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Consumer Preferences and the Meatless Meat Industry

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This is the second in a series of six articles from the author's master's thesis about plant-based meat. Previous articles in this series are: farmdoc daily, July 22, 2021.

Introduction

In the U.S. and Western Europe, agri-food systems are changing in response to consumer preferences for foods that appear to be healthier and better for the welfare of animals and the environment. The past twenty years have seen an expansion of food categories – natural foods, organic foods, non-GMO foods, sugar-free, dairy-free, gluten-free – which cater to these preferences. The latest of these trends is 'meatless meat,' which claims to be healthier than animal meat and also better for the environment. This second installment of the "Meatless Meat" article series discusses the attributes which distinguish meatless meat from animal meat.

Health Attributes

Although meatless meat products are designed to be as similar to animal meat as possible, the industry claims that they are healthier than animal meat. Lab-grown meat products, sometimes called "clean meat," claim that they are "cleaner" than animal meat because it is grown in a more sterile environment than animal meat. On a molecular level, the products resemble animal meat, but nutritional analyses have not yet been conducted on them. Plant-based meat products, too, are designed to deliver the same nutritional content as animal meat. A nutritional analysis of plant-based meat products in the U.S. market found that on average the products contain similar levels of protein content, more carbohydrates and dietary fiber, and less fat and cholesterol than the animal products they were mimicking (Kurawadwala 2021). The nutritional analysis also found that the sodium content of plant-based burgers and ground was higher than that of beef burgers and ground beef, but the sodium content of product categories like plant-based nuggets, sausages, and breakfast patties was lower than that of chicken nuggets or pork sausages (Kurawadwala, 2021).

Plant-based meat companies also promote 'natural' attributes of their products by claiming that their products don't contain animal hormones and antibiotics and are GMO-free. Lab-grown meat will not be

able to make the same claims, however, because their product process relies on GMOs and a synthetic cell growth medium. Plant-based meat is also portrayed as healthier because it comes from plants, and recent research links red meat consumption to obesity, cancer, and heart disease (U.S. Department of Health and Human Services, 2015). However, most popular plant-based meat products on the market are highly processed as they are functionally similar to highly processed meat products like burgers, nuggets, sausages and not whole cut meats which are healthier than processed meat products. Nutrition research links consumption of highly processed foods with obesity and other health problems (Hall et al., 2019).

Environmental Sustainability

The marketing strategy of many start-ups focuses on the sustainability of their production process compared to that of the conventional meat industry. Marketing messages compare the resource use of conventional meat and livestock meat and suggest that the globe cannot withstand the livestock industry much longer. Memphis Meats claims "same great taste, better for the planet." Impossible Meats says that its products "require way less land and water than cows, and produce a fraction of the emissions." Beyond Meat's website says, "we hope our plant-based meats allow you and your family to eat more, not less of the traditional dishes you love, while feeling great about the health, sustainability, and animal welfare benefits of plant protein." Mosa Meat's website states, "By 2050, global meat demand will be 70% higher than today's level. Our planet simply doesn't have enough land or water to produce this much meat using animals. And trying to do so would devastate the environment." Aleph Farms claims that it is "leaving a better legacy for future generations by establishing a responsible and sustainable food system."

These claims are backed by independent research, as well as research funded by meatless meat companies and advocacy groups. Life cycle analyses are used to compare the environmental impact of meatless and animal meat products; the overall finding of these LCAs is that both plant-based and cell-based meat products (Tuomisto & Joost Teixeira de Mattos, 2011) use considerably less energy, water, and land than animal meat, and their production emits considerably less pollution and greenhouse gases into the environment. For example, Beyond Meat commissioned the University of Michigan Center for Sustainable Systems to conduct a life cycle analysis of a 4 oz. Beyond Burger product in comparison with a 4oz. ground beef patty. The analysis considered the raw material supply (including the production of agricultural crops), processing and packaging operations, cold storage, distribution, and disposal of packaging materials, and used four indicators to determine environmental impact: greenhouse gas emissions, energy use, land use, and water. The analysis found that the production of a Beyond Burger patty results in 9.25 times less greenhouse gas emissions, 1.87 times less energy, 12.67 times less land, and nearly 200 times less water. Impossible Meat also commissioned the research consulting firm Quantis to produce a life cycle analysis of its product. This study compared 1 kg of Impossible Burger with 1 kg of beef within the same system bounds and found that Impossible Burger used 87% less water, 96% less land, 89% "global warming potential" (greenhouse gas emissions), and 92% less "aquatic eutrophication potential" (discharge of nutrients to waterways which cause algae blooms) (Quantis, 2019). Similar findings were reported in a life cycle analysis funded by the Dutch Consumers' Association (Blonk Consultants, 2017) and a study conducted by Wageningen University (Zhu & Ierland, 2004). However, a 2010 study conducted by researchers at the Swedish Institute for Biotechnology found that processing peas into a vegetarian meat product takes the same amount of energy as the processing for the equivalent product made from animal meat (Davis et al., 2010).

Conclusion

The meatless meat industry has formulated and marketed its products in a way that makes them seem to be healthier, more environmentally friendly, and more socially conscious than conventional meat products. However, consumers' willingness to substitute and pay for these products will also factor into meatless meat's competition with livestock. Current studies indicate that 25-30% of consumers would be willing to substitute meatless meat for animal meat if both products were priced the same. However, this portion could increase if meatless meat expands its marketing to reach more consumers more frequently. The next installment in the Meatless Meat article series will discuss other factors which will influence meatless meat's expansion into the U.S. market.

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