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*Special Issue: Mapping the Global Food Landscape***Meatification and the madness of the doubling narrative**

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The rise of the doubling narrative and the contestability of dietary change

Since 2008, there has been an increasingly influential narrative that world crop production must (“sustainably”) double from current levels in order to feed over nine billion people by 2050 (FAO, 2009; Ray, Mueller, West, & Foley, 2013; Soil Association, 2010; Tilman, Balzer, Hill, & Befort, 2011; UN, 2009), which has been enthusiastically embraced by large agro-input and agrifood corporations. Four prominent drivers feature in this doubling narrative: the magnitude of persistent hunger and malnourishment; further human population growth; expanded biofuel production; and expected dietary changes. At first glance, this conveys the appearance of a sober, objective assessment about the fact that there are many people hungry today, that there will soon be at least two billion more people, that more land is being devoted to biofuels given the limits to conventional fossil energy supplies, and that people with rising incomes will keep eating more animal products in line with past trends, what I have called the *meatification* of diets.¹

However, positioning massive growth in production as the central problem facing world agriculture contains several troubling assumptions. At a basic level, the primacy given to aggregate supply can be considered a spin on the failed neoliberal promise that “a rising tide lifts all boats,” thus obscuring many other deep-rooted problems. These include: the long-term marginalization of peasantries, biodiverse farming systems, and local agro-food networks;

¹ Broadly speaking, this describes the movement of meat from the periphery of human consumption patterns, where it was for the vast majority of agricultural history, to the centre.

profound disparities in effective demand; and vulnerabilities associated with chronic food deficits in many of the world's poorest countries. One of the most crucial and misleading assumptions embedded in the doubling narrative is that the continuing meatification of diets is largely unstoppable. Rather than assuming this trajectory of dietary change is beyond contest, this article summarizes the case for challenging and reversing it, and why this must be a pillar of the efforts to build more sustainable and equitable food systems.²

It helps to start with some broad context. The average person on earth today consumes nearly twice as much meat per year (43 kg in 2012) as did the average person only two generations earlier (23 kg in 1960). During this period the human population leapt from roughly three billion people to over seven billion (Weis, 2013). On the current trajectory, there will be more than nine billion people by 2050, consuming an average of more than 50 kg of meat per year.

It is also important to recognize that meatification is extremely uneven and clearly reflects global inequalities. At the apex, the average U.S. citizen consumes roughly 120 kg of meat a year, whereas the average African consumes less than 20 kg and the average South Asian less than 10 kg (Weis, 2013). These consumption disparities also reflect how rising meat consumption is an underappreciated measure of and aspiration to modernity, nourished by long-held views about the superiority of animal protein, together with some potent cultural attitudes about meat. This can be clearly seen in the fact that increased per capita meat consumption is marked as an explicit development goal in countries such as China and Venezuela, and the rising affluence in fast-growing countries (with important class differences) is projected to have the biggest role driving meatification in the coming decades.

Yet when discussing meatification, we must be clear that there is no nutritional justification, as the overwhelming weight of research on diet and epidemiological patterns strongly correlates this trajectory with an array of negative health outcomes. In particular, the increasing consumption of animal products is a major force in soaring levels of obesity and many non-communicable diseases (NCDs), or so-called “diseases of affluence,” such as cardiovascular disease, Type 2 diabetes, hypertension, fatty liver disease, and some cancers.³ In short, in terms of consumption, meatification is first and foremost about palate pleasure and culture, not necessity or health. The demand for more meat in diets has been further fortified by a powerful economic motivation on the production side, as the cycling of feed through livestock has had a crucial function in profitably absorbing grain and oilseed surpluses, which has enabled their continuing growth when it would have otherwise devastated prices (Weis, 2013; Winders & Nibert, 2004).

² Where not otherwise stated, the discussion draws from Weis, 2013.

³ According to the *Global Burden of Disease Study*, poor quality diets – marked by high levels of unhealthy fats, salt, sugar, and refined carbohydrates and low levels of vegetables, fruits, and legumes – are the largest contributing factor to the magnitude of disease on a world scale, with diet-related NCDs responsible for 63 percent of deaths. Notably, the incidence of NCDs is rising fastest among rapidly industrializing middle-income countries (Lim et al., 2012; Popkin, 2009; Popkin et al., 2012; WHO, 2010).

The meatification of diets is entwined with soaring populations of animals and revolutionary changes in how they are raised. For the vast majority of agrarian history, small livestock populations were used in mixed farming systems for their labour and for milk, eggs, and flesh, grazing on rotational pastures, scavenging on the margins of farm households, and returning condensed nutrients to the land. In contrast, the industrialization of agriculture means physically disarticulating animals from land and mixed farming systems and concentrating them in dense enclosures, and rearticulating them through great volumes of feed from industrial monocultures. This system of agriculture, the industrial grain-oilseed-livestock complex, can be likened to islands of concentrated animals within oceans of corn, soy, and other monoculture crops; it occupies nearly one-third of the world's arable land. There are now more than 70 billion animals killed for food every year with roughly 70 percent of meat by volume from pigs and chickens alone. The industrial production of these two species, led by chicken, is expected to account for virtually all further meatification if it continues. As a result, the annual population of slaughtered animals would reach 120 billion by 2050, before counting fish.

The “ecological hoofprint” is a conceptual framework for understanding the expansive resource budget and multidimensional pollution loads of the industrial grain-oilseed-livestock complex on a world scale. At the basis of this is attention to how political economic imperatives (i.e., the pursuit of economies of scale and the pressure to substitute capital and technology for labour) shape the ways that productive environments are organized in both the oceans of industrial monocultures and the islands of intensive livestock, driving biological simplification and standardization at every turn. The pressure to biologically simplify and standardize productive environments creates or exacerbates a wide range of biophysical problems that must be continually overridden, which necessitates a series of resource-intensive inputs and generates an array of ecological costs, from persistent toxins to greenhouse gas emissions (GHGs).

The damaging impacts of the biophysical overrides in both industrial monocultures and livestock operations are greatly magnified by the inevitable wastage of large portions of useable nutrition in the metabolic processes of animals. This inherent inefficiency also means that the inequality of global meat consumption is tied to great disparities in the per capita consumption of grains and oilseeds. By extension, much more land area, water, energy, and other resources must therefore be devoted to agriculture, while much more pollution and GHG emissions are generated than would be the case if plant nutrition were consumed directly. Nutritional wastage increases further because the land currently given to industrial monocultures could be used more efficiently, in ecological and nutritional terms. The impact of livestock production on the atmosphere is a major reason why meatification not only reflects global inequalities but also serves to exacerbate them, as many of the poorest parts of the world will be most immediately and adversely affected by climate change.

In sum, there is nothing inexorable about the continuing meatification of diets. Rather than assuming the world will continue to funnel vast and growing volumes of grains and oilseeds down the nutritional drain of industrial livestock production, with destructive impacts on health and environments—to say nothing of increased animal suffering—scholars, activists, and civil

society organizations should be struggling to delegitimize this course. This means calling the doubling narrative into question, and exposing it for what it is: a way of mobilizing world hunger and food insecurity to brace continuing global market integration and deepening corporate control over land, technological innovation, and patented seeds and animal breeding stock.

Key challenges and policy directions

The ecological hoofprint helps show why reversing the trajectory of meatification and dismantling industrial livestock production are central to hopes for a more equitable distribution of the world's food supply, reducing agriculture's environmental impacts (including drastically cutting GHG emissions), and building more sustainable, equitable, and humane agricultural systems that are capable of improving conditions of food and nutrition security into the future. In a warming world with so much chronic hunger and malnutrition, which climate change threatens to make much worse and in which industrial livestock is so heavily implicated, there can be no justification for cycling useable nutrition through animals to inefficiently produce food. Radical changes are needed.

Radical activists and scholars have long wrestled with how to effect seismic shifts in thinking and mobilize support for systemic change. One of the most basic dilemmas centres on how much effort should go into pursuing incremental reforms as potential steps towards bigger changes, through realms such as public education, outreach, movement building, and policy advocacy. For some, this approach tends to waste time and energy on things that are too small, too easily co-opted, and too likely to placate people or distract them from the magnitude of problems and the need to build anti-systemic movements that might someday prove capable of reconstructing alternatives in more fundamental ways.

There are numerous examples of this radical-versus-reform divide among individuals and organizations working to challenge industrial livestock production. For instance, can “Meatless Mondays” trigger deeper shifts in consciousness and behavioural change, or are they more likely to satiate potential concerns at a minimal level? Can physical and technical alterations in factory farms, feedlots, and slaughterhouses—like “enhancing” battery cages, banning gestation crates, modifying loading tunnels, improving stunning procedures—mitigate the stress and suffering of farmed animals in meaningful ways, or are they bound to largely serve the interests of capital, reducing damage and wastage, and make it easier to mollify consumers so they will continue consuming animal flesh and derivatives at the same level? Can banning the sub-therapeutic use of antibiotics bring about substantive changes in the ways animals are raised, or is this more likely to affect feed conversion ratios and public health concerns than the nature of productive environments? On these and many other questions it is often hard to find much middle ground between some of the key opponents of industrial livestock production: on one side, farmers with small, free-ranging livestock populations, people fighting for improvements in animal welfare,

and self-described “conscientious omnivores”; and on the other side, militant vegans and people fighting for abolition to all animal use and property relations.

Yet there are also risks in assuming that reformist versus radical tactics are always mutually exclusive, which can serve to fracture rather than build anti-systemic consciousness and movements. This can also exaggerate how definitively we can know where various reforms could potentially grow and coalesce over time, leaving some to ignore prospects for realizable changes that might reverberate in unpredictable ways.

So with due caution about the prospects and pitfalls of reforms, I turn attention to a few reform paths that might help begin to confront meatification. Perhaps the best prospect for substantive reforms is to leverage the growing scientific consensus that strongly links rising consumption of animal products to increasing levels of obesity and NCDs. Nutrition science-based advocacy can stress the enormous public health benefits of plant-based diets and set these against enormous public health care costs and private expenditures on drugs, health insurance, and other services (Campbell & Campbell, 2006; Popkin, 2009). This can piggyback on the dynamic advocacy of behavioural change in favour of plant-based diets that centres on improving individual health and wellness, as evident in the popular documentary *Forks over Knives* (Fulkerson & Corry, 2011; Pulde & Lederman, 2014) and the writing and workshops of best-selling author Rip Esselstyn (2009; 2013). This advocacy might also take aim at national nutritional guidelines, which have long been powerfully and destructively influenced by large corporations (Nestle, 2007).

Another target is to encourage governments to apply excise taxes on animal products that would make them relatively more expensive than more healthful foods, like whole grains, legumes, roots, tubers, nuts, fruits, and vegetables, which can be justified by the strain that poor diets place on health care systems. This could follow on some recent efforts of governments to tax fatty and calorie-dense snacks and drinks in order to reduce their consumption, which were modeled on so-called “sin taxes” for tobacco and alcohol. The push for such taxation could be fortified by the economic case for costing GHG emissions with the unified messaging that dietary patterns that are bad for human health are destructive to the environment. Such efforts would have to stress valuation for real costs, as anything that hints of regulating diets would likely be a political powder keg.

On the production side, there are also a variety of policy mechanisms that might be targeted to deincentivize industrial livestock, and here also campaigns should flag the opportunity to simultaneously improve public health and environmental outcomes. A key objective for scholars, activists, and civil society organizations in this regard is to discredit the subsidy and regulatory regimes that have long helped brace cheap grain and oilseed surpluses. Instead, governments should be encouraged to re-orient agricultural subsidies, research, extension, and other supports towards the most ecologically efficient and sustainable ways of generating sufficient supplies of macro- and micro-nutrients, and to enhance the marketing infrastructure for the distribution of fresh and minimally processed plant-based foods.

I do not believe that most animal welfare reforms will in themselves reverse the course of meatification, following the critique that Gary Francione has made of welfare advocacy (including much of what calls itself “animal rights”). On the contrary, modest gains in this realm can be seen to contribute to further expansion, to the extent that they reduce unplanned deaths, enhance profitability, and wash over consumer concerns (Francione, 2008; Francione & Garner, 2010). However, if more people come to appreciate how animals suffer in these systems, along with their destructive ecological impacts, and connect these to the political economic imperatives that are organizing them, it could be an important part of a bigger, more radical awakening. To this end, praxis must be front and centre in future research.

Questions and areas for future research

We know enough about the pathology of industrial agriculture and the urgent need to transform it, but we need better answers to questions of strategy. Unfortunately, there is a pervasive unconsciousness that surrounds the dominant agrifood system, and the failure to shake this is a big part of why the doubling narrative can hold the sway that it does. Struggles to reverse this destructive course could benefit from research in the following areas:

- 1) What policy mechanisms could serve to deincentivize industrial livestock?
- 2) How can public health and environmental impacts be marshaled to build political momentum for the re-orientation of agricultural subsidies, research, extension, marketing infrastructure, and other supports towards agroecological methods?
- 3) What new approaches to education, media, direct action, and movement and coalition building can help make the problems associated with industrial livestock production resonate much more broadly and deeply than they do now (and in both an intellectual and emotive sense, while taking cultural practices into account)?

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