

From Lab to Fork?

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It's Hard to Avoid the News

It seems like every news outlet has a story about how new-fangled alternatives to animal products are the next big thing in food. Despite all this media coverage, it's still not clear whether these trendy new foods are really an improvement for nutrition, farmers' livelihoods or the environment.



THE IMPOSSIBLE BURGER
A plant-based vegan burger created by Impossible Foods.
Impossible Foods was founded in 2011 and is located in Redwood City, California.

First, what are these new products?

There are actually a couple different types of products being marketed as meat and dairy alternatives. One group comes from a new generation of plant-based ingredients, many of which rely on genetically engineered organisms like soybeans or yeast. These products, like the Impossible Burger, are highly processed foods that use new techniques or ingredients to imitate the flavor and texture of meat or dairy products. The Impossible Burger's claim to fame is that it "bleeds" due to an ingredient called heme - a compound the company makes by inserting DNA from soybeans into genetically engineered yeast. Other companies are using genetically engineered yeast, bacteria or algae to produce proteins that imitate those found in milk or meat. Some of these next-generation plant-based products are already on the market, and many more are in development.

The Second Group of Products

The second group of products is so novel that there's a lot of fighting going on about what to call it. So far, the contenders include "lab" meat, "clean" meat, "cell-cultured" meat and several others. The Meat industry is working at the federal

level and in some state legislatures to make it illegal for cell-cultured or plant-based products to use the word "meat" on their labels.

What is it?

Setting aside what name it gets, what exactly is it? Basically, this group of products uses live cells from animals in a growth promoting medium (like growth serum from an animal) in a controlled environment (like a fermentation vat) to grow muscle fibers that can be processed into meat replacement products. These products are getting lots of attention but are further away from being commercially viable than the first group of plant-based products. But there is big money (including from some meat companies) being invested into the start-up companies working on lab meat products and enormous amount of hype about their potential to "disrupt" the food system.

The companies marketing these products are making incredibly ambitious claims about the supposed benefits of their products - especially to the environment, with lots of statements about how they are the solution to the problems caused by factory farms. And while there is no doubt that the factory farm system that produces most animal products in the U.S. is devastating to the environment, it isn't yet clear how sustainable these new alternatives really are.

List of Questions:

In fact, when it comes to these new foods, the list of questions is a lot longer than the list of answers. Here are just a few that still need to be figured out:

1. Who is in charge?

These new technologies started a turf war between different parts of the federal government, and a complicated deal between the U.S. Department of Agriculture and the Food and Drug Administration gives some responsibility to both agencies. But it's still not totally clear what rules either agency will use. Some of the questions that need to be answered are whether companies making cell-cultured products will need to first register with FDA, or just begin manufacturing. We also don't know if the FDA will use the weak system currently in place for genetically engineered products that essentially lets companies do their own safety testing or use some other regulation to trigger more vigorous oversight.

(Continued on pg. 5)

2. Is it actually better for the environment?

We don't know. Cell-cultured meat requires a number of inputs, including energy, water, and various feedstocks to feed the cells and get them to grow. Few lifecycle assessments are publicly available to understand the full impacts of production.

3. Is it safe to eat?

We don't know. And our current regulatory system isn't set up to figure it out. There is no system established to independently assess the safety of these novel ingredients, including the possibility of spreading communicable diseases (through the use of animal serum to grow cells), the potential for antibiotic resistance from the use of antibiotics, or possible allergens.

What We Do Know

What we do know is that no new-fangled product can fix our broken food system by itself. We need to take on factory farms and fight for policies to transition to pasture-based and sustainable production. That will take organizing and policy change at the local, state and federal level, not just finding a new kind of burger.

According to Impossible Foods Website www.impossiblefoods.com Five Main Ingredients of an Impossible Burger 2.0

1. Water
2. Soy-Protein Concentrate
3. Coconut Oil
4. Sunflower Oil
5. Natural Flavors

16 Other Ingredients: Contains 2% or Less

1. Potato Protein
2. Methylcellulose
3. Yeast Extract
4. Cultured Dextrose
5. Food Starch, Modified
6. Soy Leghemoglobin
7. Salt
8. Soy-protein Isolate
9. Mixed Tocopherols (Vitamin E)
10. Zinc Gluconate
11. Thiamine Hydrochloride (Vitamin B1)
12. Sodium Ascorbate (Vitamin C)
13. Niacin
14. Pyridoxine Hydrochloride (Vitamin B12)
15. Riboflavin (Vitamin B2)
16. Vitamine B12

Nutrition Facts	
106 servings per container	
Serving size	3oz (85g)
Amount per serving	
Calories	220
	% Daily Value*
Total Fat 13g	17%
Saturated Fat 10g	50%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 430mg	19%
Total Carbohydrate 5g	2%
Dietary Fiber 0g	0%
Total Sugars <1g	
Includes <1g Added Sugars	2%
Protein 20g	
Vitamin D 0mcg	0%
Calcium 21mg	2%
Iron 3mg	15%
Potassium 262mg	6%
Thiamin 16.3mg	1360%
Riboflavin 0.2mg	15%
Niacin 5mg	30%
Vitamin B ₆ 0.2mg	10%
Folate 57mcg DFE	15%
Vitamin B ₁₂ 2.2mcg	90%
Zinc 3mg	25%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.