

## Being a vegetarian can kill you? How the press mashed a genetics story

On March 29, a [research paper appeared](#) in a scholarly journal that showed, for the first time, a connection between a specific genetic variation called an insertion allele (where DNA bases are added to a genome) and vegetarian diets. From this came the hypothesis that people who had this allele could more efficiently process omega-3 and omega-6 fatty acids into chemicals we need for early brain development and controlling inflammation. It turned out that people who relied more on plants for food had this allele in higher numbers than people who ate meat.

But that's not how the media covered the paper.

The *New York Post*, never known to shy away from a heart-stopping headline, [published a story](#) entitled "Being a vegetarian could kill you, science warns," informing its readers that:

Long-term vegetarianism can lead to a genetic mutation that puts people at high risk for colon cancer and heart disease, according to a new study. Indians with a heavy, vegetable-based diet developed a genetic variation, an "allele," that leaves them vulnerable to killer heart and colon conditions, researchers said.

Over in the United Kingdom, the *Daily Mail* [warned that](#) "vegetarianism leads to genetic mutations in populations," and that:

Vegetarianism over generations can result in genetic mutations which increase the risk of heart disease and cancer. Researchers found a long-term vegetarian diet means populations are more likely to carry DNA that makes them vulnerable to inflammation. The mutation is believed to make it easier for vegetarians to absorb necessary fatty acids from plants, but also boosts their production of arachidonic acid, which increases inflammatory disease and cancer.

By "long-term," however, the Cornell University researchers were referring to many, many generations over which the allele, which can boost the expression of the enzymes *FADS1* and *FADS2* which convert omega-3 and omega-6 fatty acids, can mutate to eventually favor either vegetarians or heavy marine meat-eaters. And the area of vegetarianism (and the FADS-boosting allele) studied was in Pune, India, where more individuals are vegetarian, but not exclusively so. Finally, it did not say that being a vegetarian would lead to heart attacks, stroke and premature death.

### Getting the story, versus just getting the story

Other media outlets got closer to the real study and its implications.

The *Washington Post* [posed more appropriately](#) nuanced questions:

Why is it that some people can stay healthy only by sticking to a strict vegetarian diet? Why is it that others can eat a steak a day, remain slim, avoid heart disease and feel like a million dollars? The answers may lie in your heritage. This new study, funded by the National Institutes of Health and the U.S. Department of Agriculture, shows that different people may need radically different ratios of the substances in their diet depending on their genes, and it supports the growing evidence against a one-size-fits-all approach to nutrition and for highly personalized advice.

This is different from saying that a genetic variant can kill you. As the study authors emphasize (as do a story and news release on the Cornell website), these variations were selected for in populations that could benefit from a more efficient processing of omega-3 and omega-6 fatty acids, because they weren't as available from a plant based diet. On the flip side, the Inuit of Greenland, who eat a marine diet rich in these acids, this allele is largely deleted. American Kansans, who were studied by the Cornell team, also have a much lower frequency of the inserted allele. Further, it emphasizes that dietary advice may very well need to be adjusted according to our genetic makeup (although most Americans, regardless of their genetic makeup, still eat far too many animal-based fatty acids than is healthy).

Discovery News may have come the closest to getting the interplay between genetics and diet right. In this story, Discovery points out that these alleles were (and are) adaptations to the environment, and that a change in that environment (say, switching from a veggie diet to burgers and whole milk), might increase health risks among certain people:

In this case, cultures from certain parts of India, Africa and Asia have eaten a mostly vegetarian diet for so long that they have evolved a genetic adaption that boosts their body's ability to process certain fatty acids, according to the new study, which is published in the journal *Molecular Biology and Evolution*.

If these individuals stray from their veggie-based diets, they may be at a higher risk than other people for heart disease, colon cancer and additional health problems associated with increased inflammation, the scientists believe.

### **The real risk—diet coverage**

Diet and nutrition stories are notoriously badly covered. It's too tempting for many outlets to talk about over simplified solutions to things like obesity, heart disease, or cancer. It's equally easy, as in the Cornell FADS allele story, to quickly mold hypothesis into proven outcome. So, fat pills, diet fads and "this will kill you" type stories abound. Public health experts, including the Harvard School of Public Health, even warn against this type of coverage. According to [a website from Harvard](#), "Writers may report on a single preliminary study that is unverified by additional research, or highlight a study because it contradicts current health recommendations – the goal being an attention-grabbing headline."

Even the Cornell team admits that this, being the first to connect the FADS alleles and dietary patterns, is

an early study. That's why they compared their two populations (Pune, India, and Kansas in the U.S.) with data from the 1,000 Genome Project (and found similar patterns of allele distribution), and warned that much more needs to be done.

Marcus Feldman, a biologist at Stanford University, commented to Genetic Expert News Service, a sister site to GLP, that the data suggests certain outcomes, but doesn't prove them:

I think we're a long way from extrapolating from population type analyses of this kind to suggesting how an individual should make a decision about diet. The paper gives powerful evidence of some kind of selection over the past 2,500 years but it doesn't help an individual to decide whether being a vegetarian is healthier than being a non-vegetarian.

So, for now, it's probably okay to eat a carrot, even if you're from Kansas. But someday, nutritionists could design optimally healthy diets based on certain aspects of your genome.

**[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 [@AMPorterfield](#) on Twitter.**