

# Are vegan meat alternatives putting our health on the line?

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Veganism is typically equated with healthy eating, but today's factory-produced fake bacon, sausages and burgers could be tarnishing the halo of a plant-based diet. *New Scientist* investigates.

DONALD Watson was born in Yorkshire and spent much of his youth on his uncle's farm. But rather than making him feel at ease with breeding animals for food, the realisation that these "friendly creatures" went for slaughter horrified him. He became a vegetarian in 1924, aged 14. Two decades later, with his wife and four friends, he coined the word vegan from the first and last parts of the word vegetarian, and founded the UK Vegan Society.



Watson's diet was filled mostly with nuts, apples, dried fruit, vegetables and, when wartime rations allowed it, lentils. Fast-forward to today, and Watson would have been astonished at the wealth of vegan-friendly offerings. Browse the aisles of supermarkets in the UK, US, Australia and beyond and you will find a growing amount of space dedicated to vegan fish and meat alternatives. But while Watson's diet turned out to be a healthy one, a different picture is emerging for some of today's vegans.

Take a look at the ingredients in the ever-increasing variety of products and they can seem more like junk, packed full of salt and ingredients such as "soya protein concentrate" that you wouldn't find in a chunk of meat.

While today's factory-produced foods make it easy to switch to a vegan diet without the need to make drastic changes to eating patterns, these alternatives might be worse for our health than the meat versions they are replacing. Finding out is increasingly important, due to the growing number of people avoiding meat and dairy in their diet. So what do we – and don't we – know?

When Watson applied for vegan rations during the second world war (a request that was ultimately denied), there were just 35 members of the Vegan Society. This year, more than half a million people signed up to take a month off from eating animal products in the UK for "Veganuary", and nearly 3 per cent of people in the US avoid eating such products.

Today's vegans can have motives beyond the original concerns about animal cruelty that led to plant-based diets. Some are driven by environmental factors, such as the heavy toll of the greenhouse gases produced by the livestock industry. That isn't to say that plant-based foods don't damage the environment. It can take more water to grow nuts, for instance, than to produce the same weight of beef. Yet overall, even the lowest-impact animal-based foods are worse for the environment than plant-based substitutes.

Health can be another motivator. Although critics of early vegans didn't think it was possible to thrive on a diet without meat and dairy, this way of eating has proved to be good for health too, especially since consumption of red and processed meats is now known to increase the risk of developing several cancers. Sure, vegans must ensure they get nutrients that are typically derived chiefly from animal products, such as omega-3 fatty acids, iron and vitamin B12, but studies have shown that a plant-based diet can help you lose weight, lower your cholesterol, reduce your risk of cancer and even add a few years to your life.

Yet with the rise in popularity of veganism has come the rise in fuss-free, vegan meat alternatives, such as “no chicken” Kiev, fake bacon and even plant-based shawarma for late-night doner kebab cravings. Now, 1 in 6 food products launched in the UK are vegan.

“When I first cut meat out of my diet, I’d be cooking my own lentils, a bit of soy mince, loads of vegetables,” says Clare Thornton-Wood, a dietician and spokesperson for the British Dietetic Association. “Now you’ve got vegan chicken nuggets, vegan burgers, vegan sausages. The plant-based movement has put all this processed food into people’s diets.”

If you are worried about health, there are three things to consider when you buy these products, says Michael Clark at the University of Oxford. “What’s in them, what’s not in them and what you are swapping them for.”

Let’s start with what’s in them. As Thornton-Wood points out, plant-based meat alternatives are processed foods, that is, they have been altered in some way from their natural state. Not all processed foods are bad. Technically, a pack of vegetable sticks is processed because the carrots have been washed, chopped and packaged. But ultra-processed food often has many unhealthy ingredients added for flavour and texture, such as sugar, fat and salt.

## Meaty replicas

The meat-alternative market is rife with these additives, in part because they help replicate the flavour or texture of real meat. “Just like processed meat foods, many plant-based meat alternatives are rather high in salt,” says Tom Sanders at King’s College London. For instance, a 2018 survey by UK advocate group Action On Salt found that meat-free burgers contain more salt on average than meat burgers. Too much salt contributes to raised blood pressure and increased risk of heart disease and stroke.

Soya is a prominent feature of meat alternatives, too. Although it has a high nutritional quality – it is considered a “complete” protein, which means it contains ample essential amino acids and has a

nutritional value roughly equivalent to animal protein – it is also a controversial ingredient.

The soya in processed food comes from soya beans, which can be turned into textured soya protein or soya concentrate. An increasing body of research suggests that soya protein could be beneficial to health, with claims ranging from its ability to fight obesity and ward off osteoporosis to even protect against diseases such as prostate cancer due to the presence of compounds called isoflavones that act like oestrogen in the body. However, there is also

research showing that this oestrogen-like effect may have some negative impacts in some people, such as women with breast cancer. A consensus on its overall health benefits is hard to come by.

### Vegan vs fish and meat

Nutrition /100g	Vegan “salmon”	Atlantic salmon (wild, raw)
Kilocalories	86	142
Sugars(g)	4.8	0
Fat(g)	4.4	6.3
Protein(g)	0.3	19.8
Fibre(g)	1.0	0
Salt(g)	0.7	0.1
Nutrition /100g	Vegan “chicken” burger	Grilled chicken burger
Kilocalories	502	438
Sugars(g)	5.7	4.6
Fat(g)	17.8	8.9
Protein(g)	23.7	35.8
Fibre(g)	4.7	3.1
Salt(g)	2.3	2.2

SOURCES: VEGEX, USDA, NANDOS

One particular health claim that has received a great deal of attention is soya protein's possible role in reducing heart disease by cutting the amount of heart-damaging, low-density lipoprotein cholesterol. In 1999, the US Food and Drug Administration allowed manufacturers of products that contained more than 6.25 grams of soya protein per serving to make health claims about its ability to lower the risk of coronary heart disease, based on a significant number of studies. However, in 2017 it made a proposal to revoke this rule after a review of more recent evidence in which it decided that there was no longer significant scientific agreement to support the health claim.

According to Kristina Petersen at Pennsylvania State University, part of the confusion stems from processed foods. Research shows that plant-based diets that include unprocessed nuts, seeds, fruits, vegetables and legumes do indeed lead to a substantially lower risk of heart disease. What is problematic is that soya protein is now a key ingredient in many ultra-processed foods, and the health impacts of these are unequivocal due to other ingredients: they are bad for us.

Two recent studies from France and Spain show that ultra-processed foods are associated with an increased risk of mortality and cardiovascular disease. The Spanish study showed that people who ate more than four servings of processed foods a day increased their risk of early death by 62 per cent.

So although soya protein may, in isolation, appear to be healthy, when it is in a factory-produced meat alternative this may not be the case. Revoking the health claims on products containing soya, therefore, might be necessary to address the problem of its use in ultra-processed foods that can then be labelled as healthy, despite ultimately being bad for us, writes Petersen in the Journal of the American Heart Association.

### **“Vegans who eat a lot of ultra-processed food are more likely to be obese”**

To get a full picture of the health impact of meat alternatives, it is also important to know who is buying these products. To find out, Joséphine Gehring at the University of Paris-North, France, and her colleagues studied the diets of more than 21,000 people, including meat eaters, pescatarians, vegetarians and vegans, and discovered a gold mine of detail, which at first glance can seem contradictory.

### **Health risks**

They found that the nutritional quality of diets was generally higher for vegans than meat eaters. However, they also found that the more people avoided animal-based foods, the greater their consumption of ultra-processed foods, with these supplying 33 per cent of energy intake for meat eaters compared with almost 40 per cent for vegans. In addition, those who had become vegan most recently, or who were younger, had the highest consumption of processed foods. Gehring and her colleagues say that a vegan's consumption of processed food might outweigh the health benefits suggested in previous studies.

Vegans in the study who ate a lot of ultra-processed food were more likely to be overweight or obese, says co-author Benjamin Alles, also at the University of Paris-North. “The ‘health halo’ typically associated with a vegan or plant-based diet no longer applies to individuals who follow these diets but include a high contribution of ultra-processed plant-based food,” he says.

This trend for vegans to consume highly processed food is backed up by a 2017 study on the diets of Italian adults, which found, contrary to expectations, no difference in the environmental impact of the diet of vegetarians and vegans, probably partly due to the consumption of “industrially highly-processed plant-based meat and dairy substitutes”.

What about other additives that are used to replicate the taste and texture of meat in plant-based alternatives? Here, you can probably rest easy. While you may not recognise all of the ingredients in

these products, any additive you find in your food is approved, which means it is safe to eat. “There is a misguided perception that food additives are harmful,” says Sanders. However, what is deemed “safe” can change. For instance, the safety of the additive titanium dioxide, used to whiten foods, has been questioned by the European Food Safety Authority.

Aside from what is in meat alternatives, it is important to think about what’s not in them, says Thornton-Wood. “I think a lot of people have jumped on the vegan bandwagon for the sustainability side of it, but they haven’t necessarily done the background research to work out how they’re going to get everything they need from their diet.”

If you are eating a lot of vegan foods, you need to make sure that you aren’t missing out on the essential nutrients that omnivores typically obtain from meat, dairy and fish, such as iron, B12, omega-3 and calcium (see “The truth about plant-based dairy“). While some ready-made vegan products are of high nutritional quality, others are mainly composed of substances such as starch and the sugar trehalose, along with some colouring agents and flavourings.

The third consideration is whether meat alternatives are better or worse than what a person may have been eating otherwise, says Clark. “Some people might be substituting a healthy, home-cooked meal for a processed meat alternative. Sometimes eating vegan products might be a healthy substitution, sometimes not,” he says.

If you are eating a balanced diet with the odd processed meat alternative, it is likely that many of the health benefits of being vegan remain. Dietary fibre, which is found only in plant foods, plays a key role in improving insulin and glucose response in the body, helping to prevent diabetes.

Vegan diets also play a significant role in shifting gut microbiota to a population that appears to improve blood glucose levels and reduce body weight. These benefits are unlikely to go away completely, but they may be affected by a heavy intake of highly processed plant-based foods, says Thornton-Wood. In the end, common sense and balance are probably the best bet – as with most dietary advice. “If you eat meat alternatives one or two times a week, that’s probably fine, but if you eat fake sausages every day, that’s probably not going to be very healthy,” she says.



An employee slices vegan meat alternatives on opening day at Rudy’s Vegan Butcher on November 1, 2020 in London, England.

We need a better answer on all of this, says Clark. “With other diets that have been around for decades, we have been able to take surveys from thousands of people and say ‘these people who eat this diet are healthier in this way’. We’ve not been able to do that yet for plant-based meat and dairy alternatives. Until we have those studies, there’s going to be uncertainty around the nutritional value of them.”

Donald Watson certainly thrived without dairy and meat. He died in 2006 aged 95, apparently delighted to have proved his detractors wrong about the possibility of living well without consuming animal products. But if he had lived on industrially produced vegan food, it might have been a different story. Although adopting a vegan diet avoids the downsides of heavy meat and dairy consumption, if you are filling up on ultra-processed alternatives, you may be missing a trick.

As Thornton-Wood says: “Today, being a vegan doesn’t automatically mean you’re eating a healthy diet.”

## **The truth about plant-based dairy**

Head to your nearest coffee shop and you might hear orders for drinks with soya milk, oat milk or even pea milk.

The milk alternative market has exploded in recent years, doubling its sales globally between 2009 and 2015. Meanwhile, cow's milk sales have decreased from \$19 billion in 2013 to less than \$16 billion in 2018, according to market research firm Mintel. But are alternative milk products good for you?

“Milk” is actually a controversial name for these products. They are in fact extracts from foods like chickpeas, soya beans, oats, almonds, coconut and rice suspended in water. If they are your chosen beverage, you should be aware that some vital nutrients that are in dairy milk can be lacking in plant milks.

They are generally much lower in protein, vitamin B12 and iodine, plus other vitamins and essential nutrients, says Clare Thornton-Wood at the British Dietetic Association. Plant milks can be fortified to make up for some of this, but that isn't always the case. In the UK and EU, for example, the rules for organic status don't permit the addition of calcium.