? *American Journal of Public Health*, May 1994: 84(5): pp 722-724.