

Alternative Protein Sources

This fact sheet is intended to provide some information about novel protein sources to help inform consumers about these products.

What is meat?

Meat is currently federally defined as the part of the beef or pork animal that is skeletal or found in various other animal parts. Animals are raised on farms, slaughtered, and cut or further processed in regulated facilities to provide meat.

How are these products regulated?

Meat is regulated by the US Department of Agriculture (USDA). Animal slaughter requires daily inspection by USDA, and meat processing requires USDA inspection during every shift, including food safety checks and pathogen and residue testing. Meat processors are required to have extensive food safety plans and processes in place to control pathogens that can cause food-borne illness.

What are the food safety considerations?

Meat from animals can become contaminated with pathogens from the live animal, which may naturally occur in its intestinal tract and in the environment. Therefore, consumers should ensure they use good food safety practices when handling these products. Cook all poultry products to an internal temperature of 165°F, ground meat products to 160°F, and steaks, roasts, and chops to 145°F.

What are the nutrition considerations?

Fresh (non-processed) meat products contain one ingredient — meat. The primary nutrient from meat is protein. See the plant-based proteins nutrition considerations section for a nutritional comparison of plant-based and meat proteins.

What are plant-based proteins?

Plant-based proteins are made from soy, peas, wheat, or other plant proteins and mixed with other ingredients, such as oils. They are also called “meat analogues,” “veggie burgers,” or may be known by their product name brand (such as Gardenburger®). Recent product developments have allowed these products to reportedly “bleed” like meat: The Impossible™ burger brand products use genetically modified soy leghemoglobin, and Beyond Meat® brand products use beet juice. Binding agents such as methylcellulose may also be added. Most companies’ specific production methods are considered trade secrets.

How are these products regulated?

Plant-based protein products are currently regulated by the US Food and Drug Administration (FDA). Daily federal inspection is not required for these products. Food processors are required to have risk-based preventive food safety systems in place. Discussion and legislation is currently underway in many states and at the federal level on what can be called a “burger,” “meat,” “sausage,” or similar terms.

What are the food safety considerations?

Consumers with allergies to wheat, soy, or other ingredients need to read the label to check if the product contains ingredients to which they are allergic. Consumers should cook these products to an internal temperature of 165°F and use the same good food safety practices as with meat.

What are the nutrition considerations?

The nutritional profile of these products is generally slightly different than traditional meat products. For example, as seen in table 1 below,

Burger King's Impossible™ Whopper® patty does contain fewer calories, fat, and cholesterol and more fiber than a regular Whopper® patty. However, the Impossible™ Whopper® also contains more sodium and less protein than a regular Whopper®, and other products may contain higher levels of saturated fat in the form of coconut oil. Different products will vary nutritionally, as there are presently no established identity standards for these plant-based products. Most of these analogue products contain numerous ingredients.

The Recommended Dietary Allowance (RDA) or minimum amount of protein that people should eat each day is based on body weight. For example, a 50-year-old woman who weighs 140 pounds and does not exercise should consume 53 grams of protein a day. Therefore, a regular Whopper® meat patty would provide 38% of this person's recommended daily protein requirement, while an Impossible™ Whopper® would provide 32% of her daily protein requirement (Table 1).

What is their marketplace status?

Various restaurants offer Impossible™ burgers on their menus. Beyond Meat® and many other plant-based products are available in many grocery stores.

What is cultured meat?

Cultured meat is NOT currently available for purchase by consumers as it is not currently produced on a large scale. Cultured meat that is under development is grown in laboratories from animal

Table 1. Nutritional comparison of a regular Whopper® to an Impossible™ Whopper® (patty only)

	Regular Whopper®	Impossible™ Whopper®
Calories (Kcal)	240	210
Fat (g)	18	12
Saturated Fat (g)	8	7
Trans Fat (g)	1.5	0
Cholesterol (mg)	80	0
Sodium (mg)	230	330
Carbohydrates (g)	0	9
Fiber (g)	0	2
Sugar (g)	0	1
Protein (g)	20	17

cell cultures in culture medium. The cells are grown on an edible non-meat based scaffold that holds cells in position. It is also called “cultured protein,” “clean meat,” “lab-grown meat,” “in vitro meat,” “imitation meat,” “synthetic meat,” “fake meat,” or other terms.

How would these products be regulated?

On March 7, 2019, the USDA and the FDA signed an agreement outlining what parts of this process would be regulated by FDA and USDA. There is currently a discussion on how “cultured meat” products should be labeled.

What are the food safety considerations with these novel products?

The meat will be grown in sterile conditions, but there could still be potential for cross-contamination throughout the process. Consumers will also need to handle and cook this product as if it was meat.

What are the nutrition considerations?

It is assumed that the nutritional profile of cultured meat will be similar to traditional meat products, but more information will be available after those products are available in the marketplace.

Note that cultured milk, egg white, and leather are also under development.



Any reference to commercial products, trade names, or brand names is for information only, and no endorsement or approval is intended.

Note that this fact sheet does not cover the environmental impacts and animal welfare concerns of these various protein sources, but rather provides a list of some other resources that address those impacts.

References and resources

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