CHAPTER TWELVE

Rethinking Food and its Eaters: Opening the Black Boxes of Safety and Nutrition

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You are what you eat. This familiar aphorism – a paraphrase of Brillat-Savarin's 1825 challenge, 'Tell me what you eat; I will tell you what you are' (1970: 13) – calls our attention to eating as an act of incorporation, of taking into the body elements of the surrounding world. Food substance is widely understood to carry in it not only material and sensory properties – nutrients, fluid, fats, flavours, properties of cooling or heat – but also symbolic, associative properties that may build up or deplete desired characteristics of an eater's mind, body and character (to take a North American example, consider red meat's association with masculinity). Anthropologists have often presumed that what 'food' *is*, culturally speaking, has to do with how people perceive and comprehend its intrinsic qualities – whether reductively, in terms of material components such as nutrients (cf. Harris 1985), or syntagmatically within classificatory systems of edibility (cf. Douglas 1966) – which qualities are then 'incorporated' into bodies. Either way, when food makes the eater, eating becomes a consequential act. After all, *eating well* is widely associated both with *being well* (health) and also with *doing good* (ethics).

In 'Food as a Cultural Construction', however, Anna Meigs (1987) challenges us to rethink 'food' by looking beyond eating as an act of incorporation. We should not, she argues, presume that what food *is* boils down to intrinsic qualities, culturally perceived. For the Hua of Papua New Guinea, she explains, food does not materially exist in and of itself. Instead, what food *is* – what qualifies edibility, sustenance, even taste – is to them inseparable from *who* tended the yam or raised the pig and what that person's relationship is to a potential eater. For the Hua, Meigs (1987: 104) writes:

> Foods are not inert objects, 'things' to be bought and sold. Rather, they possess the vitality and dynamism of living beings . . . They are alive; alive not only with their own contagious qualities (their rates of growth, textures, smells, and so forth) but also with the transmittable vitality, essence, *nu* of their human producers. Last but not least, foods are alive with the feelings, the emotional intents, of their producers (and to a lesser extent their preparers).

Taking up Meigs's challenge, in this chapter I want to rethink the relationship between food and eating as a straightforward one of incorporation; not only is incorporation anything but straightforward, food and eating can be otherwise conceptualized. Rather than presume an ontology of food and an agency of eating, I want to explore recent ethnographic work, my own and others', which pushes us to view food and eating as mutually constituted within particular cultural and political economic settings (cf. Mol 2008; Abbots and Lavis 2013; Guthman et al. 2014).

In calling into question both the ontological stability of what 'food' is and the biological singularity of 'the eating body', I highlight areas where the anthropology of food can benefit from insights drawn from Science and Technology Studies (STS), particularly in questioning the sociopolitical constitution of scientific objects and knowledge, such as nutrients, pasteurization, hygiene and standards. After all, nutrition science and public health initiatives have colluded in naturalizing the aphorism, 'We are what we eat,' through what Gyorgy Scrinis (2008, 2013) calls the ideology of 'nutritionism' and Jessica Mudry (2009) analyses as 'a discourse of quantification' through which people are taught that amino acids are our bodies' 'building blocks' and that Calcium and Vitamin D 'build strong bones', while calories are necessary 'fuel' burned by metabolism to 'run' bodies. While science studies shows us how 'nature' is often what science (a cultural practice) tells us it is, anthropology is well poised to track the movement of scientific objects and knowledges across social contexts, whether cross-culturally or transhistorically.

In this chapter, I explore how technoscientific means of food preservation – pasteurization, canning, aseptic packaging – and the nutritional tenets of biomedical dietary advice function as 'black boxes'. The term 'black box', defined in the mid-twentieth century by cyberneticians, has been adopted as a term of art by science studies scholars to refer to instruments or techniques that turn inputs into outputs through sets of processes whose logic and workings may be obscure to users (Latour 1987). Black boxes 'work' in so far as they are held together by contingent 'assemblages' of institutions, rules, social hierarchies and tacit understandings. Because of this, black boxes do not always travel smoothly from place to place or from one historical moment to another. Cracks may appear under the strain of new externalities, calling into question what is inside. Examination of how and why black boxes may be coming apart, or were put together in the first place, is useful for investigating the politics of food safety because it illuminates how 'packaged food products condense ideas of quality and safety through material and semiotic connections and exist as a kind of shorthand reference to assemblages of persons, places, and production' (Tracy 2013: 440). Investigation of food-related black boxes illuminates why the pervasive understanding of 'food' in terms of 'nutrients' has not actually translated into a healthier eating public, in the United States (Mudry 2009) or elsewhere (Yates-Doerr 2011, 2012). Indeed, insofar as the black boxes of pasteurization and other technoscientific 'fixes' have been presented as authoritative indicators, even guarantors, of 'good' (safe, healthy) foods, this itself has led to unintended, sometimes deleterious, consequences, including the production and consumption of unsafe food and seemingly poor nutritional choices.

While drawing throughout on other scholars' work on food safety and nutrition, this chapter is centred on my own ethnographic research into American artisanal cheese (cf. Paxson 2013). After undergoing a relentless process of industrialization and automation throughout most of the twentieth century, cheesemaking was returned to American farms in the 1970s by a handful of 'back-to-the-landers' who regarded handcrafted cheese as a quintessential 'natural' food, valued for its symbolic opposition to the bland homogenization and over-processing of industrial foods epitomized by plastic-wrapped, orange slices of processed 'American Cheese'. Since 2000, the number of artisan cheesemakers in the United States has grown exponentially. Moreover, more than half of the country's approximately 750 cheese making artisans today work with unpasteurized (raw) milk. The very quality that gives food safety officials pause about raw-milk cheese – that it is alive with an uncharacterized diversity of microbial life – makes handcrafting it a rewarding challenge for artisan producers, and consuming it particularly desirable for epicurean and health-conscious eaters drawn to its complex flavours and purportedly 'probiotic' aspect (Paxson 2008). Nutritionism, after all, has led to a dominant view of food as 'simultaneously alimentary and therapeutic – increasingly a tool for intervention in the health and character' of bodies (Landecker 2011: 168).

Given this context, it becomes especially important to understand how constitutionally unstable foods such as handmade cheeses – or the botulism-prone home canning that Elizabeth Dunn (2008) brilliantly analyses as reflective of the decaying post-Soviet Georgian state – are material embodiments of ecosocial worlds that are far from uniform, and are riddled with politics. By including beneficial microbes such as lactic acid bacteria, as well as the harmful *E. coli*, *Listeria monocytogenes, C. botulinum* and the like, in our accounts of food politics, exploration of *microbiopolitics* extends the scaling of agro-food studies into the body, into the gastrointestinal – and out into broader political ecologies and environments (Paxson 2008). How might regulation, not to mention everyday eaters, take account of such contingent materiality?

In addressing this question, here I examine the construction and fate of a number of black boxes embedded in contemporary foods and food supply chains having to do with efforts to ensure the health and safety of eaters. By no means is my aim to be comprehensive. Rather, I mean to offer emblematic cases concerning food production as well as consumption. I begin with cheese.

WHAT *IS* CHEESE?

Cheesemaking is an ancient means of preserving milk. Cheese is a good source of protein and calcium. Cheese is dangerously full of fat and cholesterol. Cheese is an animal product. Cheese is a dairy product. Cheese is comfort food. Cheese is an ingredient. Cheese is an industrially fabricated commodity good. Cheese is an artisanally crafted luxury. Cheese is alive with a diversity of microorganisms. Cheese is delicious. Cheese causes indigestion.

That these claims may simultaneously all be true calls into question what it is that we are talking about when we talk about 'cheese'. As a category of foodstuff,

cheese names an interplay of substance and form: cheese results from acidifying and curdling milk and removing much of the watery whey; the remaining solids, rich with the *substance* of protein casein (whence the German word *Käse* and the English *cheese*) can be *formed* (whence the French *fromage* and Italian *formaggio*) into an infinite variety of shapes, sizes and types. Many of us 'know' cheese by specific types: Cheddar, Brie, mozzarella, etc., even if not all of us eat it. Abstention from a Brie-type cheese, for example, could be motivated on a number of grounds. The edibility of such a food may be called into question by a dairy allergy or lactase impersistence, or by commitment to an ethical stance such as veganism, or to a medicalized sense of well-being, as with cholesterol-free or low-fat diets.[1] Culinary context may matter: if the cheese is sliced and served atop a hamburger, an otherwise edible food can be made inedible for those following Kosher diets. Moreover, cheese's palatability may be compromised by an eater's particular sensitivity to odour, texture or flavour, as informed by prior exposure and association. 'Brie' cheese may be both edible and palatable for a particular person today but not in the future; edibility may be compromised by pregnancy (a discussion of cheese and pregnant eaters will be presented below), while palatability may vary from one cheese to another, or even from one day to the next with the very same wheel of cheese. After all, a cheese's 'becoming' is never completed. Teeming with bacteria, yeasts and moulds, cheese continues to ripen (or, from another perspective, decompose) until it is eaten, ingested, incorporated – or tossed out fully to rot.

Cheese's inherent instability, then, its resistance to standardization – particularly when made artisanally, without the standardization of ingredients and manufacturing process that characterizes industrial production (Paxson 2013) – draws our attention to its unfolding and contingent character and to the fact that edibility and palatability are *relations*. Those relations are not merely the outcome of cheese's place in various classificatory calculuses (as Mary Douglas might suggest: either pure or dangerous), but are instead entangled with broader social, agricultural and bio-cultural dynamics. The living substance of cheese continuously oozes through its discursive and technoscientific packaging. Cheese helps us to see how the 'goodness' of foodstuffs resists black boxing, whether it is the guarantee of safety (which I will address in the next section), or the rational promise of nutritional reductionism to maximize well-being (the focus of the subsequent section).

PROCESSING BLACK BOXES: THE HAZARDS OF ONE-SIZE-FITS-ALL REGULATION

In the United States, cheese safety is promoted through pasteurization. Since pasteurization kills virtually *all* naturally occurring microorganisms in milk, in order to make cheese, pasteurized milk must be reseeded with commercially available strains of lactic acid bacteria, called 'starter cultures', to set in motion the acidification and curding that leads to cheese. Pasteurization, introduced to American cheese factories beginning in the late 1920s, enabled larger quantities of milk to be pooled from more numerous and bigger dairy farms; the cheese industry adopted

routine pasteurization in order to extend the shelf life of a perishable product and to expand its market reach – that is, more for economic than for strictly health and safety reasons.

In the United States, public health concern over cheese made from unpasteurized milk dates to the Second World War, when an outbreak of typhoid among overseas service people was traced to heat-treated (but unpasteurized) Cheddar contaminated with *Salmonella typhimurium*. After a subsequent laboratory study found that a sixty-day ageing period for Cheddar cheese made from unpasteurized milk is sufficient to knock out *Salmonella*, in 1949 a mandatory ageing period for cheese made from unpasteurized milk was written into the US legal Standard of Definition for 'cheese'.

The safety regulation of cheese, essentially unchanged since 1949, continues to rely on routine pasteurization; mandatory ageing – for a minimum of sixty days at a temperature of no less than 1.7°C – is a regulatory exception to accommodate cheese made from raw (unpasteurized) milk. The idea is that pathogenic control in cheese will be accomplished in one of two ways: by pasteurizing milk to knock out any pathogens before cheesemaking begins – the industry standard – or through ageing, the idea here being that as cheese (such as Cheddar) ages, it loses moisture and gains acidity, thus becoming increasingly inhospitable to pathogenic germs.

As a technoscientific approach to food safety, pasteurization is a key symbol of modernity's ability to dominate nature for human ends. In *The Pasteurization of France*, Bruno Latour (1988) argues that once Louis Pasteur *revealed* microbes in the laboratory, scientists believed their *control* would revolutionize social relations. Hygienists, government officials and economists laid the groundwork for what they believed to be 'pure' social relations, free of microbial interference and so amenable to rational order. By the end of the nineteenth century, markets and medicine were to be modernized through Pasteurian hygiene. Biopolitics, then, is joined by what I have called *microbiopolitics*: social regulation that is carried out through the control of microbial life (Paxson 2008, 2013). Microbiopolitics entails creating and popularizing categories of microscopic biological agents (*Penicillium*, *E. coli*, *Listeria monocytogenes*, *HIV*, etc.); evaluating such agents through an anthropocentric lens; and promulgating appropriate human behaviours and practices in view of our interrelationships with microbes that enable (or derail) human infection, inoculation and digestion.

For dairy scientists trained to optimize the safety and market standardization of industrially made cheese, the benefits of pasteurization have been and continue to be obvious and incontrovertible. Drawing on Bruno Latour's work, Colin Sage argues that, 'pasteurization has taken on the characteristics of a "black box" for many scientists for which it is simply unimaginable that it would be circumvented' (2007: 210). Latour has called our attention to the power of 'black boxes' to obscure the presumptions and operations of technoscientific knowledge. A black box encases 'a piece of machinery or a set of commands' deemed 'too complex' to grapple with, once efficacy has been established; 'In its place they draw a little box about which they need to know nothing but its input and output' (Latour 1987: 2–3). Heating milk at 72°C for 15 seconds or at 63°C for 30 minutes *kills* pathogens that may be present; that is what pasteurization *is*, say scientists. So thoroughly has this process

been black boxed that pasteurization is legally confirmed in the United States by recording time/temperature treatments; it is not deemed necessary to test milk for residual microbial vitality (in order to be up to code, vat pasteurizers used by small-scale cheesemakers must be equipped with automated time/temperature recording devices; this piece of audit technology pushes the price tag for a small vat pasteurizer up to around US$28,000).

In practice, however, the outputs of black boxes, even when they would seem to 'work', exceed intended outcomes. In her study of China's modernizing dairy industry, Megan Tracy (2013) interprets ultra-high temperature (UHT) sterilization and aseptic packaging, when applied to milk produced in the remote 'grasslands' region of Inner Mongolia, not only as a technoscientific means of 'sealing out the bad' – microbes, air, light – but as doing double duty in 'sealing in' desired qualities including nutrients and flavour, but also what she names the 'terroir' qualities of 'purity' associated with the verdant grasslands on which the milk originated. In Tracy's analysis, control over the 'nature' of food substance is as discursive as it is technoscientific. Similarly in the United States, pasteurization of the milk used to make cheese not only 'seals out' unwanted, untrusted microbes, it also 'seals in' the symbolic virtue of modern progress. Untreated, 'naturally' unruly ruminant milk goes into the pasteurizer and comes out 'pasteurized': clean, pure and pathogen free – not only safe but also newly appropriate for human consumption. Within their black boxes, pasteurization and sterilization operate ideologically as well as microbiologically.

The black boxing of pasteurization in American cheesemaking does more than create confidence about the safety of pasteurized foods; it sheds doubt on the safety of foods whose manufacture employed any alternative to pasteurization. I once toured the research lab of a state university food sciences department that produces dairy products served on campus. Standing before a glass wall overlooking the automated processing plant gleaming with high-tech equipment, the lab manager responded to a question about raw milk's edibility with what seemed like genuine puzzlement that anyone in her right mind would want to risk drinking the stuff. 'We've done all this science over the last century,' he said. 'Why would you want to take a step backwards into the past? You take antibiotics, you get better. That's science.' Refusal to accept this black box, on his view, amounted to a repudiation of science itself.

But what the dairy scientist failed to recognize is that the black boxing of pasteurization not only reflects and reproduces faith in the progress of modern science, in this context it also fully presumes and works to legitimate an industrial food system. For food scientists to turn milk's pasteurization into a black box in the first place, Sage points out, milk must first be defined as essentially *in need* of technoscientific purification. Sage quotes a US food safety scientist as saying, 'There is no mystery about why raw milk is a common vehicle for salmonellosis and other enteric infections; after all, dairy milk is essentially a suspension of fecal and other microorganisms in a nutrient broth' (Sage 2007: 210, quoting Nestle 2003: 127). Industrial dairying practices – large-scale, automated, with technology separating farmers from the milking animals – are part of the constitutive assemblage of pasteurization's black boxing. On this view, which I have characterized

elsewhere as a *Pasteurian microbiopolitics* (Paxson 2008, 2013), contamination is unavoidable, but eradicable through pasteurization. Pasteurians take the position that raw milk is by its very nature hazardous to human health. On drinking the stuff, the FDA is unequivocal: 'Raw milk is inherently dangerous and it should not be consumed by anyone at any time for any purpose.'[2] As the technoscientific backbone of the food industry's industrialization, pasteurization became a potent symbol of modern progress and invented 'raw-milk cheese' – like 'home-baked bread' (Bobrow-Strain 2013), an unmarked category prior to widespread industrialization of the food supply – as its devalued Other: backwards, obsolete, unnecessarily risky, even foolish.

To appreciate the symbolic implications of pasteurization in the American food system, it is useful to consider Elizabeth Dunn's (2008) analysis of canning in Soviet and postsocialist Georgia. During the Soviet era, a Ministry of Food Processing built numerous industrial canning operations outfitted with comprehensive technological standards to rationalize trade across the Soviet Union. The Soviet industrialization of the food system, Dunn argues, 'worked' not only to feed citizens and alter their tastes and culinary practices, but also to demonstrate the efficacy, and thus existence, of the Soviet state itself. Soviet eaters presumed the safety of food provisioned by a paternalistic state, which in turn reinforced their sense that the state in fact cared for them. Central to Dunn's argument is an understanding that Soviet efficacy relied, in part, on 'black-boxing' canning as an effective method of producing 'good' food. When the 'network of actors, objects, standards, and documents' whose orchestration constituted the practice of canning 'were confined to the factory and hidden away from the end users of the product', consumers simply learned to trust that 'canned food' was safe and good, without any real understanding of how canning occurs and what measures must, in fact, be taken to ensure safety (Dunn 2008: 247). All of this was made clear following the collapse of the Soviet system as Georgians began canning foods at home, seeking to sustain the tastes they had enjoyed under the relative economic and political certainty of Soviet rule. Notable outbreaks of botulism owing to improperly sterilized and sealed food jars revealed that, 'knowledge about safe canning had not traveled along with the canned food itself or with the taste for the food the state once made' (2008: 250). Once canning was removed from the assemblage of the state-run industrial factory, it failed to operate as people imagined it would. The black box did not transfer intact from factory to home. Black boxes often do not travel well, either temporally or spatially, precisely because their closures are held together by beliefs, institutions and practices that are embedded in wider social and political contexts.

While in the Soviet case, canning did not transfer as a black box from industrial to domestic spaces of production, in the United States the industrial black boxing of pasteurization – which lead the FDA to treat raw-milk cheese as inherently and fundamentally different from pasteurized-milk cheese – has blinded many food safety regulators to non-industrial possibilities of safe cheese production. In 2004, I spent ten days on a sheep dairy farm in Vermont, participating in nearly all aspects of farmstead cheese production, including milking sheep (see Paxson 2013, Chapter 2). I would not characterize the milk produced at this dairy and

other cheesemaking farms I have visited as 'a suspension of fecal and other microorganisms in a nutrient broth.' Artisan cheesemakers who make cheese from unpasteurized milk, often on the dairy farms that supply the milk, challenge the founding assumption of Pasteurism by arguing that faecal matter is not naturally present in milk; it only gets in if humans are less than scrupulous in their dairying practices.

In contrast to the hyper-hygienic ethos that brought us the limitless shelf life of Velveeta, what I have called a *post-Pasteurian* approach to microbiopolitics embraces the idea that 'real' cheese, as a fermented food, is (rightly) teeming with living bacteria and moulds: that's what cheese *is*. In moving cheesemaking from the laboratory-like conditions of industrial factories, artisan cheesemakers have found that the black boxes of food science can produce unintended outputs. In Vermont, David and Cindy Major started the nation's first cheesemaking sheep dairy in the 1980s. In their early years of cheesemaking, after encountering problems trying to develop a protective natural rind on a cheese they were ageing, the Majors sought the advice of University of Wisconsin dairy consultants, who knew only industrial production: working with milk pooled from multiple farms, in automated factories, fabricating plastic-encased blocks of cheese that would mature, unattended, in refrigerated warehouses. Although the so-called natural rind on a cheese is the outcome of successive waves of bacteria and fungi colonizing its surface, the experts suggested that the Majors dip their cheeses in an antiseptic mould inhibitor. On their advice, David let off chlorine bombs in the ageing room to keep it sanitized! Not surprisingly, the hyper-hygienic strategy did not help the Majors solve their rind problem. Eventually, David drew an analogy between the cheeses and his sheep pastures, which suggested to him: 'Rather than sanitize, maybe we need to cultivate in the cave.' David came to perceive the cheese as a microbial ecosystem that requires him to cultivate and nurture a hospitable environment for the flourishing of those 'good' microbes that co-produce cheese with humans.

To be successful, post-Pasteurian food makers do not let microbes run wild. Repeatedly in my interviews with artisan cheesemakers, I heard that 80–90 per cent of cheesemaking is cleaning and sanitizing. Indeed, that is why I describe the artisanal microbiopolitical stance as *post*-Pasteurian rather than *anti*-Pasteurian: it *takes after* Pasteurism in acknowledging the importance of hygiene and sanitation, while moving *beyond* an antiseptic attitude to manage the microbial environment as a means of cultivating and enlisting 'good' microbes as allies that can outcompete 'bad' ones. In practice, this means monitoring and controlling the temperature and humidity of the rooms in which cheese is made and allowed to ripen, whether through automated sensors and computerized controls, or by opening and closing a window, hanging plastic sheeting in front of a wall of cheese racks, or throwing a bucket of water on the floor (see also West and Domingos 2012; West 2013).

In regulating cheese production to promote safety, the US Food and Drug Administration relies on a binary distinction, requiring one set of requirements for cheese – any cheese, regardless of type and method of fabrication – made from pasteurized milk, and another set of requirements for cheese – again, any cheese – made from unpasteurized milk. A number of problems follow from this. First,

although US food safety officials never set out to establish the 'sixty-day rule' as an equivalent standard to pasteurization, many producers and consumers have come to view it as such. The black boxing of pasteurization, I suggest, has had the unintended output of creating a sort of shadow box around its constitutive outside, namely, the legal alternative of ageing cheese for a minimum of sixty days. Producers and consumers often approach the sixty-day rule as if it, like pasteurization, were supposed to be a black box. For example, one popular book showcasing Vermont cheeses declares, 'Cheesemakers need to choose between making raw-milk cheese, which must be aged for a minimum of sixty days to destroy the bacteria in it, or pasteurized cheese, which requires heating the milk to destroy bacteria beforehand' (Ogden 2007: 11). This statement is dangerously misleading on two counts. First, varieties of cheese do not fall into discrete, essential categories of being either 'raw-milk' or 'requiring' pasteurization – technically speaking, any cheese *can* be made from either raw or pasteurized milk. Second, ageing cheeses for sixty days does not 'destroy the bacteria in it' in any absolute sense; it merely contributes to a relatively inhospitable environment for microbes such as *Salmonella*, in cheeses such as Cheddar.

The problem with the sixty-day rule is that, microbiologically speaking, not all cheeses behave like Cheddar and not all pathogens behave like *Salmonella*. Because hard, dry, sharp Cheddar constitutes a fundamentally different microbial ecology, when it comes to pathogenic vulnerability, than soft, moist, low-acidity bloomy rind cheeses such as Brie, the sixty-day ageing period does not produce the same outputs when applied to each cheese; it does not travel as a black box between Cheddar and Brie. And consider *Listeria monocytogenes,* a bacterium that can cause listeriosis, an infection that may manifest as septicaemia, meningitis, or, in pregnant women, may result in spontaneous abortion or stillbirth. Although rare, listeriosis has a 20 per cent fatality rate and accounts for roughly one-fourth of deaths attributed to foodborne illness in the United States. Cheeses with a pH above 5.5 (meaning low acidity) are more likely to harbour *Listeria* than cheeses with higher acidity. Contradicting the premise of the sixty-day rule, ageing bloomy rind cheese such as Brie or a Camembert for sixty days turns out to *increase* its susceptibility to *Listeria* because, unlike Cheddar, as it ages its acidity actually declines (D'Amico, Druart and Donnelly 2008). Catherine Donnelly, a microbiologist at the University of Vermont whose lab pioneered methods of detecting *Listeria* in foods, said to me of the sixty-day rule, 'What's sad is, there are cheesemakers who read the letter of the law [and think] "Great! For a bloomy rind cheese [from raw milk], I'll just hold it for sixty days." And it's like, oh my *God*! We've got an accident waiting to happen. And they're perfectly within legal bounds to do that.' In fact, it is what the law currently requires of them.

Further complicating the microbiopolitical field, unlike the tubercular bacillus that can be carried from sickened cow to human through milk, or *E. coli*, which originates in manure and can enter the milk supply through insanitary milking conditions, *Listeria* is a ubiquitous environmental contaminant – you may have it on your shoes – and thus it is most likely to infect a cheese during manufacture, ageing or packaging. Pasteurizing milk prior to cheesemaking is no barrier to this sort of

environmental contamination. In fact, Catherine Donnelly suggests that cheese made from pasteurized milk may be more susceptible to *Listeria* growth because it lacks the microbial diversity of raw-milk cheese – more diversity pits more of those 'good' microbes against possible baddies.

On 21 October 2010 federal agents locked the doors of the Estrella Family Creamery in Washington state, carrying out a court-ordered seizure in light of evidence presented by the US Food and Drug Administration of the 'persisting presence' of the potentially pathogenic bacterium *Listeria monocytogenes* in one of the ageing rooms where the family ripened cheese made from the raw milk of their own cows. In December of that same year, federal regulators demanded that pioneering cheesemaker Sally Jackson upgrade the jury-rigged cheesemaking equipment she had used for thirty years. Unable to afford the required modifications, Jackson retired after the Centers for Disease Control demonstrated a link between her raw-milk cheese and eight cases of illness due to enterohemorrhagic *E. coli* infection. Such cases have provided a warrant for the FDA to revisit the efficacy of the sixty-day rule (the regulation of raw-milk cheese is currently under review with government safety officials). At the same time, if outbreaks of botulism in Georgia bring to light a taste for socialist nostalgia and parallel suspicion of the postsocialist state's commitment to care for its citizens, the increasing appearance of *E. coli* O157:H7 and *L. mono* in raw-milk cheese and cheesemaking in the United States points to a counter-industrial taste for artisanally made foods as well as a distrust of one-size-fits-all federal oversight. When current regulations would seem irrational or, worse, ill-advised – and as there is clearly a consumer market for raw-milk products – some cheesemakers may be tempted to operate at the edges of the law, for example, selling under-aged raw-milk cheese at farmers' markets as 'pet food' or 'fish bait' rather than (wink-wink) for human consumption.

The sixty-day rule, put in place at the height of the cheese industry's industrialization, is becoming obsolete as a means of promoting public health. Obsolescence stems, first, from growing interest in producing and consuming raw-milk products. While in the 1950s, raw-milk cheeses were viewed as a holdover from the pre-industrial era, today they have new, positive value – still in opposition to industrial foods – as 'natural', 'authentic' or 'gourmet'. At the same time, the microbial field has transformed as pathogens of concern evolve apace with, and in opposition to, industrial agricultural practices. The Shiga toxin-producing O157:H7 mutation of *E. coli*, an intestinal bacterium included on the Centers for Disease Control list of bioterrorism agents, was first characterized in 1982 and may not have existed when the sixty-day rule was introduced. In 1949, *Listeria monocytogenes* had not yet been identified as a cause of foodborne illness.

Scrutiny of the sixty-day rule, through the work of Catherine Donnelly and others, is also, inadvertently, revealing the limitations of *pasteurization* in ensuring food safety. Both approaches to safety regulation, pasteurization as well as ageing, have been applied equally to processes of industrial and artisanal manufacture, and to a diversity of microbial ecologies we know as varieties of cheese. Such 'one-size-fits-all' regulation is being called into question by recognition that 'cheese' is not, in fact, reducible to a binary standard: pasteurization and its absence are insufficient

classificatory distinctions. 'When standards change,' notes Susan Leigh Star, 'it is easier to see the invisible work and the invisible memberships that have anchored them in place' (1991: 44). Black boxes, the fully as well as semi-opaque, are coming open at their seams.

What is revealed is that food safety is largely relational and 'not an inherent biological characteristic of a food', as nutritionist Marion Nestle (2003: 16) writes. A given food may be safe for some individuals but not others (think of allergies as well as immunities), in small quantities but not large, or at one point in time but not another. Such contingency poses a challenge for food safety regulators, producers and consumers alike (see Solomon 2015 for an ethnographic examination of the unreliability of food safety in Mumbai). Neither 'raw-milk cheese' nor 'pasteurized cheese' are one: not equally well made, or equally risky or equally tasty. Some milk is cleaner than others. Some cheesemakers are more skilled and hygienic than others. And some cheese types are more susceptible to pathogenic infection than others. The challenge – for regulators, producers and consumers – is that these meaningful distinctions are not well captured by any of our conventional cheese categories.

SWALLOWING BLACK BOXES: THE INDIGESTIBILITY OF NUTRITIONAL GUIDELINES

The notion that 'food' conveys to 'the body' not only nutrition but also a potential for broader well-being is nothing new; beginning in the 1820s, the Presbyterian minister, Sylvester Graham, promoted feeding dietary fibre to the American people as a means of improving the moral fibre of the nation by curbing immoderate appetites – his Graham Crackers, invented in 1829, could be considered an early 'functional food', thought to have a positive effect on bodily health beyond basic nutrition (Schwartz 1986). Functional thinking underpins Scrinis's (2008) notion of *nutritionism*, an ideology of nutrition promoted by nutrition scientists, dieticians, public health authorities and, more recently, food marketers, which has encouraged eating publics, now around the world, to (1) regard foods primarily in terms of their nutritional composition: an apple *is* 100 calories; meat *is* protein; cheese *is* cholesterol and fat; (2) to draw causal connections between particular nutrients and aspects of physical health or illness: Vitamin D is good for bone strength; cholesterol leads to heart disease; and (3) to rationally deploy this reductive, functional thinking to put together 'nutritionally balanced', normatively 'good' diets, without culinary regard for meals. In practice, of course, people enact this ideological approach to food and eating to varying degrees, but it is difficult today not to be influenced by it. Nutritionism produces particular kinds of eating subjects: calculating, rationally reflexive and morally concerned about the outcome of their eating (Mudry 2009, 2013; Biltekoff 2013; Veit 2013). Most people struggle to 'stay on' rationalized diets precisely because that slice of chocolate cake is, in fact, irreducible to 'fat and sugar' and simultaneously retains the characteristics of 'reward, celebration, treat, deliciousness.'

To investigate a public health campaign against obesity in Guatemala, Emily Yates-Doerr examines what she calls 'nutritional black-boxing', defined as 'the process of consolidating technical and historically contingent ideas about nourishment and the myriad relationships surrounding dietary practices into seemingly unproblematic terms: a vitamin, a nutrient' (2012: 294). Nutrients, she demonstrates convincingly, are better viewed as black boxes than as coherent, autonomous things in the world: 'as they shift contexts, the information that they seem to hold in place transforms' (2012: 295). When nutritionists working in Guatemala present to schoolchildren and women what they believe to be straightforward lessons in identifying nutritionally 'good' and 'bad' foods – sugar, because it is sweet, is also bad and should be avoided; green vegetables, because they have vitamins, are good and should be eaten – the people who receive these lessons often draw from them unintended messages. Yates-Doerr tells, for example, of a school teacher who summed up a nutrition lesson by asking his class, 'What is a good source of iron?' and became frustrated by his students' response: 'Sugar!' Where had his lesson gone wrong? Why hadn't his lesson about the nutritional benefits of meat, beans and spinach sunk in? Yates-Doerr argues it was because his science lesson was disconnected from the students' extant understanding of 'food', which is first and foremost about taste, textures and the social relations of commensality, but which is also delivered to the kitchen table through assemblages other than the one that produced the nutrition 'facts' of the lesson. It turns out that Guatamala's government requires sugar fortification to prevent nutrition deficiencies; the box of sugar from which children (and their parents) convey sweetness to their drinks and food is clearly labelled, 'Sugar with Iron.' When pro-nutrient and anti-sugar lessons contradicted one another, it is little wonder that the children resolved the conflict by erring on the side of 'sugar-has-nutrients' (indeed, more than one adult explained to Yates-Doerr, as she watched them spoon sugar into their drinks, that it was 'for the vitamins' [2012: 297]).

What, then, of American cheese? As discussed above, the FDA regulates the *production* of all cheeses according to a binary division between raw-milk and pasteurized-milk cheese. But when it comes to FDA guidelines for the safe *consumption* of cheese, the agency introduces an additional category, *softness*, warning certain consumers to avoid 'soft' cheeses. While softness is not a nutrient, the government's dietary guideline concerning cheese safety shares features of nutritional black boxing.

The FDA directs its sternest warning concerning cheese-residing microbes at pregnant women, advising until recently against 'soft cheeses' such as 'Brie, Camembert, feta, blue-veined cheese, or Mexican-style cheeses such as queso blanco fresco.' Softness is intended to represent an indirect measure of moisture, high moisture being conducive to the growth of pathogens including *Listeria monocytogenes*, linked to stillbirth and miscarriage when ingested by pregnant women. But Brie, Camembert, Feta, blue-veined, Mexican-style cheeses are not self-evidently united by 'softness.' In addition, other cheeses would seem to be soft. What about them? Categorical lumping may appear to 'simplify' a public health message, but as with nutritional black boxing in Guatemala, such simplification can introduce, rather than mitigate, confusion and complications. In 2005, when my own pregnancy test

came back positive, the first question I asked the nurse practitioner was, 'What about fresh mozzarella?' She had no idea so I went online. From participant observation as a pregnant cheese eater, I discovered that while many women have gotten the message to avoid 'soft' cheese, that message has generated quite a bit of confusion and erroneous information on pregnancy websites (see Paxson 2008). On Babycenter.com, for example, one woman asked, 'Does anyone know if those little Laughing Cow wedges are considered a soft cheese?' A pasteurized, process cheese that comes in foil-wrapped bite-sized wedges, Laughing Cow is undoubtedly *soft* but almost certainly pathogen free. In emphasizing a cheese's softness in its dietary guide for pregnant women, the FDA inadvertently drew attention away from the protective function of pasteurization.

In dietary warnings to pregnant women, 'soft cheese' is presented as a coherent type of food when in fact 'softness' obscures a heterogeneous set of risk factors. The high-moisture content of Brie and Camembert not only account for their softness but also contribute to their risk profile, while 'blue-veined' cheeses (which come in differing degrees of softness) make the list primarily owing to their pH. Taking acidity into account, the local ecology of Camembert, whose pH increases to 7.5 with ripening, is far more susceptible to *Listeria* than Feta (pH 4.4) – although equivalence is implied by their joint appearance on the warning list. Greek-Americans routinely defend Feta on pregnancy websites, citing as evidence fleets of relatives who survived pregnancy despite daily doses of the stuff (largely thanks to Feta, Greece boasts the highest per capital consumption of cheese in the world). The contraindication of experiential, bodily knowledge (as feminist medical anthropologists have argued regarding pregnancy and other biomedical care) may lead lay people to dismiss the abstract authoritative knowledge of a government agency as bankrupt, even beholden to industry interests (Abel and Browner 1998; Lock and Kaufert 1998).

'Mexican-style' cheeses are prominent on the consumer-warning list not because of their pH or moisture content (as a fresh cheese, the sixty-day rule already requires that *queso fresco* be made from pasteurized milk to be legally saleable). Instead, 'Mexican-style' cheeses are singled out because the United States' largest cheese-related outbreak of listeriosis (in the 1980s) was traced to *queso fresco* that was sold door-to-door and purportedly made in a bathtub (clearly, without a pasteurizer). The problem imagined here is not 'Mexican-style cheese' per se – this is not a matter of material reductionism – but instead the unruliness of a local microbial ecology that might flourish in a shadow economy of unlicensed commercial food production. Here, the FDA implicitly recognizes that food materializes particular social-material assemblages, but in overgeneralizing on a worst-case scenario it risks tainting a type of cheese with racist stereotypes.

Not only is the FDA diversifying its classification of cheese food beyond the pasteurized/unpasteurized divide, it is acknowledging a heterogeneity of 'eating bodies' – to some limited extent. In introducing 'soft', a sensory characteristic, as a classificatory cheese category in its dietary recommendations, the FDA acknowledges that eaters are not metabolically identical; they embody different risk profiles for foodborne illness. Pregnant women, the elderly and the immunocompromised are especially susceptible to listeriosis, and *Listeria monocytogenes* takes especially well

to mould-ripened cheeses with low acidity, such as Brie and Camembert; as foods (rather than laboratory specimens), such cheeses are recognizably 'soft.' Hence, pregnant women (in particular) are advised to avoid consuming 'soft' cheeses.

However, the actual *occurrence* of food safety – that is, the avoidance of food poisoning (if not also allergies) – calibrates to a direct relationship between a particular food substance (*this* food, in *this* condition, right *now* today) and the bodily capacity of an individual eater to incorporate that substance, hitchhiking microbes and all. As Yates-Doerr demonstrates with regard to nutrition, '"health" is not a property that can be fixed within a food; existing instead in the specificities of dietary practices, it is a process to be enacted, not an object to hold' (2012: 307; see also Yates-Doerr and Carney 2015). Food safety is a contingent relationship; food classification, predicated on a discrete separation of food (with intrinsic qualities) and its eaters (who incorporate those qualities), cannot fully get at this. Although the occurrence of food safety is particular, the *regulation* of food safety operates by setting production standards calibrated to broad categories of food substance, not to particular substances of food. Those standards are set by anticipating *possible* encounters between types of foods and types of eaters. As such, regulatory categories are designed to cast a wide net of possibility, wider than would circumscribe most actual encounters; the gap between the two can be viewed, depending on one's perspective, as an abundance of caution or as over-regulation. Put differently, food safety officials regulate from the exception – from the exceptional consumer (e.g., pregnant or immunocompromised), but also from the exceptional producer (e.g., 'bathtub' cheese). As Susan Leigh Star noted, 'there are always misfits between *standardized* or *conventional* technological systems and the needs of individuals' (1991: 36). The deployment of broad classificatory categories obscures the specificities – or exceptions – on which regulation is based.

It also, of course, elides the organoleptic, commensal and emotional aspects of eating that can attach to particular foods simultaneous with medicalized understandings. While normative attention to edibility (is this something I should eat?) may overshadow appreciation for palatability and social value (is this something I want to eat?), it does not eradicate it. Yates-Doerr writes:

> Absent from the classificatory categories of nutrition is attention to taste, pleasure and awareness of all of the social relations inherent in the production and consumption of any meal. … It is not that social context itself becomes irrelevant; rather it becomes obscured by the abstraction of a meal's value into its biochemical parts, parts that themselves come to appear as the whole source of a meal's value to the body. (2012: 304)

Borrowing from John Law (2004: 62), Bodil Just Christensen (n.d.) suggests we might best view 'food' as a 'fractional object': a 'material-semiotic assemblage consisting of layered meanings of many ontological kinds.' The social complexity of food and eating is ever-present and may resurface 'in the confusion that arises when people attempt to incorporate universalized food rules into the unpredictable and often-contradictory demands of everyday life' (Yates-Doerr 2012: 304–5).

BEYOND EATING AS INCORPORATION: MATERIALIZING LOCAL ECOLOGIES AND BIOLOGIES

In 1970, Margaret Mead described American ideas about nutrition as dominated by a Puritanical dichotomy between 'food that was "good for you, but not good"' and 'food that was "good, but not good for you"' (1970: 179). This view has underwritten and been reinforced by nutrition science, whose rational judgement of food's goodness presumes to be unswayed by any sensuous pleasures that food affords. Today, however, Mead's dichotomy is beginning to look as old-fashioned as Velveeta. More and more, I see Americans (and others) attempting to align various vectors of food's 'goodness' hoping to be pointed to perfect foods: healthy, tasty, safe, fair. Consumers seek guilt-free indulgence, and food corporations are eager to sell it to them (Mol 2009). Indeed, rather than presume that nutritionism in fact denies the body and its pleasures, as critics such as Michael Pollan (2009) lament, research by Bodil Christensen (n.d.) demonstrates that 'when food is practiced as nutrients', even by Danish gastric bypass patients and army conscripts trained to think and act within the 'logic of nutrients', eaters do not, in fact, lose their sensual appreciation for food. They may rationalize food choices on nutritional terms, but they describe the experience of eating with reference to taste, texture and satiation. Nutritional reductionism may obscure or de-prioritize other modes of apprehending and valuing food, but it does not erase them (Christensen n.d.). Amidst the dominance of nutritional reductionism, we are beginning to see a move towards embracing food as a 'fractional object', simultaneously embodying a variety of essences. Nutritionists in the Netherlands and France are beginning to emphasize the sensorial pleasures of eating as a means of mitigating the quantity of food intake (Vogel and Mol 2014; Sanabria 2015). What is more, an embrace of multiplicity in what qualities 'count' in foods occurs alongside new appreciation for diversity among eating bodies. Again, cheese offers an instructive example.

Cheese embodies the outcome of bacteria and fungi feeding on the proteins and sugars in milk to produce odorific decomposition; milk, in turn, is the outcome of domesticated cows, goats or sheep feeding on hay and pasture grasses containing cellulose, which ruminants digest thanks to the metabolic action of symbiotic microorganisms residing in their four-chambered guts. Cheese is the material legacy of ruminant and microbial bodies incorporating bits of their environment: eating, metabolizing. Put otherwise, cheese embodies *local ecologies*, by which I mean to point to a scaled-up version of what Margaret Lock has named *local biologies*. In Lock's work:

> *Local biologies* refers to the way in which the embodied experience of physical sensations, including those of well-being, health, illness, and so on, is in part informed by the material body, itself contingent on evolutionary, environmental, and individual variables. Embodiment is also constituted by the way in which self and others represent the body, drawing on local categories of knowledge and experience. (Lock 2001: 483)

In other words, bodies materialize tangible and semiotic elements of their natural and cultural environments, which may contain elements of both the 'local' and the 'global.' So too do foods. Recognition of this can be cause for celebration, as in claims to *terroir* foods and wine, valued for expressing distinctive characteristics said to be typical of their place of production (Barham 2003; Trubek 2008; Demossier 2011; Teil 2012; Rogers 2013). It can also be cause for alarm. Becky Mansfield (2011) reminds us that, owing to industrial waste runoff into waterways, the nutritional composition of fish today includes heavy metals; mercury has become part of what swordfish *is* materially, nutritionally.

How, through eating, do bodies materialize their environments? In rethinking obesity and diabetes by emphasizing the situated relationality of eating bodies, researchers are complicating the eating-as-incorporation paradigm by 'thinking metabolically' (Kendrick 2013: 237; see also Yates-Doerr 2012; Solomon 2015). Writing of the new fields of 'relational biology', including microbiome studies and nutritional epigenetics (a form of non-genetic inheritance), Hannah Landecker suggests that research scientists (if not yet nutritionists) are beginning to reconceptualize 'food' as 'a form of environmental exposure.' On this view, metabolism is more like tasting – in the sense of inquisitive sampling – than incorporation. Landecker writes, 'Today, diverse biomedical sciences of metabolism – from the study of intestinal bacteria mediating digestion to the reconceptualization of fat as an endocrine organ – are beginning to suggest that different individuals may process the same food very differently, and that different foods have potential to shape the metabolic interface in very different ways' (2011: 173). Landecker expands Brillat-Savarin's aphorism, quoted above: 'We cannot help but ingest and in the act of ingestion and digestion are drawn into the social, technical and political networks of food production, regulation and consumption. We are what we eat – but also what our parents and grandparents ate, and what we eat ate' – and metabolized, and incorporated (Landecker 2011: 187). 'It is not at all clear', writes Landecker of carnivorism, 'what the effect on metabolism is of eating bodies that themselves have had their metabolisms patterned by industrial agriculture.' If eating is relating (Bertoni 2013), then these nature–culture relations, often unseen, are far-reaching in space and time and unfold within political ecologies of production as well as consumption (cf. Baker 2013; Blanchette 2013; Heath and Meneley 2010; Weiss 2011; Yates-Doerr and Mol 2012).

Some evidence, however, points to a rise in the incidence of food allergies and autoimmune diseases. Both are understood to occur when a body's immune system has trouble distinguishing between 'self' or 'food' – that which can safely become incorporated into self – and 'non-self', that which is toxic or pathogenic to self (Martin and Cone 2003). The gut's immune system 'learns to recognize and accept ("tolerate") food, allowing it to be absorbed into the blood and lymph. It also learns to recognize dangerous pathogens and toxins ingested along with food and helps prevent them from being absorbed' – that is, by causing people to be sick (Martin and Cone 2003: 239). Immunologists have recognized that the immune system can be 'taught' to tolerate potentially dangerous substances through repeated low-dose exposure; ingesting small amounts of 'foreign' substance can 'train' the immune

system to tolerate it – this is the reasoning behind ingesting local honey (full of environmental pollen) to reduce suffering associated with hay fever.

Taking inspiration from scientific recognition that 'the tasting body is not a natural category' but instead the outcome of cultural training, Annemarie Mol extends the notion of oral tolerance to entertain the possibility of 'teaching' a body to accept, even appreciate, food that is 'good' not only for the body (in terms of health) but that is 'good' in an ethical sense, for communities of producers or for the environment (2009: 277). I see this train of associations playing out in the recreational taste education that happens at food festivals and in boutique retail shops, in which connoisseurship – the cultivation of a knowing palate – is being reformatted to include knowledge about the means and methods of the production of comestibles, whether natural wine or pasture-raised meat or artisanally made cheese (Paxson 2013; Weiss 2011; Yates-Doerr and Mol 2012).

At the 2009 California Artisan Cheese Festival in Petaluma, Cowgirl Creamery's Sue Conley and Peggy Smith introduced a taste education session by explaining that they would 'talk about cheeses in terms of the place they're made in, and how place contributes to the cheese.' Their discourse points to how *good food* and *food that's good* are being brought together through a taste education that promotes artisanal practices as well as products. The first cheese we in attendance tasted was Cowgirl Creamery's fromage blanc, a simple, fresh cheese used primarily by chefs, which they selected 'to show the reflection of the milk' produced by the organic dairy of their neighbour in Point Reyes Station, Albert Straus. With this cheese, Conley and Smith wanted 'to showcase his hard work … how he's taken care of the land and his animals.' Straus's pastures are free of herbicides and chemical fertilizers; his cows are not treated with hormones or antibiotics to boost production volume. As tasters, we were meant to draw a causal connection between the 'good, clean' milk-flavour in the cheese we were tasting and Straus's 'good, clean,' environmentally conscious dairying practice (cf. Tracy 2013). Conley and Smith went on to describe in some detail Straus's newly installed methane digester, apparently without worry that our sensory apparatuses would then register suggestive hints of manure in the taste and odour of the cheese. Instead, we were meant to taste the goodness of greenhouse gas mitigation. Here, eaters with 'good taste' are enjoined to taste the 'good' qualities of food that materialize *elsewhere* – in the environmental ecologies of food production, say, including ruminant bodies – in much the way Annemarie Mol (2009) envisions the possibility of cultivating the good taste of a true consumer-citizen. This is telling of the new taste education.

When methane digesters become part of the 'taste of place' (Trubek 2008), eaters are enjoined to develop *socially aware* tastes. This is not strictly the taste of social distinction, in a Bourdieuian sense (although considering the high-priced recreational venues at which such taste education occurs, class is certainly a part of the story). Moreover, we are seeing the cultivation of a taste for food that's good to eat and *not incidentally* ethically good to make. In the new American taste education, artisanal cheese is said to taste good, in the first instance, because 'best practices' in farming and agricultural processing – from animal health, to a diversity of clean

fodder, to sanitary milking and cheesemaking conditions, to a cheesemaker's craft skill – produce 'best quality' food and drink. On this view, an eater's enjoyment of a well-made cheese will therefore be heightened by knowing that the methods of production work to accomplish worthwhile ends beyond producing cheese: in keeping agricultural land out of the hands of developers, for example, or in the organic remediation of industrially farmed land, or sustaining the ability of a fourth-generation to continue family dairy farming. Recent sensory consumer research bears this out, at least in cheese-producing regions: focus-group surveys with cheese-buying consumers in Vermont indicate that 'the sensory experience of Vermont artisan cheese stems from a mix of intrinsic, organoleptic properties and extrinsic, socially embedded properties' including 'the farming practices of the cheesemakers' and an 'ethos of craftsmanship' in their production methods (Lahne and Trubek 2014: 132–3). Consumers 'confirm that their preferences for a particular taste also reflects their preference for a certain set of production and farming practices' which they credit with generating that taste (2014: 137).

Here, and not unlike what Meigs writes of the Hua of Papua New Guinea, questions of *who* makes food, *how* and within what nature–culture *relations*, are directly germane to what food 'is.' Living, metabolizing, microbially diverse cheese is upheld as a microcosm of the life-enhancing transformation of agricultural landscapes and regions in which artisan food-making wishes to participate. For this to be a persuasive claim, however, food makers must sort out microbial friend from foe – work (not faith) that produces the conditions through which a post-Pasteurian, counter-industrial diet might (for some) safely emerge. Microbiopolitics extends agro-food studies not only into the body of eaters, then, but also into the embodied knowledge of food producers.

'Microbes connect us through diseases,' Latour writes (1987: 37), 'but they also connect us, through our intestinal flora, to the very things we eat.' And through the things we eat, to wider ecologies and landscapes. At the beginning of the twenty-first century, as it comes to light that 90 per cent of what we think of as the human organism turns out to comprise microorganisms, the adage, 'We are what we eat,' gains new vitality. And if we are what we eat, then local biologies, local ecologies, can and should raise questions about environmental justice, agricultural labour politics and food safety regulation as well as further questions of health and illness. The new food politics, accompanied by a new taste education, aims not to consolidate 'black boxes' but instead to deliver something resembling CSA boxes: collections of foods whose nutritional and social values are meant to be open to eaters and feeders. To what extent it succeeds remains to be seen.

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NOTES

1. A more precise term than lactose intolerance, lactase impersistence refers to the tapering off of a body's production of the enzyme lactase, required for the digestion of lactose (Wiley 2011; see also Wiley, Chapter 10, this volume).
2. US Food and Drug Administration website, "Questions & Answers: Raw Milk." From 1 March 2007; updated on 26 March 2010. http://www.fda.gov/Food/FoodSafety/ProductSpecificInformation/MilkSafety/ucm122062.htm. Accessed 16 June 2010.

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