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Genes May Have a Big Influence on Vegetarianism
A new study examined how nature and nurture affect decisions to give up meat

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Key points

• Dutch researchers used twins to examine the impact of genes on vegetarianism and preferences for meat and plant-based foods.
• Identical twins were much more similar than fraternal twins in giving up meat, suggesting that genes play a significant role in vegetarianism.
• Genes became less influential in male (but not female) preferences for meat as they grew up.
• These results may help explain why most people find it hard to completely give up eating meat.

Why do some people find it easy to give up meat and others don’t? When our 12-year-old daughter Katie became a vegetarian, we thought she was going through a stage. Wrong. Katie did not eat meat for the next 25 years.

Her sister Betsy, in contrast, was always an adventurous omnivore—she has consumed worms in Thailand, crickets in Mexico, and whale meat in Japan. (She says it’s tough and greasy.) The differences in our daughters’ relationships with meat are particularly interesting because Betsy and Katie are twins.

Why should two kids with the same parents, born eight minutes apart and exposed to the same food environment from birth, have such different attitudes toward meat? Dutch researchers recently examined the relative importance of heredity and environment on the decision to go veg and on sex differences in the impact of genes on meat-eating. Their results are surprising.
Assessing the Impact of Nature and Nurture on Behavior

Betsy and Katie are fraternal twins. If genes play an essential role in developing psychological traits, identical twins (who share 100 percent of their genes) should be more alike than fraternal twins like my daughters, who share, on average, 50 percent of their genes. Behavior geneticists use similarities and differences between identical and fraternal twins pairs to calculate a statistic called heritability. This is the percentage of individual differences in a trait that are attributable to genes.

Heritabilities can range from 1 (individual differences are completely genetic) to 0 (genes play no role in individual differences). Hundreds of studies have found that genes influence nearly all psychological human traits. For example, genes account for 40-50 percent of differences in basic personality traits, roughly 40 percent in political attitudes, about 30 percent of differences in sexual orientation, and 50 percent in dog ownership. Researchers have generally found that individual differences in preferences for meats and vegetables are 30-50 percent attributable to the influence of genes.

The Behavior Genetics of Vegetarianism

The new study by the Dutch research team is the first to examine the role of genes in vegetarianism. They studied the food preferences of 7,197 adult twins and their non-twin siblings drawn from the Central Population Registry of Finland. In addition to examining the influence of genes on decisions to become a vegetarian, they were interested in how exposure to meat and plant-based foods during childhood affected adult food preferences and sex differences in the impact of genes on food preferences.

The participants completed a series of questions on their preferences for three kinds of meat and three kinds of vegetables, the frequency they were served these foods as children, and their willingness to try two dozen novel types of meats and vegetables. Finally, they were asked, “Are you a vegetarian or vegan?”

The Surprising Results

Some of the results were not surprising. Men, for example, preferred meat more than women. Men were also more willing to try novel kinds of meats, and they ate more meat when they were kids.

Women preferred to eat plants more than men, and they were more willing to try novel plant-based foods. As you would expect, participants exposed to meat more during childhood liked meat more when they grew up—ditto with plant-based foods.

Other results were unanticipated. For example, in childhood, genes played a bigger role in individual differences in meat-eating in the boys (31 percent genetic) than in the girls (11% genetic.) But when the participants grew into adulthood, the reverse was true. Only 26 percent of differences between the men in preferences for meat were attributable to genes compared to 55 percent of differences between women.

But the biggest surprise was the extent that genes influenced decisions to become vegetarian or vegan. Fifteen percent of the women and five percent of the men identified as vegetarians or vegans. (Because of their small numbers, vegans were combined with the vegetarians in this analysis.)

The identical twins were much more alike in their decision to give up meat than the fraternal twins. (For stat geeks, the “polychoric correlations” were .76 for pairs of identical twins compared to .38 for fraternal twins.) While the math is beyond the scope of this blog, the researchers estimated that a whopping 75 percent of individual differences in decisions to eat or not eat meat were attributable to the direct and indirect influence of genes.
The Bottom Line

The results of the study raise some interesting questions. Take sex differences. Why did the impact of environmental factors on meat-eating increase and genes decrease as the men (but not the women) grew into adulthood? The researchers suggested the greater importance of environmental factors in male meat consumption reflects sex differences in socialization processes. This makes sense to me.

However, the most surprising finding of the study was that 75 percent of individual differences in vegetarianism were attributable to genes. By comparison, twin studies usually find the impact of genes on individual differences in human behaviors is in the 20-50 percent range. The reasons for the high degree of influence of genes on vegetarianism are unclear, and multiple factors and many genes could play a role. For example, they could be due to genetic differences in taste sensitivity (see this blog post) or nutritional needs.

The most interesting idea is that decisions to give up eating meat are affected by genetically influenced differences in moral values. Indeed, using a large sample of twins drawn from the Finish registry, the Dutch research team recently reported that genes played major roles in individual differences in sexual attitudes and behaviors and support or condemnation of recreational drug use.

Like every study, this research has limitations. Indeed, Laura Wesseldijk, one of the study’s authors, wrote to me in an email,

I think we should interpret these results with caution… Note that the heritability estimate reflects the importance of genetic influences in this particular Finnish sample. It would be useful to replicate this in other countries, hopefully in larger samples with more (especially male) vegetarians!

I expect, however, that the results of this study of genetic effects on the diets of Finnish twins will generally apply to other populations—at least in Western countries. However, I guess that replications of the research will find the genetic component of vegetarianism is closer to 40% or 50 percent than 75 percent.

In an email, Dr. Wesseldijk told me, “The most important thing is that people get the bigger picture of what this research shows instead of the specific statistics.”

She is right. According to a recent report by Yale University researchers, only five percent of Americans are vegetarians or vegans—numbers that have been stable for several decades. As shown by the large cultural differences in per capita meat consumption, biology is not destiny for eating flesh.

However, research in behavior genetics could help explain why it is so difficult for most people to give up meat and why most vegetarians and vegans eventually resume their carnivorous ways.

References


For more on psychological aspects of vegetarianism, see:

What's the Deal With Vegetarians Who Hate Vegetables

Why Do 84% of Vegetarians and Vegans Return to Eating Meat?