Dear TK,

Emily Bazelon gave me your contact info. I wrote a Medical Examiner for her a while back, as well as several Explainers for Dan Engber. It's been a while since I last pitched Slate, but I now have another Medical Examiner pitch. A little about me: I'm a freelance science and health writer based in Brooklyn, and I have recently been writing for Scientific American, Popular Mechanics, Nature Medicine, and Mother Jones. Please let me know what you think!

Ever since the US Department of Agriculture and the Department of Health and Human Services published their first *Dietary Guidelines for Americans* thirty years ago, fat has been a four-letter word. To minimize your risk for heart disease, the guidelines say, limit your overall intake of total fat and saturated fat in favor of carbohydrates. The evidence for these recommendations has been based solely on the following argument: since saturated fat is known to increase "bad" LDL cholesterol, and people with high levels of LDL cholesterol are more likely to develop heart disease, saturated fat intake must increase heart disease risk. If A equals B and B equals C, then surely, A must equal C.

Not so. In making this extrapolation, scientists and policymakers made a grave mistake: They assumed that all LDL cholesterol is the same, and that all of it is bad. A spate of recent research is now overturning this fallacy and raising major questions about the wisdom of the current U.S. nutritional guidelines, which are up for revision next year.

The term "LDL cholesterol" refers to the cholesterol that is housed inside low-density lipoprotein (LDL) particles, and it turns out that there are actually four LDL particle types, classified by size: very small, small, medium, and large. Last year, Ronald Krauss, director of atherosclerosis research at the Children's Hospital Oakland Research Institute, analyzed blood samples from 4,600 healthy Swedish men and women and found that blood levels of only the two smallest LDL particles played a role in whether the subjects later developed heart disease; larger LDL particles appeared to be neutral with regards to heart health.

This finding is particularly interesting in light of what Krauss had shown a decade earlier: men who switch from eating low-fat diets to high-fat diets experience an increase in total LDL cholesterol (as expected), but the change is solely the result of an increase in large LDL particles rather than small. In other words, fat consumption increases only those LDL particles that are harmless. Fat may, in fact, even be healthier than carbs in this regard: a study published in *Nutrition Research* in 2008 reported that subjects who followed a high-fat, low-carb diet for eight weeks experienced a 46 percent drop in blood concentrations of small LDL particles, while those who followed a high-carb, low-fat diet experienced a 36 percent spike in them -- a finding that suggests that carbohydrates, not fat, might actually be guilty of increasing heart disease risk. (Interestingly, confusion over LDL could explain why the women who participated in the famed Women's Health Initiative Hormone Trials, designed to assess the health effects of hormone replacement therapy, suffered more heart attacks: despite the fact that their total LDL cholesterol levels dropped on the hormones, concentrations of small LDL actually increased.)

Molecular biology is not the only thing exonerating saturated fat from its disease-causing allegations; clinical studies are too. A randomized controlled trial published in the *New England Journal of Medicine* in 2008 found that subjects who ate low-carb, high-fat diets for two years had significantly improved lipid and cholesterol blood profiles compared to those on Mediterranean or high-carb, low-fat diets. Another *New England Journal of Medicine* study based on data from the Nurses' Health Study found an overall inverse correlation between the amount of vegetable fats the women ate and their risk of coronary heart disease. And a meta-analysis being published in the *American Journal of Clinical Nutrition* this month, which included 21 studies involving nearly 350,000 subjects, analyzed the relationship between saturated fat intake and heart disease and concluded that "there is no significant evidence for concluding that dietary saturated fat is associated with an increased risk of coronary heart disease and coronary vascular disease."

I'd love to write a Medical Examiner piece about the true role that saturated fats and carbohydrates play in heart health and the dire need for changes to the existing nutritional guidelines. Please let me know what you think, or if you have any additional questions.  Thanks!