Protein Substitutions

Plant-based burgers and hot dogs that look and taste like meat are becoming staples of the American diet.

September 2, 2019 By Gerrie E. Summers

Findings from a recent observational study published in The British Medical Journal suggested that individuals who ate the most red meat, especially processed meats, such as bacon and hot dogs, experienced a higher risk of premature death compared with those who cut back on these sources of animal protein.

The study didn't conclude how much meat folks can safely eat before their health takes a hit. But usually the response of consumers who are faced with such news is predictable: They embark on a quest for alternatives to meat, as evidenced by the growing popularity today of plant-based replacements meant to mimic the taste, texture and appearance of meat.

But this is hardly new. In the United States, John Harvey Kellogg, MD—of Kellogg's Corn Flakes fame—created mock meats inspired by the vegetarian lifestyle embraced by the Seventh-day Adventist Church.

Kellogg produced meat substitutes, aka meat analogues, named Nuttose and Protose, that were served at sanatariums—health resorts affiliated with the church where folks went to get rejuvenated—and were commercially available in the 1890s.

These alternatives also met the demand for healthier, low-cost substitutes that could protect a growing population from health concerns such as foodborne illness and contamination caused by unhealthy meat production practices and conditions.

Today, revenue from textured vegetable protein, tofu, seitan and other plant-based sources of mock meat is projected to climb to $27.9 billion by 2025, according to a new market research report.

A recent Nielsen Homescan Panel Protein survey shows that U.S. and Canadian consumers believe that plant-based proteins offer superior nutritional values and offer more health benefits compared with animal protein. Many think these meat substitutes improve overall health and help folks manage their weight.

Millennials (those born between 1981 and 1996) show a particular affinity for vegan options, but

they’re not alone. One third of consumers buy plant-based meat substitutes in addition to traditional meat products.

Meatless alternatives have been advertised and promoted by manufacturers and some health professionals as being healthier than animal meat because they don’t contain growth hormones and antibiotics, which are fed to most cattle. Both humans and animals are susceptible to antibiotic resistance from the overuse of these drugs in meat production.

In addition, not eating meat eliminates the chance of getting food poisoning from undercooked meat as well as the risk of food-borne illnesses from pathogens that cause diseases linked with animals, such as mad cow disease.

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By extension, getting protein from plant sources is more ethical and better for the environment. Raising cattle for meat production requires a lot of energy, land and other resources. Cows contribute to climate change when they emit methane, a greenhouse gas. (Fifteen percent of greenhouse gas emissions are from livestock.) Additionally, the water used for crops and animals and during the manufacturing process cannot be conserved.

Animal waste pollutes waterways and causes disease, and workers exposed to toxic gases face health risks. Furthermore, the welfare of animals poses a concern for many.

But these issues aside, the key reason for the surge in popularity of plant-protein-based diets is arguably their connection to health.

In a recent study conducted by researchers from the Harvard T.H. Chan School of Public Health and Purdue University, which was published in the journal Circulation, people on diets that replaced red meat with healthy plant proteins experienced a decrease in risk factors for cardiovascular disease.

Indeed, such findings have driven much of the hoopla over a slew of plant-based burgers currently dominating the “meatless meat” industry. And let’s not forget the yum factor.

Beyond Meat’s Beyond Burger is said to taste better than traditional veggie burgers. Then there’s the Impossible Burger, a soy-based mock burger from California-based Impossible Foods that’s on the menu at Burger King. The company’s mock burger even sizzles and bleeds like hamburger meat—courtesy of soy leghemoglobin (short for legume hemoglobin).

But a meat-free product labeled “vegan,” “vegetarian” or “plant-based” isn’t necessarily healthier.

While meatless burgers are lower in cholesterol than beef burgers, these faux meats are heavily processed in order to look and taste more like the real deal. Some of these burgers post calorie counts and saturated fat content similar to those of red meat, and most are also very high in sodium. Additionally, the juicy burgers may also contain questionable ingredients.

Many commercial organic pea proteins have tested positive for high levels of glyphosate, an herbicide linked to cancer. Soy also receives scrutiny because of the plant's estrogen-like isoflavone compounds—genistein and daidzein—which were once believed to interfere with hormones, increase the risk of breast cancer and contribute to thyroid problems.

Ingredients in plant-based textured vegetable proteins labeled "soy protein isolates" or "isoflavone supplements" are processed and could also contain questionable additives.

In 2014, MorningStar Farms products, as well as some Boca Burgers, were tested and found to contain GMOs, or genetically modified organisms. The soy leghemoglobin in the Impossible Burger is derived from yeast genetically engineered to mimic the heme molecule found in natural meat.

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The new and improved Impossible Burger that launched this year shone a brighter spotlight on meatless alternatives, fueling the growing market. Consumers who shun carbs in favor of protein for health reasons but want to avoid loading up on red meat are driving the demand for plant-based proteins. And mainstream meat companies are responding by investing in a variety of meat-free foods.

Tyson Foods, America's top manufacturer of meat products, launched Tyson Ventures, which, until recently, owned Beyond Meat. The start-up is investing in plant-based meat products via its Raised & Rooted brand. In addition, Perdue now offers vegan and plant-based proteins.

Hormel Food's Applegate Farms, producers of natural and organic meats, is said to be eyeing investments in the plant-based industry, and Nestle will have a pea protein–based burger (to be sold as part of its Sweet Earth brand) this fall.

Previously, meat alternatives were created more as options for vegans and vegetarians and those who wanted to eliminate meat from their diets or those who already had. While some were delicious, most didn't truly taste like beef or chicken.

But the next generation of meat substitutes are being designed to attract meat eaters by actually tasting exactly like meat.

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In the future, faux meats will be produced from animal cells. Cargill, a multinational agricultural foods corporation, is investing in companies—such as Memphis Meats—that produce meat from cell cultures.

These manufacturers are using techniques to engineer meat from pieces of lab-grown animal cells to make chicken strips, meatballs and other foods that don't require breeding, raising and slaughtering living creatures. But the current cost is prohibitive—one meatball costs $1,000 to produce.

One major problem with introducing new meat alternatives into the market is how difficult it will be for consumers to decipher ingredient lists. The challenge will involve making sense of new, unfamiliar substances—some of which might not even be disclosed for proprietary reasons—as well as packaging and nutrition claims.

Currently, certain meat alternatives can be just as pricey as meat, and, considering their contents, some people may deem it better simply to buy free-range chicken, grass-fed beef or wild-caught seafood that is antibiotic- and hormone-free. (It should be noted that prices might decrease if the big companies manufacture their own plant-based meats.)

The Department of Agriculture predicted that in 2018 meat consumption would hit an all-time high—222.2 pounds of red meat and poultry per person—and this trend continues. As the world's population grows, so will meat consumption.

But the good news is that renewed interest in reducing how much animal flesh we eat means alternatives to meat will continue to evolve.

That very well could mean better flavor, texture and way less processing to make plant-based proteins a truly healthier option.

More Mock Meat History

Grinding out replacements for animal protein is a uniquely American industry.

By Gerrie E. Summers

After John Harvey Kellogg, MD, used nuts and cereals to make vegetarian substitutes for meat in the 1890s, other entrepreneurs quickly followed suit.

By 1900, Madison Foods near Nashville was developing soy-based meat alternatives. Another business, The Sanitarium Food Company in Loma Linda, California, sold some of the first commercially available mock meats made from soy and wheat. In 1937, Madison Foods launched Soy Burger, the earliest known meatless burger.

Sales of meat substitutes soared during World War II when the government rationed red meat. Later, a line of meatless breakfast fare made of textured soy protein was sold under the MorningStar Farms label. Then Gardenburger launched its veggie burger in 1981 and Tofurky its turkey meat replacement in 1995.

After the Food and Drug Administration initially issued an authorized health claim in 1999 that soy protein as part of a healthy diet might lower cholesterol and the risk of heart disease, the demand for analogue meats grew even more. The agency later proposed a rule to revoke this claim because of inconsistent findings to support it. At press time, a decision by the FDA to retract or retain the claim was expected.

In 2000, Kraft acquired Boca Burger. Two years later, Burger King became the first major fast food

chain to make veggie burgers available nationally.

Most recently, Impossible Foods and Beyond Meat launched their own branded patties, which are sold in many restaurants across the country.

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