NICOLE E. NEGOWETTI*

Taking (Animal-Based) Meat and Ethics off the Table: Food Labeling and the Role of Consumers as Agents of Food Systems Change

* Lecturer on Law and Clinical Instructor, Harvard Law School Animal Law and Policy Clinic. The author thanks the Food & Drug Law Institute for the opportunity to present a version of this paper at the 2019 Symposium, and in particular, Nigel Barrella for his very helpful comments. The author also benefitted from feedback received at the Second Annual Academy of Food Law and Policy Conference from Professors Timothy Lytton, Alexia Burnet Marks, Sarah Morath, Michael Roberts, Joanna Sax, Susan Schneider, Steph Tai, and Diana Winters.

OVERVIEW

The global scientific community is calling for "a radical transformation of the global food system" to change course from a food production system that threatens climate stability and ecosystem resilience and constitutes the single largest driver of environmental degradation and transgression of planetary boundaries. To achieve such a sweeping change will require a shift from current consumption patterns of meat and dairy in Western diets. This Article is the first legal scholarship to critically examine one market-based strategy to actualize the change—the production and widespread availability and acceptance of plant-based meat to shift consumers away from industrial animal-based meat—and to explore the role of labeling in effectuating the theory of change. In particular, this Article identifies and then applies the seemingly contrasting narratives of plant-based meat as both normal and transformative—that is, the same as, but critically different and better than animal-based meat. This Article analyzes labeling regulations regarding naming and credence claims to assess how plant-based meat will succeed in fulfilling the promises in these narratives. This Article offers a unique contribution to the growing dialogue and scholarship regarding social change and political consumerism in the context of meat consumption and reduction goals.

INTRODUCTION

Increasingly, evidence suggests that the global food system requires a large-scale transition to address climate change and critical human

and planetary health challenges.[1] One key feature of such a transition in industrialized Western societies is a shift away from the current levels of meat and other animal product consumption and toward increased consumption of more plant-based foods.[2] Even as the environmental, public health, and animal welfare impacts of eating meat are made more widely known, eaters may feel ambivalent about meat consumption, but nevertheless resist the idea of eliminating or significantly reducing meat in their diets.[3] High meat consumption patterns in the United States and other Western countries are maintained, often through coping strategies such as obscuring the animal origin of meat, the adaptation of beliefs,[4] or strategic ignorance.[5] To help actualize a shift to plant-based diets, start-up food

---

1 *See* Walter Willett et al., *Food in the Anthropocene: The EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems*, 393 LANCET COMM'NS 447 (2019); EAT-LANCET COMM'N, SUMMARY REPORT OF THE EAT-LANCET COMMISSION 5 (2019), https://eatforum.org/content/uploads/2019/07/EAT-Lancet_Commission_Summary_Report.pdf [https://perma.cc/FN4K-5MVE] ("Global food production threatens climate stability and ecosystem resilience and constitutes the single largest driver of environmental degradation and transgression of planetary boundaries. . . . A radical transformation of the global food system is urgently needed.").

2 Joseph Poore & Thomas Nemecek, *Reducing Food's Environmental Impacts Through Producers and Consumers*, 360 SCIENCE 987, 991 (2018).

3 Jennie Macdiarmid et al., *Eating Like There's No Tomorrow: Public Awareness of the Environmental Impact of Food and Reluctance to Eat Less Meat as Part of a Sustainable Diet*, 96 APPETITE 487, 487 (2016) (noting that "[m]eat consumption is a complex and can be an emotive issue." For example, "it has both positive and negative nutritional attributes. It can be a rich source of nutrients in the diet, providing high quality protein and essential micronutrients, but at the same time diets high in red, specifically processed meat, have been associated with increased risk of some chronic diseases.").

4 Brock Bastian & Steve Loughnan, *Resolving the Meat-Paradox: A Motivational Account of Morally Troublesome Behavior and Its Maintenance*, 21 PERSONALITY & SOC. PSYCH. REV. 278, 278 (2017) ("Most people the world over eat meat, yet a vast majority of meat-eaters also find animal suffering offensive, emotionally disturbing, and potentially disruptive to their dietary habits. We term the apparent psychological conflict between people's dietary preference for meat and their moral response to animal suffering 'the meat-paradox.'"). The study concludes by stating that "[w]hen moral conflicts emerge, they are met with a suite of convenient beliefs about our (lack of) responsibility, the (lack of) harm it causes, and the (lack of) identity we would experience without it." *Id.* at 293.

5 Marleen C. Onwezen & Cor N. van der Weele, *When Indifference Is Ambivalence: Strategic Ignorance About Meat Consumption*, 52 FOOD QUALITY & PREFERENCE 96, 103 (2016) (studying how different consumer groups make decisions about eating meat and characterizing consumers into the following categories: "Indifferent consumers do not experience conflicting thoughts [about eating meat]; Struggling consumers experience conflicting thoughts and accompanying negative emotions. Coping consumers and Strategically Ignorant consumers both found a way to deal with the conflicting thoughts, respectively by changing behaviour and by ignoring the meat-related issues."); Cor van der

companies are creating meat from plants that mimic the appearance, texture, and taste of conventional animal products. When offered at comparable prices and as conveniently as animal-based products, plant-based alternatives are a market-based strategy that "take[s] ethics off the table"[6] and automatizes the purchase of plant-based products. Thus, for vegan advocates and plant-based food companies, these products are undeniably a way to "save the planet" without sacrificing taste or convenience or paying a premium to do so.[7] For an increasingly large segment of the population that is "flexitarian" or "reducetarian," shifting consumption away from animal-based products toward plant-based diets is a deliberate decision for ethical, environmental, or health reasons.[8] For these eaters who consciously weigh the pros and cons of substituting plant-based for animal-based meats,[9] it can be challenging to sift through the political rhetoric and narratives around the attributes that generally appeal to consumers, such as sustainability, naturalness, healthfulness, and overall transparency in how the product was made.

This Article evaluates the market-based theory of change and examines the role of food labels in helping to advance or thwart that strategy in light of social science research regarding food choice, meat consumption, and willingness to eat plant-based meat. Using food labeling as the framework, this Article explores the paradox of plant-based meat as being both the same as conventional meat to appeal to consumers who desire familiarity, and different, as superior to animal-based meat, in an attempt to attract consumers whose food choices are

---

Weele et al., *Meat Alternatives: An Integrative Comparison*, 88 TRENDS IN FOOD SCI. & TECH. 505, 505–06 (2019).

6 GOOD FOOD INST., GFI OUTCOMES: WHY GFI IS A SUPERB PHILANTHROPIC INVESTMENT (2017), https://animalcharityevaluators.org/wp-content/uploads/2017/11/gfi-outcomes-why-gfi-is-a-superb-philanthropic-investment-10-01-17.pdf [https://perma.cc/36BC-VREU].

7 *See, e.g.*, *Why Good Food?*, GOOD FOOD INST., https://www.gfi.org/why [https://perma.cc/EXG8-QQ9L] (last visited Sept. 28, 2020).

8 *The F Word: Flexitarian Is Not a Curse to the Meat Industry*, NIELSEN (July 25, 2019), https://www.nielsen.com/us/en/insights/article/2019/the-f-word-flexitarian-is-not-a-curse-to-the-meat-industry/ [https://perma.cc/72XM-6N2G].

9 Although this Article focuses on alternatives to conventional meat, I do not imply that increasing the consumption of meat substitutes is the only way to encourage more sustainable consumption patterns. *See, e.g.*, Joop de Boer et al., *"Meatless Days" or "Less but Better"? Exploring Strategies to Adapt Western Meat Consumption to Health and Sustainability Challenges*, 76 APPETITE 120 (2014). However, meat substitutes can play an important role in the sustainability agenda and support the development and implementation of policy agendas. Chrysostomos Apostolidis & Fraser McLeay, *Should We Stop Meating Like This? Reducing Meat Consumption Through Substitution*, 65 FOOD POL'Y 74, 85 (2016).

motivated by altruistic factors. Regarding the first goal, the legal and regulatory debates regarding use of "meat" terminology on labels will be discussed. To advance the second goal of communicating superiority, labeling regulations and controversies regarding credence claims will be analyzed.

This Article will begin in Part I by analyzing the issues regarding the naming and labeling of plant-based "meat" and will then analyze voluntary credence claims that convey the benefits of plant-based meat. Part I also provides an overview of plant-based meats that are currently and soon to be on the market and reviews social science research on the drivers and barriers of animal-based and plant-based meat consumption. Part II details and analyzes the market-based theory of food systems change by drawing on political consumerism scholarship. To explore how the theory of change aims to shift consumer behavior and the narratives of sameness and superiority touted by plant-based meat producers and advocates, Part III discusses the ongoing legal and regulatory debates regarding the naming and labeling of plant-based meats. Part IV discusses how plant-based meat producers will communicate the attributes of their products as different and superior to animal-based meat, using credence claims such as "natural" and "sustainable" or "climate-friendly" on food labels.

I
PLANT-BASED MEAT AND FOOD CHOICE DRIVERS AND BARRIERS

Products intended to replace conventional meat, dairy, and eggs are being developed and are coming to the market at a rapid pace, precipitated by the urgency of climate change, widespread animal suffering, and public health epidemics. As the recent groundbreaking EAT-Lancet Report emphasized, the situation is dire: "Global food production threatens climate stability and ecosystem resilience and constitutes the single largest driver of environmental degradation and transgression of planetary boundaries. . . . A radical transformation of the global food system is urgently needed."[10] Avoiding meat and dairy is now widely recognized as the most significant way to reduce one's environmental impact on greenhouse gas emissions, land use, biodiversity loss, water pollution, pesticide use, and antibiotic use.[11] A large body of evidence has also shown that high consumption of red

---

[10] EAT-LANCET COMM'N, *supra* note 1, at 5.

[11] Poore & Nemecek, *supra* note 2, at 987.

meat, especially processed red meat, is associated with an increased risk of type 2 diabetes,[12] cardiovascular disease,[13] certain types of cancer (including colorectal cancer),[14] and mortality.[15] Consumption of processed red meat, such as bacon, hot dogs, and sausages, has been associated with additional health outcomes, including chronic obstructive pulmonary disease,[16] heart failure,[17] and hypertension.[18] Plant-based proteins that shift consumption away from animal-based meat could play a significant role in achieving both climate and public health goals.

There is significant opportunity for disruption of the conventional meat industry. While, by some accounts, meat consumption in the United States is declining,[19] it remains more than three times the global average.[20] Americans eat an average of 220 pounds of poultry and livestock products per year, about 92 of those pounds in red meat,[21]

---

12 An Pan et al., *Red Meat Consumption and Risk of Type 2 Diabetes: 3 Cohorts of US Adults and an Updated Meta-Analysis*, 94 AM. J. CLINICAL NUTRITION 1088, 1095 (2011).

13 Renata Micha et al., *Red and Processed Meat Consumption and Risk of Incident Coronary Heart Disease, Stroke, and Diabetes Mellitus: A Systematic Review and Meta-Analysis*, 121 CIRCULATION 2271 (2010).

14 Daniel Demeyer et al., *Mechanisms Linking Colorectal Cancer to the Consumption of (Processed) Red Meat: A Review*, 56 CRITICAL REVS. FOOD SCI. NUTRITION 2747 (2016).

15 Susanna C. Larsson & Nicola Orsini, *Red Meat and Processed Meat Consumption and All-Cause Mortality: A Meta-Analysis*, 179 AM. J. EPIDEMIOLOGY 282 (2013); Andrea Bellavia et al., *High Red Meat Intake and All-Cause Cardiovascular and Cancer Mortality: Is The Risk Modified by Fruit and Vegetable Intake?*, 104 AM. J. CLINICAL NUTRITION 1137 (2016).

16 Joanna Kaluza et al., *Consumption of Unprocessed and Processed Red Meat and the Risk of Chronic Obstructive Pulmonary Disease: A Prospective Cohort Study of Men*, 184 AM. J. EPIDEMIOLOGY 829 (2016).

17 Joanna Kaluza et al., *Processed and Unprocessed Red Meat Consumption and Risk of Heart Failure: Prospective Study of Men*, 7 CIRCULATION HEART FAILURE 552 (2014).

18 Yan Zheng et al., *Association of Changes in Red Meat Consumption with Total and Cause-Specific Mortality Among U.S. Women and Men: Two Prospective Cohort Studies*, 365 BMJ l2110 (2019).

19 Roni A. Neff et al., *Reducing Meat Consumption in the USA: A Nationally Representative Survey of Attitudes and Behaviours*, 21 PUB. HEALTH NUTRITION 1835, 1835 (2018). This recent study on meat reduction prevalence in the United States found that about two-thirds of the general population reported reducing at least one type of conventional meat in their diet in the past three years. *Id.* at 1841. However, while 55% of the reducer sample decreased its red and processed meat consumption, and of these reducers, 37% increased their seafood and poultry intake, overall, only 10% of the reducers reported decreased consumption of all four categories of conventional meat (poultry, seafood, red meat, and processed meat). *Id.* at 1838.

20 Carrie Daniel, *Trends in Meat Consumption in the USA*, 14 PUB. HEALTH NUTRITION 575, 575 (2011).

21 *Per Capita Consumption of Poultry and Livestock, 1960 to Forecast 2021, in Pounds*, NAT'L CHICKEN COUNCIL, https://www.nationalchickencouncil.org/about

which translates to approximately 10 ounces per day. At 222 pounds per person, overall meat consumption comes out to the equivalent of more than 800 quarter-pound burgers per person when measured by weight or about 2.4 burgers per day.[22] These quantities of meat are derived from living, sentient animals. Just in the U.S., an estimated 25,000,000 chickens, 736,000 turkeys, and 800,000 cows raised for beef are slaughtered for food each day.[23] Replacing those burgers with plant-based alternatives could have significant benefits for animals, and for human and planetary health.

A. Overview of Alternative Meats

Vegetarian and vegan diets have been practiced for thousands of years,[24] and for decades meat substitutes, such as tofu, tempeh, and seitan, have been available for purchase in Western countries. But now, novel processing techniques are being used to create a new generation of plant-based meat that closely mimics animal-based meat in appearance, taste, smell, and function.[25] The Good Food Institute's plant-based mind map categorizes plant-based meats into four groups. First, products that are functionally equivalent to meat, such as textured vegetable protein (TVP). Second, natural foods with textures similar to animal-based meat, such as mushrooms and Asian jackfruit. Third, products such as seitan, tofu, or tempeh that have a similar texture to meat, but do not taste like meat. And finally, products such as chicken nuggets and burgers that replicate "the taste, appearance, and function"

-the-industry/statistics/per-capita-consumption-of-poultry-and-livestock-1965-to-estimated-2012-in-pounds/ [https://perma.cc/VB9G-VANT] (Sept. 16, 2020).

22 Chase Purdy, *The Average American Will Eat the Equivalent of 800 Hamburgers in 2018*, QUARTZ (Jan. 4, 2018), https://qz.com/1171669/the-average-american-will-eat-the-equivalent-of-800-hamburgers-in-2018/ [https://perma.cc/Y89C-UUR6]; *see Food Availability and Consumption*, ECON. RSCH. SERV., U.S. DEP'T AGRIC., https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/food-availability-and-consumption/ [https://perma.cc/PE5L-M5TA] (Feb. 28, 2020) ("While Americans are consuming more vegetables and fruit than in 1970, the average U.S. diet still falls short of the recommendations in the 2015-2020 Dietary Guidelines for Americans for these major food groups. Americans, on average, consumed more than the recommended amounts from the meat, eggs, and nuts group and the grains group in 2017.").

23 Matt Zampa, *How Many Animals Are Killed for Food Every Day?*, SENTIENT MEDIA, https://sentientmedia.org/how-many-animals-are-killed-for-food-every-day/ [https://perma.cc/UR6W-WXQY] (Mar. 1, 2020).

24 *See* Matthew B. Ruby, *Vegetarianism. A Blossoming Field of Study*, 58 APPETITE 141, 141 (2012).

25 *See* M.A. Asgar et al., *Nonmeat Protein Alternatives as Meat Extenders and Meat Analogs*, 9 COMPREHENSIVE REVS. FOOD SCI. & FOOD SAFETY 513, 513 (2010).

of meat.[26] In just two decades, advances in biochemistry have enabled scientists to understand more fully how amino acids, proteins, carbohydrates, lipids, and salt—the building blocks of meat—interact on a molecular level to form the flavor and texture that we associate with meat.[27] Using this science, food companies such as Beyond Meat and Impossible Foods are creating plant-based meats that mimic the taste, texture, and appearance of animal products.[28] A 2019 consumer survey by research group Kerry confirmed the strategy of plant-based meat producers—and about 73% of respondents expressed their belief that meat alternatives should mimic the taste of meat.[29] Plant-based meat producers are aiming to replicate the success of the plant-based (soy, almond, oat, cashew, and many others) milk sector, which is currently worth $1.8 billion.[30] In comparison, the plant-based meat category, which includes burgers, nuggets, strips, cutlets, and sausage links, is worth $801 million.[31] Foods that mimic the taste, appearance, and functionality of animal-based meat are the focus of this Article.

Development of alternative protein products responds to and continues to drive interest among Millennials and Generation Z, a significant percentage of whom consider themselves "flexitarians" who are seeking to reduce, but not completely avoid, their meat consumption.[32] In general, 85% of the U.S. population eats meat, 10%

---

26 CHRISTINE LAGALLY ET AL., GOOD FOOD INST., PLANT-BASED MEAT MIND MAPS: AN EXPLORATION OF OPTIONS, IDEAS, AND INDUSTRY 3 (2017), https://www.gfi.org/files/PBMap.pdf [https://perma.cc/C3KZ-MH,BF].

27 MARTIN ROWE, BRIGHTER GREEN, BEYOND THE IMPOSSIBLE: THE FUTURES OF PLANT-BASED AND CELLULAR MEAT AND DAIRY, 6 (2019), https://brightergreen.org/wp-content/uploads/2019/11/Beyond-the-Impossible.pdf [https://perma.cc/9CA4-Q3D8].

28 *Id.*; Julia Horowitz, *Meatless Farm Breaks into Booming US Market with Whole Foods Deal*, CNN BUS. (June 24, 2019), https://www.cnn.com/2019/06/24/business/meatless-farm-whole-foods/index.html [https://perma.cc/9H47-XLYA].

29 *See also* Maria Godoy, *How to Get Meat Eaters to Eat More Plant-Based Foods? Make Their Mouths Water*, NPR: THE SALT (Feb. 10, 2019), https://www.npr.org/sections/thesalt/2019/02/10/692114918/how-to-get-meat-eaters-to-eat-more-plant-based-foods-make-their-mouths-water [https://perma.cc/3AYK-VU75].

30 Jeff Gelski, *Consider Five Issues in Plant-Based Meat Alternatives*, FOOD BUS. NEWS (Nov. 14, 2019), https://www.foodbusinessnews.net/articles/14899-consider-five-issues-in-plant-based-meat-alternatives [https://perma.cc/A92U-F9NP]; *Plant-Based Market Overview*, GOOD FOOD INST., https://www.gfi.org/marketresearch [https://perma.cc/B7JC-6X99] (last visited Sept. 28, 2020).

31 Gelski, *supra* note 30.

32 *Rethink Meat in Meal Occasions: 'Power of Meat' Report*, PROGRESSIVE GROCER (Mar. 1, 2019), https://progressivegrocer.com/rethink-meat-meal-occasions-power-meat-report [https://perma.cc/HV7A-ATLU] (reporting that among Generation Z, 13% eat a flexitarian diet versus just 6% of Boomers. Women, at 15%, are also more likely to be flexitarians than men, at 6%); Julie Gallagher, *Anuga Report: Flexitarians Driving Plant-*

are flexitarian, and 5% are vegetarian or vegan.[33] Eighty percent of Millennials eat meat alternatives, according to a 2017 report from Mintel, a market research company.[34] A 2019 consumer survey by research group Kerry found that 62% of respondents who said they eat plant-based meat alternatives also said they eat meat.[35]

Beyond Meat and Impossible Foods are the leading companies that have created ground beef analogs, available in grocery stores and restaurants, and are developing other animal product replacements. In May 2019, Beyond Meat had the best IPO of the year, surging more than 163% on the day of its market debut, in addition to partnering with fast-food restaurants Carl's Jr., Dunkin', Del Taco, and TGI Friday's.[36] Not to be outdone, Impossible Foods's burgers are now in approximately 10,000 restaurants, including White Castle, Red Robin, and Burger King, and recently became available in grocery stores across the United States.[37] Impossible Foods continues to innovate its production and views itself not as a burger company, but rather, as a tech platform company that intends "to produce a full range of meats and dairy products for every region in the world to completely replace the need for animals in the food system, full stop. This is not a fad, but

---

Based Innovations, SPECIALTY FOOD ASS'N (Oct. 9, 2017), https://www.specialtyfood.com/news/article/plant-based-innovations-appeal-flexitarian-market/ [https://perma.cc/Q9C8-NV8E]. There are also blended products that are meat products blended with plant-based protein. For example, Tyson Foods launched the Raised & Rooted brand that includes plant-based nuggets and blended burgers featuring a blend of pea protein and other plant ingredients. RAISED & ROOTED, https://www.raisedandrooted.com/ [https://perma.cc/ZE2Y-X547] (last visited Sept. 26, 2020); *see also* BETTER MEAT CO., https://www.bettermeat.co/why-blend [https://perma.cc/NZ39-NGUA] (last visited Sept. 26, 2020).

33 Anne-Marie Roerink, *The Power of Meat 2019: An In-Depth Look at the Meat Department Through the Shoppers' Eyes*, ANNUAL MEAT CONF. 13 (Mar. 1, 2019), https://www.meatconference.com/sites/default/files/books/2019/Power-of-Meat-Presentation-Redacted.pdf [https://perma.cc/N8UH-ARHW].

34 Patty Johnson, *What Consumers Really Think About Meat Alternatives*, MINTEL (Oct. 1, 2018), https://www.mintel.com/blog/consumer-market-news/what-consumers-really-think-about-meat-alternatives [https://perma.cc/NT8J-UPGS].

35 Jeff Gelski, *Consider Five Issues in Plant-Based Meat Alternatives*, FOOD BUS. NEWS (Nov. 14, 2019), https://www.foodbusinessnews.net/articles/14899-consider-five-issues-in-plant-based-meat-alternatives [https://perma.cc/U7F6-9AE9].

36 Amelia Lucas, *Beyond Meat Surges 163% in the Best IPO So Far in 2019*, CNBC, https://www.cnbc.com/2019/05/02/beyond-meat-ipo.html [https://perma.cc/8C56-8VQR] (May 3, 2019, 9:40 AM).

37 David Yaffe-Bellany, *The Fish Is Boneless. (Fishless, Too.)*, N.Y. TIMES (July 10, 2019), https://www.nytimes.com/2019/07/10/business/fake-fish-impossible-foods.html [https://perma.cc/JUP8-WPQL].

a necessity."[38] In 2020, the company announced its intention to commercialize a plant-based pork product in China.[39] It is estimated that by 2054, nonanimal-based sources of processed protein will account for a third of total protein consumption.[40] By the end of 2018, over $17 billion had been invested in the plant-based industry with $673 million pledged in 2018 alone—a 40% increase over the previous year.[41]

Cellular agriculture is also using technology to create products such as cell-based meat (also referred to as "cultivated" meat)[42] to replace conventional meat, seafood, dairy, and eggs. In 2013, biochemist Mark Post, of Maastricht University in the Netherlands, introduced a proof-of-concept cell-based beef patty,[43] and since then, more than twenty-five companies have been developing cell-based food products for humans and pets.[44] Although cell-based food products will not be available in mainstream markets in the immediate future, other products made via acellular agriculture will be available soon. In July

---

38 Alina Tugend, *Is the New Meat Any Better than the Old Meat?*, N.Y. TIMES (Sept. 24, 2019), https://www.nytimes.com/2019/09/21/climate/plant-based-meat.html [https://perma.cc/XFY7-TLUY]. Impossible Foods is not alone in its innovative endeavors. Emergy Foods, through its new brand called Meati Foods, aims to be "the first in market to produce whole cuts of plant-based meat in the form of steak and chicken breasts." Joe Fassler, *A Startup Just Announced the World's First Fake-Meat "Steaks" Made from Fungi. Are We Ready?*, COUNTER (Oct. 29, 2019, 9:22 AM), https://thecounter.org/move-over-plant-based-meat-fungi-steaks-are-here/ [https://perma.cc/Z8C5-B4VZ].

39 Yifan Yu, *'Impossible Pork' Unveiled with China as High-Priority Market*, NIKKEI ASIAN REV. (Jan. 8, 2020), https://asia.nikkei.com/Business/CES-2020/Impossible-Pork-unveiled-with-China-as-high-priority-market [https://perma.cc/DTK9-JDWF].

40 Camilla Stice, *WhooPea: Plant Sources Are Changing the Protein Landscape*, LUX RSCH. (Dec. 22, 2014), https://members.luxresearchinc.com/research/report/16091 [https://perma.cc/884X-TZXX].

41 BRIANNA CAMERON & SHANNON O'NEILL, GOOD FOOD INST., STATE OF THE INDUSTRY REPORT: PLANT-BASED MEAT, EGGS, AND DAIRY 10, 17 (2019), https://www.gfi.org/non-cms-pages/splash-sites/soi-reports/files/SOI-Report-Plant-Based.pdf [https://perma.cc/4X67-AVN7].

42 Bruce Friedrich, *Cultivated Meat: Why GFI Is Embracing New Language*, GOOD FOOD INST. (Sept. 13, 2019), https://www.gfi.org/cultivatedmeat [https://perma.cc/C654-U6XW].

43 For an overview of the origins of Mark Post's burger, see Isha Datar & Daan Luining, *Mark Post's Cultured Beef*, NEW HARVEST (Nov. 3, 2015), https://www.new-harvest.org/mark_post_cultured_beef [https://perma.cc/XQ6N-CSWG]; Neil Stephens et al., *Making Sense of Making Meat: Key Moments in the First 20 Years of Tissue Engineering Muscle to Make Food*, 3 FRONTIERS SUSTAINABLE FOOD SYS. 1, 4 (2019).

44 *See* Brook Sunness, *Lab Grown Meat Companies*, CELL BASED TECH., https://cellbasedtech.com/lab-grown-meat-companies [https://perma.cc/7RU7-ERKR] (last visited Sept. 26, 2020). For example, Memphis Meats, BlueNalu, Finless Foods, JUST, and Aleph Farms are companies creating these products. *Id.*

2019, Perfect Day released limited quantities of its "frozen dairy dessert" made via acellular agriculture.[45] Acellular agriculture involves using cells or microbes, such as yeast or bacteria, to reproduce fats and proteins, a form of manufacturing that is around forty years old.[46] Insulin, which used to require the slaughter of pigs, is now mainly developed with yeast; rennet, which used to be gathered from calves' stomachs, is now produced using genetically engineered bacteria, fungi, or yeasts.[47] San Francisco-based Clara Foods plans to launch its egg white product created using this fermentation process by 2020.[48] Other novel products use "precision fermentation" to create protein from microorganisms without the use of genetic engineering.[49] In June 2019, AT Kearney, a global management consulting firm, predicted that by 2040, plant-based and cell-based meat products would occupy respectively 25% and 40% of the global meat market.[50] More aspirational investors and analysts predict that plant-based and cell-based companies could create a future food system that is (animal) meatless.[51] Of course, in order for such a future to be realized, eaters must be willing and motivated to shift away from their current animal meat-centric diets and substitute alternative proteins. To understand the

---

45 Elaine Watson, *Perfect Day Gives Fans First Taste of Animal-Free Dairy with Limited Edition Ice Cream Release*, FOODNAVIGATOR-USA (July 11, 2019), https://www.foodnavigator-usa.com/Article/2019/07/11/Perfect-Day-gives-fans-first-taste-of-animal-free-dairy-with-limited-edition-ice-cream-release# [https://perma.cc/7A4E-7WZB]; *see How it Works*, PERFECT DAY, https://www.perfectdayfoods.com/how-it-works/ [https://perma.cc/CW6A-M7C8] (last visited Sept. 26, 2020).

46 Erin Kim, *What Is Cellular Agriculture?*, NEW HARVEST (Aug. 16, 2016), https://www.new-harvest.org/what_is_cellular_agriculture [https://perma.cc/XF34-479M].

47 *Id.*

48 Elaine Watson, *Clara Foods Completes Series B, Joins Forces with Ingredion to Commercialize Egg Proteins. . . Minus the Chicken*, FOODNAVIGATOR-USA (Apr. 25, 2019), https://www.foodnavigator-usa.com/Article/2019/04/25/Clara-Foods-completes-Series-B-joins-forces-with-Ingredion-to-commercialize-chicken-less-egg-proteins [https://perma.cc/N3VT-7L2Z].

49 CATHERINE TUBB & TONY SEBA, RETHINKX, RETHINKING FOOD AND AGRICULTURE 2020-2030 6 (Sept. 2019), https://www.rethinkx.com/food-and-agriculture#food-and-agriculture-download [https://perma.cc/VP7M-JKGC].

50 CARSTEN GERHARDT ET AL., ATKEARNEY, HOW WILL CULTURED MEAT AND MEAT ALTERNATIVES DISRUPT THE AGRICULTURAL AND FOOD INDUSTRY? (2019), https://www.atkearney.com/retail/article/?/a/how-will-cultured-meat-and-meat-alternatives-disrupt-the-agricultural-and-food-industry [https://perma.cc/DMG4-BN9U].

51 Jade Scipioni, *Tyson Foods CEO: The Future of Food Might Be Meatless*, FOX BUS. (Mar. 7, 2017), https://www.foxbusiness.com/features/tyson-foods-ceo-the-future-of-food-might-be-meatless [https://perma.cc/HY6K-WBPW]; Richard Branson, *Clean Meat Is the Future of Meat*, VIRGIN (Feb. 12, 2018), https://www.virgin.com/richard-branson/clean-meat-future-meat [https://perma.cc/P828-DF25].

role labeling can play in attracting and sustaining a significant consumer base that trades plant-based for animal-based meat, the following section explores the motivations of food choice. Although this Article is focused on plant-based meat because those products are already available in restaurants and stores, most of the analysis applies to both plant-based and cell-based meats (referred together as alt-proteins).

B. Food Choice Architecture: Drivers and Barriers of Animal-Based and Plant-Based Meat Consumption

Understanding the factors that shape consumer decisions to eat animal-based meat and the willingness to switch to plant-based versions provides insight into how the market-based theory of change will be employed. Studies of consumer motivations[52] provide a foundation for understanding the importance of labeling to achieve the theory of change. To better understand the motivations for choosing animal-free versions of burgers, sausages, and other protein products, researchers have identified "consumption orientations" as the main motivations and justifications people advance for their eating choices.[53] Food consumption orientations include

> orientations toward health (i.e., seeking food that is healthy and increases wellness), convenience (i.e., seeking food that is fast and easy to access with minimal effort), pleasure (i.e., pleasing or indulging oneself through food), naturalness (i.e., preference for foods produced with less synthetic chemicals such as organic foods), sociability (i.e., eating with others, enjoying conviviality and commensal food experiences), price (i.e., food and eating based on

---

52 Although this research on consumer decision-making is focused on choice, it assumes that all consumers have an opportunity to freely make choices. It must be noted that one's food environment, including physical and social surroundings, one's proximity to the nearest supermarket or restaurant, access to public transportation, as well as other societal influences such as food marketing and government agriculture policies, is a significant determinant of one's food choices. *See* Nicole Larson & Mary Story, *A Review of Environmental Influences on Food Choices*, 38 ANNALS BEHAV. MED. S56 (2009). "In the U.S. and many parts of the world, the so-called food environment . . . makes it far too hard to choose healthy foods, and all too easy to choose unhealthy foods." *Toxic Food Environment: How Our Surroundings Influence What We Eat*, HARV. T.H. CHAN SCH. PUB. HEALTH, https://www.hsph.harvard.edu/obesity-prevention-source/obesity-causes/food-environment-and-obesity/ [https://perma.cc/N2SY-BMCK] (last visited Sept. 26, 2020). Studies have also examined broader societal influences on individual food choices, from food marketing to government policies. *Id.*

53 João Graça et al., *Consumption Orientations May Support (or Hinder) Transitions to More Plant-Based Diets*, 140 APPETITE 19, 20, 25 (2019) (exploring consumer willingness to change eating habits and motivations to start eating more plant-based meals).

> financial reasons), and social image (i.e., eating to present oneself positively in social contexts).[54]

While food-choice motivations vary in degree of influence depending on the individual, general patterns emerge within certain consumer groups.

In 2020, the Good Food Institute (GFI), a global nonprofit that supports the alternative protein sector, published a comprehensive literature review of studies examining the barriers and drivers of animal and plant-based meat consumption.[55] The GFI review found that taste, personal health, cost, and convenience motivate general food choice for most of the U.S. population, but some consumers are also motivated by altruistic factors, such as concern for the environment or animals.[56] When consumers are under pressure due to time, cost, and other constraints, food choices are driven by "foundational" drivers. Examples of "foundational" drivers are taste, cost, and convenience, rather than "evolving" or "aspirational" drivers, such as health and nutrition, sustainability, and impact on the environment and animals.[57]

---

54 *Id.*

55 KERI SZEJDA ET AL., GOOD FOOD INST., ACCELERATING CONSUMER ADOPTION OF PLANT-BASED MEAT: AN EVIDENCE-BASED GUIDE FOR EFFECTIVE PRACTICE 7 (2020), https://www.gfi.org/images/uploads/2020/02/NO-HYPERLINKED-REFERENCES-FINAL-COMBINED-accelerating-consumer-adoption-of-plant-based-meat.pdf [https://perma.cc/C4WG-AXZP].

56 *Id.* (citing JACK RINGQUIST ET AL., DELOITTE, CAPITALIZING ON THE SHIFTING CONSUMER FOOD VALUE EQUATION (2016), https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consumer-business/us-fmi-gma-report.pdf [https://perma.cc/J6QE-XEUC]) (finding that of 5,000 U.S. consumers, 49% were strongly motivated by "traditional" drivers of food choice (i.e., price, taste, convenience), while 51% were strongly motivated by "evolving" factors, such as health and wellness, safety, social impact, and familiarity). The studies discussed in this section were all completed before the COVID-19 pandemic. It remains to be seen how food consumption may be affected. By some accounts, "[t]he pandemic is likely to produce a more sustainable, healthier era of consumption over the next 10 years, making consumers think more about balancing what they buy and how they spend their time with global issues of sustainability—suggesting a healthier human habitation of the planet." Sam Mehmet, *COVID-19 Likely to Prompt Era of "Ethical Consumption," Survey Finds*, NEW FOOD MAG. (May 4, 2020), https://www.newfoodmagazine.com/news/109732/covid-19-likely-to-prompt-era-of-ethical-consumption-survey-finds/ [https://perma.cc/R9H8-VZNJ]. This prediction is based on results of a recent study that found that 50% of consumers said they are shopping more health-consciously and will likely continue to do so, and 45% of consumers said they are making more sustainable choices when shopping and will likely continue to do so. ACCENTURE, HOW COVID-19 WILL PERMANENTLY CHANGE CONSUMER BEHAVIOR 14 (2020), https://www.accenture.com/_acnmedia/PDF-123/Accenture-COVID19-Pulse-Survey-Research-PoV.pdf#zoom=40 [https://perma.cc/937S-QUWB].

57 SZEJDA ET AL., *supra* note 55, at 7.

The GFI review found that "foundational drivers must [typically] be met—in order of taste and then cost or convenience—before consumers will make 'aspirational food choices.'"[58] Transparency was important to all consumers, regardless of their primary food choice driver.[59]

Purchases of plant-based meat are motivated by the same factors as those driving food choice in general; taste is overwhelmingly the prime motivator. A 2019 study of 2,518 U.S. consumers assessed the general population's perception of plant-based products.[60] Results were then formulated into recommendations for increasing purchase intent of plant-based products, bringing about positive behavior change, and influencing consumers to choose plant-based products over their conventional meat and dairy counterparts.[61] The study used implicit testing[62] to identify the greatest drivers of purchase behavior and how perceptions of plant-based foods differ among demographic groups. Taste was the strongest motivator of purchase intent.[63] Familiarity and tradition were also highly influential in motivating consumers to purchase plant-based products, and consumers were more likely to purchase products that appeared familiar to them than those that appeared novel.[64] Omnivore consumers liked products that looked comparable to their conventional meat or dairy counterparts and language that was not unusual or incongruous.[65] In general, consumers preferred terms that are more common in the marketplace, such as veggie "chicken" and veggie "beef," rather than veggie "fish" and veggie "pork."[66] Consumers also expressed the desire for products to

---

58 *Id.*

59 *Id.*

60 JAMES PARRY & KERI SZEJDA, GOOD FOOD INSTIT., HOW TO DRIVE PLANT-BASED FOOD PURCHASING: KEY FINDINGS FROM A MINDLAB STUDY INTO IMPLICIT PERCEPTIONS OF THE PLANT-BASED CATEGORY (2019) (citing JAMIE PARRY & RORY MITCHELL, MINDLAB, ASSESSING THE GENERAL POPULATION'S IMPLICIT PERCEPTIONS OF THE PLANT-BASED FOOD CATEGORY (July 2019)), https://www.gfi.org/images/uploads/2019/10/GFI-Mindlab-Report-Implicit-Study_Strategic_Recommendations.pdf [https://perma.cc/7Q4E-CU8L].

61 *Id.* at 4.

62 To determine the attributes most likely to increase purchase intent, the authors correlated data from a product purchase intent test (assessing which plant-based products consumers would most likely purchase) with data from a product associations test (assessing the attribute associations that consumers hold with plant-based products). *Id.*

63 *Id.* at 9.

64 *Id.*

65 *Id.* at 10.

66 For example, most consumers rejected unusual language or altered familiar language, such as malk, cashewgurt, and veggiemilk, on the packaging for plant-based dairy products.

be fresh, nutritious, and healthy but found these less important than taste and familiarity. Similarly, altruistic attributes, such as sustainability and animal welfare, were less important to consumers and much less likely to influence purchasing decisions.[67]

The most important drivers in the "evolving" or "aspirational" food choice category are related to health and wellness and include considerations such as nutritional content, ingredients' status as natural or artificial, and production methods' status as organic.[68] Environmental sustainability is an increasingly important driver of food choice. A 2019 International Food Information Council survey found that over 60% of consumers (in comparison to 37% in 2018) reported sustainability as having a moderate-to-major impact on their purchasing decisions.[69]

In a study of Americans who are reducing meat consumption, half of respondents cited cost (51%) and health or both (50%) as main drivers for reduction, while others cited environmental concerns (12%) and animal welfare (12%) as primary reasons for reducing meat consumption.[70]

In addition to the drivers of plant-based meat consumption, barriers to meat reduction have also been studied. Overall, the greatest barriers are the enjoyment of eating conventional meat, health concerns (particularly regarding lack of protein), lack of familiarity with alternatives to conventional meat and their preparation, fear of new foods, and general unwillingness to alter current eating patterns.[71] Just as familiarity was found to be an important driver of plant-based meat purchases, food neophobia,[72] which refers to a "reluctance to eat and/or

---

Id. at 19. Familiar descriptors, such as nondairy and dairy-free, were better accepted and far more appealing to consumers. *Id.* at 14, 19.

67 *Id.* at 22. While these motivations were fairly consistent across all demographic groups, some differed in the strength of their influence according to age and dietary behavior. *Id.* Millennials were more likely to be influenced by product availability (or convenience) and environmental impact, while older generations were more likely to be influenced by taste and familiarity. *Id.*

68 *Id.*

69 INT'L FOOD INFO. COUNCIL FOUND., 2019 FOOD & HEALTH SURVEY (2019), https://foodinsight.org/wp-content/uploads/2019/05/IFIC-Foundation-2019-Food-and-Health-Report-FINAL.pdf [https://perma.cc/8R7Y-R7QZ].

70 Neff et al., *supra* note 19, at 1840.

71 SZEJDA ET AL., *supra* note 55, at 18.

72 Aversion to new foods can also be explained and understood by applying the Diffusion of Innovations Theory, originally developed by E.M. Rogers in 1962 to explain how the adoption of new ideas, products, or behaviors spreads throughout a population over time

avoidance of novel foods,"[73] can be a significant negative predictor of intention to purchase plant-based meat. This suggests that food neophobia may be a barrier to consumers' willingness to try and purchase plant-based meat.[74] Although plant-based meat is made primarily with familiar plant-based protein sources, such as soy, wheat, or peas, many products that closely mimic animal-based meat are novel foods because of unique ingredients, processing techniques, or use of biotechnology.[75] A study of consumers in the United States, India, and China found that the lower one's food neophobia then the more they intend to purchase plant-based meat. Of U.S. participants, 23.8% reported moderately high to high food neophobia.[76] Another study found that 58% of participants did not adopt a plant-based diet because of their preference for eating familiar foods.[77]

To develop effective interventions and policies, there is a need for researchers to better understand the factors that encourage consumers to eat less meat and investigate the role that meat substitute products can play in reducing meat consumption. As will be discussed below, plant-based meat that closely mimics animal-based versions is one market-based strategy of change to be explored.

II
PLANT-BASED MEAT AND THE MARKET-BASED THEORY OF CHANGE

Part I highlighted the opportunities to shift consumption away from animal-based meat, but it also discussed some significant obstacles to meat reduction. In addition to the barriers consumers may face individually, reducing the quantity of meat consumed in the average Western diet may require a profound societal transition. Meat holds a special status in many societies, is one of the most popular food

through communication. SZEJDA ET AL., *supra* note 55, at 22 (citing E.M. ROGERS, DIFFUSION OF INNOVATIONS 283–85 (5th ed. 2003)). The main premise of the Diffusions of Innovations Theory is that some people, labeled "innovators" and "early adopters," within a social system are more willing to adopt or consider a particular change than are others in the "late majority" and "laggards" groups.

73 Patricia Pliner & Karen Hobden, *Development of a Scale to Measure the Trait of Food Neophobia in Humans*, 19 APPETITE 105, 105 (1992).

74 Christopher Bryant et al., *A Survey of Consumer Perceptions of Plant-Based and Clean Meat in the USA, India, and China*, 3 FRONTIERS SUSTAINABLE FOOD SYS. 1, 4, 6 (2019).

75 SZEJDA ET AL., *supra* note 55, at 16.

76 *Id.*

77 Pasi Pohjolainen et al., *Consumers' Perceived Barriers to Following a Plant-Based Diet*, 117 BRITISH FOOD J. 1150, 1158 (2015).

products in many countries, and is generally perceived as a healthy food.[78] Therefore, wholesale changes in consumer diets may not be easily achieved in the short term due to tradition, cultural values, and hedonistic lifestyles.[79] From a policy perspective, various regulatory options are available to promote these changes and encourage plant-based food consumption, such as consumer education, financial incentives, and regulatory mechanisms like taxes. But plant-based meat represents a theory of change that positions consumers as the change agents by giving them what they want.

In general, "[t]heories of change identify and hypothesize the causal linkages that will lead to desired results."[80] A market-based theory of change is premised on social science research findings that consumers primarily make food decisions based on price, taste, accessibility, and convenience.[81] According to the theory, if alternatives are available that meet these criteria, then consumers will switch to plant-based or cell-based versions of meat. As demand for animal-based meat is reduced, factory farming of animals and "outdated technology" will become obsolete.[82]

Many individuals view attempts to address the systemic supports for industrial animal agriculture as futile. The path of least resistance is to appeal to consumers, but not by asking them to sacrifice foundational food choice drivers. The GFI has noted that "[b]y making plant-based and [cell-based] meat affordable and accessible, [alternative food producers and advocates] can take ethics off the table, making the nonanimal choices the default while also making it much easier for consumers to make choices that align with their values."[83] Ethical

---

78 Apostolidis & McLeay, *supra* note 9, at 75.

79 *Id.*; Erik de Bakker & Hans Dagevos, *Reducing Meat Consumption in Today's Consumer Society: Questioning the Citizen-Consumer Gap*, 25 J. AGRIC. ENV'T ETHICS 877, 881 (2012).

80 Michael Quinn Patton, *The Global Alliance Formally Adopts a Theory of Transformation*, GLOB. ALL. FOR FUTURE FOOD, https://futureoffood.org/the-global-alliance-makes-history-with-formal-adoption-of-a-theory-of-transformation/ https://perma.cc/98JP-C8UM] (last visited Sept. 26, 2020).

81 *See supra* Part I.

82 Laurel Oldach, *Biochemistry of a Burger*, ASBMBTODAY (Oct. 1, 2019), https://www.asbmb.org/asbmb-today/industry/100119/biochemistry-of-a-burger [https://perma.cc/5G9G-EERE].

83 GOOD FOOD INST., GFI OUTCOMES: WHY GFI IS A SUPERB PHILANTHROPIC INVESTMENT 2 (Oct. 1, 2017), https://animalcharityevaluators.org/wp-content/uploads/2017/11/gfi-outcomes-why-gfi-is-a-superb-philanthropic-investment-10-01-17.pdf [https://perma.cc/W9A2-Z9MC].

arguments for criticizing the consumption of meat are plentiful. From the perspective of global fairness, it can be argued that people in the Global North are mainly responsible for the ecological destruction and degradation of our earth. This destruction is suffered disproportionally by people living in poorer countries, and, therefore, people in the Global North should significantly reduce their consumption of animals. The moral duty of reducing our meat consumption can thus be related to responsibilities with respect to the environment, other human beings, and future generations. Eating meat also raises fundamental ethical issues about our moral responsibilities toward animals, particularly regarding the commodification and suffering of animals in industrial agriculture systems.[84] Yet, different ethics can conflict when making purchasing decisions. For example, a person may think about climate change or animal suffering but also about their budget and the desires of other family members.[85]

The growing popularity of plant-based protein is not driven by vegans and vegetarians. Instead, the growing popularity of plant-based protein is driven "by the omnivores and flexitarians that are becoming more aware of the impacts of the animal agricultural industry on our planet. That is driving the creation of these bio mimics, where the taste and sensory attributes are replicated by using different and more sustainable sources."[86] According to David Welch, Director of Science and Technology at the Good Food Institute, "We can tell people to eat healthy dishes full of greens, grains and beans. But what we see is that most people don't want to do this. Our theory of change . . . is to make something people want."[87] Put another way by Impossible Foods CEO Pat Brown, "You don't solve the problem [of climate change, environmental degradation, etc.] by asking people to change their diets."[88] Herein lies the contradiction—the market-based theory of change relies on consumers for its actualization but has little-to-no faith in ethics-based decision-making by those eaters. Such strategy, and its apparent success, raises the question of the role consumers are playing

84 De Bakker & Dagevos, *supra* note 79, at 888.

85 *Id.* at 889.

86 Katy Askew, *Feeding Plant-Based Innovation: 'Fermentation Is the Future of the Alternative Protein Industry*,*'* FOOD NAVIGATOR (Apr. 30, 2020), https://www.foodnavigator.com/Article/2020/04/30/Feeding-plant-based-innovation-Fermentation-is-the-future-of-the-alternative-protein-industry [https://perma.cc/A7EP-NUTT].

87 *Id.*; *see* GOOD FOOD INST., *supra* note 83, at 25. Motivated primarily by the immense suffering of billions of farmed animals, GFI aims to increase market share of alternative proteins (plant-based and cell-based) to offset animal-based meat meals. *Id.*

88 Oldach, *supra* note 82.

in this change. Is the emerging alternative protein industry successfully persuading consumers to supplement their meat-centric diets, or are consumers acting as food systems change agents, who are demanding alternatives to unsustainable and unhealthy conventional meat, thereby disrupting the animal meat industry? This question requires research and other strategy implications. The following section evaluates the market-based theory of change.

A. Market-Based Theory of Change Possibilities and Problems

To assess the alternative protein theory of change first requires an understanding of the discourse around food systems change brought about by ethical consumption, or the strategy of "voting with [one's] dollar (or [one's] fork)."[89] The market-based theory of ethical consumption aims to shape the market in a way that preserves the environment, addresses poverty, and promotes democracy by harnessing the power of consumer choice.[90] Underpinning the theory of ethical consumption is the rationale that consumer choices send market signals through supply chains to the actors that influence where and how the supply chain functions, and under what conditions. When individuals understand that consumer choices hold the power to transform food value chains, it falls heavily on each individual to make choices that contribute to food systems consistent with commonly shared values, such as fairness and environmental stewardship. Given this positioning, consumer choice and individual responsibility can be

---

[89] Emily Huddart Kennedy et al., *Food Activists, Consumer Strategies, and the Democratic Imagination: Insights from Eat-Local Movements*, 18 J. CONSUMER CULTURE 149, 150 (2018). In contrast to the market-based theory of change, see the HEAL Food Alliance's Theory of Change, which confronts systemic inequalities in the food system that require political action and policy solutions. *Theory of Change*, HEAL FOOD ALL., http://healfoodalliance.org/strategy/theory-of-change/ [https://perma.cc/LQ7U-7GHZ] (last visited Sept. 26, 2020).

[90] While the idea of consumer choice has a powerful cultural resonance, its role in ethical consumer discourse raises difficult questions. "[T]he idea of 'voting with your dollar' is not an invention of social justice activists or environmentalists, but is fundamentally rooted in classical market theory. Early in the nineteenth-century, Austrian economist Frank Fetter wrote, 'every buyer . . . determines in some degree the direction of industry. The market is a democracy where every penny gives the right to vote.'" Josée Johnston, *The Citizen-Consumer Hybrid: Ideological Tensions and the Case of Whole Foods Market*, 37 THEORY & SOC'Y 229, 244 (2008). Thus, the potential for inequity—for those with wealth to have more influence—is great.

understood as "a regulatory regime based on voluntarism, market solutions and the state acting at a distance."[91]

According to the theory, by offering a maximum number of choices that appeal to a wide variety of consumers, consumers troubled by social inequity or environmental impacts can opt for "fair trade," "organic," or "humane" goods.[92] Exploring claims made on açaí labels, Professor Christine Parker and colleagues write that such claims

> encapsulate dominant neoliberal constructions of global food systems as capable of providing ethical, healthy products through supply chains significantly governed and arranged by market signals. These marketing claims implicitly task consumers with sending the "right" market signals to shape food supply chains and reinforce the positioning of consumers as regulators of our own consumption and the ultimate determiners of our own bodily health.[93]

In the case of açaí berries, marketing suggests that if consumers govern their choices "correctly" by eating these "utopian edibles," not only can they protect themselves from cancer, aging, and heart disease but they can simultaneously alleviate poverty and related inequalities experienced by the indigenous inhabitants of the Amazon while preserving biodiverse ecologies.[94] Exercising consumer choice thus appears as both a viable and convenient strategy, particularly when compared to the onerous demands of organizing social movements. Consequently, "changing the world is 'easy' when consumers focus on shopping for justice or sustainability."[95] Hence, purchasing commodities can satisfy one's personal desires while also contributing to social good.[96] This hybrid concept of a "citizen-consumer" implies a social practice that can satisfy competing ideologies of consumerism (an ideal rooted in individual self-interest) and citizenship (an ideal rooted in collective responsibility to social and ecological commons).[97]

---

91 Christine Parker et al., *Consumer Power to Change the Food System? A Critical Reading of Food Labels as Governance Spaces: The Case of Açaí Berry Superfoods*, 15 J. FOOD L. & POL'Y 1, 7 (2019) (citing Unni Kjærnes, *Ethics and Action: A Relational Perspective on Consumer Choice in the European Politics of Food*, 25 J. AGRIC. & ENV'T ETHICS 145, 147 (2012)).

92 *Id.* at 3.

93 *Id.* at 1.

94 *Id.*

95 Johnston, *supra* note 90, at 233.

96 *Id.* at 230 (analyzing Whole Foods's strategy of enticing shoppers "to become 'citizen-consumers' who can have it all – pursue their interest in delicious food, while feeling good about their responsibilities to other people, other species, and the environment").

97 *Id.* at 232.

While the "vote with your fork" strategy rosily gives consumers responsibility for shaping the global supply chains to achieve broader societal goals, this theory has been widely critiqued.[98] Some sociology scholars have portrayed consumers as people who cannot be trusted to change their behavior[99] and are thus obstacles to sustainability.[100] This "consumerist pessimism"[101] is supported by studies demonstrating the attitude-behavioral intention gap—that although a substantial number of affluent consumers hold the opinion that "we have to do something" about the environmental and animal welfare problems of modern livestock industry, most consumers fail to act or only do so inconsistently.[102] Specifically in the context of reducing meat consumption, one author notes, "The call that people should be better informed about the moral complications of their meat consumption, and be urged to adopt a more sustainable lifestyle, seems like a voice crying in the wilderness of our supermarkets."[103]

Market-based approaches have also been widely critiqued and contested by scholars and activists for their failure to address food systems issues. While it may be appealing to accept that the consumer-citizen approach can effectively combine consumer desires with citizenship responsibilities to larger political and ecological collectivities, others propose that acts of consumption alone cannot constitute an effective response to complex problems and that these approaches may instead work to legitimate and perpetuate individualism.[104] Such strategies, as those of the alternative food movement, are criticized for drawing attention away from political action and instead perpetuate the neoliberal rationale[105] that underlies

---

98 ZYGMUNT BAUMAN, DOES ETHICS HAVE A CHANCE IN A WORLD OF CONSUMERS? 190 (2009) (opining that "the consumer is an enemy of the citizen").

99 De Bakker & Dagevos, *supra* note 79, at 880.

100 *Id.* at 879–80.

101 *Id.* at 881.

102 *See* Iris Vermeir & Wim Verbeke, *Sustainable Food Consumption: Exploring the Consumer "Attitude Behavioral Intention" Gap*, 19 J. AGRIC. & ENV'T ETHICS, 169, 187–88 (2006).

103 De Bakker & Dagevos, *supra* note 79, at 880 (noting that "these discussions about modern consumers are far removed from the position that consumers are a sine qua non to solve the protein issue").

104 Kennedy et al., *supra* note 89, at 150.

105 With reduced state intervention, and notably high levels of corporate concentration, global food chains represent a neoliberal approach to governance in which private regulation and consumer choice are key organizing principles for food systems. Parker et al., *supra* note 91, at 7.

many of the industrial food system's structural problems. Some of these critiques are grounded in unfair labor practices, unfettered corporate control and consolidation of the food system, allegiances between elected representatives and corporations, animal suffering, insufficient government support for sustainable agriculture, and a reliance on fossil fuels, all of which arguably ignore structural inequalities based on race, class, and gender.[106]

The market strategy of alternative protein producers is not motivated by environmentalism and ethics. Unlike the traditional consumer-citizen model where a consumer makes food choices based on values, the strategy of alternative protein producers and advocates seeks to take environmentalism and ethics off the table. In turn, this alleviates consumers of the difficulties and ambiguities of decision-making based on ethics across the supply chain.[107] Instead, the strategy of alternative protein producers is based on the assumption that the majority of consumers will be motivated solely by taste, price, and convenience. While the alternative protein theory of change recognizes taste and price as paramount to consumer decision-making about food, the companies also seek to communicate credence attributes of the products to would-be plant-based meat eaters swayed by the myriad of environmental, health, or animal welfare benefits. The following section explores how producers are attempting to straddle the line between familiarity and parity while also conveying superiority.

B. Narratives of Plant-Based Meat: The Same, but Better

As discussed previously, to achieve their theory of change, plant-based meat producers seek to position their products as the same, yet

---

[106] *See* Kennedy et al., *supra* note 89, at 164; *see, e.g.*, Julie Guthman, *The Polanyian Way? Voluntary Food Labels as Neoliberal Governance*, 39 ANTIPODE 456, 473–74 (2007); Patricia Allen & Julie Guthman, *From "Old School" to "Farm-to-School": Neoliberalization from the Ground Up*, 23 AGRIC. & HUM. VALUES 401, 412 (2006). However, several authors have used survey data to show that ethical consumption can be positively associated with traditional political engagement. Thus, refuting the hypothesis that ethical consumption replaces or prevents the adoption of traditional forms of political engagement. Johnston, *supra* note 90, at 230.

[107] Maria Tziva et al., *Understanding the Protein Transition: The Rise of Plant-Based Meat Substitutes*, 35 ENV'T INNOVATION & SOCIETAL TRANSITIONS 217, 220 (2020) ("The supply chain of plant-based meat substitutes can be described in four broad steps. In the first step, a variety of protein crops are cultivated globally. In the second step, crops are procured and processed into protein ingredients, such as protein concentrates and isolates. In the third step, firms in the food sector purchase protein ingredients, formulate and process them into texturized intermediary products for the development of final meat substitutes. In the last step, products reach consumers through retail and food service.").

better. In light of consumer studies reflecting the importance of familiarity when purchasing alternative proteins, plant-based producers are investing considerable effort and capital in creating products that simulate the visceral expectations of their conventional counterparts. In these ways, the burgers, beef crumbles, and chicken strips conform to largely Anglo-American norms and expectations that have come to define the particular categories of meat, dairy, and eggs. The popularity of animal food consumption is thus not the target of disruption here; rather, it is to deliver products that are indistinguishable in enjoyment, cultural value, and familiarity and, by doing so, reconfigure what qualifies as meat, dairy, and eggs in consumer thinking.[108] Providing "the same" as conventional products involves normalizing plant-based meat as food and, through this normalization, redrawing consumers' understanding and conceptualization of meat.[109]

As an example of how this narrative of sameness is articulated by plant-based meat producers, in interviews discussing his company's work, CEO Ethan Brown of Beyond Meat specifically describes and promotes his products as meat. For him, the raw materials may be different, but the end products remain the same: "Meat is really made up of five constituent parts, the amino acids, lipids, carbohydrates, minerals and water. They're actually present in plants. What we're doing is building a piece of meat directly from the plant so the compositions are basically, the same. In that case, we are delivering meat."[110] Similarly, by identifying the molecules that make meat *meat*, Impossible Foods claims to have uncovered the secret to transforming plants into meat. Pat Brown, CEO and Founder of Impossible Foods stated,

> The heme in mammalian muscle gives raw meat its "bloody" flavor. And the release of heme during cooking catalyzes the explosion of flavors and aromas that makes burgers—or any kind of meat—taste so "meaty." . . . [L]eghemoglobin, found in the roots of legumes, . . . helps them extract nitrogen from the air to enrich the soil. When we mixed leghemoglobin with plant proteins, fats and other simple nutrients, it transformed what would otherwise have been a dull

---

108 *See* Alexandra E. Sexton, *Eating for the Post-Anthropocene: Alternative Proteins and the Biopolitics of Edibility*, 43 TRANSACTIONS INST. BRIT. GEOGRAPHERS 586, 595 (2018).

109 *Id.*

110 Interview with Ethan Brown, CEO, Beyond Meat, on PBS NewsHour (Nov. 26, 2015), http://www.pbs.org/newshour/bb/is-it-possible-to-build-meat-out-of-plant-protein/ [https://perma.cc/UM42-4WRH]; *see also* Ethan Brown, *Beyond Meat*, *in* THE FUTURE OF MEAT WITHOUT ANIMALS 4 (Brianne Donaldson & Christopher Carter eds., 2016).

> tasting veggie burger into…*meat!* And the meat cooked, smelled and tasted like meat from a cow.[111]

The eating experiences associated with animal foods are explicitly celebrated in the narratives found on food company websites and social media. For example, statements such as "The revolutionary plant burger that looks, cooks, and satisfies like beef" have been included on websites and Instagram posts, accompanied by descriptions of plant-based meat that emphasize their "delicious" taste and "mouth-watering juiciness and chew."[112] Plant-based food company websites also show videos of burgers cooking on grills, spitting fat, and turning from pink to brown as they are cooked, just like animal-based meat.[113]

While claiming sameness to appeal to omnivore consumers who seek familiar foods, plant-based producers also assert difference and superiority to appeal to consumers who may be swayed by the ethical, environmental, and health benefits. The tension between being the same as conventional meat products, while also being superior, and therefore different, is an issue that has significant ramifications for the legal and regulatory framework for labeling. The following section discusses how the producers of plant-based meat have straddled the issue of equivalence and superiority while demanding use of terminology employed by conventional animal agriculture. The different production methods of plant-based meat versus traditional livestock production are de-emphasized by proponents, yet these differences are precisely why these products are worthwhile. For example, Impossible Foods claims, "We make [our product] entirely from plants, without the destructive impact of livestock, so that you, your children, and your grandchildren's children will always be able to enjoy a good ol' fashioned burger."[114] This statement appeals to

---

111 Pat Brown, *Heme & Health: The Essentials*, MEDIUM (Mar. 2, 2018), https://medium.com/impossible-foods/heme-health-the-essentials-95201e5afffa [https://perma.cc/82B4-AV9B].

112 Alexandra E. Sexton et al., *Framing the Future of Food: The Contested Promises of Alternative Proteins*, 2 ENV'T & PLAN. E: NATURE & SPACE 47, 57 (2019); *see* David Lipman, *How We Know You'll "Like Very Much" the New Impossible Burger*, MEDIUM (Jan. 7, 2019), https://medium.com/impossible-foods/how-we-know-youll-like-very-much-the-new-impossible-burger-3d841683cec1 [https://perma.cc/Q22J-DU6X].

113 Sexton, *supra* note 112.

114 Jim Lister, Bleedin' Vegan Burgers, APE CREATIVE (July 10, 2017), https://www.apecreative.com/bleedin-vegan-burgers/ [https://perma.cc/GFF9-YM2S]. Similarly, Perfect Day, which is an animal-free and flora-based company, describes its process as "our dairy flora can use fermentation to convert plant sugar into milk proteins—whey and casein—that are nutritionally identical to those that come from cows, but without the downsides. We call this flora-based dairy protein, since it comes from flora instead of

tradition and familiarity while highlighting how a plant-based burger is environmentally superior to the conventional animal-based version. The company further explains,

> We think of it as meat made a better way . . . Meat today basically is made using pre-historic technology, using animals to turn plants into this very special category of food that is defined by a particular kind of delicious flavor, sensory experience and nutritional profile with general affordability and accessibility. . . . Unlike the cow—first of all, it's not even trying to be delicious! And it stopped improving at that a million years ago. We are able to optimize our meats for deliciousness, sustainability, nutrition and affordability. And we are able to keep getting better and better.[115]

The environmental benefits are proudly proclaimed by Impossible Foods: "Compared to beef from a cow, producing the Impossible Burger uses 87% less water, emits 89% fewer greenhouse gases into the atmosphere, contributes 92% less water pollution, and uses 96% less land."[116]Additionally, "80% less herbicide is required to produce the Impossible Burger than an average American cow-derived burger, because of the large amount of crops required to feed a cow to produce beef."[117]

Plant-based meats are often touted as products free from pathogens and contaminants, and they are described as "cleaner," "safer," "disease-free," and "natural" in comparison with their conventional counterparts.[118] The owners of the plant-based Herbivorous Butcher in Minneapolis, Minnesota, explain, "[W]e're offering something with health benefits better than any animal product; our protein is enriched with nutritional yeast, B vitamins in addition to being high protein and

---

animals." *How It Works*, *supra* note 45. The results are "vegan and lactose-free versions of age-old favorites (like cheese, yogurt, and ice cream) for an entirely new generation of foods that address how we eat today and for years to come." *Id.* Thus, animals are unnecessary to produce the foods.

115 Lora Kolodny, *Impossible Foods CEO Pat Brown Says VCs Need to Ask Harder Scientific Questions*, TECHCRUNCH (May 22, 2017, 1:25 PM), https://techcrunch.com/2017/05/22/impossible-foods-ceo-pat-brown-says-vcs-need-to-ask-harder-scientific-questions/ [https://perma.cc/E3WE-LXXS].

116 Pat Brown, *How Our Commitment to Consumers and Our Planet Led Us to Use GM Soy*, MEDIUM (May 16, 2019), https://medium.com/impossible-foods/how-our-commitment-to-consumers-and-our-planet-led-us-to-use-gm-soy-23f880c93408 [https://perma.cc/S83K-P2Q4].

117 *Id.*

118 Brianne Donaldson, *Introduction: In the Blink of an Eye*, *in* THE FUTURE OF MEAT WITHOUT ANIMALS, *supra* note 110, at xv.

low-fat . . . We don't just make meat replacements; we make meat improvements."[119]

The debates about alternative proteins' promises and meanings have largely occurred within the business and advocacy communities but have recently become part of the agenda of established food corporations, regulators, and lawmakers. As a result of this broadened debate, the meaning of "meat" has been held up for scrutiny against existing regulatory frameworks and the political power of the existing livestock industry, which has lobbied for federal and state legislators to solidify its stronghold over "meat" terminology.[120] Thus, questions of whether alternative proteins are "meat" have taken on new political and cultural meanings.

On one hand, the multiple benefits of plant-based versions of animal products call into question whether to dispense with the terms "meat," "beef," "pork," etc. in favor of "plant protein." As one author has suggested, new terminology such as "mylk"[121] or perhaps "shmeat"[122] in lieu of "meat," could signal a departure from the oppression that those terms signify. On the other hand, is there really *value* in those names that the animal agricultural industry fears will be usurped, as will be discussed below, that plant-based meat companies can reimagine? Or do these terms *already* encompass plant-based (and cell-based) versions?

As the discussion of consumer studies demonstrated, familiarity in terms of appearance and taste plays a significant role in food choice. Names can play a very important role in the support, public acceptance, and development of new technologies and concepts.[123] Part III will describe the battles over the term "meat" on alternative proteins.

---

119 *Id.*

120 Stephens et al., *supra* note 43, at 10.

121 Iselin Gambert, *Got Mylk?: The Disruptive Possibilities of Plant Milk*, 84 BROOK. L. REV. 801, 804 (2019).

122 Jacob Metcalf, *Meat Shmeat: Food System Ethics, Biotechnology and Re-Worlding Technoscience*, 19 PARALLAX 74, 74 (2013).

123 Catherine Kramer, *What Is In Vitro Meat?*, FOOD PHREAKING, Nov. 2015, at 1, 33, http://www.foodphreaking.com/FP02_WhatIsInVitroMeat.pdf [https://perma.cc/MX3F-Q443].

III
THE NAMING AND LABELING OF "MEAT"

A. Overview of Labeling Regulatory Oversight

The Food and Drug Administration (FDA) is responsible for protecting public health by ensuring the safety and proper labeling of all domestic and imported food except meat, poultry, and processed eggs, which are regulated by the U.S. Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS). The Food Drug and Cosmetic Act (FDCA), enacted in 1938, prohibits the misbranding of food and gives the FDA the authority to oversee the safety and labeling of food.[124] In 1990, Congress amended the FDCA by enacting the Nutrition Labeling and Education Act of 1990 "to clarify and to strengthen the [FDA's] legal authority to require nutrition labeling on foods, and to establish the circumstances under which claims may be made about nutrients in foods."[125] The Nutrition Labeling and Education Act preempts state laws and local laws that impose labeling requirements that are "not identical" to the requirements of the FDCA; therefore, the ability of state governments to enact labeling laws is significantly constrained.[126]

The Federal Trade Commission (FTC) and the FDA have overlapping jurisdiction to regulate the advertising and labeling of foods. Section 343(a) of the FDCA prohibits the "misbranding" of food, which includes labeling that "is false or misleading in any particular."[127] Section 5 of the Federal Trade Commission Act prohibits "unfair or deceptive acts or practices,"[128] and § 12 and § 15 of the Federal Trade Commission Act prohibit "any false advertisement" of food products that is "misleading in a material respect."[129] This shared jurisdiction over labeling and advertising of food products operates pursuant to a longstanding Memorandum of Understanding between the agencies. Under this agreement, the FDA

---

124 Federal Food, Drug, and Cosmetic Act, Pub. L. No. 75-717, 52 Stat. 1040 (1938) (codified as amended at 21 U.S.C. §§ 301–99(i)).

125 H.R. REP. NO. 101-538, at 7 (1990), *as reprinted in* 1990 U.S.C.C.A.N. 3336, 3337.

126 21 U.S.C. § 343-1(a)(2). One exception to preemption provided by Congress is that the preemption clause will not apply to laws that require warnings concerning the safety of food. Nutrition Labeling and Education Act of 1990, Pub. L. No. 101-535, § 6(c)(2), 104 Stat. 2353, 2364 (1990).

127 21 U.S.C. § 343(a).

128 15 U.S.C. § 45(a).

129 *Id.* §§ 52, 55.

exercises primary responsibility for regulating food labeling, while the FTC assumes primary responsibility for ensuring that advertising of food products is truthful and not misleading.[130]

Use of the term "meat" on plant-based products has been controversial and has been met with opposition by the animal agriculture industry, as will be discussed below. These debates may seem like petty battles between powerful agricultural industry and start-up food companies—but it belies a larger and more pressing cultural conversation taking place about the nature of food, our expectations of what food is, and how those expectations evolve.[131] For the companies creating plant-based meat, freedom over naming and labeling represents parity, a level playing field, and a key tactic to converting dairy and meat-eating consumers. Will a new vernacular be required due to legal and regulatory constraints, or will a new lexicon be created to distinguish these products in a postanimal agriculture market?

1. Defining "Meat"

As discussed above, the FDA has jurisdiction over all plant-based food products, including plant-based "meats." The statutory and regulatory definitions of "meat" make clear that plant-based alternatives do not fall under the purview of the USDA's FSIS, which regulates most aspects of the safety and labeling of traditional (nongame) meats, poultry, and certain egg products pursuant to its authority under the Federal Meat Inspection Act. The Federal Meat Inspection Act does not define the term "meat," although it defines a "meat food product" as "any article capable for use as human food which is made wholly or in substantial part from meat or other portion of the carcass of any cattle, sheep, swine, or goats."[132]

---

130 Memorandum of Understanding Between the Federal Trade Commission and the Food and Drug Administration (MOU 225-71-8003), https://www.fda.gov/about-fda/domestic-mous/mou-225-71-8003 [https://perma.cc/WY33-APSS] (Dec. 15, 2017) ("The Food and Drug Administration has primary responsibility for preventing misbranding of foods, drugs, devices, and cosmetics shipped in interstate commerce. . . . In the absence of express agreement between the two agencies to the contrary, the Food and Drug Administration will exercise primary jurisdiction over all matters regulating the labeling of foods, drugs, devices, and cosmetics.").

131 Chase Purdy, *Clean Meat Can't Replace Traditional Meat Because There's No Such Thing as "Traditional" Food*, QUARTZ (May 3, 2018), https://qz.com/1267429/clean-meat-cant-replace-traditional-meat-because-theres-no-such-thing-as-traditional-food/ [https://perma.cc/473M-3RSQ].

132 21 U.S.C. § 601. Through its implementing regulations, FSIS defines "meat" as

> [t]he part of the muscle of any cattle, sheep, swine, or goats which is skeletal or which is found in the tongue, in the diaphragm, in the heart, or in the esophagus,

2. Federal "Meat" Labeling Restrictions

In response to the growing popularity and availability of plant-based meats and the looming threat of cell-based meats coming to market, the U.S. Cattlemen's Association (USCA) has led federal and state efforts to restrict plant-based producers' use of "meat" terms. In 2018, the U.S. Cattlemen's Association petitioned the FSIS to add definitions of the terms "beef" and "meat" to the FSIS Food Standards and Labeling Policy Book and to limit use of the terms "meat" or "beef" to "animals born, raised, and harvested in the traditional manner."[133] Specifically, the USCA requested that the FSIS require that any product labeled as "beef"[134] come from cattle that have been born, raised, and harvested in the traditional manner, rather than coming from alternative sources, such as a synthetic product from plants, insects, or other nonanimal components and any product grown in labs from animal cells.[135] The USCA has further requested that the broader definition of "meat" be limited to the tissue or flesh of animals that have been harvested in the traditional manner.[136] This would similarly prohibit products from

---

> with or without the accompanying and overlying fat, and the portions of bone [(in bone-in product such as T-bone or porterhouse steak)], skin, sinew, nerve, and blood vessels which normally accompany the muscle tissue and which are not separated from it in the process of dressing.

9 C.F.R. § 301.2(tt) (2020).

133 U.S. Cattlemen Ass'n, Petition for the Imposition of Beef and Meat Labeling Requirements: To Exclude Products Not Derived Directly from Animals Raised and Slaughtered from the Definition of "Beef" and "Meat" (Feb. 9, 2018), https://www.fsis.usda.gov/wps/wcm/connect/e4749f95-e79a-4ba5-883b-394c8bdc97a3/18-01-Petition-US-Cattlement-Association020918.pdf?MOD=AJPERES [https://perma.cc/4H8H-3SZS].

134 While FSIS does not define "beef" or "beef products" in its regulations, it has defined numerous beef products in its Food Standards and Labeling Policy Book. Additionally, the USDA's Agricultural Marketing Service has defined such terms in its regulations. Under the Agricultural Marketing Service regulations, "beef" means "flesh of cattle." 7 C.F.R. § 1260.119 (2020). Cattle is defined as "live domesticated bovine animals regardless of age." *Id.* § 1260.118. "Beef products" means "edible products produced in whole or in part from beef." *Id.* § 1260.120.

135 In March 2018, the FDA and the USDA announced a joint regulatory framework for cell-based meat and poultry. U.S. DEP'T OF HEALTH & HUM. SERVS., FOOD & DRUG ADMIN., U.S. DEP'T OF AGRIC. FOOD SAFETY & INSPECTION SERV., FORMAL AGREEMENT BETWEEN THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES FOOD AND DRUG ADMINISTRATION AND U.S. DEPARTMENT OF AGRICULTURE OFFICE OF FOOD SAFETY (Mar. 7, 2019), https://www.fsis.usda.gov/wps/wcm/connect/0d2d644a-9a65-43c6-944f-ea598aacdec1/Formal-Agreement-FSIS-FDA.pdf?MOD=AJPERES [https://perma.cc/DZ6A-5PLQ]. Because FSIS will regulate the labeling of these products, the agencies conceded that the foods are "meat." *Id.*

136 U.S. Cattlemen Ass'n, *supra* note 134.

alternative sources such as a synthetic product from plant, insects, or other nonanimal components and cell-based meat being labeled as "meat."[137]

The Cattlemen were transparent about their rationale, stating directly that "both the synthetic product and the lab grown product from animal cells directly compete, or will soon directly compete, against actual beef products that are born, raised and harvested in the traditional manner. Thus, in USCA's view both categories should be excluded from the definition of 'beef.'"[138]

The Cattlemen's request to restrict labeling of plant-based meats is directed at the wrong agency, given that the FDA has oversight over the labeling of all plant-based foods and the USDA does not have any legal authority over those foods.[139] In recognition of this authority, the USDA typically refers questions about the use of meat terms on plant-based labels to the FDA. For example, in April 2016, the USDA referred an inquiry about the label of a plant-based bacon product to the FDA because the product did not contain pork.[140]

Although the FSIS has not responded to the USCA petition, a recent bipartisan bill, introduced to the U.S. House of Representatives by Anthony Brindisi (D-NY) and Roger Marshall (R-KS) in October 2019, would satisfy the Cattlemen's requests and is directed at the

---

137 *Id.* at 2.

138 *Id.* at 8.

139 Letter from Plant Based Foods Ass'n to Carmen Rottenberg, Acting Deputy Under Sec'y for Food Safety, U.S. Dep't Agric. Food & Safety Inspection Serv. re: Petition filed by the U.S. Cattleman's Ass'n, Docket No. FSIS-2018-0016 (May 25, 2018), https://plantbasedfoods.org/wp-content/uploads/2018/05/PBFA-comment-on-USCA-Petition.pdf [https://perma.cc/NDU9-Y5U4]. Nevertheless, several months after the USCA petition was filed, USDA investigators visited Kroger Co., Safeway, Whole Foods Market, and other grocery stores in California, New Jersey, Ohio, and Oklahoma, where they took photos of plant-based meat products made by Beyond, Late July Snacks LLC, and Sweet Earth Foods, a subsidiary of Nestle, and made note of their locations. Jacob Bunge & Heather Haddon, *America's Cattle Ranchers Are Fighting Back Against Fake Meat*, WALL ST. J. (Nov. 27, 2019, 5:30 AM), https://www.wsj.com/articles/americas-cattle-ranchers-are-fighting-back-against-fake-meat-11574850603?mod=hp_lead_pos5 [https://perma.cc/Y5D3-YCH3].

140 Letter from the Good Food Inst. et al. to the Food Safety & Inspection Serv. Docket Clerk, U.S. Dep't Agric. re: U.S. Cattlemen's Ass'n Petition to Restrict Beef and Meat Terms on Food Labels 4 (Apr. 17, 2018), https://www.gfi.org/images/uploads/2018/04/GFIetal-Comment-FSIS-2018-0016.pdf [https://perma.cc/5GPA-TF62].

> FDA replied that the label contained the phrases "Vegan, Plant Based Substitute for Pork Bacon" and "Plant-Based," and concluded that FDA "would likely not object to the use of certain terms like 'bacon' if they are appropriately qualified or if the label otherwise clearly and accurately discloses the nature of the product."

Id. at 4 n.9 (quoting e-mail from Seyra Hammond, FDA, to Mark Wheeler, USDA (May 3, 2016)).

FDA.[141] The bill, titled The Real Marketing Edible Artificials Truthfully Act of 2019, known as the Real MEAT Act of 2019, would amend the Federal Food, Drug, and Cosmetic Act "to ensure that consumers can make informed decisions in choosing between meat products such as beef and imitation meat products."[142] It would require the FDA to find any "imitation meat food product"[143] to be misbranded unless its label bears, in type of uniform size and prominence, the word "imitation" immediately before or after the name of the food and a statement that clearly indicates the product is not derived from or does not contain meat.[144] The bill would also define the term "beef" or "beef product" to mean "any product containing edible meat tissue harvested in whole form from domesticated Bos indicus or Bos taurus cattle."[145]

This bill addresses a problem that does not exist and is wholly unnecessary. As far as this author can tell, there are no FDA warning letters on record citing misleading labeling of plant-based products, no consumer protection lawsuits alleging the same, and no other evidence that there is any consumer confusion or misleading labeling practices associated with the use of "meat" terminology on plant-based products, apart from bare assertions from the conventional meat industry.[146]

---

141 Elaine Watson, *The Real MEAT Act 2019: Plant-Based Brands Should Use Term 'Imitation' Meat*, FOODNAVIGATOR-USA, https://www.foodnavigator-usa.com/Article/2019/10/29/The-Real-MEAT-Act-2019-Plant-based-brands-should-use-term-imitation-meat [https://perma.cc/HZ8Y-DTDQ] (Oct. 31, 2019, 12:28 AM).

142 Real Meat Act of 2019, H.R. 4881, 116th Cong. (2019).

143 "Imitation meat food product" is defined as "any product manufactured to appear as a meat food product or any food product which approximates the aesthetic qualities (primarily texture, flavor, and appearance) and/or chemical characteristics of specific types of meat but does not contain any meat, meat food product, or meat byproduct ingredients" (i.e., plant-based burgers, sausages, strips, etc.). *Id.* at 6.

144 *Id.* at 4–5.

145 *Id.* at 6.

146 For example, the label for the Beyond Meat Beyond Burger clearly states that it contains "Plant-Based Burger Patties" that contain "20G of Plant Protein per Serving." BEYOND MEAT, https://www.beyondmeat.com/products/the-beyond-burger/ [https://perma.cc/9ZN3-XPCC] (last visited Sept. 18, 2020). Thus, the consumer knows that this food is both plant-based and a burger. Likewise, Beyond Meat's Beefy Crumbles label clearly identifies the plant-based nature of the product by stating that it has "13G of Plant Protein per Serving" and contains "Plant-Based Protein Crumbles," while indicating the functional use of the crumbles, which are "Beefy" and are depicted in a tomato sauce over pasta. BEYOND MEAT, https://www.beyondmeat.com/products/beefy/ [https://perma.cc/C93X-ZET9] (last visited Sept. 18, 2020).

3. State Meat Labeling Laws

In 2018 and 2019, half of the U.S. states proposed bills to restrict use of "meat" on food labels.[147] The bills passed in twelve of those states.[148] Each of the bills is unique and is different in scope. For example, some cover cell-based meat only, and others cover plant-based meat. Missouri became the first state to enact a law prohibiting the labeling of products as "meat"[149] if not derived from "harvested production livestock or poultry."[150] The law limits the definition of "meat" to only the "edible portion of livestock or poultry carcass or part thereof."[151] Montana's House Bill 327 would define not only "meat" but also "hamburger" and "ground beef" as animal products.[152] "Hamburger" or "ground beef" means ground fresh or frozen beef or a combination of both fresh and frozen beef, with or without the addition of suet, to which no water, binders, or extenders are added. The term includes only products derived from the edible flesh of livestock or a livestock product, as meat is defined in section 81-9-217 of the bill.[153] Most recently, Wisconsin Senate Bill 464, introduced in September 2019, would prohibit the labeling or sale of a product labeled as "meat" unless that product comes from the flesh of a living animal or insect and does not include cell-cultivated meat products.[154]

---

147 H.R. 2604, 44th Leg., 1st Reg. Sess. (Ariz. 2019); H.R. 19-1102, 77th Gen. Assemb., 1st Reg. Sess. (Colo. 2019); S.B. 211, 2019 Leg., Reg. Sess. (Ga. 2019); H.R. 1425, 116th Leg., 2d Reg. Sess. (Haw. 2019); H.R. 2556, 101st Gen. Assemb., Reg. Sess. (Ill. 2019); H.R. 1414, 121st Gen. Assemb., 2d Sess. (Ind. 2020); S. 299, 2018 Leg., Reg. Sess. (Iowa 2018); H.R. 2437, 2020 Leg., Reg. Sess. (Kan. 2020); L.B. 594, 106th Leg., 1st Sess. (Neb. 2019); H.R. 222, 54th Leg., 1st Sess. (N.M. 2019); S. 304, 111th Gen. Assemb., Reg. Sess. (Tenn. 2019); H.R. 3799, 86th Leg., 1st Sess. (Tex. 2019); H. 233, 2019 Leg., Reg. Sess. (Vt. 2017); H.R. 2274, 2019 Reg. Sess. (Va. 2019); H.R. 1519, 66th Leg., Reg. Sess. (Wash. 2019); S. 464, 2019 Leg., Reg. Sess. (Wis. 2019).

148 H.R. 518, 2019 Leg., Reg. Sess. (Ala. 2019); H.R. 1407, 92d Gen. Assemb., Reg. Sess. (Ark. 2019); H.R. 311, 2019 Leg., Reg. Sess. (Ky. 2019); S. 152, 2019 Leg., Reg. Sess. (La. 2019); H.R. 311, 2019 Leg., Reg. Sess. (Miss. 2019); H.R. 327, 66th Leg., 1st Reg. Sess. (Mont. 2019); H.R. 1400, 2019 Leg., 1st Reg. Sess. (N.D. 2019); S. 392, 55th Leg., 1st Reg. Sess. (Okla. 2019); H.R. 4245, 123d Gen. Assemb., Reg. Sess. (S.C. 2019); S. 68, 2019 Leg., Reg. Sess. (S.D. 2019); S. 68, 65th Leg., 1st Gen. Sess. (Wyo. 2019).

149 Chase Purdy, *A Single State Wants to Define Meat for America*, QUARTZ (Aug. 28, 2018), https://qz.com/1372313/a-new-missouri-law-creates-a-definition-of-meat-for-america/ [https://perma.cc/WGM7-LVYV].

150 S. 627, 99th Gen. Assemb., 2d Reg. Sess. (Mo. 2018).

151 MO. REV. STAT. § 265.300 (2015).

152 H.R. 327, 66th Leg., 1st Reg Sess. (Mont. 2019).

153 *Id.*

154 S. 464, 2019 Leg., Reg. Sess. (Wis. 2019).

Mississippi's new law, Senate Bill 2922, stipulates that cell-based, plant-based, or insect-based foods cannot be labeled as "meat" or "a meat food product" (e.g., "hamburgers," "hot dogs," "sausages," "jerky," etc.).[155] Specifically, Senate Bill 2922 amended section 75-35-15(4) of the Mississippi Code to state, "A food product that contains cultured animal tissue produced from animal cell cultures outside of the organism from which it is derived shall not be labeled as meat or a meat food product. A plant-based or insect-based food product shall not be labeled as meat or a meat food-product."[156] Such products still run afoul of the law even if the labels include claims like "100% vegan," "plant-based," or "meatless."

The Arkansas Truth in Labeling Law (Act 501) prohibits companies from representing their foods as meat or meat products "when the agricultural product is not derived from harvested livestock, poultry, or cervids [deer]."[157] Act 501 further states that "'[m]eat' does not include a [s]ynthetic product derived from a plant, insect, or other source; or [p]roduct grown in a laboratory from animal cells."[158] Act 501's stated purpose is "to protect consumers from being misled or confused by false or misleading labeling of agricultural products that are edible by humans."[159] However, Act 501 does not include legislative findings that consumers have been or could be confused about the use of such terms on plant-based or cell-based meats that are not yet on the market.

Three of the food labeling laws have been challenged as unconstitutional by advocates and food producers. The GFI, the American Civil Liberties Union (ACLU), the Animal Legal Defense Fund (ALDF), and Tofurky brought a lawsuit in Missouri federal court, challenging the law on First Amendment grounds.[160] Although plaintiffs attempted negotiation with Missouri, at the time of writing, the parties reached an impasse, and litigation is now set to move

---

155 S. 2922, 2019 Leg., Reg. Sess. (Miss. 2019).

156 *Id.*

157 ARK. CODE ANN. § 2-1-305(6) (LEXIS through all legislation enacted and approved in 2020).

158 *Id.* § 2-1-302(7)(B). The law includes the following definitions: beef is the "flesh of a domesticated bovine, such as a steer or cow, that is edible by humans;" pork is the "flesh of a domesticated swine that is edible by humans;" and poultry includes "domestic birds that are edible by humans." *Id.* § 2-1-302(2), (12), (14).

159 *Id.* § 2-1-301.

160 Turtle Island Foods v. Richardson, No. 2:18-cv-04173, 2019 U.S. Dist. LEXIS 224840 (W.D. Mo. Sept. 30, 2019).

forward.[161] In October 2019, the district court judge in Missouri declined to issue a preliminary injunction to block a Missouri law that defines what food products may be labeled as "meat" from going into effect before the case is decided, finding that

> [t]he statute only prohibits companies from misleading consumers into believing that a product is meat from livestock when it is, in fact, plant-based or lab-grown. The Court agrees and finds that plaintiffs have shown no risk of irreparable harm because their labels truthfully disclose that their products are plant-based or lab-grown and the Missouri Department of Agriculture has advised that products with these types of statements on their labels do not misrepresent themselves.[162] Thus, plaintiffs have not shown that they are at any risk of either prosecution for violating the statute or that there is any need to change their labels or advocacy efforts.[163]

Plaintiffs the ACLU, the GFI, and Turtle Island Foods have appealed the decision.[164]

On the same day the Mississippi law went into effect, the Plant Based Foods Association, Institute for Justice, and plant-based food company Upton's Naturals filed a lawsuit challenging Senate Bill 2922,[165] which criminalizes the use of "meaty" terms to describe plant-

---

161 *See* Elaine Watson, *Litigation to Resume in Plant-Based 'Meat' Battle in Missouri as Settlement Talks Reach Impasse*, FOODNAVIGATOR-USA (July 5, 2019), https://www.foodnavigator-usa.com/Article/2019/07/05/Litigation-to-resume-in-plant-based-meat-battle-in-Missouri-as-settlement-talks-reach-impasse [https://perma.cc/9HS3-SX5H].

162 The Missouri Department of Agriculture issued a Memorandum on August 30, 2018, to provide guidance on how the Missouri Department of Agriculture will implement the labeling law. Memorandum from Jefferson City, Missouri, Dep't of Agric. to the Meat Inspection Program re: Missouri's meat advertising law (Aug. 30, 2018) (on file with the agency). The memo states that the Missouri Department of Agriculture

> will not refer products whose labels contain the following: Prominent statement on the front of the package, immediately before or immediately after the product name, that the product is "plant-based," "veggie," "lab-grown," "lab-created," or a comparable qualifier; and Prominent statement on the package that the product is "made from plants," "grown in a lab," or a comparable disclosure.

Id. at 2.

163 *Richardson*, 2019 U.S. Dist. LEXIS 224840, at *20–21.

164 Associated Press, *Judge Declines to Block Fake-Meat Law; Appeal Is Filed*, ABC NEWS (Oct. 4, 2019, 12:18 PM), https://abcnews.go.com/US/wireStory/judge-declines-block-fake-meat-law-appeal-filed-66066382 [https://perma.cc/YL2A-2X3L]; *Challenging Missouri's Meal Labeling Law*, ANIMAL LEGAL DEF. FUND, https://aldf.org/case/challenging-missouris-meat-law/#:~:text=In%202018%2C%20the%20Animal%20Legal,come%20from%20a%20slaughtered%20animal.&text=The%20law%20went%20into%20effect%20on%20Aug. [https://perma.cc/Y8E5-S7EF] (Sept. 26, 2019).

165 Complaint for Declaratory and Injunctive Relief, Upton's Naturals Co. v. Bryant, No. 3:19-cv-462-HTW-LRA (S.D. Miss. July 1, 2019).

based and cell-based meat.[166] The suit was brought against Mississippi's Governor and Commissioner of the Department of Agriculture and Commerce, arguing that the label restrictions violate their First Amendment right to free speech, among other claims. Upton's Natural and the Plant Based Foods Association are seeking a declaratory judgment that Senate Bill 2922 violates the First and Fourteenth Amendments to the U.S. Constitution, a preliminary injunction prohibiting enforcement of Senate Bill 2922 throughout the duration of the litigation, and a permanent injunction.[167] Following filing of the lawsuit, the Mississippi Department of Agriculture and Commerce issued draft regulations that provided a carve-out for plant-based foods.[168] The draft regulation provides that a plant-based food product will not be considered to be labeled as a "meat" or "meat food product" if one or more of the following terms, or a comparable qualifier, is prominently displayed on the front of the package: "meat free," "meatless," "plant-based," "veggie-based," "made from plants," "vegetarian," or "vegan."[169] Accordingly, any plant-based food product labeled with such a qualifier is not "labeled as meat" as to violate Mississippi law. Further, the draft regulations permit, but do not require, food establishments and retailers to separate plant-based food products from their meat-based food product offerings. Pursuant to the draft regulations, food establishments and retailers must ensure that any plant-based foods they offer comply with the qualifiers set out above and are not "false or misleading."[170] On November 7, 2019, the plaintiffs voluntarily dismissed their lawsuit after the regulation was finalized.[171]

---

166 S. 2922, 2019 Leg., Reg. Sess. (Miss. 2019).

167 *Id.*

168 Press Release, Andy Gipson, Comm'r, State of Miss. Dep't of Agric. & Com. (Sept. 6, 2019), http://www.mdac.ms.gov/press_releases/2019/2019_09_06.pdf [https://perma.cc/3MPD-CML6]. Mississippi's draft regulations *do not* apply to cell-based meat products. This suggests that labeling law will apply to those products and they will not be permitted to use "meat" terminology. *See* Food & Drug L. at Keller & Heckman, *Mississippi Reverses Stance on Plant-Based Meat Labeling*, NAT'L L. REV. (Sept. 10, 2019), https://www.natlawreview.com/article/mississippi-reverses-stance-plant-based-meat-labeling [https://perma.cc/8P9C-ZXMU].

169 Mississippi Proposed Rule, Labeling of Plant-Based Foods (proposed Sept. 2019), https://www.sos.ms.gov/adminsearch/ACProposed/00024402b.pdf [https://perma.cc/G3LY-BDVB].

170 *Id.*

171 Andrew Wimer, *Victory for Vegan Burgers: New Mississippi Labeling Regulations Will Not Punish Plant-Based Meat*, INST. FOR JUST. (Nov. 7, 2019), https://ij.org/press-release/victory-for-vegan-burgers-new-mississippi-labeling-regulations-will-not-punish

On July 23, 2019, two days before Senate Bill 2922 was to take effect, the GFI, the ACLU, the ALDF, and Tofurky brought a lawsuit to challenge Arkansas's law.[172] The plaintiffs allege that Act 501 violates Tofurky's and others' First Amendment right to make truthful and nonmisleading statements about the identity, quality, and characteristics of plant- and cell-based meat products.[173] They also argue that Act 501 is unconstitutionally vague in violation of the Fourteenth Amendment's Due Process Clause. In particular, plaintiffs allege that the bill is unclear as to whether the prohibition against use of "a term that is the same as or similar to a term that has been used or defined historically in reference to a specific agricultural product"[174] would apply to Tofurky's "deli slices" or plant-based "chick'n."[175] The final count alleges that Act 501 violates the Dormant Commerce Clause by improperly burdening interstate commerce.[176] To avoid violating Act 501, plant-based and cell-based meat producers must conform their products' nationwide labeling and marketing to comply with the Arkansas law or establish a separate labeling and marketing regime.[177] The complaint alleges that proponents of the law indicated that Act 501 was designed to provide federal regulation by making it difficult for companies to comply with different labeling laws.[178]

According to Tofurky CEO Jaime Athos, the labeling laws force plant-based producers, such as Tofurky, to keep their existing labels at "substantial risk of ruinous civil liability."[179] Each violation under the Arkansas, Missouri, and Mississippi laws would be punishable by a civil penalty up to $1,000. Moreover, the labeling laws force a plant-based producer to either incur significant costs to design and distribute different labels just for products sold in the states with the labeling restrictions (potentially confusing consumers), change its packaging nationwide, or stop selling its products in states with the restrictions,

---

-plant-based-meat/ [https://perma.cc/4VMV-GJCQ]; Stipulation of Dismissal, Upton's Naturals Co. v. Bryant, No. 3:19-CV-462-HTW-LRA (S.D. Miss. Nov. 7, 2019).

172 Complaint at 1, Turtle Island Foods, SPC v. Soman, 424 F. Supp. 3d 552, (E.D. Ark. 2019) (No. 4:19-cv-514-KGB) [hereinafter Soman Complaint].

173 *Id.* at 13.

174 ARK. CODE ANN. § 2-1-305(10) (2020).

175 Soman Complaint, *supra* note 172, at 14.

176 *Id.* at 15.

177 *Id.*

178 *Id.* at 7.

179 *Id.* at 12.

such as Arkansas or Missouri.[180] All of these options significantly disadvantage plant-based producers from competing with conventional meat companies, which was the sole intent of the laws.[181] The following section analyzes the purpose and constitutionality of these laws.

B. Analysis of Labeling Laws

The meat labeling laws are unnecessary to protect consumers and are very likely to be found unconstitutional in violation of the food producers' First Amendment commercial speech rights.[182] Labeling laws do not advance any legitimate government interest, given that there is no evidence of consumer confusion,[183] federal and state laws already prohibit false or misleading labels,[184] and plant-based producers distinguish their products with phrases such as "plant-based," "vegan," and "made with plants." The laws are more burdensome than necessary to prevent any consumer confusion[185] and are content-based and speaker-based regulations that prohibit truthful representation by competitors of the conventional meat industry.

---

[180] Elaine Watson, *Plant-Based 'Meat' Battle Heats Up in Arkansas as Tofurky Challenges 'Unconstitutional' Law*, FOODNAVIGATOR-USA (July 22, 2019), https://www.foodnavigator-usa.com/Article/2019/07/22/Plant-based-meat-battle-heats-up-in-Arkansas-as-Tofurky-et-al-challenge-unconstitutional-law [https://perma.cc/MLL4-4GPE]; Soman Complaint, *supra* note 172, at 12.

[181] *See, e.g.*, Suggestions in Support of Plaintiffs' Motion for Preliminary Injunction at Exhibits 3–4, Turtle Island Foods, SPC v. Richardson, 425 F. Supp. 3d 1131 (W.D. Mo. 2018) (No. 2:18-cv-4173 FJG). "[T]he legislative sponsors and supporters of the Statute acknowledged publicly—including on the floor of the Missouri House of Representatives—that their interest in enacting the Statute was to protect the animal agriculture industries from competition by plant-based meat producers." *Id.* at 13.

[182] Commercial speech and advocacy are both types of expression protected by the First Amendment. *See* Sorrell v. IMS Health Inc., 564 U.S. 552, 557 (2011); Cent. Hudson Gas & Elec. Corp. v. Pub. Serv. Comm'n of New York, 447 U.S. 557, 557 (1980).

[183] Ass'n of Nat'l Advertisers v. Lungren, 809 F. Supp. 747, 756 (N.D. Cal. 1992) ("If First Amendment scrutiny in the commercial speech arena is to have any bite at all, a legislative body cannot justify its restrictions on commercial speech simply by declaring that marketing claims are misleading.").

[184] *Cent. Hudson*, 447 U.S. at 564 (holding that regulation on commercial speech "may not be sustained if it provides only ineffective or remote support for the government's purpose").

[185] Restrictions on commercial speech must be "not more extensive than is necessary." *Id.* at 566. *See* Ocheesee Creamery LLC v. Putnam, 851 F.3d 1228, 1240 (11th Cir. 2017) (holding that the state of Florida violated the First Amendment when it told a creamery that it could not label its fat-free milk as "skim milk" without adding Vitamin A and finding that the state's restriction on the term "skim milk" was "clearly more extensive than necessary to serve its interest in preventing deception and ensuring adequate nutritional standards").

These laws do pose the question of why nomenclature is so important; the laws reflect a battle for the center of the plate. A Mintel 2018 consumer survey revealed that more than two-thirds (67%) of Americans agree that meat is essential to a balanced diet and just over one-half (51%) believe a meal is not complete without meat.[186] Rather than changing this perspective on the importance of "meat" to a meal, plant-based producers are attempting to shift consumers' perception of what "meat" is. At the same time, animal meat producers are seeking to lock in the idea of meat as derived from slaughtered animals.

Despite the labeling regulatory debate, "when consumers eat something that looks and tastes identical to meat, they're going to call it meat."[187] Similar to how the term "milk" is defined by regulation as lacteal secretion of a cow, consumers don't put "soy beverage" in their coffee and cereal—they use soy "milk."[188] This suggests that the fights over "meat" terminology will not hinder the continued growth of the plant-based meat sector that appeals to a variety of consumers for reasons such as taste, ethics, health, and environmental sustainability.[189] Consumers will recognize "meat," albeit from plants, as meat.

As the above sections discussed, there are several reasons why plant-based meat producers seek to use familiar "meat" terminology and, likewise, why animal-meat producers are fighting to restrict the use of such labeling terms. Yet, plant-based producers also want to convey that their versions of meat are different from, and superior to, animal-based meat. The following section discusses how plant-based meat producers will seek to distinguish their products using credence labeling claims.

---

186 *Taste Is the Top Reason US Consumers Eat Plant-Based Proteins*, MINTEL (Feb. 15, 2018), https://www.mintel.com/press-centre/food-and-drink/taste-is-the-top-reason-us-consumers-eat-plant-based-proteins [https://perma.cc/4FCT-R478].

187 Chris Taylor, *Will the Future Forget About Meat?*, MASHABLE, https://mashable.com/feature/dear-22nd-century-future-food-meat/?utm_cid=mash-com-fb-main-link#MS9vqCPqPuqr [https://perma.cc/A3FP-CUG5] (last visited Sept. 26, 2020).

188 *Id.*

189 Although health and environmental concerns may not be the primary motivators in food choice, they are nonetheless desirable product attributes for a large set of consumers, particularly those segments already reducing meat consumption or those who are open to eating plant-based meat. SZEJDA ET AL., *supra* note 55, at 63; *see, e.g.*, Gunne Grankvist et al., *The Impact of Environmental Labelling on Consumer Preferences: Negative vs. Positive Labels*, 27 J. CONSUMER POL'Y 213, 213–23 (2004); A.C. Hoek et al., *Healthy and Environmentally Sustainable Food Choices: Consumer Responses to Point-of-Purchase Actions*, 58 FOOD QUALITY & PREFERENCE 94, 94 (2017).

IV
CREDENCE CLAIMS: DISTINGUISHING PLANT FROM ANIMAL MEAT

While certain information is required to be on food labels, such as the common or usual name of the food product, its ingredients, nutrition facts panel,[190] and declaration of allergens, claims about the attributes of a food are voluntary and permitted so long as they are truthful and not misleading.

"Credence claims" are statements made by manufacturers, sellers, and marketers about their products that consumers cannot independently verify, such as "sustainability."[191] Although some claims may imply differences in composition, credence claims typically apply to production methods, rather than physical attributes of the product. Importantly, consumers are not able to test the property in the final product.

Unlike voluntary health and nutrient content claims such as "healthy,"[192] credence claims are not defined by regulation. Credence claims primarily indicate what is *not* in a product and are used for marketing, such as "clean" or "natural," and absence claims, such as "non-GMO." Communicating the benefits of alternative proteins may become a priority of alternative protein producers' marketing on and off package labels. Once consumers recognize the similarities between plant-based and meat-based products, then credence claims can play a role in persuading consumers to pay the price premium for alternative proteins.[193] Currently, plant-based meat achieves this similarity through the use of conventional terminology and product placement in the respective meat and dairy sections (as opposed to separate "vegan" or "natural foods" sections) in grocery stores. Studies consistently show that consumers are willing to pay a premium for food products with credence attributes that they find desirable, such as "natural,"

---

190 21 U.S.C. § 343(q); 21 C.F.R. § 101.9 (2020).

191 NEAL D. FORTIN, FOOD REGULATION: LAW, SCIENCE, POLICY, AND PRACTICE 107 (2d ed. 2017); *see* U.S. FOOD & DRUG ADMIN., GUIDANCE FOR INDUSTRY: FOOD LABELING GUIDE (2013).

192 *See* Nicole E. Negowetti, *A Planetary Health Approach to the Labeling of Plant-Based Meat*, J. FOOD & DRUG L. (forthcoming 2020) (recommending a broader definition of "healthy" to encompass both human and planetary health).

193 At the time of writing this Article, alternative proteins are more expensive than their animal-derived counterparts.

"humane," "non-GMO," and "organic."[194] Consumer studies also demonstrate the halo effect of "clean" and "natural" products—"naturalness" is often equated with healthfulness. In a consumer perception study, high levels of agreement were observed that "natural" foods are "healthier" (53%), "safer to eat" (47%), and "better for the environment" (45%), despite an absence of scientific support for such conclusions.[195] The following section discusses the regulatory oversight of these common credence claims.

A. Regulating Credence Claims

Regulation of credence claims often falls under the prohibitions against false or misleading claims by state and federal agencies. As previously discussed, the FDA prohibits the "misbranding" of food products, defined as the use of product labeling that is "false or misleading in any particular." The FTC, through § 5 of the Federal Trade Commission Act, is broadly empowered to take action to prevent "[u]nfair methods of competition in or affecting commerce, and unfair or deceptive acts or practices in or affecting commerce."[196] To determine whether a label on a product, or a term used in advertising a product, is deceptive, the FTC applies the "reasonable consumer standard," which questions what a "reasonable consumer" would believe the label to mean.[197] Applying this standard, the FTC regulates not only the express meaning of a given label or term used in advertising but also anything that the label or term would imply to a reasonable consumer.[198] In addition, because consumers often pay

---

194 Kent D. Messer et al., *Process Labeling of Food: Consumer Behavior, the Agricultural Sector, and Policy Recommendations*, COUNCIL FOR AGRIC. SCI. & TECH., Oct. 2015, at 8.

195 JAYSON L. LUSK, CONSUMER PERCEPTIONS OF HEALTHY AND NATURAL FOOD LABELS 30 (2019), https://static1.squarespace.com/static/502c267524aca01df475f9ec/t/5c4df49440ec9a53af435ab4/1548612761167/report_revised.pdf [https://perma.cc/6ESP-NRCG].

196 15 U.S.C. § 45(a)(1).

197 FED. TRADE COMM'N, FTC POLICY STATEMENT ON DECEPTION (1983), https://www.ftc.gov/system/files/documents/public_statements/410531/831014deceptionstmt.pdf [https://perma.cc/Z5YB-JVHV].

198 Jason Czarnezki et al., *Creating Order Amidst Food Eco-Label Chaos*, 25 DUKE ENV'T L. & POL'Y 281, 301 (2015). Puffery is excluded from the FTC's enforcement of unfair and deceptive practices. Puffery is defined as either "an exaggerated, blustering, and boasting statement upon which no reasonable buyer would be justified in relying" or "a general claim of superiority over comparable products that is so vague that it can be understood as nothing more than a mere expression of opinion." Pizza Hut, Inc. v. Papa John's Int'l, Inc., 227 F.3d 489, 497 (5th Cir. 2000).

premiums for plant-based products, competition and consumer protection lawsuits play an important role in policing deceptive claims. To avoid regulatory and litigation risks, food producers must be able to substantiate all possible interpretations of credence claims and utilize claims that are unambiguous and not misleading.

As the state labeling bills demonstrated, credence claims will likely be scrutinized closely because plant-based food producers intend to compete with animal-based products and seek to replace them. Competitors can make complaints about misleading or false claims to the FDA or FTC or file lawsuits under the Lanham Act's § 43(a).[199] The dispute between Unilever and plant-based food producer Hampton Creek (now Just) provides an example of these avenues.[200] The Lanham Act[201] provides an opportunity for competitors who have suffered injury or are imminently threatened with a concrete and particularized "injury in fact" that is fairly traceable to the challenged action of the defendant and likely to be redressed by a favorable judicial decision.[202] In *Pom Wonderful LLC v. Coca-Cola Co*., the Supreme Court held that compliance under the FDCA does not preclude a claim under the Lanham Act because the statutes are complementary, not in conflict.[203] The FDCA and its regulations do not provide a ceiling on Lanham Act claims. The Supreme Court held that "the Lanham Act protects commercial interests against unfair competition, while the FDCA protects public health and safety."[204] Although a claim against one meat producer by a competitor is likely to be preempted where the

---

[199] 15 U.S.C. § 1125(a)(1) prohibits

> false or misleading description of fact, or false or misleading representation of fact, which—(A) is likely to cause confusion, or to cause mistake, or to deceive as to the affiliation, connection, or association of such person with another person, or as to the origin, sponsorship, or approval of his or her goods, services, or commercial activities by another person, or (B) in commercial advertising or promotion, misrepresents the nature, characteristics, qualities, or geographic origin of his or her or another person's goods, services, or commercial activities.

Lanham Act claims can be brought by "any person who believes that he or she is or is likely to be damaged by such act." *Id.*

[200] Unilever (Hellman's) sued Hampton Creek because it does not have "egg-yolk containing ingredients." Complaint at 15, Conopco, Inc. v. Hampton Creek, Inc., No. 2:14-cv-06856 (D.N.J. dismissed Dec. 18, 2014).

[201] 15 U.S.C. § 1125(a).

[202] Lujan v. Defenders of Wildlife, 504 U.S. 555, 560 (1992).

[203] POM Wonderful LLC v. Coca-Cola Co., 573 U.S. 102, 106 (2014).

[204] *Id.* at 115.

USDA has preapproved a label,[205] claims could, in theory, be brought against a plant-based food producer.

States also have Unfair and Deceptive Acts and Practices statutes.[206] These statutes prohibit deceptive practices in consumer transactions and, in many states, also bar unfair or unconscionable business practices.[207] California's trio of consumer protection laws—the Unfair Competition Law,[208] False Advertising Law,[209] and Consumer Legal Remedies Act[210]—have been used together to combat meat industry advertising.[211] Similarly, the District of Columbia Consumer Protection Procedures Act[212] establishes a broadly available and liberally "enforceable right to truthful information from merchants about consumer goods and services" available for purchase or lease in the District.[213]

As discussed above, labeling laws and regulations require disclosure of certain nutrition and safety information, but food companies have discretion in disclosing food production methods, labor practices, the supply chain, and even the use of novel food ingredients that the company deems to be "generally recognized as safe" and therefore

---

205 Sanderson Farms, Inc. v. Tyson Foods, Inc., 549 F. Supp. 2d 708, 719 (D. Md. 2008) ("If Plaintiffs' Amended Complaint had alleged that the Defendant's labels were false and misleading under the Lanham Act, the claim would be precluded as an attempt by Plaintiffs to use the Lanham Act as a vehicle to challenge the USDA's primary jurisdiction under the PPIA to determine whether or not a label is false or misleading." (emphasis omitted)).

206 For examples of the use of false advertising law to prevent the false "humane" washing of meat and other animal products, see Carter Dillard, *False Advertising, Animals, and Ethical Consumption*, 10 ANIMAL L. 25 (2004).

207 NAT'L CONSUMER L. CTR., UNFAIR & DECEPTIVE ACTS & PRACTICES (9th ed. 2016).

208 CAL. BUS. & PROF. CODE §§ 17200–17210 (Deering, LEXIS through Aug. 30, 2020 legislation).

209 *Id.* §§ 17500–17509.

210 CAL. CIV. CODE §§ 1750–1784 (Deering, LEXIS through Aug. 30, 2020 legislation).

211 *See, e.g.*, People for the Ethical Treatment of Animals v. Whole Foods Mkt. Cal., Inc., No. 15-cv-04301 NC, 2016 WL 362229, at *1 (N.D. Cal. Jan. 29, 2016) (claiming violation of California law including, inter alia, the Unfair Competition Law, the False Advertising Law, and the Consumer Legal Remedies Act). Similar cases have been filed concerning poultry product advertising. *See* Organic Consumers Ass'n v. Sanderson Farms, Inc., 284 F. Supp. 3d 1005, 1009 (N.D. Cal. 2018) (filing claims under California's Unfair Competition Law and False Advertising Law); Direct Action Everywhere SF Bay Area v. Diestel Turkey Ranch, No. RG17847475 (Cal. Sup. Ct. filed Nov. 13, 2017); Leining v. Foster Poultry Farms, Inc., No. BC588004 (Cal. Sup. Ct. filed July 13, 2015).

212 D.C. CODE §§ 28-3901–3913 (2018).

213 *See id.* § 28-3901(c).

exempt from premarket approval by the FDA.[214] Though the law does not compel certain disclosures, increasingly, the market does. To communicate to consumers in a way that increases sales, food companies may select claims that are not necessarily aligned with consumer understanding or expectations of the term. Without enforcement or accreditation of a regulatory defined term, such as "organic," or an explanation from the food company of how it is using the term, companies can be open to consumer protection lawsuits, enforcement actions by the FDA or the USDA for misbranding, or loss of trust from consumers and market share. The following sections will explore credence claims controversies involving "naturalness," "environmental sustainability," and genetic engineering to illustrate the challenges for food companies, consumers, and agencies.

B. The Elusive "Natural" Definition

The term "natural" is not defined in the FDCA, and the FDA has expressly declined to define "natural" in any regulation or formal policy statement.[215] The FDA adopted an informal policy that "natural" means merely that "nothing artificial or synthetic (including colors regardless of source) is included in, or has been added to, the product that would not normally be expected to be there."[216] Consumers and consumer protection groups have demanded that the FDA provide clarity around the terms "natural" and "clean" to ensure high standards, consistency, and more transparency in food labeling.[217] As shown in a 2018 consumer survey by the Food Marketing Institute, the vast majority of shoppers (68%–78%) believe the government needs to have higher standards and more consistency associated with products claiming to be natural, healthy, organic, or clean label.[218]

---

214 *See* Martha Dragich, *GRAS-Fed Americans: Sick of Lax Regulation of Food Additives*, 49 IND. L. REV. 305 (2016).

215 *See* Nicole E. Negowetti, *A National "Natural" Standard for Food Labeling*, 65 ME. L. REV. 582, 585–86, 592 (2013) (explaining how the FDA has repeatedly refused to define the term).

216 Food Labeling: Nutrient Content Claims, General Principles, Petitions, and Definition of Terms, 58 Fed. Reg. 2302, 2407 (Jan. 6, 1993).

217 Charles F. Woodhouse, *Food Lawyers Face Challenges from 21st Century Logistics, FSMA, and the Clean Label Movement*, A.B.A. FOOD, COSMS. & NUTRACEUTICALS, Winter 2017, at 2 (quoting Lu Ann Williams, *Formulating Clean Label Products*, FOOD TECH. (Dec. 2016)).

218 FOOD MKTG. INST., THE TRANSPARENCY IMPERATIVE: PRODUCT LABELING FROM THE CONSUMER PERSPECTIVE 25 (2018).

Only about one in ten shoppers (11%–13%) believed that there is no need for the government to have higher standards or consistency associated with any of these product claims.[219] The need for clarity from the FDA is made evident by the lack of understanding about product claims.[220]

The FDA has repeatedly declined to regulate the term "natural" due to competing priorities and difficulties establishing a generally accepted definition.[221] However, since 1993, the agency has informally stated that "natural" foods are those that have "nothing artificial or synthetic (including all color additives regardless of source) . . . included in, or . . . added to" the product "that would not normally be expected to be [there]."[222] Because this definition is only "guidance," it does not carry the force and effect of law. Although the USDA Food Safety and Inspection Service also has an informal policy for "natural" claims, its Standards and Labeling Policy Memorandum 055 provides a more detailed definition for the term "natural" used in the labeling of meat and poultry products.[223] The USDA definition is more closely aligned with consumer expectations for the term "natural," as well as "clean label," because it not only prohibits artificial flavors or flavoring, coloring ingredients, chemical preservatives, and artificial or synthetic ingredients but it also requires that a "natural" product and its ingredients are not more than minimally processed.[224] Memorandum 005 also advises that all food products claiming to be "natural" should be accompanied by a brief explanation of the advertiser's intent in claiming that the food is natural (e.g., "This product is natural because it contains no artificial ingredients and is only minimally processed").[225]

---

219 *Id.*

220 CONSUMER REPS., https://www.consumerreports.org/food-labels/seals-and-claims [https://perma.cc/W4AM-QWU6] (last visited Sept. 27, 2020).

221 *See* Negowetti, *supra* note 215, at 585–86, 592.

222 Food Labeling: Nutrient Content Claims, General Principles, Petitions, and Definition of Terms, 58 Fed. Reg. 2302, 2407 (Jan. 6, 1993).

223 U.S. DEP'T OF AGRIC., FOOD SAFETY & INSPECTION SERV., FOOD STANDARDS AND LABELING POLICY BOOK 109–10 (2005), https://www.fsis.usda.gov/wps/wcm/connect/7c48be3e-e516-4ccf-a2d5-b95a128f04ae/Labeling-Policy-Book.pdf?MOD=AJPERES [https://perma.cc/ZXW5-72RD].

224 *Id.* Minimal processing may include (1) traditional processes used to make food edible, to preserve it, or to make it safe for human consumption (e.g., smoking, roasting, freezing, drying, fermenting) or (2) physical processes that do not fundamentally alter the raw product or that only separate a whole, intact food into component parts (e.g., grinding meat, separating eggs into albumen and yolk, pressing fruits to produce juices). *Id.*

225 *Id.* at 110.

The opposition to "processed" foods is related to the growing demand and health halo of "natural" claims. In contrast to "natural," which consumers equate to "healthy," are processed foods. In a 2018 consumer survey by the Food Marketing Institute, a study revealed that most shoppers do not have a complete understanding of claims made on food products. When asked how well they understand claims such as natural, healthy, or clean label, less than one-half of shoppers say they completely understand or know what is meant by these claims.[226] Only 37% of respondents understand what is meant by claims that a product is "natural," and only 18% of respondents completely understand what is meant by a claim that a product has a "clean label."[227] More than one-half of shoppers (51%) fail to understand what is meant by clean label.[228] Despite the lack of understanding, consumers demand natural and clean food products.[229]

The FDA received growing pressure to define "natural." The FDA received repeated calls from consumer advocates, food companies, Congress,[230] and courts[231] seeking a definition of "natural." Finally, in November 2015, the FDA "announc[ed] the establishment of a docket to receive information and comments on the use of the term 'natural' in the labeling of human food products, including foods that are genetically engineered or contain ingredients produced through the use of genetic engineering."[232] The agency received 7,600 public

---

226 FOOD MKTG. INST., *supra* note 218, at 24.

227 *Id.*

228 *Id.*

229 INT'L FOOD INFO. COUNCIL, CLEAN LABEL VALUES AMONG MILLENNIALS AND GENERATION Z (2018), https://foodinsight.org/wp-content/uploads/2018/10/High-Res-Images_IFIC-Clean-Label-Report_rev918_1018.pdf [https://perma.cc/W8NY-W3ZT].

230 Congress has signaled its expectation for the FDA to make headway in promulgating a uniform standard on "natural." In a July 2017 report accompanying the 2018 Agriculture legislation, the FDA was ordered by Congress to provide a report "within 60 days of enactment of this Act on the actions and timeframe for defining 'natural' so that there is a uniform national standard for the labeling claims and consumers and food producers have certainty about the meaning of the term." *In re* Kind LLC "Healthy and All Natural" Litig., 287 F. Supp. 3d 457, 469 (S.D.N.Y. 2018) (emphasis omitted) (citing H.R. REP. NO. 115-232, at 72 (2017)).

231 Nicole E. Negowetti, *Defining* Natural *Foods: The Search for a* Natural *Law*, 26 REGENT U. L. REV. 329, 340–43 (2014).

232 Use of the Term "Natural" in the Labeling of Human Food Products; Request for Information and Comments, 80 Fed. Reg. 69,905, 69,905 (proposed Nov. 12, 2015) (to be codified at 21 C.F.R. pt. 101).

comments about whether and how to officially define the term.[233] In 2018, former FDA Commissioner Scott Gottlieb announced that the FDA planned to address the "natural" definition "very soon."[234] The FDA Director of the Center for Food Safety and Nutrition, Susan Mayne, announced in September 2019 that the agency is working diligently to define "natural."[235] Because of documented consumer confusion over the term's meaning and lack of preemptive effect of the FDA's informal policy,[236] consumer protection litigation has focused on the misleading use of "natural" claims for over the past decade.[237] Despite the lack of definition, consumer demand for "natural" food, or the food industry's use of the term, does not indicate signs of abating.[238]

Although each plant-based meat product is unique in its ingredients and processing, neither the Beyond Burger nor the Impossible Burger fits into existing FDA policy regarding "natural" as "nothing artificial or synthetic (including color additives regardless of source) has been included in, or has been added to, a food that would not normally be expected to be in the food."[239] Both products use different

---

233 *Use of the Term Natural on Food Labeling*, U.S. FOOD & DRUG ADMIN., https://www.fda.gov/food/food-labeling-nutrition/use-term-natural-food-labeling [https://perma.cc/X475-34MP] (Oct. 22, 2018); *Use of the Term "Natural" in the Labeling of Human Food Products*, U.S. FOOD & DRUG ADMIN., https://beta.regulations.gov/docket/FDA-2014-N-1207 [https://perma.cc/9YLF-3EFV] (last visited Oct. 27, 2020).

234 Sam Bloch, *FDA Commissioner Scott Gottlieb Wants to Define "Healthy" and "Natural,"* COUNTER (Mar. 29, 2018, 5:49 PM), https://thecounter.org/fda-scott-gottlieb-natural-clean-labels-national-food-policy-conference/ [https://perma.cc/PL6R-PZT6].

235 Susan T. Mayne, Dir., Ctr. for Food Safety & Applied Nutrition, Remarks at the Public Meeting on Horizontal Approaches to Food Standards of Identity Modernization (Sept. 27, 2019).

236 "With only an informal policy statement on which to rely for the definition for 'natural,' the FDA has taken little action against companies for improperly using the term, and instead appears to favor issuing warning letters." Gabriele v. ConAgra Foods, Inc., No. 5:14-CV-05183, 2015 WL 3904386, at *5 (W.D. Ark. June 25, 2015). FDA-issued warning letters "are advisory and do not signal final agency action." *Id.* Thus, "there are no federal requirements regarding the term 'natural' to be given preemptive effect." *Id. See also* Grocery Mfrs. Ass'n v. Sorrell, 102 F. Supp. 3d 583 (D. Vt. 2015).

237 *See* Nicole E. Negowetti, *Food Labeling Litigation: Exposing Gaps in the FDA's Resources and Regulatory Authority*, BROOKINGS INST. (June 2014), https://www.brookings.edu/wp-content/uploads/2016/06/Negowetti_Food-Labeling-Litigation.pdf [https://perma.cc/L99J-64DV].

238 *See* Emily M. Moscato & Jane E. Machin, *Mother Natural: Motivations and Associations for Consuming Natural Foods*, 121 APPETITE 18, 18 (2018) ("Despite awareness that the label natural may be little more than a marketing gimmick, the preference for natural foods persists.").

239 Food Labeling: Nutrient Content Claims, General Principles, Petitions, and Definition of Terms, 58 Fed. Reg. 2302, 2407 (Jan. 6, 1993).

ingredients—Beyond uses beet juice and Impossible uses heme—to give its burgers a "bloody" color. However, as the following section explains, some plant-based meats have positioned and will likely continue to position themselves as "natural" foods, which has sparked controversy among various interest groups. Until the FDA clarifies the definition, plant-based meat producers must confront the expectations of consumers, plaintiffs' attorneys, consumer protection organizations, and the so-called natural food industry in deciding whether to use the term on labels or in marketing.

1. The "Natural" Meat Controversy

Plant-based meat companies are ultimately making processed foods, as previously discussed, but there have been controversies as a result of marketing that is more in line with natural, organic offerings.[240] Jack Bobo, food technology expert and industry consultant, explained that when the companies tried to position themselves as being in the organic, gluten-free, natural product space, they failed to consider that they would receive pushback from groups opposed to genetically modified and processed foods.[241] "As Bobo explains, how people use language around their products matter, especially when consumers are shopping and eating in an environment in which there's suspicion[, even if scientifically unwarranted,] around genetically modified ingredients and the health impacts of processed foods."[242] As predicted, positioning plant-based meat companies as "natural" and "clean" products has brought the companies under scrutiny.

When Impossible Foods was prominently featured at the Natural Products Expo West in 2019, serving their burger to attendees at the world's largest natural food trade show without mention that their product contained bioengineered ingredients, there was considerable backlash.[243] For Dana Pearls of the advocacy organization Friends of

---

240 Chase Purdy, *Plant-Based Meats Sound Healthy, but They're Still Processed Foods*, QUARTZ (July 1, 2019), https://qz.com/1655309/beyond-meat-needs-to-communicate-how-it-makes-its-plant-based-burger/ [https://perma.cc/JUL5-6CYJ].

241 *Id.*

242 *Id.*

243 Ken Roseboro, *Promotion of GMO-Derived Impossible Burger at World's Largest Natural Food Trade Show Denounced as Deceptive*, ECOWATCH (Apr. 4, 2019, 1:06 PM), https://www.ecowatch.com/impossible-burger-gmo-derived-2633695810.html?rebelltitem=3#rebelltitem3 [https://perma.cc/J933-SVAG]. "Jim Thomas, co-executive director of ETC Group, which tracks new genetic engineering technologies, said Impossible Foods exhibiting at Natural Products Expo West was 'like inviting in an arms manufacturer to

the Earth, the exhibition raised issues of "deceptive marketing" because consumers "believe 'natural' means that no artificial ingredients or genetically engineered ingredients were used."[244] Frank Lampe, vice president of communications and industry relations for the United Natural Products Alliance, expressed "disappointment" over Impossible Foods' use of "a 'natural products' show to promote its certainly not-natural product."[245] He further commented, that "[t]he halo effect of being perceived as natural by its presence at the show . . . is a disingenuous move by Impossible Foods."[246]

The controversy around Impossible Foods was primarily due to its use of genetic engineering to produce soy leghemoglobin (heme), a "magic" ingredient that gives meat its flavor and color.[247] Critics claimed that the Impossible Burger was masquerading as a "natural" food and questioned the ability of third-party certifiers to develop criteria for the certification and evaluation of novel products and ingredients. [248] Lampe called for an assessment of synbio ingredients and products already in the marketplace in foods and dietary supplements but highlighted the challenges of doing so given the rapidly changing marketplace, coupled with a lack of mandated federal labeling or testing protocols for the new classes of genetically engineered products. [249] In addition, Alan Lewis, director of government affairs and food and agriculture policy for Natural Grocers, called on the natural food community "to take a strong stand against new GMO products like the Impossible Burger," saying that heme "qualifies for scrutiny" because "[n]ovel molecules and unknown ingredients have never been embraced in natural food." [250]

---

exhibit at a peace convention.'" *Id. See* ROWE, *supra* note 27, at 33 ("The standoff between some environmentalists and plant-based and cellular agriculturalists is, to this author, another iteration of the longstanding debates over what is or is not 'unnatural.' Its echoes and fears exist in words like 'fake' and 'petri-tarian'—as if the animal whose meat we eat or milk or eggs we take is not herself a product of scientific investigation in labs and genetic manipulation, or is not regularly artificially inseminated, mutilated, fistulated, hooked up to milking machines, trucked to slaughter, or subject to a host of other mechanized, technologized, and automated systems.").

244 Roseboro, *supra* note 243.

245 *Id.*

246 *Id.*

247 *Heme + the Science Behind Impossible*, IMPOSSIBLE FOODS, https://impossiblefoods.com/heme/ [https://perma.cc/MP4U-R7G4] (last visited Sept. 27, 2020).

248 Roseboro, *supra* note 243.

249 *Id.*

250 *Id.*

Some "natural" diet and public health advocates have argued against what they see as an unnecessary technologization of plant foods. At the 2018 Good Food Institute Conference, Dr. Dean Ornish, president and founder of the nonprofit Preventive Medicine Research Institute, objected to Impossible Foods employing genetically modified soy leghemoglobin to deliver heme to its burger.[251] Ornish stated that although he understood that the overall health outcomes for consumers eating plant-based burgers might be better than if they ate the animal-based versions, he and Dr. Hu, professor at Harvard T.H. Chan School of Public Health,[252] have raised concern about studies showing that heme may increase the risk of cancer[253] and type 2 diabetes and may also be an allergen.[254] At a sustainable foods conference in January 2018, Impossible was criticized for rushing its product to market before a full safety test on the Impossible Burger was carried out.[255] In July of that year, the FDA, after raising initial concerns about heme,[256] indicated to Impossible that it considered heme "generally recognized as safe" and approved a color additive petition in July 2019.[257]

Some food tech companies are walking the line between "natural" and "innovative," thus appealing to consumers' desire for familiarity

---

251 The Good Food Inst., *From Field to Fork: The Science and Nutrition Behind Plant-Based Meat*, YOUTUBE, at 20:12–21:07 (Oct. 11, 2018), https://www.youtube.com/watch?v=X_vviu0391E&feature=emb_title [https://perma.cc/6GLH-L9CV].

252 Frank B. Hu et al., *Can Plant-Based Meat Alternatives Be Part of a Healthy and Sustainable Diet?*, 322 JAMA 1547, 1547 (2019).

253 Mary H. Ward et al., *Heme Iron from Meat and Risk of Adenocarcinoma of the Esophagus and Stomach*, 31 EUR. J. CANCER PREVENTION 134, 134 (2012).

254 Maxwell Arnold, *How the 'Impossible Burger' Revealed Some Disturbing FDA Practices*, FORBES (Aug. 31, 2017, 1:59 PM), https://www.forbes.com/sites/quora/2017/08/31/how-the-impossible-burger-revealed-some-disturbing-fda-practices/#e4c07a66aa9a [https://perma.cc/JVR7-XACA].

255 Ken Roseboro, *Impossible Burger Exec Grilled at Sustainable Foods Summit*, ORGANIC & NON-GMO REP. (Mar. 6, 2018), https://non-gmoreport.com/articles/impossible-burger-rep-grilled-sustainable-foods-summit/ [https://perma.cc/D9CF-6B9J]. Beyond Meat faced its share of controversy as well. In June 2019 a consumer interest group issued concerns around one of the ingredients in Beyond Meat's production process. "Beyond Meat has explained that the consumer group [was] wrong about its use of a chemical called hexane. 'The pea protein we use is extracted using a water-based process,' said Kelli Wilson of Beyond Meat in a statement." Purdy, *supra* note 240. "There are no other solvents and that process at no time involves the use of or exposure to hexane in any way." *Id.*

256 Stephanie Strom, *Impossible Burger's 'Secret Sauce' Highlights Challenges of Food Tech*, N.Y. TIMES (Aug. 8, 2017), https://www.nytimes.com/2017/08/08/business/impossible-burger-food-meat.html [https://perma.cc/7LKU-CYK4].

257 Listing of Color Additives Exempt from Certification; Soy Leghemoglobin, 84 Fed. Reg. 37,573, 37,574 (Aug. 1, 2019) (to be codified at 21 C.F.R. pt. 73).

but also touting the benefits made possible through novel technologies. For example, Perfect Day explains that its protein is made using safe and proven fermentation techniques similar to how many common food components like vitamins, probiotics, enzymes, and natural flavors are made, yet the company also describes how biotechnology is used to alter yeast to produce dairy proteins.[258] In popular discussions, these ideas of naturalness and biotechnology are often incompatible. Given the controversy over "ultra-processed" food, well-supported recommendations to avoid them, and genuine concern with public health, the next wave of plant-based meats will endeavor to develop products that are healthier and "natural," while closely mimicking the taste, texture, and appearance of conventional meat. Development is already underway. For example, Nature's Fynd (formerly known as Sustainable Bioproducts)[259] is creating a whole food source of protein described as "natural, that's leveraging nature's own technology and that enables us to come back to something that's very real."[260] The company claims its products are completely animal-free, high in protein, non-GMO, and use only natural ingredients.[261] How such a product will be described and labeled ("fungal-based" or "flora-based," rather than "plant-based"), and whether they can be considered "natural" by consumers (and their attorneys) are key questions for the plant-based companies to consider.[262]

2. Public Perceptions of Processing and the "Natural" and "Healthy" Debates

Although the FDA's "natural" definition does not address the level of processing that would render a food "unnatural," plant-based meats have been scrutinized for their degree of "processing." The popular

---

258 *Got a Question?*, PERFECT DAY, https://www.perfectdayfoods.com/faq/#gmos [https://perma.cc/F7NW-84DX] (last visited Sept. 27, 2020); *see also*, *Our Products Deliver OMGs Not GMOs*, BEYOND MEAT (July 23, 2018), https://www.beyondmeat.com/whats-new/our-products-deliver-omgs-not-gmos/ [https://perma.cc/JD83-5A5P].

259 NATURE'S FYND, https://www.naturesfynd.com/ [https://perma.cc/78KU-NECR].

260 Megan Poinski, *Inside Sustainable Bioproducts' Plan to Feed the World with a Discovery in a Volcano*, FOODDIVE (Oct. 10, 2019), https://www.fooddive.com/news/inside-sustainable-bioproducts-plan-to-feed-the-world-with-a-discovery-in/563010/ [https://perma.cc/3C6H-4F62].

261 *Id.*

262 Elaine Watson, *Sustainable Bioproducts Gears Up for 2020 Launch of Consumer Brand Built Around New-to-the-World Protein Source*, FOODNAVIGATOR-USA, https://www.foodnavigator-usa.com/Article/2019/09/11/Sustainable-Bioproducts-gears-up-for-2020-launch-of-consumer-brand-built-around-new-to-the-world-protein-source [https://perma.cc/4BU9-UE67] (Nov. 21, 2019, 7:58 PM).

debate regarding the healthfulness of plant-based proteins meant to mimic meat (in contrast to tofu, tempeh, seitan, and other less high-tech plant-based proteins), the issue of "processing" dominates the discussion. The long list of ingredients in Beyond Burger and Impossible Burger is frequently cited as proof that the products are not healthy.[263] Debates about these "processed" foods have created confusion about the various attributes of these products. On one hand, plant-based meats are benefiting from the halo of plant-based foods as nutritionally, environmentally, and ethically superior. A recent consumer survey showed that "[w]hile taste tops the list of reasons to eat plant-based proteins, perceived health benefits are on consumers' minds, as nearly half (46 percent) of Americans agree that plant-based proteins are 'better for you' than animal-based options, and three-quarters (76 percent) say plant-based foods are healthy."[264] However, the counter-narrative is that these products are no better than other unhealthy, processed foods and less beneficial than humanely raised meat.[265]

As discussed above, the new generation of plant-based burgers, in contrast to tofu, seitan, etc., are intended to be familiar to meat-eating consumers, and thus, closely mimic animal-based meat. Processing is the hallmark of plant-based meats, and techniques will continue to become more sophisticated to more closely mimic conventional animal products. For example, the Food Process Engineering Laboratory at Wageningen University in the Netherlands is collaborating with the company Vegetarian Butcher to transform plants into muscle-like structures and textures using a Couette cell device. The Couette cell device

> consists of two concentric cylinders, one of which rotates around the other while the ingredients are sandwiched in between. By exerting force on the proteins in the mixture, the ingredients lengthen into fibres and wind around one another. The result is a gelatinous red

263 Kelsey Piper, *Meatless Meat Is Becoming Mainstream — and It's Sparking a Backlash*, VOX (Oct. 7, 2019, 7:50 AM), https://www.vox.com/future-perfect/2019/10/7/20880318/meatless-meat-mainstream-backlash-impossible-burger [https://perma.cc/2ZWY-PNLL].

264 *Taste Is the Top Reason US Consumers Eat Plant-Based Proteins*, *supra* note 186.

265 *See* Negowetti, *supra* note 192.

> slab of plant meat that contains long, thick, elastic muscle-like fibres which look and flake apart like pulled pork or beef.[266]

When a plant-based slab of meat is grilled, it sizzles, browns, and smells like an animal-based steak.[267] The innovative processing is what confers benefits to the products and their consumers. In light of emerging public health studies, plant-based meat companies should endeavor to continue to improve the nutritional profiles of their products and aim to source and use healthier and more environmentally sustainable ingredients.[268]

C. GMO, GE, and BE: Making Sense of Genetic Engineering to Create Plant-Based Meat

Plant-based meat producers will continue to grapple with how to communicate the processes which are being used to create their foods. While the strategy of creating plant-based meat that mimics animal-based versions may be beneficial to obtain food consumers' attention and acceptability, unclear communication about "meat-like" products can lead to criticism that the public is being misled or that food enterprises are "messing unnaturally" with original products.[269] A fundamental issue in the debate regarding the merits and problems with "processing" is the use of genetic engineering. A challenge for plant-based protein companies is communicating transparently about the processes being used to create their products, namely the use of biotechnology. Transparency is essential to earning consumer trust and acceptance because adherence only to labeling laws and regulations will likely be insufficient to achieve transparency.

Unfortunately, the Bioengineered (BE) Food Disclosure Standard is a missed opportunity to provide clarification of the many issues that

---

266 *Plant-Based Meat Could Create a Radically Different Food Chain*, ECONOMIST (Oct. 12, 2019), https://www.economist.com/international/2019/10/12/plant-based-meat-could-create-a-radically-different-food-chain [https://perma.cc/HT87-2J66].

267 *Id.*

268 This, in fact, is a goal of many plant-based meat producers and efforts have been made to reduce sodium. The Impossible Burger 2.0, launched in 2019, reduced the amount of salt and saturated fat in its burger.

> We aimed to improve the nutritional profile and did exactly that, delivering a new product with fewer calories, lower total fat, lower saturated fat and lower sodium. We swapped the wheat protein for soy protein—higher quality protein by PDCAAS (Protein Digestibility-Corrected Amino Acid Score) standards—and reduced the amount of coconut oil while adding sunflower oil.

Lipman, *supra* note 112.

269 De Bakker & Dagevos, *supra* note 79, at 883.

will emerge in the labeling of novel plant-based meat. This Section provides an overview of the BE Food Disclosure Standard and highlights labeling issues for plant-based meat companies in communicating the use of novel technologies. Specifically, this section addresses whether BE labeling is required, whether non-GMO labeling is permissible, and in light of the significant confusion that exists in the wake of the National BE Food Disclosure Standard, makes recommendations to ensure transparency about these novel products.

1. National BE Food Disclosure Standard Overview

Under the Food, Drug, and Cosmetic Act (FDCA), the FDA's long-standing position has been that whether a food is produced using genetic engineering is not a fact that must appear on a food's label. Indeed, a statement containing such information on a label could be false or misleading, and thus illegal, "if, when considered in the context of the entire label or labeling," the statement suggests "that a food product or ingredient is safer, more nutritious, or otherwise has different attributes than other comparable foods because the food was not genetically engineered."[270]

In 2014, Vermont passed a law that departed from the FDA's long-held presumption.[271] Vermont's new law required special labeling on the packages of many genetically engineered or genetically engineered-derived foods offered for sale in the state after July 1, 2016. Trade groups sued Vermont, asserting First Amendment, Dormant Commerce Clause, and preemption arguments. The federal district court denied their motion for a preliminary injunction, concluding that the law's core mandatory disclosure requirement was likely consistent with the First Amendment.[272] The plaintiffs appealed to the Second Circuit, which heard argument but never decided the appeal because in July 2016 President Obama signed the bipartisan National Bioengineered Food Disclosure Standard (the Standard). The Standard preempted the Vermont law, prompting the plaintiffs in the Vermont

---

270 U.S. FOOD & DRUG ADMIN., VOLUNTARY LABELING INDICATING WHETHER FOODS HAVE OR HAVE NOT BEEN DERIVED FROM GENETICALLY ENGINEERED PLANTS: GUIDANCE FOR INDUSTRY (2019).

271 VT. STAT. ANN. tit. 9, § 3043 (2014).

272 Grocery Mfrs. Ass'n v. Sorrell, 102 F. Supp. 3d 583, 635–36 (D. Vt. 2015). The court concluded that the law was likely unconstitutional insofar as it prohibited the use of "natural" and similar terms to refer to GE food products but found no likelihood of irreparable harm as to those issues. *Id.* at 636, 641–42, 645–48.

litigation to dismiss their appeal and the underlying suit.[273] Because the Standard is a marketing, not food safety, law, it is directed to the USDA, not to the FDA. The Standard amends the Agricultural Marketing Act of 1946, not the FDCA, and does not alter the FDA's preexisting authority over food safety.[274] The law required the USDA to issue a final rule,[275] which it did in December 2018, to create and implement a mandatory disclosure standard for food intended for human consumption that is or may be bioengineered.[276] The USDA's Agricultural Marketing Service, which also administers the National Organic Program, is responsible for implementing the new law.[277]

Although a comprehensive analysis is beyond the scope of this Article, there are several aspects of the Standard that are particularly relevant to the labeling of plant-based meats. The law defines the term "bioengineering" as referring to a food "(A) that contains genetic material that has been modified through in vitro recombinant deoxyribonucleic acid (DNA) techniques; and (B) for which the modification could not otherwise be obtained through conventional breeding or found in nature."[278] This definition is narrower than "genetic engineering" and is subject to various exclusions. Some exclusions include food served in restaurants or similar establishments; food derived from animals that consumed bioengineered feed; and certain foods containing USDA-regulated meat, poultry, and egg products.[279] USDA-certified organic food is also exempt.[280] The law requires the USDA to allow food manufacturers three options for disclosure on food packages: text, symbols, or an electronic or digital link (e.g., a QR code).[281] On-package labeling is thus allowed but not required. The disclosure law contains two preemption provisions, plus a savings clause. The first provision preempts disclosure or labeling requirements that are not identical to the national standard.[282] The

273 National Bioengineered Food Disclosure Standard, Pub. L. No. 114-216, § 1, 130 Stat. 834 (2016) (codified as amended at 7 U.S.C. §§ 1639–1639c, 1639i–1639j, 6524).

274 7 U.S.C. § 1639c(b)(1).

275 *Id.* §§ 1639b(a)(1)–(2).

276 National Bioengineered Food Disclosure Standard, 83 Fed. Reg. 65,814 (Dec. 21, 2018) (to be codified at 7 C.F.R. pt. 66).

277 *See BE Disclosure*, AGRIC. MKTG. SERV., U.S. DEP'T AGRIC., https://www.ams.usda.gov/rules-regulations/gmo [https://perma.cc/SY6X-57XP] (last visited Sept. 27, 2020).

278 7 U.S.C. § 1639(1).

279 *Id.* §§ 1639a(c)(2), 1639b(b)(2)(A), (b)(2)(G)(i).

280 *Id.* § 6524.

281 *Id.* § 1639b(b)(2)(D), (d).

282 *Id.* § 1639b(e).

second provision preempts "any requirement relating to the labeling of whether a food . . . or seed is genetically engineered (which shall include such other similar terms as determined by the [USDA]) or was developed or produced using genetic engineering."[283] The savings clause preserves "any remedy created by a State or Federal statutory or common law right" against preemption.[284]

2. Misleading Non-GMO Claims

The BE Food Standard did not address non-GMO claims. This omission was a missed opportunity to address claims that have a high potential to mislead and confuse consumers by giving the impression that GMO products are unsafe, that non-GMO products are somehow "better," or even that a genetically modified version of the food is possible or available.[285] Greg Jaffe, the Biotechnology Director of the Center for Science in the Public Interest, has written about misleading statements made by the Non-GMO Project,[286] such as "there is no consensus on the safety of GMOs,"[287] and urged that the Non-GMO Project not become "the default national marketplace standard for non-GMO product verification."[288] However, with the omission of Congress, the Agricultural Marketing Service, and the FDA to address non-GMO claims, this has effectively happened, and the non-GMO

---

283 *Id.* § 1639i(b).

284 *Id.* § 1639j.

285 *See* Greg Jaffe, *Biotech Blog—Shopping for Honesty: Sorting Out Non-GMO Claims*, CTR. FOR SCI. PUB. INT. (Apr. 17, 2017), https://cspinet.org/news/biotech-blog%E2%80%94shopping-honesty-sorting-out-non-gmo-claims-20170417 [https://perma.cc/CF74-9EJF].

286 *Non-GMO Project Standard*, NON-GMO PROJECT (July 26, 2019), https://www.nongmoproject.org/wp-content/uploads/Non-GMO-Project-Standard-Version-15.pdf [https://perma.cc/UBW4-R2BP].

287 As evidence of this statement's falsity, Jaffe points to The National Academy of Sciences 2016 report, *Genetically Engineered Crops: Experiences and Prospects*, which examined all the evidence regarding potential negative effects and benefits of currently commercialized genetically engineered crops and the potential benefits and negative effects of future GE crops. Jaffe, *supra* note 285. The report concluded that "no differences have been found that implicate a higher risk to human health and safety from these GE foods than from their non-GE counterparts." *Id.* "That same conclusion has been reached by other respected scientific and regulatory bodies, including the European Commission (https://europa.eu/rapid/press-release_MEMO-15-4778_en.htm), the World Health Organization (https://www.who.int/foodsafety/areas_work/food-technology/faq-genetically-modified-food/en/), and the U.S. Food and Drug Administration (https://www.fda.gov/food/food-new-plant-varieties/consumer-info-about-food-genetically-engineered-plants)." *Id.*

288 *Id.*

seal can be viewed on products including cookies,[289] kitty litter,[290] and salt.[291]

In addition to the ubiquitous butterfly seal, there is a proliferation of self-certifying companies that use their own symbols and often unknown verification standards.[292] For example, King Arthur Flour products have two different claims: its 100% whole wheat flour claims to be "non-GMO," while its unbleached self-rising flour states that it was "sourced Non-GMO."[293] Even water is labeled non-GMO.[294] Tropicana orange juice includes the "Non-GMO Project" seal on its package,[295] yet its sole ingredient is oranges, and there are no commercially grown, genetically engineered oranges. Every brand of orange juice is naturally "non-GMO," provided the only ingredient is oranges. The same is true of nut butters that have "Non-GMO Product" seals even though their only ingredient is almonds or peanuts, and there are no genetically modified varieties of those nuts. With such a lax regulatory environment, companies can market their food products as "non-GMO" and charge a premium price for nonexistent distinctions that give them a competitive advantage. To combat misleading non-GMO claims, the Information Technology and Innovation Foundation submitted a citizen petition to the FDA in September 2018 asking the agency to issue a regulation prohibiting use of the term "non-GMO" on

---

289 *Verified Products*, NON-GMO PROJECT, https://www.nongmoproject.org/find-non-gmo/verified-products/# [https://perma.cc/P8ND-SZ4N] (last visited July 8, 2020).

290 *The Good Earth Pet Product Earns Non-GMO Project Verification*, NON-GMO PROJECT (Feb. 18, 2016), https://www.nongmoproject.org/blog/the-good-earth-pet-product-earns-non-gmo-project-verification/ [https://perma.cc/TU7M-C6QP].

291 Jonathan Knutson, *A Sad Day for Our Society When Salt Is Labeled Non-GMO*, AGWEEK (May 28, 2018), https://www.agweek.com/opinion/columns/4451159-sad-day-our-society-when-salt-labeled-non-gmo [https://perma.cc/2NWT-99NA].

292 Jaffe, *supra* note 285.

293 *GMO FAQs*, KING ARTHUR FLOUR, https://www.kingarthurflour.com/about/products/docs/gmo-faqs [https://perma.cc/SU9N-5ZT3] (last visited Sept. 27, 2020). In fact, no genetically engineered wheat is commercially grown in the United States or available in other markets. *Wheat Sector at a Glance*, ECON. RSCH. SERV., U.S. DEP'T AGRIC., https://www.ers.usda.gov/topics/crops/wheat/wheat-sector-at-a-glance/ [https://perma.cc/Q996-Q6PC] (June 26, 2020); Jaffe, *supra* note 285.

294 *GMO Free Water? A Product You've Been 'Dying' For*, GENETIC LITERACY PROJECT, https://geneticliteracyproject.org/2015/07/07/gmo-free-water-a-product-you've-been-dying/ [https://perma.cc/C8ER-LN3J] (last visited Sept. 27, 2020).

295 Stephanie Strom, *Some Tropicana and Other PepsiCo Products to Carry Non-GMO Project Seal*, N.Y. TIMES (Dec. 10, 2015), https://www.nytimes.com/2015/12/11/business/some-tropicana-and-other-pepsico-products-to-carry-non-gmo-project-seal.html?_r=0 [https://perma.cc/A2JK-Q7ZN].

consumer foods and to require manufacturers to revise their labeling to omit the term.[296] The FDA is still reviewing the petition.

3. Communicating Biotech Processes on Plant-Based Meat

Using genetic engineering allows plant-based food producers to create ingredients that give their products the color and flavor of meat. For example, Impossible Foods proudly announced the use of genetic engineering to create its signature ingredient, soy leghemoglobin, and the use of BE soybeans to create its burger.[297] The strange result of the BE Food Disclosure Standard is that disclosure is required for soy, but not for soy leghemoglobin, because only products that "contain [modified] genetic material" trigger disclosure.[298] This makes little sense from the perspective of informing consumers about the use of genetic engineering involved in creating the product. This is a criticism of the Standard that generally excludes refined foods that are derived from bioengineered crops but do not contain detectable modified genetic material.[299] The Standard did not contemplate the variety of biotech tools that are being used to create a new generation of alt-proteins. Although most of the products will escape required disclosure under the law, there are legal landmines if companies represent themselves as "non-GMO" or "natural," as previously discussed, if this conflicts with consumer perception or can be considered misleading in any particular way.

Most companies in the alternative protein space use "precision fermentation" to write DNA sequences to insert into micro-

---

296 Info. Tech. & Innovation Found., Citizen Petition to the Food & Drug Admin. (Sept. 24, 2018), http://www2.itif.org/2018-non-gmo-citizen-petition.pdf [https://perma.cc/PMW2-NF2N]. On July 23, 2019, the agency informed the Information Technology and Innovation Foundation that it has not yet reached a decision on the petition. Letter from Douglas A. Balentine, Dir., Off. Nutrition & Food Labeling, to Robert Atkinson, President, Info. Tech. & Innovation Found. (July 29, 2019), https://www.regulations.gov/document?D=FDA-2018-P-3640-0008 [https://perma.cc/EFN2-UZC8].

297 *Does It Contain Genetically Modified Ingredients?*, IMPOSSIBLE FOODS, https://faq.impossiblefoods.com/hc/en-us/articles/360023038894-Does-it-contain-genetically-modified-ingredients- [https://perma.cc/3DRM-X9F5] (last visited Sept. 27, 2020).

298 However, Impossible Foods does indicate on its webpage that the Impossible Burger contains two BE ingredients—the soy protein and the heme. *Why Does the Package Have a Bioengineered Symbol on It?*, IMPOSSIBLE FOODS, https://faq.impossiblefoods.com/hc/en-us/articles/360036138833-Why-does-the-package-have-a-bioengineered-symbol- [https://perma.cc/W8YN-BGLF] (last visited Sept. 26, 2020).

299 National Bioengineered Food Disclosure Standard, 83 Fed. Reg. 65,814, 65,816 (Dec. 21, 2018) (to be codified at 7 C.F.R. pt. 66).

organisms.[300] Companies can "instruct" the microorganisms to produce target molecules, or they program an organism to make it grow a single high-value component, such as a protein, and leave the rest of the biomass as waste.[301] Companies are engineering microorganisms, including yeast, bacteria, and fungi, to produce collagen and gelatin, egg proteins, heme proteins that can be used in plant-based meat, milk proteins, proteins found in breastmilk, or a combination of these.[302]

Motif Ingredients, a startup created by Gingko Bioworks, a biotech firm in Boston,[303] also uses fermentation to make flavorings and other additives to improve texture and function of foods by inserting specific DNA sequences into the genomes of yeast.[304] Fermenting that yeast will then produce their desired products. The goal of these companies is to source their ingredients to enable food companies to create their own plant-based meats.[305] While these are biotech processes, similar to how Impossible Foods produces its "BE heme," some companies are less inclined to embrace the BE label. Instead, they are relying on the BE Disclosure Act's definition of BE to assert that although the *process* is genetic engineering, the *final product* is not a GMO. For example, the animal-free dairy company Perfect Day explains that its "flora-made protein does not contain GMOs."[306] This is, of course, factual. No genetic material remains in the final purified proteins used in Perfect Day's dairy products. However, invoking "natural" processes could be misleading, which could spur consumer protection litigation. The company describes its process as follows:

> The microflora we work with are really good at producing different kinds of protein naturally. We simply give them instructions for

---

300 TUBB & SEBA, *supra* note 49, at 6.

301 Elaine Watson, *Noblegen Gears Up for Launch of Complete Protein from a Non GMO Source That Can Go "Head to Head" with Animal Protein*, FOODNAVIGATOR-USA (Sept. 25, 2019, 3:34 PM), https://www.foodnavigator-usa.com/article/2019/09/25/noblegen-gears-up-for-launch-of-complete-protein-from-a-non-gmo-source-that-can-go-head-to-head-with-animal-protein [https://perma.cc/ZZG6-ZECC].

302 TUBB & SEBA, *supra* note 49, at 6.

303 Jason Kelly, *Introducing Motif: The Future of Food Is _____*, GINKGO BIOWORKS, https://www.ginkgobioworks.com/2019/02/26/introducing-motif/ [https://perma.cc/PZR7-5CU2] (last visited June 5, 2020). The firm has developed platforms that automate and scale the organism engineering, allowing engineers to prototype novel biological designs.

304 MOTIF FOODWORKS, http://madewithmotif.com/ [https://perma.cc/84M2-3LNF] (last visited Sept. 27, 2020).

305 *Plant-Based Meat Could Create a Radically Different Food Chain*, *supra* note 266.

306 *Does Your Protein Contain GMOs?*, *Got a Question?*, PERFECT DAY, https://www.perfectdayfoods.com/faq/#gmos [https://perma.cc/EE37-A9C6] (last visited Sept. 27, 2020).

> producing exactly the type of protein we want—in this case, the milk proteins casein and whey. We then filter out the modified flora, leaving only pure protein. In other words, genetic modification is part of our process, but it is not present in the final product.[307]

Clara Foods, a company creating egg whites via fermentation that aims to bring products to market in 2020, avoids mention of GMOs on its website.[308] Instead, Clara Foods' website describes its process for creating "clean protein" as such:

> We begin by mixing two ingredients found in nearly every good kitchen: sugar and yeast. Next, we use advanced yeast engineering and fermentation technologies to selectively cultivate the perfect strain of yeast.
>
> We end with protein, tailor made for its purpose. Whether egg albumen for baking, environmentally friendly antimicrobials, or pure, clean protein, our process can make anything.[309]

On the other end of the BE spectrum, other companies have decided not to use biotechnology in creating their plant-based meat. In contrast to Impossible Foods, Beyond Meat proudly markets its products as non-GMO and has secured third-party verification under the Non-GMO Project.[310] Founder and CEO Ethan Brown of Beyond Meat has said, "We feel a deep commitment to uphold our customer's [sic] trust and provide them with clean, plant-based proteins without the ingredients we know they are increasingly uncomfortable with, including GMOs."[311] By describing the products as "clean" in the announcement of being non-GMO, Brown plays to consumers' perceptions regarding GMOs as inferior, or "unclean," in contrast perhaps to conventional meat or BE-labeled competitor products. It would be a stretch to suggest that the Beyond Burger would otherwise fit into consumers' expectations regarding "clean" eating and the growing "clean" labeling trend.[312] However, under the non-GMO halo, plant-based meats can give consumers the impression of "natural," wholesome, plant-based meals.

Although Beyond Meat does not use biotechnology in creating its products and can therefore adopt the non-GMO label, other companies

---

307 *Id.*

308 CLARA FOODS, https://www.clarafoods.com/ [https://perma.cc/KBR4-SLNS] (last visited Sept. 27, 2020).

309 *Id.*

310 *Our Products Deliver OMGs Not GMOs*, *supra* note 258.

311 *Id.*

312 *See* discussion *supra* Section IV.B.1.

are employing innovative processing technologies to develop protein without using genetic engineering. Other companies using "precision fermentation" claim that they are employing natural processes that do not involve genetic engineering.[313] For example, Canada-based company Noblegen is using a unique fermentation method called "Facilitated Expression." This method allows them to "coax algae"[314] to produce a variety of ingredients, including palm oil replacements and beta-glucan (a form of soluble fiber linked to improving cholesterol),[315] and complete proteins that have the same nutrition and functionality of animal proteins.[316] Noblegen describes the process as "produc[ing] nutrient-rich ingredients with minimal processing and no genetic modification. We use an ancient, natural method that we can cost-effectively scale at an industrial level."[317] As founder Adam Noble explained, "To have a complete protein from a Non GMO source that's certified vegan but can mimic animal protein is really the holy grail in the food industry right now."[318] Similar to Noblegen, Triton has developed a "traditional non-GMO" process for developing strains of algae that are rich in beta-carotene (yellow in color) and others that are rich in heme, called "Essential Red."[319] Triton claims that a plant-based meat product with Essential Red algae "cooks, smells, and tastes like animal meat."[320]

Perhaps the most surprising technological development is the creation of protein from air.[321] Air Protein is based on preliminary

313 TUBB & SEBA, *supra* note 49, at 6.

314 Watson, *supra* note 298.

315 Rena Goldman, *Beta Glucan: The Heart-Healthy Fiber*, HEALTHLINE, https://www.healthline.com/health/beta-glucan-heart-healthy [https://perma.cc/4Y5M-DHCJ] (Dec. 16, 2016).

316 NOBLEGEN, https://noblegen.com/ [https://perma.cc/EC7X-EV2A] (last visited Sept. 27, 2020).

317 NOBLEGEN, https://noblegen.com/process/ [https://perma.cc/42SQ-4MVP] (last visited Oct. 19, 2020). Noblegen founder Adam Noble explained that "[p]eople have never been able to do what we've been able to do in our production process without genetic modification, and over this year we've been aggressively filing patents to lock down the core elements of our process down to the food applications, so we have a very broad IP protection strategy." Watson, *supra* note 301.

318 Watson, *supra* note 301.

319 *Algae Based Alternative Meat*, TRITON ALGAE INNOVATIONS, https://www.tritonai.com/alternative-meat-ingredients [https://perma.cc/GX5U-S3MS] (last visited Sept. 27, 2020).

320 TRITON ALGAE INNOVATIONS, https://www.tritonai.com/ [https://perma.cc/QR82-KYDU] (last visited Sept. 27, 2020).

321 *See* AIR PROTEIN, https://www.airprotein.com/ [https://perma.cc/4W64-Z36C] (last visited Sept. 27, 2020); SOLAR FOODS, https://solarfoods.fi/ [https://perma.cc/S6E2-JTAA]

research by NASA scientists seeking to produce food for a yearlong mission and microbes called hydrogenotrophs, which act like plants in converting carbon dioxide into food.[322] As astronauts exhaled CO_2, microbes captured and converted it, with other inputs such as power and water, into food the astronauts could eat.[323] Then these astronauts would exhale CO_2, further enabling the hydrogenotrophs to continue producing an endless cycle of nutrients.[324] Air Protein claims to be a complete protein that is rich in vitamins and minerals, it can be used to make meatless meats "with an amino acid profile comparable to animal protein, and double the amount of amino acids compared to protein made from soybeans."[325] Creating Air Proteins involves "No GMO, No Pesticides, No Herbicides, No Hormones, No Antibiotics" and "is produced using ALL natural processes."[326]

Although most of the innovative products described in this section are in early development and not yet available for purchase, how they will be labeled is a key consideration before they come to market. Companies would be wise to consult with the FDA as soon as possible.[327] These products, given their successful marketing and promises of disruption to animal agriculture, will likely be scrutinized. Already, Friends of the Earth, in its 2018 report *From Lab to Fork: Critical Questions on Laboratory-Created Animal Product Alternatives*, questioned how transparent alternative protein producers will be in listing all ingredients and processes—including GMOs—on the product labels.[328] The report found, for example, that Impossible Foods initially claimed that its heme protein from engineered yeast was "identical to" heme from animals, but the official documentation on the biochemical structures provided to the FDA showed that Impossible

(last visited Sept. 27, 2020); NOVONUTRIENTS, https://www.novonutrients.com/ [https://perma.cc/HRJ6-HFFU] (last visited Sept. 27, 2020); DEEP BRANCH BIOTECH., https://deepbranchbio.com/ [https://perma.cc/79J7-KA7M] (last visited Sept. 27, 2020).

322 *Science*, AIR PROTEIN, https://www.airprotein.com/science [https://perma.cc/JSH6-3Z85] (last visited Sept. 27, 2020).

323 *Id.*

324 *Id.*

325 *About*, AIR PROTEIN, https://www.airprotein.com/about [https://perma.cc/A859-92WD] (last visited Sept. 28, 2020).

326 *Id.*

327 For example, Noblegen indicated that it has been advised that its proteins could be listed in ingredient statements as "protein concentrate (Euglena)" or "protein concentrate (algae)." Watson, *supra* note 301.

328 DANA PERLS, FRIENDS OF THE EARTH, FROM LAB TO FORK: CRITICAL QUESTIONS ON LABORATORY-CREATED ANIMAL PRODUCT ALTERNATIVES 9 (2018).

Burger inadvertently contains forty-six additional engineered proteins.[329] Misleading "natural," "sustainable," "healthy," and non-GMO claims will be policed by plaintiffs' attorneys, competitors, consumer protection organizations, the FDA, and the FTC. Given that these innovative products will employ processes that are unfamiliar to most consumers, providing clarifying statements about any of the above, and other claims, might aid consumers in understanding how the terms are being used.[330] To provide clarity to consumers, and in turn, likely earn their trust, companies could consult with government agencies and consumer protection groups to communicate how they create their products. These consultations could adapt our common language and develop terms that consumers will likely understand.[331] Although disclosure of the process used to create the products will not

---

329 *Id.* The FDA did issue a "no questions" letter to Impossible Foods in 2018. Letter from Dennis M. Keefe, Dir., Off. Food Additive Safety, to Gary L. Yingling, Morgan, Lewis & Bockius LLP (July 23, 2018), https://res.cloudinary.com/dlvhhibcv/image/upload/Documents/2018-07-23_GRN_737_Response_Letter.pdf [https://perma.cc/5CBD-48ME]. As Breakthrough's executive director, Ted Nordhaus, wrote at the time,

> There is no actual evidence that heme produced in this way might have negative effects. But for [Friends of the Earth] and other GMO opponents, the absence of evidence does not constitute evidence of absence. Nor must the wildly speculative risks they invoke be considered in the context of the well established environmental and health risks associated with beef production and consumption.

Ted Nordhaus, *Impossible Environmentalism: Green Groups Promote Utopian Fantasies*, USA TODAY (Sept. 7, 2017, 12:16 PM), https://www.usatoday.com/story/opinion/2017/09/07/impossible-environmentalism-does-not-address-sustainability-ted-nordhaus-column/570651001/ [https://perma.cc/4BHP-7A5Z].

330 *See* TUBB & SEBA, *supra* note 49, at 10 (providing a list of terms for "The New Language of Food" including: "Precision Biology," defined as "[t]he coming together of modern information technologies like artificial intelligence (AI), machine learning, and the cloud, with modern biotechnologies like genetic engineering, synthetic biology, metabolic engineering, systems biology, bioinformatics, and computational biology;" "Precision Fermentation," defined as "[f]ermentation plus precision biology," which is a "process that allows us to program micro-organisms to produce almost any complex organic molecule;" "Precision-fermentation Enabled," defined as "[a]ny product or production technique that is improved, or made possible by, advances in precision fermentation costs or capabilities;" and "Precision-fermentation Enhanced," defined as "[a]ny product with ingredients made by precision fermentation. These products do not contain animal-derived meat").

331 Disclosure of biotechnology can lead to increased acceptance and consumer trust. For example, a study of Vermont's labeling law, now preempted by the National Bioengineered Food Disclosure Standard, found that public opposition to GMOs fell by almost 20% after the law was enacted. In the research, Lusk and Kolodinsky find that "simple disclosure, one of the suggestions for the standards being developed at the federal level, is not likely to signal to consumers that GE foods are more risky, unsafe, or otherwise harmful than before label exposure and might, in fact, do the opposite." Jane Kolodinsky & Jayson L. Lusk, *Mandatory Labels Can Improve Attitudes Toward Genetically Engineered Food*, 4 *SCI. ADVANCES* 1, 3 (2018).

be mandatory, and processing aids are not required to be disclosed on the ingredient label,[332] the FDA can help play a role in ensuring that voluntary claims, such as non-GMO and natural, are not false or misleading. A guidance document for this emerging industry would likely be useful to capture the FDA's current thinking after consulting individually with companies and for the public to understand the meaning of certain terms and phrases, such as "fermentation," "flora-based," "plant-based," "microbial-based," "precision-fermentation enhanced," and "precision biology."[333] Being able to independently assess the benefits and risks of these novel technologies will be an extremely difficult feat for the average consumer.[334] Beyond safety assessments conducted by the companies and/or the FDA, labeling should play a role in helping consumers to make informed decisions about food produced using new technologies.[335]

D. Eco-Labeling: Communicating Environmental Benefits

Plant-based food producers will certainly seek to market and capitalize on their efficiencies and small ecological footprints in comparison to their conventional counterparts.[336] Consumer surveys

---

[332] 21 C.F.R. § 101.100(a)(3)(ii) (2020).

[333] Given the rates of scientific illiteracy in the United States and failures of scientists to effectively communicate to the public, educational efforts should play a role in helping understand the new wave of alternative proteins. *See* Chris Mooney, *Americans Are Still Scientifically Illiterate — and Scientists Still Need a PR Team*, WASH. POST (Jan. 29, 2015, 1:19 PM), https://www.washingtonpost.com/news/energy-environment/wp/2015/01/29/americans-are-still-scientifically-illiterate-and-scientists-still-need-a-pr-team/ [https://perma.cc/8AYQ-ZCTQ].

[334] Although beyond the scope of this Article, an important issue to address is the adequacy of the current "generally recognized as safe" voluntary notification, which is the preferred regulatory pathway for novel food producers that ensures the safety of new ingredients.

[335] Granted, consumers are generally unaware of how conventional animal-derived food is produced, but alt-proteins signal a new era in food production and transparency. *See* ANIMAL WELFARE INST., CONSUMER PERCEPTIONS OF FARM ANIMAL WELFARE (2019), https://awionline.org/sites/default/files/uploads/documents/fa-consumer_perceptionsof farmwelfare_-112511.pdf [https://perma.cc/5AJN-BGPU] (Aug. 2018). In a 2016 survey conducted by the Opinion Research Corporation for Consumer Reports, 50% of consumers said they thought the natural label meant that the animal went outdoors, while 69% said they thought the label should mean that animals went outdoors. Results were similar for the organic label (54% said that organic meant animals went outdoors, and 68% said the claim should mean that animals went outdoors). *Id.* at 12.

[336] Research from New York University's Stern Center for Sustainable Business in 2019 demonstrated that sustainability is a growing marketing trend. The research finds that sustainability-marketed products are responsible for *more than half of the growth* in consumer-packaged goods since 2013. Tensie Whelan & Randi Kronthal-Sacco, *Research:*

are increasingly showing that, especially among younger adults, environmental sustainability is a factor in purchasing decisions,[337] and plant-based meat companies that can deliver on taste and satisfy the "meat-eating" experience are benefiting from consumers' mental shift toward sustainable products. A 2019 Health Aspirations & Behavioral Tracking Service study revealed that although taste, convenience, health, and affordability are still primary factors for choosing foods and beverages, sustainability can be a deciding factor for some consumers if all other factors are equal.[338]

Avoiding meat and dairy is now widely recognized as the most significant way to reduce one's environmental impact on greenhouse gas emissions, land use, biodiversity loss, water pollution, pesticide use, and antibiotic use.[339] The potential role these meat replacements could play is enormous—they "may be the only pragmatic way to reverse climate change."[340] Touting the sustainability of plant-based

Actually, Consumers Do Buy Sustainable Products, HARV. BUS. REV. (June 19, 2019), https://hbr.org/2019/06/research-actually-consumers-do-buy-sustainable-products [https://perma.cc/CTH3-SZ5X].

337 Darren Seifer, *Are Consumers Walking the Sustainability Talk?*, NDP (Oct. 1, 2019), https://www.npd.com/wps/portal/npd/us/blog/2019/are-consumers-walking-the-sustainability-talk/ [https://perma.cc/3JSQ-DG3L]. Health Aspirations & Behavioral Tracking Service revealed that "9% of adults consider the environment a top factor when making food and beverage purchase decisions. Younger adults, aged 18–44, are most likely to feel this way." *Id. See also* INT'L FOOD INFO. COUNCIL FOUND., *supra* note 69. A 2019 review of thirty-four articles focused on consumer behavior relating to meat consumption and environmental attitudes identified the demographic traits of individuals who are most likely to reduce their conventional meat consumption for environmental reasons. Ruben Sanchez-Sabate and Joan Sabaté, *Consumer Attitudes Towards Environmental Concerns of Meat Consumption: A Systematic Review*, 16 INT'L J. ENV'T RSCH. & PUB. HEALTH 1220, 1221 (2019). These consumers were more likely to be younger and female and to value ecology, and they were more likely to live in Europe and Asia than in the United States. *Id.* at 1225. Overall, the number of environmentally motivated consumers who expressed a willingness to reduce their meat consumption constitutes around 5%–18% of the population. *Id.* at 1223.

338 Mary Ellen Shoup, *NPD Group: US Consumers Beginning to Weigh in Environmental Impact When Making Food and Beverage Purchases*, FOODNAVIGATOR-USA (Oct. 15, 2019, 4:16 PM), https://www.foodnavigator-usa.com/Article/2019/10/15/NPD-Group-US-consumers-beginning-to-weigh-in-environmental-impact-when-making-food-and-beverage-purchases [https://perma.cc/QJ6T-SEUA]; *see* Becky Ramsing, *Food Trends for 2020 Show a Sustainability Focus*, JOHNS HOPKINS CTR. FOR LIVABLE FUTURE (Jan. 7, 2020), https://clf.jhsph.edu/viewpoints/food-trends-2020-show-sustainability-focus [https://perma.cc/AEW2-473B].

339 *See, e.g.*, Poore & Nemecek, *supra* note 2.

340 Alina Tugend, *Is the New Meat Any Better Than the Old Meat?*, N.Y. TIMES (Sept. 24, 2019), https://www.nytimes.com/2019/09/21/climate/plant-based-meat.html [https://perma.cc/U89V-BHDS] (quoting Jeff Anhang, environmental and social specialist with the *World Bank* Group's International Finance Corporation).

alternatives to conventional animal products is an attribute that has already been, and will continue to be, a critical marketing strategy for the industry. In 2018, both Impossible Foods and Beyond Meat received the United Nations Environment Planetary Health Champion of the Earth Award.[341] Life cycle assessments commissioned by Beyond Meat and Impossible Foods of these products' environmental impacts have demonstrated their benefits. Beyond Meat commissioned the Center for Sustainable Systems at the University of Michigan to conduct a "cradle-to-distribution" life cycle assessment of the Beyond Burger.[342] The purpose of the study was to compare environmental impacts, including "greenhouse gas emissions, cumulative energy demand (energy use), water use, and land use," with those from typical beef production in the U.S.[343] A secondary purpose was to highlight opportunities for improvement in the environmental performance of the Beyond Burger product chain and provide Beyond Meat with a benchmark against which improvement efforts can be measured.[344] Based on a comparative assessment of the current Beyond Burger production system with a 2017 beef life cycle assessment, the Beyond Burger generates 90% fewer greenhouse gas emissions, requires 46% less energy, and has over 99% less impact on water scarcity and 93% less impact on land use than one-quarter pound of U.S. beef.[345]

The Impossible Burger life cycle assessment was similarly impressive. Compared to conventional ground beef, the Impossible Burger reduces environmental impacts across every impact category studied in this report—87% less water, 96% less land, 89% fewer

---

341 Press Release, UN Env't Programme, Celebrating Bold Environmental Leadership and a Plastic-Free Future (Oct. 3, 2018), https://www.unenvironment.org/news-and-stories/press-release/celebrating-bold-environmental-leadership-and-plastic-free-future [https://perma.cc/WVS8-ESE3].

342 MARTIN C. HELLER & GREGORY A. KEOLEIAN, UNIV. MICH., BEYOND MEAT'S BEYOND BURGER LIFE CYCLE ASSESSMENT: A DETAILED COMPARISON BETWEEN A PLANT-BASED AND AN ANIMAL-BASED PROTEIN SOURCE 7 (2018) ("[T]he chosen functional unit for comparison was defined as 4 oz. (quarter pound, 0.113 kg) uncooked burger patty delivered to retail outlets. This is the marketed patty size of the Beyond Burger and a standard consumer product size for beef patties. System boundaries included upstream ingredient and raw material supply (including farm production of agricultural crops), processing and packaging operations, cold storage, distribution to point of sale, and disposal of packaging materials. Retail and consumer stages, including potential losses at those stages, were excluded, as they were considered equivalent in both product systems.").

343 *Id.*

344 *Id.*

345 *Id.*

greenhouse gas emissions, and 92% less aquatic pollutants.[346] About 80% less herbicide is required to produce the Impossible Burger than an average American cow-derived burger because of the large amount of crops required to feed a cow to produce beef.[347]

While the sustainability claims of the alternative proteins have been largely well received, environmental group Friends of the Earth has raised concerns about potentially misleading or unsubstantiated "sustainability" claims made by plant-based or cell-based food producers like Perfect Day, Clara Foods, and Impossible Foods.[348] One particular concern involves the feedstocks, including sugarcane, corn, and natural gas, required to produce these proteins for the envisioned "synthetic bioeconomy."[349] These feedstocks are produced with chemical-intensive industrial monocultures like GMO corn or sugar,[350] which could require large amounts of synthetic fertilizers that pollute the water and air, or with natural gas, which is produced with techniques like hydraulic fracturing or "fracking." These feedstocks could also require toxic pesticides and herbicides, such as chlorpyrifos, glyphosate, and atrazine,[351] which are linked to cancer and associated with developmental and reproductive harm.[352]

These concerns juxtaposed with the proven environmental benefits of plant-based meat reveal how "sustainability" can be subject to different interpretations. Impossible Foods' decision to use BE soy and

---

346 Sofia Khan et al., *Environmental Life Cycle Analysis: Impossible Burger 2.0*, IMPOSSIBLE FOODS (Mar. 20, 2019) [hereinafter *Impossible Burger 2.0*], https://impossiblefoods.com/mission/lca-update-2019/ [https://perma.cc/9PKC-YWJQ]; SOFIA KHAN ET AL., COMPARATIVE ENVIRONMENTAL LCA OF THE IMPOSSIBLE BURGER WITH CONVENTIONAL GROUND BEEF BURGER 3–4 (2019) [hereinafter COMPARATIVE ENVIRONMENTAL LCA].

347 COMPARATIVE ENVIRONMENTAL LCA, *supra* note 346, at 48.

348 PERLS, *supra* note 328, at 8.

349 *Synthetic Biology: The Bioeconomy of Landlessness and Hunger*, ETC GROUP (June 14, 2013), http://www.etcgroup.org/content/synthetic-biology-bioeconomy-landlessness-and-hunger [https://perma.cc/AMC2-LYUG].

350 For example, Clara Foods, which is creating egg proteins via fermentation, uses corn sugar as feedstock. Elaine Watson, *Clara Foods Completes Series B, Joins Forces with Ingredion to Commercialize Egg Proteins. . . Minus the Chicken*, FOODNAVIGATOR-USA (Apr. 25, 2019), https://www.foodnavigator-usa.com/Article/2019/04/25/Clara-Foods-completes-Series-B-joins-forces-with-Ingredion-to-commercialize-chicken-less-egg-proteins [https://perma.cc/62S3-QERM].

351 HEALTH CARE WITHOUT HARM, REDEFINING PROTEIN: ADJUSTING DIETS TO PROTECT PUBLIC HEALTH AND CONSERVE RESOURCES (2017), https://noharm-uscanada.org/sites/default/files/documents-files/4679/Redefining%20Protein%20Report_4-13-17.pdf [https://perma.cc/5E39-67QU].

352 PERLS, *supra* note 328, at 8–9.

use genetic engineering to produce heme as a "sustainable" choice[353] weighs the claims of one set of environmental values—those held by people who consider the manipulation of nature through genetic engineering to be potentially dangerous or unhealthy for the environment, wildlife, and humans—against the company's environmental values, which focus on how the raising of animals and the growing of feed used to supply them harms the environment, wildlife, and humans. "It would be fair to say that each holds the others' views to be unreasonable, ideologically driven, and unscientific."[354] This divergence of opinion also exemplifies the difficulty of reaching a consensus on the term "sustainable."

Disclosure of production practices is voluntary, but the growing public interest in such information,[355] the overwhelming ecological benefits of plant-based alternatives, and the companies' commitment to transparency likely signal an emphasis on how the products were produced. The FDA and the FSIS have taken the position that producers do not need to affirmatively disclose a production practice unless it affects the product "in a manner that is not obvious to consumers in the absence of labeling," such as when a product is irradiated.[356] To date, the FSIS has not required any affirmative labeling of animal husbandry practices, despite growing consumer interest in how animals are raised for food.[357] Disclosures regarding production practices on plant-based foods will be another way of differentiating themselves from animal-based meat products.[358] Ample evidence suggests that most consumers are out of touch with modern agriculture and remain uninformed about the industrial animal

---

353 Michael Eisen, *How GMOs Can Save Civilization (and Probably Already Have)*, MEDIUM (Mar. 16, 2018), https://medium.com/impossible-foods/how-gmos-can-save-civilization-and-probably-already-have-6e6366cb893 [https://perma.cc/36UP-FPHC]; Brown, *supra* note 116.

354 ROWE, *supra* note 27, at 30.

355 Samuel R. Wiseman, *Localism, Labels, and Animal Welfare*, 13 NW. J. L. & SOC. POL'Y 66, 79–80 (2018) (noting that shoppers and diners increasingly pay attention to the "environmental attributes" of food and, more generally, the "origin and production" of their food and providing sources).

356 *See* Irradiation of Meat Food Products, 64 Fed. Reg. 72,150, 72,157, 72,163 (Dec. 23, 1999) (to be codified at 9 C.F.R. pts. 381, 424).

357 *See, e.g.*, CONSUMER PERCEPTIONS OF FARM ANIMAL WELFARE, *supra* note 335 (compilation of consumer research in this area).

358 *See* Douglas A. Kysar, *Preferences for Processes: The Process/Product Distinction and the Regulation of Consumer Choice*, 118 HARV. L. REV. 525, 529 (2004) (arguing that consumers "often have 'preferences for processes'" in terms of the processes followed in producing a consumer good).

production practices that are used to produce their food.[359] Yet, consumer surveys demonstrate that consumers care about how a food was produced and that having the information regarding sustainability could influence purchasing behavior. In a 2019 survey, more than half of respondents said knowing where their food comes from is highly important; nearly half said the same about knowing a manufacturer has a commitment to environmental sustainability.[360]

1. Crafting Clear and Informative Eco-Labels

One way to motivate changes in food consumption is through environmental food labels, or eco-labels,[361] which serve as a form of informational regulation, or "regulation through disclosure."[362] However, there is much debate over the design and effectiveness of them.[363] Eco-labeling schemes have been criticized as more confounding than helpful and for having little impact on consumer behavior.[364] As with other credence claims being used by the companies in marketing and labeling, transparency and clear messaging are essential. An unqualified "sustainable" claim conveys very little information to consumers beyond what they assume the term to mean. A majority of consumers (63%) in a 2019 study responded that it is difficult to know whether their food choices are environmentally sustainable,[365] but 63% of those respondents strongly agreed that if it were easier to know whether foods are environmentally

---

359 "Unfortunately, a majority of today's consumers are at least three generations removed from agriculture, are not literate about where food comes from and how it is produced." Caitlin Dewey, *The Surprising Number of American Adults Who Think Chocolate Milk Comes from Brown Cows*, WASH. POST (June 15, 2017), https://www.washingtonpost.com/news/wonk/wp/2017/06/15/seven-percent-of-americans-think-chocolate-milk-comes-from-brown-cows-and-thats-not-even-the-scary-part/ [https://perma.cc/X4RF-URLT] (quoting a white paper by the National Institute for Animal Agriculture).

360 INT'L FOOD INFO. COUNCIL FOUND., *supra* note 69, at 50.

361 *See, e.g.*, Apostolidis & McLeay, *supra* note 9, at 84 (suggesting that sustainability labeling can be persuasive to eco-conscious consumers).

362 Cass R. Sunstein, *Informational Regulation and Informational Standing:* Akins *and Beyond*, 147 U. PA. L. REV. 613, 613 (1999).

363 Laurent Muller et al., *Environmental Labelling and Consumption Changes: A Food Choice Experiment*, 73 ENV'T & RES. ECON. 871, 872 (2019).

364 "There is an emerging consensus that consumer-oriented product certification cannot drive transformation of production practices toward greater environmental sustainability." Kurt B. Waldman & John M. Kerr, *Limitations of Certification and Supply Chain Standards for Environmental Protection in Commodity Crop Production*, 6 ANN. REV. RES. ECON. 429, 431 (2014).

365 INT'L FOOD INFO. COUNCIL FOUND., *supra* note 69, at 53.

sustainable, it would have a greater influence on their purchasing decisions.[366]

Currently, companies may seek accreditation through one of the more than 460 eco-labeling systems globally,[367] approximately 150 of which include food.[368] The profusion of labels makes it difficult for consumers to compare products; as a consequence, although they really perceive that labels are a sign of environmental quality, consumers will choose a label according to the image it conveys, rather than what it actually represents.[369] One study of nutrition and fuel economy labeling suggested that an effective eco-label should be simple to understand and include reference values, which permit comparisons and put information in context.[370] For example, one effective approach used with fuel economy labels has been to translate obscure attributes into more comprehensible attributes.[371] Harmonization[372] and certification by an independent third-party NGO or regulator can provide engaged consumers with a measurable analysis created by experts and provide a single point of product comparison for the less-engaged consumer.[373]

Eco-labels attempt to induce consumers to choose eco-friendly items over a substantially similar, but not as eco-friendly, item. Because eco-friendly products are often more expensive to produce, labels are a mechanism for sellers to capture consumers' willingness to pay more

---

366 *Id.*

367 ECOLABEL INDEX, http://www.ecolabelindex.com/ecolabels/ [https://perma.cc/D3GA-P28A] (last visited Sept. 28, 2020).

368 Klaus G. Grunert et al., *Sustainability Labels on Food Products: Consumer Motivation, Understanding and Use*, 44 FOOD POL'Y 177, 177 (2014) (noting approximately 432 global labeling systems, "of which 147 include standards for food/beverage"); *see, e.g.*, Michael P. Vandenbergh, *Private Environmental Governance*, 99 CORNELL L. REV. 129, 149–50 (2013) (describing Marine Stewardship Council certification of sustainable fisheries and certification of aquaculture and the associated labeling of fish produced under these programs).

369 Dorothée Brécard, *Consumer Confusion Over the Profusion of Eco-Labels: Lessons from a Double Differentiation Model*, 37 RES. & ENERGY ECON. 64, 79 (2014).

370 Adrian R. Camilleri, *Consumers Underestimate the Emissions Associated with Food but Are Aided by Labels*, 9 NATURE CLIMATE CHANGE 53, 54 (2019).

371 *Id.*

372 Leonie Dendler, *Sustainability Meta Labelling: An Effective Measure to Facilitate More Sustainable Consumption and Production?*, 63 J. CLEANER PROD. 74, 81 (2014) (proposing a Sustainability Meta Labelling Scheme that condenses existing product-labels and other communication measures into an overarching sustainability message in order to better inform consumers of a product's sustainability metrics).

373 *Id.* at 80.

for the actual or perceived benefits associated with the environmental claim.[374] This strategy could be very useful for plant-based food producers who seek to compete with conventional animal products but, at least in the short term, are charging a higher price. Eco-labels can be used to convey how plant-based meat is "sustainable" throughout the food's life cycle—its raw materials, production process, distribution, use, and disposal, including consideration of pollution, waste, and carbon footprint.[375]

A danger is present that plant-based meat can exemplify "green consumerism," similar to concerns of "health-washing" from use of terms such as "natural," non-GMO, or potentially even from "plant-based." Green consumerism refers to the "production, promotion, and preferential consumption of goods and services on the basis of their pro-environment claims."[376] Green consumerism can serve as a poor substitute for overall sustainable consumption and could create an illusion of progress, for example, by uncritically equating numbers of plant-based burgers consumed with climate change mitigation. Green consumerism could also distract from the urgent structural food systems changes needed to produce and consume food within planetary boundaries.[377] In this way, green consumerism puts the onus upon the consumer to take charge of the multifaceted food systems problems, and as such, has been referred to as "consumer scapegoatism."[378] Nevertheless, while recognizing the limits to green consumerism as a driver of sustainability, further research is warranted to determine whether and how consumer demand could drive food systems change away from industrial animal agriculture and toward resilient systems that nourish people, the planet, and all its inhabitants.

CONCLUSION

Increasing concern from eaters about food and agriculture generally, and the industrial meat industry in particular, is an important driver of public debate and social change. The growing popularity of plant-based meat may signal success of the market-based theory of change to

374 Jason J. Czarnezki et al., *Crafting Next Generation Eco-Label Policy*, 48 ENV'T L. 409, 418 (2018).

375 Jason J. Czarnezki, *The Future of Food Eco-Labeling: Organic, Carbon Footprint, and Environmental Life-Cycle Analysis*, 30 STAN. ENV'T L.J. 3, 39 (2011).

376 Lewis Akenji, *Consumer Scapegoatism and Limits to Green Consumerism*, 63 J. CLEANER PROD. 13, 13 (2014).

377 *Id.*

378 *Id.* at 22.

reduce animal-based meat consumption. It may thus illustrate the transformative capacity of consumer agency.[379] Despite the valid critiques of market-based solutions to food systems change discussed in Part II, the potentialities of consumers as change agents "should not be ridiculed or even neglected altogether."[380] As other authors have noted,

> [C] onsumption is an omnipresent aspect of the modern world that can only be ignored by losing contact with social reality. By the same token, if it is recognized that consumers are part of the current ecological problem, it is reasonable and fair to assume that consumers are also part of developing more sustainable solutions.[381]

Regarding reducing meat consumption in Western countries for environmental, public health, and animal welfare reasons, plant-based meat can play a role in achieving these significant goals.

This Article has explored the ways in which labeling can be used by plant-based producers to communicate the similarity and superiority of their products in comparison to animal-based meat. As the discussion of consumer purchasing drivers and barriers has shown, conveying these attributes can make a significant impact in persuading consumers to substitute plant-based for animal-based meat. The Article also discussed why efforts to thwart communication of alt-proteins as "meat" are not only unconstitutional but they are also unlikely to prevent the products from becoming more widely accepted.

Currently, alternative proteins—both plant-based and cell-based meats—represent theories of change that can, and should, be tested to determine whether they are serving as more sustainable and healthy substitutes for animal-based meat consumption. As the companies and alternative protein products continue to evolve, so will the discussions and debates regarding the products' names and attributes. We can also expect companies to use creative marketing and labeling claims to communicate their assertions of benefits. Alt-proteins are not silver bullets, nor are they unqualified goods that can simultaneously reverse climate change, improve public health, and end animal suffering. Yet, they do have the potential, which should be researched and evaluated, to be a better option in terms of human, nonhuman animal, and planetary health. In addition to affordability and availability, labeling

---

379 Eivind Jacobsen & Arne Dulsrud, *Will Consumers Save The World? The Framing of Political Consumerism*, 20 J. AGRIC. & ENV'T ETHICS 469, 469–82 (2007).

380 De Bakker & Dagevos, *supra* note 79, at 887.

381 *Id.*

can play an important role in providing eaters with information that enables them to make such a choice.