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Critical reflections on "humane" meat and plant-based meat "alternatives"

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Abstract

Canadians are among the top meat consumers in the world. Greenhouse gas emissions, biodiversity loss, animal stress and suffering, worker health and safety, and cardiovascular disease are among the multitude of issues tied to high rates of meat consumption. In response to rising concern and debate over the impacts of meat consumption, two sectors of the food industry have grown considerably in recent years: "humane" meat and plant-based meat "alternatives." The former attempts to ameliorate harms via more ethical farming practices, and the latter utilizes technological innovations to replace animal-based meat. In this article, we outline a dilemma wherein pathways to more sustainable and ethical food systems may require both an acceptance of these solutions and a push beyond them towards more complex, systemic changes. We conclude with a brief discussion of critical food guidance, and the potential roles of law, regulation, and policy in driving incremental but important changes.

Keywords: Animal welfare; critical food guidance; food systems; sustainability; ultra-processed

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Introduction

Over the past fifty years, levels of global meat consumption have increased tremendously (particularly poultry, pig, and cattle), and Canada ranks among the top fifteen countries with an average of 93.68 kilograms of meat consumed per person per year, or the equivalent to approximately 257 grams (nine ounces) per day (FAO, 2019). This trend is a significant cause for concern, as meat-based diets demand more energy, land, and water resources than diets based on plants (Pimentel & Pimentel, 2003; Tilman & Clark, 2014). However, there is considerable debate about the exact impacts and the variation between production methods (Garnett et al., 2017; Katz-Rosene, 2020). Scholars also note that human health risks are a key concern; for example, high levels of meat consumption have been associated with several different types of cancer and increased incidence of cardiovascular disease (Willett et al., 2019). Added to environmental and human health risks is a range of other issues tied to global meat production, including harms to animals and dangerous working conditions in slaughterhouses due to high production speeds (Fitzgerald, 2015; Weis, 2007, 2013a). As it is now well established that industrial meat production has significant social and environmental consequences for our planet (see Lappé, 2010; Weis, 2013b), a variety of responses have emerged. Here we focus on two trends: "humane" meat and plant-based meat "alternatives."

In July 2018, fast-food restaurant chain A&W Canada began selling the 100% plant-based "Beyond Meat" burger. Greeted with more popularity than expected, the new veggie burger sold out in a matter of weeks (Skerrit, 2018). Beyond Meat is a plant-based meat alternative company with a mission to help address the health, environmental, and animal welfare issues associated with livestock production and consumption; their products are sold in grocery stores, restaurants, and other venues (Beyond Meat, 2022). The rising popularity of plant-based meat substitutes, which are often (but not always) ultra-processed[1], has grown in tandem with an increased focus on sustainability and animal welfare conditions in the meat industry. For example, McDonald's Canada has made commitments regarding the sourcing of "certified sustainable" beef, adopting standards to improve soil health and minimize animal stress (The Canadian Press, 2018). These two trends warrant further critical reflection regarding their potential benefits and drawbacks.

"Humane" meat is meant to offer consumers an ethical meat option (via privately managed animal treatment standards that exceed industry minimums), and plant-based meat "alternatives" are meant to circumvent the problems associated with meat production by introducing a replacement to industrial livestock agriculture and the consumption of animals.

[1] Ultra-processed foods are industrial formulations of ingredients, made to be ready-to-eat, highly palatable, marketable, and profitable. These products often displace other food groups in the diet (Moubarac, 2017). Examples include: sweet or savoury packaged snacks; chocolate, confectionery; mass-produced breads/buns; margarines and spreads; ready to heat products including pre-prepared pies, pasta, and pizza dishes; poultry/fish "nuggets"/"sticks", sausages, burgers, hot dogs, and powdered/packaged "instant" soups, noodles, and desserts.

While radically different in their solutions for addressing mounting concerns over the sustainability and ethicality of meat consumption, both "humane" meat and plant-based meat "alternatives" are enveloped and entangled in similar complexities and contradictions related to the functioning of the broader food system. That is, neither sector is capable of offering solutions that fundamentally and effectively address the systemic causes of unsustainable, unhealthy, and unethical food production and consumption practices. Our exploration reviews ongoing debates over these two trends, focusing on the overall complexity of finding sustainable and ethical solutions to the overproduction and overconsumption of meat. The notion of *critical food guidance* reveals a pathway for beginning—and renewing—critical, reflective dialogues over food.

Critical food guidance, as introduced by Sumner and Desjardins (2022, this issue), is about opening the idea of food guidance beyond the narrow framings of the status quo and using inclusive and operationalizable principles and actions capable of generating transformations to a more sustainable food system. Meat consumption represents a critical point of debate within this overall project of critical food guidance. High rates of meat consumption, made possible by industrial-scale production, are a global concern, and "humane" meat and plant-based meat "alternatives" provide important sites for exposing the complexity and intractability of this problem. In this article, we present a broad review of literature on the global impacts of meat consumption and the rise of these two sectors of the food industry. Our aim is to add further nuance to current understandings of meat and its complex connections to sustainability, health, and ethics. We end our analysis by detailing three examples wherein law, regulation, and policy related to meat and plant-based meat "alternatives" can play an important role in shifting actions, ideas, and dialogues for both consumers and producers alike and can open up conversation for more critical food guidance.

Critical reflections on "humane" meat

The advent of "humane" meat certification programs

The rise in global meat consumption is made possible by the industrialization of animal farming, including the introduction of factory farming using "Concentrated Animal Feeding Operations" (CAFOs), which maximize production while compromising animal welfare (Cassuto, 2014; Weis, 2007) and the physical and psychological distress of workers in modern slaughterhouses (Fitzgerald, 2010; Genoways, 2014). In 2020, the COVID-19 pandemic projected a global spotlight onto the working conditions and risks associated with slaughterhouses and meat packing plants (Middleton et al., 2020). Overall, however, animal welfare concerns are largely "out-of-sight, out-of-mind" for the average consumer. The production and consumption of animal products have been normalized within modern industrial societies (Fitzgerald, 2015;

Fitzgerald & Taylor, 2014). This normalization process renders animal welfare concerns inconsequential, hidden, and ignored. Growing recognition of—and debate over—the rights and welfare of animals has led to important reactions, not only from consumers and food/environmental activists, but the meat industry as well.

In response to growing concerns regarding the conditions of CAFOs and slaughterhouses, and the harms experienced by animals destined to become food, a more sustainable and humane form of animal agriculture has become a priority for the industry (and for some consumers). Temple Grandin, perhaps the most famous proponent of improving animal welfare conditions in livestock agriculture, has pioneered many methods for low stress handling, restraint, stunning, and transport of farm animals (Grandin, 2008; Grandin & Johnson, 2009). Attention has also been paid to the potential impacts that animal stress can have on the quality of meat (Ferguson & Warner, 2008; Lebret & Čandek-Potokar, 2021). The management and care of farm animals has become a scientific field of its own, focused on the development of animal welfare standards based on scientific research from fields such as animal and veterinary science, as well as animal behaviour, stress physiology, and veterinary epidemiology (Fraser et al., 2013). This science-based approach to animal welfare plays an important role in law, regulation, and policy.

In Canada, the nationally developed *Codes of Practice for the Care and Handling of Farm Animals* provides guidance on animal care requirements and recommended practices for livestock agriculture across the country. These are "science- and consensus-based" *Codes of Practice* developed by the National Farm Animal Care Council (NFACC), which include requirements based on federal and provincial regulations as well as recommended practices designed to improve animal welfare conditions (NFACC, 2022). Unique Codes are developed for different species using a seven-step process that involves industry representatives (via a Code Committee), scientists (via a Scientific Committee), and feedback from the public (NFACC, 2022). Overall, it is the voluntary aspects of these Codes, and their development with and by industry stakeholders, that Bradley and MacRae (2011) point to as a key challenge regarding the legitimacy (and uptake) of these welfare standards. Relatedly, while noting some positive elements to the NFACC's codes and processes, Sankoff (2019) raises criticism over the level of industry self-regulation and level of control over the narrative regarding farm animal welfare. For consumers not satisfied with the NFACC's codes, or Canada's broader regulatory standards, "humane" meat has emerged as an answer.

Put simply, "humane" meat can be understood as privately developed and managed quality assurance guarantees for animal treatment that exceed minimum industry standards. Currently, several third-party certification programs are operating in Canada for labelling meat that has been produced with some form of improved animal welfare considerations. These include Certified Humane Raised and Handled issued by Humane Farm Animal Care (2022), Certified Animal Welfare Approved issued by A Greener World (2022), and Animal Welfare Certified issued by Global Animal Partnership (2022)—all of which are U.S. based organizations. Additionally, the SPCA Certified program issued by the British Columbia Society for the Prevention of Cruelty to Animals (BC SPCA) ran from 2002 to 2020 but has since shifted

to supporting these three international programs (BC SPCA, 2022). Furthermore, Organic Standards also include specific animal welfare considerations, for instance regarding shelter, animal stress, and stocking rates (Canadian Organic Growers, 2021). What remains unclear, however, is the extent to which these "humane" certifications surpass industry standards like the NFACC's *Codes of Practice*. Furthermore, it is also unclear whether further harm may result from the circulation of discourses regarding meat that is deemed "humane", and therefore freed from any moral self-regulation.

What does "humane" mean, and who gets to decide?

In December 2020, U.S. based non-profit Farm Forward released a report criticizing "humane" meat certifiers, labelling these schemes as a form of consumer deception and "humanewashing" due to the limited extent to which these programs implement improved animal welfare conditions (Decoriolis, 2020). Exemplifying this, a false advertising complaint was filed in 2016 by the not-for-profit legal defense fund Animal Justice. It argued that Safeway's use of the Certified Humane label, issued by Humane Farm Animal Care, used language and imagery regarding their chicken meat products which was deceptive and misleading (Animal Justice, 2016). Chickens were described as being provided "ample space" in "cage-free environments", but, in terms of actual standards, this meant "that producers may not exceed thirty kg/m^2, or approximately fifteen birds per square metre" (Animal Justice, 2016). Not only is it already standard practice to not cage broiler chickens (as opposed to egg laying hens), but Canadian standards call for a maximum of thirty-one kg/m^2, nearly equivalent to the improved standards for the certified "humane" meat (Animal Justice, 2016; NFACC, 2016). In addition to the consumer-side issue regarding the unclear meaning of "humane" labels, there have also been reactions from the wider meat industry regarding which animal welfare considerations count as "humane."

The Alberta beef industry provides an instructive example of producer-side debates over which farming practices are considered "humane." Alberta produces more beef than any other province, accounting for over two-fifths of the country's cattle in 2016, including 3.34 million beef cattle (Statistics Canada, 2017). Not only are the business interests of this sector supported by organizations like the Alberta Beef Producers who represent the province's 18,000 beef cattle producers (Alberta Beef Producers, 2022), but Alberta beef also boasts significant and dedicated public support (Blue, 2008). This context contributed to industry and consumer backlash against Vancouver-based restaurant chain Earls, who announced in April 2016 that they would source beef from the U.S. instead of Alberta because suppliers were unable to offer enough certified humane products to meet their demand (Rieger, 2016a). Several Canadian politicians joined the wave of criticism, including Brian Jean (then Opposition Leader of the Wildrose Party), Brad Wall (then Premier of Saskatchewan), and Jason Kenney (then Member of Parliament, Conservative Party of Canada), who took to Twitter to argue that Canadian beef is (already)

produced humanely (Postmedia News, 2016; The Canadian Press, 2016a,b). Amidst backlash and consumer boycotts, Earls issued an apology and reversed their decision to not source beef from Alberta (Rieger, 2016b; The Canadian Press, 2016a,b). So, while organizations like Animal Justice have demanded more from "humane" meat certifiers, meat industry actors defend the farm animal welfare standards already being used in Canadian agriculture. Beyond debates over what constitutes "humane," there are important connections being drawn between the "humane" meat industry and campaigns to lower or limit how much meat is consumed.

In 2016, Maple Leaf Foods—Canada's largest food processor (Maple Leaf Foods, 2022)—launched a brand called Greenfield Natural Meat Co. to provide ethically raised, sustainable meat options (Pedersen, 2017). In addition to promoting their products (mainly pork) as "humanely raised" (Greenfield Natural Meat Co., 2022), in 2017, Greenfield advocated for Meatless Mondays (Vasil, 2019), the global campaign to forgo eating meat for one day per week. Additionally, Maple Leaf Foods has become a major actor in the plant-based meat "alternatives" space (Vasil, 2019), which is explored further in the subsequent section. Such business ventures may be viewed, in part, as means to obtain moral legitimacy on topics of social and environmental concern (Fuchs, 2007). These are critical examples of meat industry actors seeking to capitalize on both the trend toward eating meat viewed as morally and ethically acceptable as well as the trend away from eating meat, or at least consuming it less often.

Some scholars have pointed to the danger of "humane" meat discourses (e.g., "happy meat") that aim to make people more comfortable with eating meat, and thereby work to perpetuate the exploitation and oppression of non-human animals (Cole, 2011; Francione & Garner, 2010). Mason and Singer (1980) take issue with meat certified as "humane" without a clear definition of what constitutes "humane" practices—for instance, should "humanely" raised chickens be granted access to the outdoors? Meat eaters seeking ethical options may face challenges attaining their consumption goals, as "humane" meats may not meet their expectations, and potentially misleading labels add further confusion (Rothgerber, 2015). Furthermore, options for "humane" meat add further complexity to food discourses that are unevenly experienced. For example, "humane" meat discourses have gendered implications wherein mothers are tasked with confronting the paradox of educating children on ethical choices while shielding them from the realities of animal slaughter (Cairns & Johnston, 2018). Overall, it remains unclear whether the advent of "humane" meat will make significant changes to the overall experiences and consumption patterns of meat eaters, as the distinction of "humane" meat on grocery shelves offers little opposition to conventional agriculture, instead offering a "premium" meat product to consumers, and a "unique selling proposition" for meat companies.

It is also unclear if "humane" meat consumers are typically part of the movement towards eating less meat. This is a key point, since some of the more humane methods of animal agriculture will require compromises in production yields, bringing attention to the feasibility of humane and sustainable livestock production in the global food system (Erb et al., 2009). Meatless Monday campaigns are complicit in complicating these ethical and environmental

discourses. As Morris (2018) outlines, Meatless Mondays (or, in the U.K., Meat Free Monday) help to depoliticize associated environmental and animal rights and welfarist movements; Meatless Mondays are depicted in the media as an easy and reasonable change that can benefit the environment and reduce animal lives lost. In his study on the neoliberal tendencies of Meatless Mondays, Ross Singer (2017) suggests these campaigns are more likely to get people to try meatless meals occasionally than to adopt substantive, long-term dietary changes towards completely plant-based diets or reduced meat consumption. This overall perpetuation of the status quo is reflected in environmental organizations more broadly, who tend to favour less-radical initiatives when promoting changes to consumer behaviour such as diet (Freeman, 2010). The advent of "humane" meat has triggered a discursive battleground over the morality of animal agriculture, and ambiguity and uncertainty over what "humane" means is further complicated by the parallel rise in meat "alternatives."

Critical reflections on plant-based meat "alternatives"

Plant-based meat alternatives: "Impossible" and "Beyond"

While the actors discussed above concentrate on creating a "better" meat industry, others are focused on replacing the consumption of traditional meat products with plant-based "alternatives." The plant-based foods industry has grown rapidly in recent years, with the launch of the Plant-Based Foods Association in March 2016 and several investors and food industry insiders pointing to growth potential in this sector (Collins, 2018; FAIRR, 2016; Food in Canada, 2018; Plant Based Foods Association, 2018). According to Euromonitor (as cited in Ng, 2020), as of 2020, the global meat substitute sector is worth $20.7 billion and is expected to grow to $23.2 billion by 2024. In Canada, between 2013 and 2017, global meat substitute launches nearly doubled, and the segment grew ninety percent in the five-year period preceding 2018 (Food in Canada, 2018). Grocery sales surged throughout 2020, with people forced to cook at home amid lockdowns. Plant-based meat performed particularly well, outpacing the growth of animal-based meat and having clear benefits in terms of supply chain stability (Gaan, 2020). The rise of the plant-based sector is associated with many of the same concerns as the "humane" and "sustainable" meat industries, but it has also been propelled forward by distinct concerns regarding the health value of a plant-based diet.

Ultra-processed meat alternatives are a major part of this growing sector. Some of the biggest names have been around for decades, including Tofurky, which originally launched in 1980 with the Turtle Island Food Company selling tempeh (Tofurky, 2018). In 1995, the company introduced its namesake item, Tofurky (Tofurky, 2018). Similarly, Yves Veggie Cuisine has been around for over twenty years (Yves Veggie Cuisine, 2018). In the past decade, there has been explosive growth in this sector, with the appearance of a wide variety of

companies making plant-based meat alternatives. These foods are considered meat alternatives mostly due to the high protein content provided by their soy, pea, or gluten base, as well as their attempt to mimic the appearance and taste of meat. Growth in the traditional meat alternatives category has also been paralleled by rapid growth in companies looking to replace other animal products, including plant-based egg and seafood replacements (Atlantic Natural Foods, 2018; Eat Just, 2021; Ocean Hugger Foods, 2018; The EVERY Company, n.d.).

Companies at the forefront of the alternatives market have recently become the target of acquisition by Big Food[2] companies and investors looking to diversify their portfolios (FAIRR, 2018). In 2017, Nestlé acquired Sweet Earth, a meat alternative maker, and the following year, Unilever acquired Dutch-based company the Vegetarian Butcher (Watson, 2017; Wood, 2018). Meanwhile, another Big Food giant, Danone, acquired milk alternatives behemoth WhiteWave (Danone, 2018). Maple Leaf Foods has worked to revamp its product portfolio, making a pledge to become the "most sustainable protein company in the world" (Maple Leaf Foods, 2018a); to achieve this goal, the company has acquired a number of "sustainable meat" companies as well as some meat-alternatives companies, including Lightlife and Field Roast (Maple Leaf Foods, 2017a; 2017b). These acquisitions are being celebrated as a way to scale up the consumption of plant-based products, while at the same time several vegan organizations have pointed to the acquisition of new plant-based brands as hypocrisy from a company that also sells animal products (Ettinger, 2017).

Simultaneously, the same fast-food companies that are pushing for "humane" and "sustainable" animal-based products are providing options to non-meat eaters and to those curious to experiment with plant-based diets. As mentioned, A&W Canada has received some of the widest attention in this respect with the launch of their Beyond Meat Burger in the summer of 2018, which quickly sold out across the country (A&W Food Services of Canada, 2018). Beyond Meat has gone on to see rollouts in other restaurants and has become a staple in the vegetarian options from meal kit delivery company Hello Fresh (Beyond Meat, 2019). The Beyond Meat Burger's popularity further demonstrates a growing desire for meat alternatives. Selling features for the Beyond Meat Burger include claims that it "looks, cooks, and tastes like a fresh beef burger" while still having twenty grams of protein, with no genetically modified organisms (GMOs), soy, or gluten (Beyond Meat, 2018). The company's website features a side-by-side comparison of the burger's nutritional information with a traditional beef patty, showing how the plant-based burger outperforms the competition across a range of nutritional markers (Beyond Meat, 2018).

The biggest competitor to Beyond Meat is the Impossible Burger, a plant-based burger that promises to deliver a meat-like texture and flavour (Impossible Foods, 2018a). The Impossible Burger uses genetic engineering to deliver this flavour, which comes from heme (iron); DNA from the root of soy plants is inserted into genetically engineered yeast which is

[2] Big Food organizations refer to transnational food and beverage manufacturing corporations that control more and more of the production and distribution of ultra-processed food products globally (Monteiro & Cannon, 2012).

then fermented to produce higher concentrations of heme than would be possible otherwise (Impossible Foods, 2018a). These innovations, and others like them, can be expected to gain momentum as the plant-based meat alternative sector continues to grow; however, questions remain about their ability to transform eating habits and truly tackle the status quo of meat consumption.

Ultra-processed and corporate controlled foods—a panacea or a smoke screen?

Given the outstanding questions associated with "humane" and "sustainable" meat, it would seem to be a given that the meat alternatives sector is positioned to make more robust changes to our eating habits. However, the growing use of ultra-processed meat alternatives brings its own host of challenges. Ultra-processed foods have become the focus of a growing body of literature. Numerous authors have demonstrated that diets high in these foods continue to spread globally, while being associated with negative outcomes for dietary quality across a number of metrics (Fardet, 2016; Juul & Hemmingsson, 2015; Louzada et al., 2015; Luiten et al., 2016; Monteiro et al., 2013; Monteiro et al., 2018). In high-income countries, ultra-processed foods now represent roughly fifty to sixty percent of total food consumed (Juul & Hemmingsson, 2015; Monteiro et al., 2013; Monteiro et al., 2018). These food products have been associated with diets that are lower in micronutrients and higher in sugar and sodium, while being less satiating and potentially leading to increased caloric consumption (Fardet, 2016; Louzada et al., 2015; Steele et al., 2016).

While not all plant-based alternatives are created equal, the use of plant-based meat alternatives popular in the fast-food sector in particular may perpetuate the consumption of foods that are higher in fat and salt and are associated with poorer overall dietary outcomes (Bowman et al., 2004; Janssen et al., 2018; Jiao et al., 2015; Schlosser, 2012). The introduction of these products allows fast food companies to "solve" the meat problem while still bringing customers through their doors. Not only are many other foods they are selling associated with less nutrient-dense diets, but the consumption of these products also often uses wasteful take-away packaging (Aarnio & Hämäläinen, 2008). While a single focus on the health implications of these particular products is not the issue here, the simple replacement of meat products with meat alternatives should be considered critically as it does not question status quo societal level eating patterns. Simply replacing meat with plant-based meat alternatives does not engage or educate citizens through critical food guidance on the protein-rich, potentially environmentally friendlier, less-processed lentils, nuts, whole grains, peas, and beans advocated for by nutritionists (Young, 2019). At the same time, it does not question narratives regarding our personal responsibility to eat better, nor does it question the discourses used by corporate actors that stand to gain from the continued consumption of these products.

An important and ongoing challenge in dietary change conversations revolves around individual change versus systemic change. The benefits from mass reductions in meat

consumption have been the subject of much research, with a variety of studies showing reduced GHG emissions, reduced water use, and even health benefits that would result from decreased consumption of meat, suggesting it is one of the most important ways to bring our food system within environmental limits (Springmann et al., 2016; Springmann et al., 2018a; Tilman & Clark, 2014). Discussions of the individualization of behaviour change have become a key part of debates on numerous environmental behaviours (Maniates, 2001; Osbaldiston & Schott, 2012). Food is made even more complicated by the fact that people need to eat, and food is deeply personal. How do we create changes to individual habits at a systemic level? There is currently a growing literature in behavioural economics that attempts to answer this question (Kahneman, 2013; Thaler, 2016). However, to date, this literature has been fairly inconsistent in the food space, rife with methodological challenges, and focused on obesity and health rather than sustainability (Bickel & Vuchinich, 2000; Hamblin, 2018; Just & Payne, 2009; Resnick, 2018). Similarly, in the environmental space, there has been a vast literature that shows promise but does not offer easy answers or steadfast rules, given the complexity of human decision-making (Lehner et al., 2016; Osbaldiston & Schott, 2012; Schubert, 2017).

There has also been debate around moralizing and individualizing consumption choices in a way that is classist, elitist, racist, ableist, and sexist. Considerable work has shown how health and ethical discourses have created eating ideals that may result in further marginalization and judgement (Biltekoff, 2013; Johnston et al., 2011). In a commentary, Trembath (2019, para 9) articulates this point: "I can't help but notice that when fake meat was the purview of food utopians and visionary chefs, thought leaders were enthusiastically in favor of it. But as soon as fake meat hit the plastic trays at Burger King, they were fretting about how over-processed it was." Parker (2020) argues that public health nutrition discourses on risk, health, and environment individualize through market neoliberalism and choice, and reinforce dominant narratives of femininity and what it means to be a good citizen. Systemic shifts in meat consumption patterns and the narratives, policies, and ideals we reinforce to reduce meat consumption are intertwined with broader societal debates on class, race, and individualization. Critical food guidance has an important role to play in highlighting these nuances to ensure our pursuit of health and sustainability goals does not mean trade-offs in terms of equity and justice.

Recent literature on the consumption of meat substitutes has shown that the "substitution effect may not be as large as hoped for in the transition to more sustainable food behaviour" (Siegrist & Hartmann, 2018, p. 5). Simultaneously, this study found that increasing consumer knowledge of the ecological implications of certain food choices could lead to more sustainable choices (Siegrist & Hartmann, 2018). However, others have cautioned that consumers consistently underestimate the environmental impacts of the meat industry, focusing instead on more visible issues such as packaging (Macdiarmid et al., 2016; Tobler et al., 2011). These studies highlight the complexity of achieving behaviour change and challenge the assumption that simply offering alternatives will create a shift.

Structural changes that nudge consumers to eat less meat may be one piece of the puzzle for reducing meat consumption. However, the norms and behaviours that have led to current

intake levels of meat are not fundamentally challenged by the consumption of meat "alternatives." This is especially significant when considering corporate actors that have become heavily involved in this industry. Ultimately, there are various pathways to meat sustainability, but, as Katz-Rosene and Martin (2020) demonstrate, whether it is "replacement, modernization, or restoration," there are those that stand to win and those that stand to lose. With actors advocating the benefits of each pathway, there are also contradictions between the three (Katz-Rosene & Martin, 2020). Inconsistencies apparent in a variety of pathways to meat sustainability point to the complexity of this issue, and the narratives that may be accompanied to advocate for each pathway. Corporate actors that are selling ultra-processed meat alternatives stand to gain financially from pathways that lead to less meat consumption overall, and they are thus active in promoting their alternatives as a way to reduce the environmental burden and to deal with issues of animal welfare. Interestingly, as noted earlier, Maple Leaf Foods are attempting to engage in a variety of meat sustainability pathways by diversifying their portfolio to include meat products made sustainable by their production methods, meat alternatives, and traditional meats; they claim they are working with farmers to demand changes, for example by transitioning sows from gestation crates to "advanced open housing" (Maple Leaf Foods, 2018b). Such attempts to have it all create another space wherein critical food guidance is needed—the "treadmill of production" (see Schnaiberg, 1980) facilitates the integration of sustainability, health, and economic goals, often with the latter being prioritized.

The connected nature of the meat industry and alternatives brings to light questions of how to raise awareness of the complex challenges of meat while simultaneously giving rise to new ethical questions over who controls this industry, and where consumer dollars end up. Companies in the meat industry face numerous questions around their moral legitimacy, given their two-sided role. On one side, they contribute to the environmental, health, and animal welfare problems associated with production; on the other side, they offer public debates on these issues (see Fuchs, 2007, p. 144). The meat alternatives industry is not immune to this response. The technology used for the Impossible Burger is a salient example, as it has not been without its controversies. Aside from concerns about the genetic modification of foods (e.g., Lappé, 2010), the company was targeted by PETA (People for the Ethical Treatment of Animals) after it was revealed that lab testing on rats was conducted, prompting a response from the company defending the need for this testing to gain Federal Drug Administration (FDA) approval for their product (Impossible Foods, 2018b). Impossible Foods argued that the backlash was undermining the cause, but many were not convinced about the seeming incompatibility with the company's mission to "make meat using plants, so that we never have to use animals again" (Impossible Foods, 2018a; Hoar, 2018). In 2019, there was further controversy when Moms Across America, an advocacy group, claimed that Impossible Burgers contained eleven times higher levels of the controversial herbicide glyphosate (which they deemed dangerously high levels) when compared with Beyond Meat burgers (Moms Across America, 2019). Impossible Foods has rebuked these claims, and it appears that the controversy has largely blown over with little media coverage on this issue after 2019 (Impossible Foods, 2019). These

examples illuminate the complexity of seemingly "easy wins" in efforts to shift away from meat consumption. Questions remain over how much of an alternative to the challenges of modern diets these products provide. While certainly replacing meat, these products still create questions that require further dialogue and demonstrate a need for critical food guidance.

Critical food guidance and meat

Industrial capitalist agriculture for meat production comes at a cost. Costs include disease threats (e.g., swine and avian flu), impacts of fertilizer and other chemical runoff, psychological violence associated with factory farms and industrial slaughterhouses, and the suffering of intensively confined animals raised for consumption (Weis, 2010). Significant, global changes are needed regarding the production and consumption of meat products—particularly those tied to intensive and industrial animal agriculture. This will, among a host of other initiatives, necessitate a shift in how meat is valued and understood. As Weis (2013b) describes it, "while the meatification of diets has long been held as a goal and measure of development and a marker of class ascension, it should instead be understood as a vector of global inequality, environmental degradation, and climate injustice" (pp. 81-2). Innovative and nuanced methods for reimagining society's relationship with meat are needed to maintain and accelerate critiques of a *status quo* that views meat as a dietary keystone.

Food guidance recommending more plant-based—and less animal-based—foods, and acknowledging the health and environmental benefits of plant-based diets, are important steps towards more critical and informed processes for making sustainable food choices. However, the complex problems associated with the meat industry are insufficiently addressed by Canada's food guide and industry innovations regarding "humane" meat and plant-based meat "alternatives." Meat eating is a dilemma (Pollan, 2006), a paradox (Loughnan & Davies, 2019), and a problem that needs further problematizing (Katz-Rosene & Martin, 2020). There are numerous socially and historically embedded norms, discourses, behaviours, and ideas that connect meat consumption and production to environmental sustainability, human and animal health, and social justice—few topics can boast such complexity.

Contemporary meat production, processing, and consumption practices are viewed as "stable, normal, and inevitable", and there is a need for action that "destabilizes a normative view of current methods and makes it possible to envision alternatives" (Fitzgerald, 2015, p. 141). According to Fitzgerald (2015), "there is a need to educate ourselves about the ways animals used as food are produced and processed, how this has changed, the consequences thereof, and, importantly, why the current methods of production, processing, and consumption are used today" (p. 141). Reflecting on this need to "educate ourselves," it seems that the entrance of "humane" meat and plant-based meat "alternatives" may represent a welcome start to a much longer and more elaborate campaign towards a more humane and environmentally sustainable food system. However, this campaign will require further frameworks to create the

critical food guidance necessary to build knowledge and skills and to create a food system that falls in line with the principles laid out by authors such as Levkoe et al. (2017), focusing on the integration of social, ecological, and economic sustainability.

Various policies, laws, and regulations offer important opportunities for addressing the increasingly complex problems of the meat industry, in part by enhancing governance tools that limit the powers of corporate players while contributing to the destabilization of norms around meat consumption. These emerging tools and deliberations can play a role in starting conversations that are necessary to inform and bolster efforts towards critical food guidance. How meat is imagined, produced, and consumed varies across time and space; we are constantly adapting and debating our relationship with animals, including those we treat as food. Rules and incentives—deployed through programs, policies, regulations, and laws (government-led or otherwise)—offer a unique means to firmly establish new ideas, norms, and values. Three examples include: (1) proposals for taxation on red meat, sugar, and other foods targeted as problematic; (2) labelling requirements for using words such as "natural," "sustainable," and "humane" on product packaging; and (3) symbolic legislation that recognizes the sentience of animals. Each of these is briefly elaborated in turn.

Proposals for taxation

The idea of implementing a taxation scheme for unsustainable meat products is not new, and is covered extensively by Goodland (1997), who proposes a tax scheme based on an animals' efficiency in converting grains into meat (swine, cattle, goats, and sheep being the least efficient and highest taxed). Denmark, Germany, and Sweden have all considered proposals for taxation on meat, particularly red meats such as beef; these proposals all focused on taxes at the point of sale to the consumer and were created in reaction to growing awareness of climate impacts associated with the meat industry (FAIRR, 2017). Farm Animal Investment Risk & Return (FAIRR) argues that a meat tax is all but inevitable, but showcases various mechanisms for accounting for the environmental and social costs of meat—including New Zealand's inclusion of livestock in emissions trading, Germany's sales tax debates for meat and dairy, and the Netherlands' study into fair meat prices (FAIRR, 2020). Taxes to change consumption behaviour have received increasing attention in the last few years, and in 2019 a Green MP in the UK, Caroline Lucas, continued calls for a meat tax (Harvey & van der Zee, 2019). Sugar taxes have been a popular response to overconsumption of sugar, with the World Health Organization advocating for their use, and early adopters showing promising results (Baker, Jones, & Thow, 2018; Thomson Reuters, 2016). A modelling study focused on the health implications of meat consumption concluded that such a tax would decrease consumption and demonstrated a context-specific optimal level in high- and middle-income countries (Springmann et al., 2018b).

There remains considerable debate over the economic impacts of such taxes, whether they will actually change consumer behaviour, and what should be done with the revenue

generated. In Germany, proposals for a tax on meat and dairy originally advocated for the revenue to go to animal welfare initiatives, but Angela Merkel's Christian Democratic party argued that it would be better spent helping farmers restructure (FAIRR, 2020, p. 13). Others have argued that a meat tax is too simplistic to deal with the complexities of meat consumption and production, while potentially hurting the poorest consumers (Baggini, 2019). While taxes on meat and sugar present their own complications, there is still support for them as a "second-best" instrument, with examples of first-best options (optimal carbon pricing, nitrogen regulation, and ecosystem valuation) continuing to see little uptake (Funke et al., 2021). Regardless of the mechanism, the pricing of meat is an important tactic to consider in the current trajectory of global increases in total meat consumption, the ubiquity of ultra-processed foods, and the array of cultures in which meat holds a central role. Economic instruments such as taxation may be part of the broader picture of adopting critical food guidance and could offer new opportunities to raise awareness, or simply to adjust where dollars end up in the food system.

Labelling requirements

Product labelling in Canada includes a wide range of rules regarding product origins, expirations, allergens, organic foods, health claims, advertising, and a range of other aspects (CFIA, 2018a;, 2018b). There is also a range of labelling requirements for meat products, such as nutrition labelling, grade designations (e.g., AAA), and even stipulations for voluntary claims and statements, for instance "Extra Lean" (CFIA, 2018c). Product labelling laws may offer effective recourse for false advertising concerns raised by Animal Justice about "certified humane" chicken, as discussed above. If industry is given too much latitude with regard to claims in labels and advertising, consumers wishing to educate themselves about the impacts of certain foods may be met with additional hurdles. Debates over labelling discussed below further problematize the issue of "humane," "sustainable," and plant-based alternatives, demonstrating a need for food guidance that critically engages with the complexities of these marketed solutions.

For example, a study on niche markets in California found that the "certified humane" label caused confusion, was not always identifiable to customers, and made up a much smaller market category in comparison to other niche meat categories, specifically "grass-fed," "certified organic," and "naturally raised" (Gwin & Hardesty, 2008). In the plant-based alternatives space, debate has emerged in the last few years over the use of terms such as "meat," "burger," "butter," and "milk". In the United States, several states have passed laws limiting the use of these terms to products coming from livestock, arguing that they create confusion when appearing on plant-based products (Bromwich & Yar, 2019; Danley, 2020). These state-level bills have resulted in a patchwork of different laws across the U.S. (Bromwich & Yar, 2019; Danley, 2020). The introduction of labeling bills has not gone unchallenged, and, in many cases, judges are finding that there is little consumer confusion and that qualifiers, such as plant-based, vegan, soy, or cashew, ensure that consumers understand what it is they are buying (Watson, 2021). In the EU,

attempts to create similar bans on the use of the term burger failed (Berger, 2020). In Canada, the Canadian Food Inspection Agency launched a consultation in late 2020 on "proposed updates to guidelines for industry on simulated meat, simulated poultry, and certain plant-based protein foods" (CFIA, 2020a). The goal of the consultation and updates was to clarify what counts as simulated meat and poultry products and outline the rules for labelling, advertising, composition, and fortification (CFIA, 2020a). No regulatory requirements were changed as a result of the consultations, though the proposed guidelines were updated to help differentiate plant-based meat alternatives from plant-based foods not intended as meat substitutes (CFIA, 2020b).

Labelling is not without its limitations. It does have the potential to further corporate efforts to individualize responsibility, as discussed previously. Other issues arise regarding who controls the industry and the motivations behind different marketing and labelling strategies. As demonstrated, there is some resistance to corporate actors with an interest in meat that are also providing and marketing alternatives. There is also debate over who invests in these companies on broader social, environmental, and health grounds. The investment of Nestlé in Sweet Earth is one example of this, where the company was criticized for working with the corporate giant known globally for numerous scandals related to human health and environmental damage. The CEO went on the defence, stating, "I think there's something wrong with a system that thinks it's great for technology companies to invest in companies that want to change the food system, but somehow it's not right for big food companies to invest in them" (Watson, 2017b, box 1). Further critique, reflection, and education are needed to build a deeper understanding of the complications (and subjectivity) involved in the labelling and advertising of newly created categories of meat and meat alternatives.

Legislation on animal sentience

Generally speaking, Canada's laws involving animals see all animals as property and focus on human interests (Fearon, 2017). The result is a set of laws that permit the raising of livestock animals in confined, intensive, industrial conditions. Considering such legal frameworks, scholars like Gary Francione (1996) have called for "the *incremental eradication of the property status of animals*" (p. 4, emphasis original). In 2015, among other legislative amendments such as banning the use of animals to test finished cosmetic products, the New Zealand Parliament passed an amendment recognizing that animals are sentient (Buchanan, 2015). Quebec, in amending its Civil Code, also introduced amendments to recognize animal sentience in 2015, though an attempt to do the same in 2016 at the national level—through a private member's bill introduced by then MP Nathaniel Erskine-Smith—was defeated in Parliament (World Animal Protection, 2020). While legislative measures such as this may be viewed as largely symbolic in nature, they represent an important, incremental step towards affording animals adequate (if not equal) treatment under the law.

In many ways, legislation contributes to re-shaping social norms and expanding understandings of ethics, morality, and social values—crucial for any notion of critical food guidance. This is particularly relevant to arguments regarding the potential risks of powerful actors co-opting terms like "humane", while failing to challenge the overall *status quo* of meat consumption (Arcari, 2017). There is a need to continuously (re)evaluate the extent to which animal welfare laws and standards reflect public values and opinions with the goal of continuously improving human-animal relations over time.

Conclusion

Critical food guidance is a vision for (re)learning how to eat—it is about both capitalizing on the most cutting-edge technological innovations and returning to methods, ideas, and traditions that have been lost for the sake of profit and convenience. "Humane" meat is an emerging market that attempts to confront the animal welfare concerns of industrial livestock production; accompanying this is the potential for co-opting welfare and sustainability discourses while circumventing demands for substantive change. Ethical, sustainable, and health promoting meat-free alternatives add considerable complexity to this debate, as they are arguably part of the solutions promoted within the principles of critical food guidance. At the same time, ultra-processed meat alternatives may add momentum to global trends toward ready-to-eat meals, thereby eroding the knowledge, culture, and social values embedded in meal preparation. In presenting critical reflections on both "humane" meat and plant-based meat "alternatives," we do not attempt to build a road map toward more sustainable meat consumption, and instead seek to install a warning sign by showcasing the complexities that envelop these two solutions towards ethics and sustainability in this industry. Overall, the development of principles and policies regarding the promotion of more sustainable consumption practices—including the consumption of meat and meat alternatives—demands a dynamic approach, capable of critical self-reflection and constant course correction in light of less-than-ideal solutions.

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