

# Claims of nutritional superiority of organic milk, meat challenged by scientists

Are organic foods nutritionally better for you?

That's the claim made in two meta-studies, on organic [meat](#) and [milk](#), published in the *British Journal of Nutrition* on February 16. Newcastle University professor of ecological agriculture Carlo Leifert supervised the analysis of 196 papers on milk and 67 on meat, claiming to find clear differences in terms of fatty acid composition, and concentrations of certain essential minerals and antioxidants that led them to conclude that organic milk and meat were healthier food choices.

Among the key claimed findings, some positive towards conventional foods:

- Organic milk and meat had 50% more omega-3 fatty acids than conventional milk and meat, which they claim—controversially—is a significant health benefit.
- Organic meat had slightly lower concentrations of myristic and palmitic acids, which have been associated with cardiovascular disease.
- Organic milk had 40% more [conjugated linoleic acid](#), which is controversially claimed as a proven health benefit.
- Organic meat and milk had slightly higher concentrations of iron, Vitamin E and carotenoids.
- Mother/child cohort studies that indicated that organic dairy reduced certain diseases like eczema.
- Iodine, which is low in most foods, and for which the World Health Organization recommends fortification tablets even in the UK, was found to be 74% more prevalent in conventional milk.
- Milk yield was 23% lower for organic milk.



In sum, the two meta-reviews, claimed Lefert, are “further evidence of the health benefits of organic food,” and should prompt people to reconsider their food choices:

People choose organic milk and meat for three main reasons: improved animal welfare, the positive impacts of organic farming on the environment, and the perceived health benefits. But

much less is known about impacts on nutritional quality, hence the need for this study.

Several of these differences stem from organic livestock production and are brought about by differences in production intensity, with outdoor-reared, grass-fed animals producing milk and meat that is consistently higher in desirable fatty acids such as the omega-3s, and lower in fatty acids that can promote heart disease and other chronic diseases.

### Organic claims, contested; no original research

The researchers did no original research, relying on studies they hand selected as representative of the literature. In contrast to the Leifert teams claims, a study by researchers at Stanford University (see “[Little evidence of health benefits from organic foods, study finds](#),”), which was a [meta-review of 237 studies](#), is widely considered the gold standard of independent research in reviewing nutritional differences between organic and conventional foods.

If some of Leifert’s team’s claims sound familiar, it’s because they’ve been made before by Leifert and most of the authors listed in this review. In 2014, many of them made similar claims in a [British Journal of Nutrition](#) paper that related antioxidants, organic crops and pesticide residue levels in a paper they claimed was the largest “systematic literature review and meta-analyses” ever undertaken documenting the purported benefits of organic food.

In a study co-authored with Leifert, economist and former Washington State University adjunct professor [Charles Benbrook](#), the key American contributor to this meta-review, claimed in a December 2013 *PLoS ONE* [paper](#) that organic milk provided nutritional benefits over conventional milk. That paper—also touted as the most comprehensive of its kind—was [widely criticized](#) by scientists, who claimed it selectively used data and presented contested claims of health benefits as if they were part of a scientific consensus.

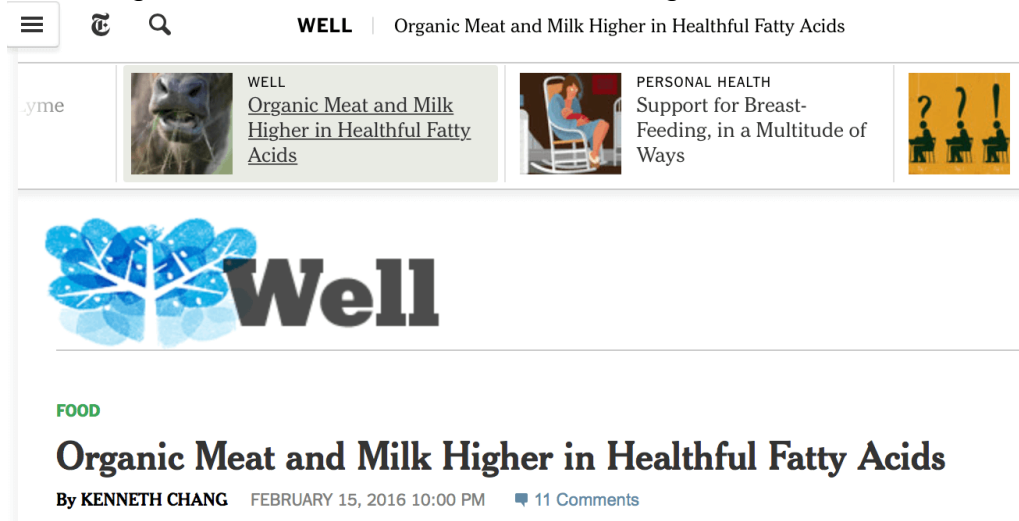
All of the researchers involved in the Leifert study have connections to the organic industry. Leifert owns an organic farm in Greece and is a vocal public advocate for the claim that organic foods provide substantial health benefits when compared to conventional products. Benbrook, who lost his adjunct professor job at WSU in spring 2015, has had [100% of the research cited in this meta-review financed by the organic industry](#). He is now a [consultant, most recently for the Environmental Working Group](#), a critic of conventional farming and crop biotechnology. The study itself was funded significantly by the organic industry: “The European Commission, the executive body of the European Union, and the Sheepdrove Trust, a British charity that supports organic farming research, paid for the analysis, which cost about \$600,000.

### Rapturous media coverage?

[Media coverage](#) of the earlier studies by Leifert and Benbrook was largely uncritical, with headlines like of the [New York Times](#), and “Yep, [s](#). Many pro-organic groups, including [ed](#) the claims unblushingly.



on behalf of organic foods was even more intense, extending globally. Kenneth Chang of *The New York Times*, again made the contested claim that organic meat and milk are higher in “healthful fatty acids.”



The screenshot shows a web page from 'Well+Good'. At the top, there's a navigation bar with a menu icon, a search icon, and the text 'WELL | Organic Meat and Milk Higher in Healthful Fatty Acids'. Below this is a row of three featured articles. The first article, on the left, has a thumbnail of a cow and the title 'Organic Meat and Milk Higher in Healthful Fatty Acids'. The second article, in the middle, has a thumbnail of a person sitting in a chair and the title 'Support for Breast-Feeding, in a Multitude of Ways'. The third article, on the right, has a thumbnail with question marks and exclamation marks. Below this row is a large blue tree logo with the word 'Well' in a bold, sans-serif font. Underneath the logo, the word 'FOOD' is written in green. The main headline of the article is 'Organic Meat and Milk Higher in Healthful Fatty Acids' in a large, bold, black font. Below the headline, it says 'By KENNETH CHANG FEBRUARY 15, 2016 10:00 PM' and '11 Comments'.

Medical XPress, normally a measured news resource, [headlined](#) its report, “New study finds clear differences between organic and non-organic milk and meat.” [Dozens of other posts](#) echoed this perspective, many of them repeating the erroneous statement that the Leifert meta-study was the “largest ever comparing organic and conventional foods.”

Anti-conventional food and pro-organic websites piled on, burning up social media and flooding the web with comments bashing conventional food.

Pro-organic British Soil Association chief executive [Helen Browning echoed the sentiment of these uncritical media reports](#):

This research confirms what many people have always thought was true – what you feed farm animals and how you treat them affects the quality of the food, whether it’s milk, cheese or a cut of meat. These scientists have shown that all the hard work organic farmers put into caring for their animals pays off in the quality of the food they produce – giving real value for money.

### What do independent scientists say?

The reality, once again, is that the media has gotten it wrong. Outside of the media’s overwhelmingly pro-organic echo chamber, mainstream scientists have weighed in, although most news outlets have chosen not to receive input from them on this study. The UK’s Science Media Centre, known for its independence, [posted reactions](#) from three prominent British scientists.

“Overall, this is very detailed and valuable work, but the differences between organic and conventionally farmed produce should be evaluated as part of the whole human diet,” noted Ian Givens, professor of food chain nutrition at the University of Reading. “When they are, most differences are very small indeed.”

Tom Sanders, professor emeritus of Nutrition and Dietetics at King's College London, was more pointed in his criticism. "In my opinion, the press release contains headline-grabbing speculative health claims that stretch credibility to the limit," he told the SMC.

This meta-review, these and other scientists said, have serious flaws in five major areas:

**First**, the potential benefits of omega-3 fatty acids versus omega-6 fatty acids are overstated. While some scientists argue that higher ratios of omega-6 to omega-3 lead to greater health risks, that's not the consensus belief. Dr. Walter Willett, chairman of the nutrition department at the Harvard School of Public Health has [said](#) that studies like Benbrook's 2013 study that claim that omega-6 fatty acids are harmful promote a "false assumption." According to Willett, omega-6s are actually associated with a lower risk of heart disease. The ratio touted in this meta-review is "irrelevant," [he said](#), and health conscious consumers should eat more of both kinds of fatty acids—directly contradicting a central assumption in the original Benbrook study.

There are also much better sources of omega-3 fatty acids than milk. First, skim, or non-fat milk, which is recommended by many regulatory and nutrition authorities over whole, fat-containing milk, has no omega-3 fatty acids (in fact, it has no fatty acids at all). Second, [other sources abound](#) that have far higher levels of these beneficial fatty acids, particularly salmon and some nuts. Milk from ruminants were "poor sources of polyunsaturated fatty acid and contain large amounts of potentially harmful saturated and trans fats", Givens noted.

Studies by University of California, Davis researcher Alison Van Eenemann showed that mice (and possibly cows) could be engineered to [manufacture their own](#) omega-3 fatty acids in milk, with the insertion of an omega-3 desaturase gene into the animal's genome.

**Second, the review cited percentage increases, which imply greater beneficial changes than actually exist.** According to Givens, "much emphasis is placed on the 56 percent higher omega-3 fatty acid content. But this increase is in milk fat, not the whole milk. Switching from conventional to organic milk would increase omega-3 intake to 33 mg percent—an increase of only 1.5 percent of our total diet."

**Third**, the review ignores the potential negative health impacts of organic foods. According to Givens:

Organic produce isn't more nutrient-packed in every regard, either. The lower iodine and selenium content of organic milk has been recognised before, and since milk is the greatest single source of dietary iodine, the lower value in organic milk needs to be recognised. This is especially true for pregnant women, for whom iodine is a critical nutrient to ensure the healthy development of their baby.

The blood cholesterol (especially low density lipoprotein cholesterol) raising effects of butter fat are well established and mainly attributed to its high saturated fatty acid content, but its trans fatty acid content also contributes. Recent research<sup>1</sup> has shown that trans vaccenic acid, the trans isomer naturally found in butterfat, raises blood cholesterol as much as industrially

produced trans fatty acids. There is no evidence to show that organically produced butter has a more favourable effect on blood cholesterol.

Margaret Rayman, Professor of Nutritional Medicine at the University of Surrey, agreed:

Using the figures in the paper, we have calculated that while a glass of full-fat organic milk (200 ml) will give 2% more of the daily requirement for long-chain omega-3 PUFAs (6.4% vs. 4.4%), it will provide 14% less of the adult daily iodine requirement (21.2% vs. 35.2%). This may have implications for public health as milk and dairy products are the main source of iodine in the UK diet and we have shown that iodine deficiency in pregnant women is linked to lower IQ in their children. As a considerable proportion of UK pregnant women are iodine deficient, a switch to organic milk may exacerbate this deficiency unless consumers include other iodine sources in their diet. Further information can be found in our [BDA Iodine Food Fact Sheet](#).

**Fourth**, the studies the Newcastle-based team reviewed show the results of feeding cows grass, and not of organic methods, meaning that the claims that organic products are superior in some regards is deceptive. Cows, like all other animals, [do not make](#) omega-3 fatty acids on their own—they must get it from their diets. According to Givens:

Differences in content such as fatty acids or iodine occur primarily because organic animals are fed more of a forage-based diet, such as grass, than their non-organic counterparts. You get the same kind of changes in food composition if non-organic animals are fed forage-rich diets too. It's the choice of feed, not the organic farming method, which makes the difference.

Sanders elaborated on that key deceptive claim:

Cows that eat grass produced milk and meat that contained up to 50 percent more omega-3 fatty acids than those fed on grains. In the countries where there is a lot of rain such as UK, Ireland, Brittany and New Zealand most milk and cheese comes from cows fed on grass and you can tell this from the bright yellow colour derived from the carotene present in grass.

Organic milk that's from cows fed on grain, which is allowed under U.S. organic standards, [lacks this favorable profile](#), noted Val Giddings, senior fellow at the Information Technology and Innovation Foundation (ITIF).

**Fifth**, statistical analyses of the study by the Science Media Centre showed a number of problems. These included the use of unweighted meta-analysis, which give equal weight to all studies (so a study on a sample size of 10 would be considered equal to a study with a sample size of several hundred). While the tighter focus on fatty acids was more precise in this study than the group's work in 2014, it still revealed a strong publication bias, which can overestimate the size of a hypothetical effect.



The authors also attempt to reframe other studies in an apparent attempt to score ideological points. They wrote, “recently published results from several mother and child cohort studies linking organic milk and dairy product consumption to a reduced risk of certain diseases,” including “reduced risks of eczema in babies.” However, the “recently published results” included one 2008 study that showed no relationship between disease, nutrition quality and organic food, except a reduction in eczema in babies fed a “strictly organic diet.” A well-respected 2010 review of 12 studies [found no relationship](#) between disease risk and organic food.

### **Take away**

Note that not one article that we came across highlighted these conflicts of interest. If industry-funded scientists and open advocates of conventional farming, including consultants for Big Ag, were to have had a study published making clearly exaggerated and often unscientific claims, we can be assured it would have died in the media upon delivery. But consultants and boosters for Big Organic? It’s featured on the front pages of papers and web sites across the world.

This latest review by researchers long associated with the organic industry flies in the face of existing research that has not found any significant nutritional difference between organic and conventionally raised foods. Organizations such as the European Food Safety Agency (EFSA), the USDA’s National Organic Program and even the National Dairy Council have all challenged claims that organic is somehow, better. Truly independent research, such as the Stanford meta-study, are convincing and definitive.

But it does seem like grass-fed cows are a good thing. No matter what was used to help the grass grow.

**Andrew Porterfield is a writer, editor and communications consultant for academic institutions, companies and non-profits in the life sciences. He is based in Camarillo, California. Follow [@AMPorfield](#) on Twitter.**

**[Jon Entine](#), Executive Director of the [Genetic Literacy Project](#), is a Senior Fellow at the Institute for Food and Agricultural Literacy, University of California-Davis. Follow [@JonEntine](#) on Twitter**