

Volume 8, Issue 13

November 1, 2022

Plant and Fungal-based Meats and Cultured Meats Are Claimed to Be Better for the Planet, and for Our Health — But Is That Really True?

Part 1



“Fake meat” products can be divided into these three categories:

- 1.** Products that are produced by combining ingredients derived from plants and fungi to create a product that mimics meat.
- 2.** Products created by culturing animal cells (from beef, poultry, fish, and others).
- 3.** Products produced by culturing genetically modified plant and fungal cells.

Because this topic covers a substantial amount of information, it will be published in two consecutive weekly issues. In this first issue, we'll consider products in category 1, and the other two categories will be discussed in next week's issue.

Plant and Fungal-based Products That Mimic Meat

Products from this category have been on the market for several years now, and until recently, have seen sales volume that has increased relatively rapidly. In recent months, however, the sales volume of these products has slowed, and in some cases, declined.

According to information posted by Plant-based Meat Market (n.d.),¹ some of the main companies involved in this industry include Beyond Meat, Kellogg Company, Impossible Foods Inc., ConAgra foods, and Tofurkey (in the U.S.), Maple leaf foods (in Canada), Unilever (in the UK), Gold&Green Foods Ltd (in Finland), Sunfed (in New Zealand),

and Monde Nissin (in the Philippines).

Plant and fungal-based foods promise some very desirable benefits.

Individuals and organizations who promote plant and fungal-based meat products often make claims similar to the following quote (Bryant, 2022, August 1).²



"There are increasingly strong reasons to move away from industrial animal agriculture for the good of the environment, animals, our personal health, and public health."

While claims such as these appear to make choosing plant and fungal-based meat products over the real thing a “no-brainer”, are

these claims actually accurate? The above quote comes from an article recently published in Future Foods, and it appears to be a well-written, scientific article, based on valid references, but note that the author is actually a psychologist who was one of a group of psychologists who performed the research study discussed in the article. While the fact that the study was done by psychologists shouldn't reflect on the accuracy or integrity of the article, would you go to a psychologist for dietary advice?

Does that article offer an honest, impartial viewpoint?

In the disclosures at the end of the article, the author reveals that he's an independent research consultant who works with alternative protein companies. While the conclusions stated in the article may be valid from a psychological viewpoint, if the study had been done by food scientists, instead, it's likely that the conclusions reached would have emphasized the human nutritional issues associated with plant and fungal-based foods, rather than behavioral and environmental issues.

The advantages of plant and fungal-based meat are obvious.

And those abundantly advertised advantages of plant and fungal-based meat products include the ability to obtain the basic nutritional advantages and taste appeal of meat from plant and fungal-based ingredients, thereby eliminating the need for animal-based products, and at the same time, avoiding the environmental demands imposed on the planet by the current domestic livestock industry. While this sounds almost too good to be true, especially to animal welfare groups, environmental advocacy groups, and many individuals who would prefer to become vegetarians, if the process were easier, unfortunately, most of the current products are not able to live up to that promise. Although some products appear to be significantly better than others, the category as a whole, has some major issues that beg to be addressed.

Plant and fungal-based meat products are ultra-processed foods.

This is probably the biggest problem faced by plant and fungal-based meat products. As a recently published Medical Express article points out, “most fake meats are classified as ultra-processed foods” (Livingstone, and Marchese, 2022, August 16).³ That fact in itself brings into question whether these products are truly beneficial for

the environment, and it definitely raises concerns about human health claims. The article also points out that some plant and fungal-based meat products actually contain more fat, and some of them contain more sodium, than real meat, which appears to detract from the reason why many people would choose plant and fungal-based foods in the first place.



Ultra-processed foods are typically unhealthful foods.

It's common knowledge that highly processed foods are not particularly good choices for a healthy diet. Almost everyone in the general population would be better off without them, if alternative options are available. Highly processed foods have been shown to increase the risk of obesity, diabetes, heart disease, high blood pressure, and other health issues.

A recent study published in the Lancet concluded (in part) that (Anastasiou, Baker, Hadjikakou, Hendrie, & Lawrence, 2022):⁴

"Ultra-processed foods are fundamentally unsustainable products; they have been associated with poor health and social outcomes and require finite environmental resources for their production."

This study also pointed out that ultra-processed foods are associated with significant diet-related energy, greenhouse gas emissions, and land use requirements that are imposed upon the environment. While it may be true that altogether, plant and fungal-based meat demands upon the environment may be lower than the demands associated with the production of animal-based meat, whether they could be labeled as environmentally friendly, is debatable, because their production definitely imposes significant demands upon the environment.

Ultra-processed foods have also been associated with declining mental health.

In a study done by researchers from Florida Atlantic University's Schmidt College of Medicine, Hecht, Rabil, Steele, Abrams, Ware, Landy, & Hennekens (2022, July 28), found that data from over 10,000 adults showed that individuals who consumed the most ultra processed foods, had significantly more mental health issues, than those who ate fewer ultra-processed foods.⁵ The researchers concluded:

"Individuals reporting higher intakes of UPF were significantly more likely to report mild depression, more mentally unhealthy and more anxious days and less likely to report zero mentally unhealthy or anxious days. These data add important information to a growing body of evidence concerning the potential adverse effects of UPF consumption on mental health."

Ultra-processed foods have also been associated with an increased risk of colorectal cancer.

Researchers at Tufts University and Harvard University analyzed data from three large studies, the Health Professionals Follow-Up Study (1986-2014), the Nurses Health Study (1986-2014), and the Nurses

Health Study II (1991–2015) (Wang et al., 2022).⁶ They divided the subjects into five groups according to the amount of ultra-processed foods consumed. Compared with the lowest category, men in the highest category had a 29% increased risk of developing colorectal cancer. Women in these groups showed no correlation, implying no increased risk. Certain subgroups of ultra-processed foods, such as meat, poultry, and seafood-based ready to eat foods, showed an increased risk of the development of colorectal cancer, of 44% for men, and 17% for women.



Plant and fungal-based foods tend to be off limits for people who have food sensitivities.

As the article by Livingstone, and Marchese (mentioned above) points out, plant and fungal-based foods typically get their protein from sources such as soy, peas or other legumes, and wheat gluten. Therefore, most people who have food sensitivities, and especially those who have multiple food sensitivities, cannot safely eat plant and fungal-based meat products.

How nutritious are plant and fungal-based meat products?

In a study published in the Journal of Nutrition and Dietetics, in 2021, 37 plant and fungal-based ground beef products that were available in the U.S. in 2019 were analyzed (Harnack, et al., 2021).⁷ The researchers found that compared with real ground beef, the plant and fungal-based alternatives contained comparable or better levels of most nutrients, except that they contained less protein, zinc, and vitamin B-12 than ground beef. Since most people eat beef because it's a good source of protein and vitamin B-12, these deficiencies could lead to long-term health problems if dietary allowances are not made to compensate for the deficiencies.

Nutritional attributes vary among plant and fungal-based meat products.

The nutritional characteristics of these products vary, of course, so that some may be better for human health, than others. Most of them could be readily adapted to almost anyone's diet (except for the allergen issues, of course), provided that allowances were made to take care of any protein, or vitamin or mineral deficiencies. Transparency in the advertisements for these products, and the labeling, needs to be improved, because some people are probably misled to believe that, because the products mimic meat, they provide equivalent nutrition. And of course, that isn't true.

This wouldn't be the first time that the health of the general population has declined.

As most of us are aware, human health began to decline during the Neolithic period, as agriculture was adopted and developed. Agriculture was reluctantly accepted because this planet could no longer produce enough wild game and other wild food sources to feed the growing human population. Basically, we were running out of protein. The adoption of agriculture imposed new health issues on the population, but in return, it allowed the human population to survive, and eventually expand (although not necessarily thrive).

Is this déjà vu?

Or are we actually running out of protein again, for the second time in the history of civilization. Or could it be that we've suddenly become especially conscious of our environmental impact on this planet because of recent weather cycles, and meteorological events, and the motivation inspired by that awareness is driving the growth of plant-based meat sales?

Is the rise in popularity of plant and fungal-based meat actually a political movement?

In most of the articles written in support of plant and fungal-based foods, the environmental benefits to the planet seem to be emphasized more prominently than human health considerations. This is actually making good use of psychology, because sustainability, environmental issues, and the health of the planet are high on the list of most consumer's concerns these days, so it has a powerful effect on purchasing decisions. And as noted above, animal rights groups and environmental advocacy groups have long been campaigning for the changes that widespread adoption of plant and fungal-based meats could bring.



Next week's issue will discuss fake meat products in categories 2 And 3. These are meat products produced by culturing cells.

References

1. Plant-based Meat Market. (n.d.). Plant-based Meat Market by Source (Soy, Wheat, Blends, Pea), Product (Burger Patties, Strips & Nuggets, Sausages, Meatballs), Type (Beef, Chicken, Pork, Fish), Distribution Channel, Storage and Region - Global Forecast to 2027 . Retrieved from <https://www.marketsandmarkets.com/Market-Reports/plant-based-meat-market-44922705.html>
2. Bryant, C. J., (2022, August 1). Plant-based animal product alternatives are healthier and more environmentally sustainable than animal products. *Future Foods*, 6, 100174. Retrieved from <https://www.sciencedirect.com/science/article/pii/S2666833522000612?via%3Dihub>
3. Livingstone, K., and Marchese, L. (2022, August 16). Is fake meat healthy? And what's actually in it? Retrieved from <https://medicalxpress.com/news/2022-08-fake-meat-healthy.html>
4. Anastasiou, K., Baker, P., Hadjikakou, M., Hendrie, G. A., & Lawrence, M. (2022). A conceptual framework for understanding the environmental impacts of ultra-processed foods and implications for sustainable food systems. *Journal of Cleaner Production*, 368, 133155 Retrieved from <https://www.sciencedirect.com/science/article/abs/pii/S0959652622027445>
5. Hecht, E. M., Rabil A., Steele E. M., Abrams G. A., Ware, D., Landy, D. C., & Hennekens, C. H. (2022, July 28). Cross-sectional examination of ultra-processed food consumption and adverse mental health symptoms. *Public Health Nutrition*, 1-10. Retrieved from <https://www.cambridge.org/core/journals/public-health-nutrition/article/crosssectional-examination-of-ultraprocessed-food-consumption-and-adverse-mental-health-symptoms/CD2C496A199CAB4A9056C00DB5F8AFDE>
6. Wang, L., Du, M., Wang, K., Khandpur, N., Rossato, S. L., Drouin-Chartier, J-P., . . . Zhang, F. F. (2022). Association of ultra-processed food consumption with colorectal cancer risk among men and women: results from three prospective US cohort studies. *British Medical Journal*,

378. e068921 Retrieved from <https://www.bmj.com/content/378/bmj-2021-068921>

7. Harnack, L., Mork, S., Valluri, S., Weber, C., Schmitz, K., Stevenson, J., & Pettit, J. (2021). Nutrient Composition of a Selection of Plant-Based Ground Beef Alternative Products Available in the United States. *Journal of the Academy of Nutrition and Dietetics*, 121(12), P2401-2408. Retrieved from [https://www.jandonline.org/article/S2212-2672\(21\)00303-8/fulltext](https://www.jandonline.org/article/S2212-2672(21)00303-8/fulltext)