

## **Nutritional Value of Traditional Meat vs. Plant-Based Meat Products**

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There has been a lot of hype lately about plant-based meat products and some claims that plant-based meat products are nutritionally equal to traditional meat products, if not better.

Plant-based meat products are not new, as we have had soy-extended burgers and veggie-burgers for a long time, but generally these products were not well accepted by consumers, due to texture and flavor problems. There have also been some wheat protein-based products available for quite a while, that mimicked the texture of meat fairly well, but never got the media hype of the current plant-based burgers. However, the gluten in the wheat protein is a problem for some people. The newer plant-based products (e.g., Beyond Meat, Impossible Burgers) have come much closer to copying the texture and flavor of traditional meat products. Because of the popularity of modern plant-based meat products, they will be the focus of the following discussion, rather than the less popular veggie-burgers.

The makers of the modern plant-based meat products have done a good job matching the macronutrients of their new products to that of traditional meat products. Macronutrients include protein, fat, and moisture. But to make these products, they are using heavily-processed protein products, (e.g., isolated, extracted, hydrolyzed, fermented, etc.), from whole vegetables. The impact of these processing methods, on the nutritional effects (e.g., digestibility) of these vegetable proteins, is not yet known, but nutritionists are skeptical. Nutritionists recommend that people need to consume more vegetables but not in the form that are used in producing the plant-based meat products.

It has been well established that animal proteins contain a better balance of essential amino acids than plant proteins. Essential amino acids cannot be produced in the human body, so are “essential” to be consumed in the human diet, for proper growth and maintenance. When our bodies are making proteins for growth and maintenance, if an amino acid is missing that is needed to produce a protein, that protein is not produced. I would compare it to trying to make sausage when you run out of spice mixes. If you don’t have the spice mix, you don’t make sausage.

The high quantity and quality of proteins in meat, results in meat proteins having a higher nutrient density than plant proteins. Meat proteins also contain a lot of iron and the iron in meat is much more absorbable from meat than from vegetable sources. Also, meat is the only natural source of Vitamin B<sub>12</sub>.

The vegetable proteins used in the modern plant-based products include isolated soy protein (Impossible Burger) and isolated pea protein (Beyond Meat). Soy protein lacks several amino acids, including methionine and lysine and is on the list of allergenic ingredients that some people need to avoid. Pea protein also lacks methionine and unprocessed pea protein has a much lower digestibility than either soy or meat proteins.

In addition to meat, animal proteins include milk and eggs, which contain proteins that are of higher digestibility and biological value than meat. So, this discussion would be different if companies were trying to make meat-like products from eggs and milk.

Besides protein, the modern plant-based meat products contain similar fat content to traditional meat products. To obtain that level of fat, vegetable oils are added to the vegetable proteins. Coconut oil is commonly used in the Beyond Meat and Impossible Burger products and coconut oil contains 80% saturated fatty acids. Saturated fatty acids are claimed to be less desirable for people to consume than unsaturated fatty acids. Beef fat is known to contain 50% saturated fatty acids.

The commercial plant-based burgers contain 18-20 ingredients to compete with the texture and flavor of traditional meat products. Traditional ground beef only contains beef. Sodium content is rather high in the plant-based burgers (see table below).

Cholesterol content is the one component that some would say is a negative factor for traditional meat products, particularly for people who have issues with controlling their cholesterol levels. Plant-based products also contain fiber, which is not in traditional meat products.

In conclusion, based upon the information provided here, it appears that fiber content is the major nutritional benefit to consuming plant-based burgers vs. traditional burgers. Nutritionists are agreeing that consuming plant-based burgers occasionally is okay, but do not encourage the consumption of these products as a healthy alternative to traditional meat products.

	<b>Impossible Burger</b>	<b>Traditional Ground Beef</b>
<b>Cost</b>	\$12/lb.	\$3.50/lb.
<b>Ingredients</b>	Water, soy protein concentrate, coconut oil, sunflower oil and natural flavors	Beef
<b>Calories</b>	240	240, 80/20 beef
<b>Cholesterol</b>	0	80mg
<b>Sodium</b>	370mg	55mg/3oz
<b>Protein</b>	19g	19g/4oz
<b>Color</b>	Leghemoglobin	Myoglobin
<b>Vitamins</b>	Beats beef in folate, B12, thiamin, and iron	Vitamin B12 only in animal products, Iron Absorption Factor in meat
<b>Flavors</b>	Mask vegetal “green” notes in pea protein and the “beany” notes in soy. Insert meat flavors. (Foods that need their flavor and appeal inserted industrially).	Mineral, musky, charry, “umami” flavors

Table from Washington Post, 2019