

Safe at any scale? Food scares, food regulation, and scaled alternatives

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Abstract The 2006 outbreak of *E. coli* O157:H7, traced to bagged spinach from California, illustrates a number of contradictions. The solutions sought by many politicians and popular food analysts have been to create a centralized federal agency and a uniform set of production standards modeled after those of the animal industry. Such an approach would disproportionately harm smaller-scale producers, whose operations were not responsible for the epidemic, as well as reduce the agroecological diversity that is essential for maintaining healthy human beings and ecosystems. Why should responses that only reinforce the problem be proffered? We use the framework of accumulation and legitimation to suggest corporate and government motives for concealing underlying problems and reinforcing powerful ideologies of individualism, scientism, and centralizing authority. Food safety (or the illusion of safety) is being positioned to secure capital rather than public welfare. We propose implementing the principle of subsidiarity as a more democratic and decentralized alternative. Because full implementation of this principle will be resisted by powerful interests, some promising intermediate steps include peer production or mass collaboration as currently applied to disease prevention and surveillance, as well as studying nascent movements resisting current food safety regulations.

Keywords Accumulation · *E. coli* · Food safety · Legitimation · Peer production · Scale · Spinach scare · Subsidiarity

Abbreviations

CDC	United States Centers for Disease Control and Prevention
<i>E. coli</i>	<i>Escherichia coli</i> [serotype O157:H7]
FDA	United States Food and Drug Administration
GAO	United States Government Accountability Office
HACCP	Hazard Analysis and Critical Control Point
NIH	United States National Institutes of Health

Introduction

We invoke regulatory law for the control of the corporate activities; but we must not forget the other kinds of activities contributing to the making of society, nor attempt to apply to them the same methods of correction—Liberty Hyde Bailey, The Holy Earth, p. 25

In late summer 2006, US consumers were faced with a major food scare. Fresh, bagged spinach¹ was found to be contaminated with a particularly virulent strain of *E. coli*

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¹ The use of the term “fresh” is quite questionable. Technically, once spinach is washed and bagged it becomes a processed food and thus is no longer fresh. More practically, any food that travels hundreds of kilometers from point of production to point of sale and can sit for a week or more waiting to be sold is hardly fresh. While “uncooked” might be a more accurate term, we follow the industry convention in this paper.

O157:H7. The outbreak seemed to strike in a number of successive waves over 6–8 weeks, sickening people in some 26 states and ultimately causing the death of at least three persons (CDC 2006). The media had a field day reporting on the possible cause(s) and extent of this food safety scare, frequently capitalizing on the paradox that spinach and leafy greens more generally, once considered healthy foods, were now the source of serious bacterial contamination, illness, and worse. Restaurants stopped serving spinach in their salads and salad bars. University dining services likewise kept spinach off the menu and consumers shunned the vegetables—a shunning that has continued into the present (Cuite et al. 2007). In response, the \$240 M/year industry laid off hundreds of workers (most of them migrant laborers), complied with a two week federal recall of all fresh and bagged spinach, and estimated its losses at about \$100 M (Hirsch 2007; Schmit 2006a).

The immediate concern of government and industry was to locate the source of the contamination and to eliminate it. It took nearly a week to accurately identify the distributor (Dole, via Natural Selection Foods) of the *E. coli* O157:H7 infected spinach and where it had been grown (Monterey and San Benito Counties, approximately 150 km south of San Francisco). Finding its actual source would take far longer. The various causes hypothesized were deer, wild pigs, dirty human hands, overflowing drainage ditches, nearby beef ranches, and contaminated ground water (Nestle 2006; Siegel 2006).

By March 2007, six months after the outbreak, government officials had tracked the O157:H7 strain of *E. coli* to four spinach farms in San Benito and Monterey Counties (Withers 2007). One, a 50.9A spinach field farmed by Otto Kramm, chief operating officer of Mission Organics, was publicly implicated. According to a joint report of the investigation published by the California Department of Health Services and the FDA (CADHS/FDA), *E. coli* O157:H7 “indistinguishable from the outbreak strain ... was identified in river water, cattle feces, and wild pig feces on (a grass-fed beef ranch) ... just under one mile from the spinach field” (2007, 3). While no *E. coli* O157:H7 or pig tracks were found in the spinach field itself and “no definitive determination” (CADHS and FDA 2007, 4) could be made regarding how the *E. coli* contaminated the spinach, law suits against the farm were initiated.

As the spinach scare continued, news accounts made it increasingly clear that the real weakness in the US food system did not lie with the industry or science and technology, but with government. Indeed, it was the government’s job to protect public health, to ensure food safety, and to exercise regulatory oversight over the nation’s food supply. According to assorted consumer advocacy organizations (Consumers Union, Center for

Science in the Public Interest), members of Congress, food system analysts, and the GAO, the government had fallen down on the job (Wood 2006). Those in a position to know explained that the responsibility for maintaining food safety (vegetables in this case) was split unevenly and illogically between the FDA and the USDA, agencies that had a history of minimal cooperation (GAO 2007; Nestle 2002; Schlosser 2006). Measures were needed “similar to the Hazard Analysis and Critical Control Point (HACCP) standards that meat and poultry producers are required to comply with nationwide” (Wood 2006, np). Legislation, ultimately called the Safe Food Act of 2007, was introduced by Durbin and DeLauro² to “unify food safety functions under a single agency and give it the authority and resources needed to oversee the entire food system” (Nestle 2006, np). In short, a set of uniformly administered and centrally applied regulations and standards were being proposed to protect the citizenry and to save large-scale agriculture.

While these were the general outlines of the crisis, the fall of spinach and governmental accountability from public grace sheds light on a collection of ironies, most of which have not been adequately addressed. One such irony is the central role afforded scientific solutions and post-incident, diagnostic technologies (e.g., vaccines, irradiation, DNA signatures), while leaving uninvestigated the naturally low incidence of *E. coli* O157:H7 in the production systems of developing nations and in pasture-based animal production (Downing 2006; Finz and Allday 2006; Glausiusz 2007; Pollan 2006). This, in turn, generates the further irony that the preferred solution—applying tighter bureaucratic oversight and regulation (e.g., state-of-the-art equipment, increased paperwork and fees, centralized inspection sites and uniform protocol, increased transportation costs)—privileges the very system responsible for the public health crisis in the first place. Stated a bit more directly: Because the proffered political remedy is not scale-sensitive, it disadvantages and may severely affect smaller, regionally based production systems, systems that were not implicated in the spinach scare and that have had significantly different and less far-reaching food safety problems (Waltner-Toews 1996).

It is this last irony that provides the problematic grist for the present paper, and we use the spinach scare not as a classic case study but as a way of framing our concern with the larger irony noted above. Why is it possible that the solution to an industrially created problem is a policy that reinforces the industry while diminishing the viability of

² The bill, “Safe Food Act of 2007,” sponsored by Durbin (S654) and DeLauro (HR1148), was introduced on May 1, 2007. It is basically a recycling of the “Safe Food Act of 2005” and the “Safe Food Act of 2006.” None of these bills made it out of committee.

alternatives? Why are scaled solutions not considered and given legal and regulatory room to operate? In an effort to explain what is happening, we will discuss the relationship of foodborne health risks to scale, document the foodborne health risks associated with smaller-scale, alternative operations, and suggest how the proposed federal policy may adversely affect them. We argue that these local, more regionally based production and marketing systems have not perpetuated—and cannot perpetuate—crises of the nature or magnitude of the spinach scare. Yet, they do not figure into the proposed solution. To help explain this “oversight,” we appeal to arguments based in the state’s sometimes conflicting roles of legitimation and capital accumulation (Habermas 1973; O’Connor 1973; Wolfe 1977). We recognize that expanding individual and market choice (as opposed to direct political engagement) offers the illusion of popular control while reducing the nation state’s fiscal responsibility, thus improving its ability to assist capital. The erosion of this illusion, however, signaled by systemic crises such as the spinach scare, necessitates state-level guarantees that offer real or imagined public protections. Here, maintaining a political culture of fear proves especially useful. It permits the state to establish monolithic guarantees that, while focused on the individual (i.e., consumer), neither redistribute power nor extend democratic processes in ways that challenge capital and market fundamentalism. When state strategies do not work, however, industry itself must take over (or threaten to take over) the responsibilities of legitimation. Finally, we consider the possibility of more democratized and scale-sensitive food safety policies and practices and propose a few small steps that may move us in that direction.

Matters of scale

Differing impacts

According to media reports, about 1600 lbs of spinach from Otto Kramm’s plot was sent to Natural Selection’s San Bautista packing plant on August 15, 2006 (Withers 2007). This finite amount of produce, harvested from some 2.8A, would soon be commingled with spinach from three other farms³ and hundreds of other acres. If, as it has been alleged, Kramm’s spinach was contaminated with *E. coli* O157:H7, then the bacteria were given the perfect hiding place. According to reports, bacterial contamination is less apt to develop in head lettuce than in leaf lettuce and less apt to appear in loose greens than in bagged greens.

³ Eade Ranch, Taix Ranch, and Wickstrom Ranch also were identified as sources of *E. coli* 1057:H7 contamination in the bagged spinach. Only Paicines Ranch, however, had the “exact” signature.

Despite the health implications of these varietal and delivery options, it is interesting note that they received little public or policy consideration (Engel and Lin 2007; Glausiuz 2007).

In addition to the commingling of produce—in this case only one day’s worth—a maze of commercial labels further assisted in rendering Kramm’s spinach incognito as they accompanied the leafy green across the United States. According to one news report, “Some 34 brands of spinach bagged by Natural Selection Foods were recalled, although in the end, all the contaminated spinach that investigators recovered ... carried the Dole label” (Withers 2007, np). No news article published a corporate flow chart or provided a full disclosure of the corporate players involved. The connections, as completely as we can reconstruct them, among Kramm’s plot, Paicines Ranch, Mission Organics, Natural Selection Foods, and Dole are presented in Fig. 1. If these convoluted corporate relationships hampered FDA investigators, surely they confused most spinach consumers. On the one hand, the diversity of labels suggested a diversity of brands and the existence of many independently operated, competing companies. This, in turn, gave the illusion of vast consumer choice (and hid the absence of any real diversity). On the other hand, if something were to go wrong as it did in the case of bagged spinach (and as it will in any food system, large or small) the problem would assume national and international proportions.⁴

The extensive and crippling nature of industrial-scale disasters—from PBB, to BSE, to *E. coli* O157:H7—is hardly a new phenomenon. With each new industrial disaster, the consumer is left hurt, angry, scared, and increasingly clueless—a victim—and turns to the state for protection. But, when the state lacks immediate answers and/or remedies, the public grows wary. In this case, the avoidance of fresh spinach and leafy greens by consumers was (and still is) a reactionary attempt to insure personal health and safety. This is precisely how Consumers Union framed the issue of foodborne safety and leafy greens. Consumers, they allowed, “are really sitting ducks. They need government intervention” (Cone and Lin 2007, np).

Had Kramm sold his allegedly contaminated spinach directly to consumers at a farmers market or to a local food cooperative or restaurant, the scale of the crisis would have been quite different. People might have gotten sick and someone might have died, but the outbreak would have been localized—it would have remained in context. While hardly the desired outcome, it would have made it possible to quickly trace the problem back to its source and with greater assurance that its immediate cause(s) could be identified (e.g., evidence of wild pigs, cattle or

⁴ The bagged spinach was shipped to and recalled from Canada, Mexico, Taiwan, Hong Kong, and Iceland (FDA 2006).

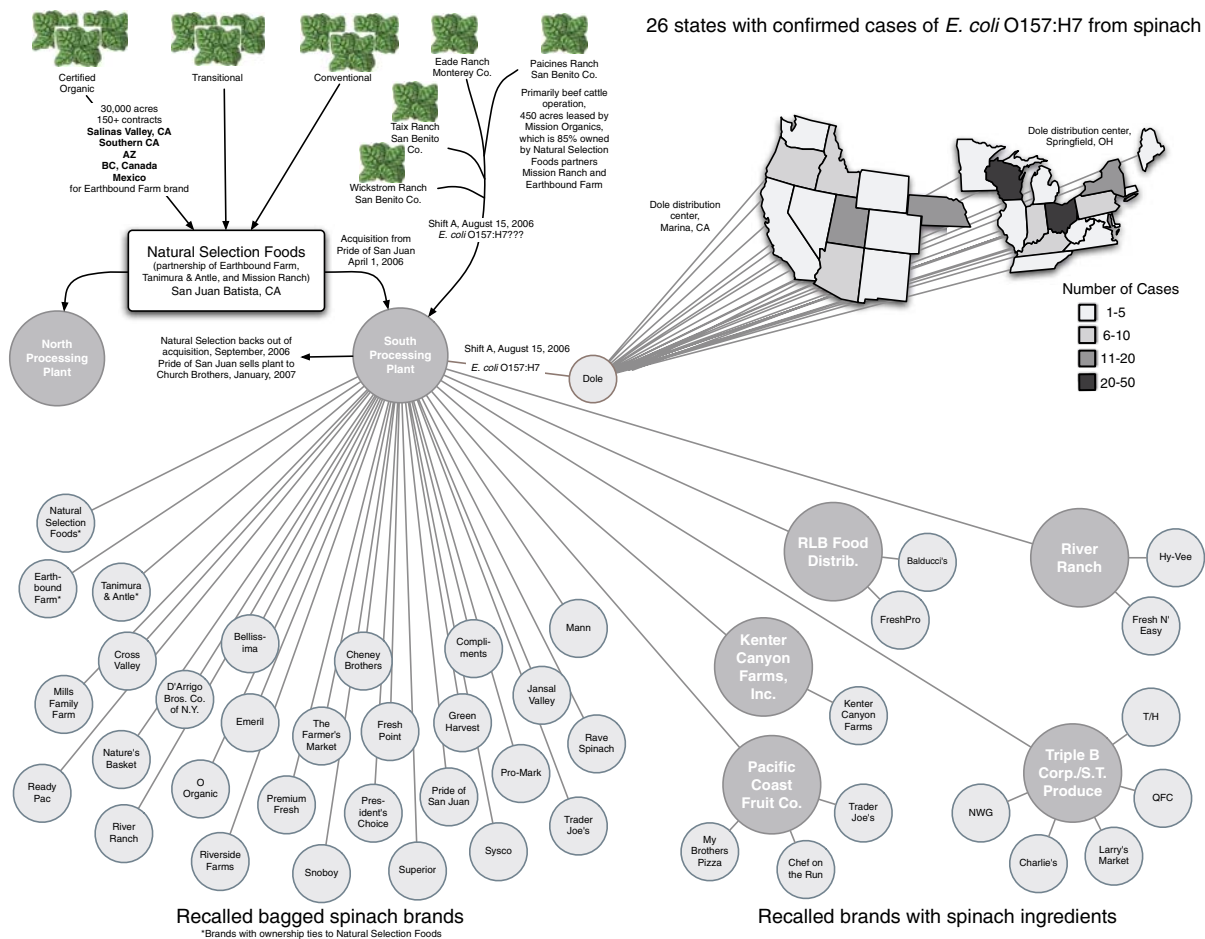


Fig. 1 The 2006 *E. coli* outbreak in Natural Selection Foods’ bagged spinach commodity chain

contaminated irrigation water might still remain; contaminated spinach might still be in the fields). The consumer’s relationship to the contaminated spinach and to the system that produced and delivered it would be far more transparent. A knowledgeable public cannot be as easily and consistently victimized as one that depends (and trades) solely on corporate labels and logos. Scientists and health officials, likewise, could have investigated the reasons for the outbreak, and remedial action could have been taken with far less collateral damage. Yet, even today, “officials [say] they [aren’t] able to determine exactly how the spinach became contaminated, despite an unprecedented six-month investigation” (Bailey 2007, np). It still is not clear just who was accountable or why, although Dole, Natural Selection, and Mission Organics have settled out of court with clients of the law firm Marler Clark (Ha 2007).

Differing health threats

Still, the supposition that an outbreak could have been contained if Otto Kramm had only marketed his spinach

directly to consumers is hardly sufficient. It assumes that *E. coli* O157:H7 would be as likely to appear in a small, decentralized operation/system as in a large one. This being so, it also assumes that increased investment in laboratory science and the increased use of scientifically derived (and patentable) diagnostic tools and antibody-based treatments to better track and eliminate offending bacteria wherever they appear—in bagged spinach, irrigation water, or cattle manure—are universally appropriate (Glausiusz 2007; Steele 2006). These are questionable assumptions.

E. coli O157:H7, scientists note, was basically unknown in the US prior to its first outbreak in 1982, though it has grown over ten fold since, and is now considered an “emerging disease” (Altekruse et al. 1997). Indeed, Lee Riley, professor of infectious disease and epidemiology at University of California—Berkeley is quoted as saying, “We don’t see this disease in India, Africa, China. We only see it in highly technologically advanced countries, and the reason is because of this highly centralized food processing system” (Finz and Allday 2006, A-10).

Small-scale operations have their own food safety problems, but these are of a distinctly different nature, most

often associated with ethnic/traditional foods and preparation practices (e.g., botulism, trichinosis). In the US such outbreaks have been brought under control, though they are still “associated with direct-from-farm and wild pork, and with particular ethnic groups, rather than with commercially produced meat (Bailey and Schantz 1988 cited in Waltner-Toews 1996, 178). But several things need to be underscored here. First, these “ethnic” outbreaks continue to be isolated and sporadic; they are not the source of wide-spread foodborne illness. Stated a bit differently, Waltner-Toews (1996, 178) writes, “that while commercially distributed foods account for a small proportion of incidents, they account for the majority of cases (MacDonald 1986).” Equally important is his observation that, not only has the perception of a safe food supply been based on the control of rare diseases, but that they are diseases the control of which can be used to justify centralized quality control in food processing (commercial canning as a control for botulism) and industry commercialization of animal production (confinement housing of swine to prevent trichinosis) (Waltner-Toews 1996, 178).

What this suggests is that our foodborne crises/illnesses are both self-created and self-selected.

Differing contexts

If scale—smaller production and marketing systems, in particular—does not eliminate problems, it does keep them manageable. It also mitigates the tendency to essentialize production practices. In the case of the spinach scare, much was made of the fact that the contaminated spinach had been organically grown. Early news reports suggested that the contaminated spinach was organic, a claim that ultimately proved false (Sander 2006). Six months later, however, news accounts reasserted the connection. Kramm’s plot was in transition to organic management, and his spinach was not marketed as organic, but his ties to Mission Organics and Natural Selection Foods established guilt by association. Likewise, the fact that the exact strain of *E. coli* O157:H7 was found on a grass-fed cattle ranch within 1600 kilometers of the spinach fields suggested that there also might be something seriously wrong with grass-fed beef. Thus, the bacteria’s assumed connection to organic and grass-fed foods became a significant part of the spinach story—a conflation that was both politically potent and contextually superficial.

Much has been written about the environmental and human health benefits of organic practices (Benbrook 2005; Bengtsson et al. 2005; Hole et al. 2005; Lu et al. 2006; Marriot and Wander 2006; Pimentel 2006). Likewise, there is a growing literature that recognizes that the gut of a grass-fed cow is inhospitable to colonization by

E. coli O157:H7 (Benbrook 2006a; Diez-Gonzalez et al. 1998; Planck 2006). Admittedly, these are contentious issues, with heavily invested interests on both sides of the debate. It is true that *E. coli* can be (and has been) found in organic produce and in improperly composted manure (Benbrook 2006b; Cummins 2006; Diez-Gonzales 2006; NESTC 2004; OTA 2006). Once again, it is not a question of absolutes but of differential contexts. What is frequently lost in this debate and what was certainly lost in the CADHS/FDA report and its news coverage is the notion of scale (2007). Organic food, when industrialized, will encounter the same volume and capital-efficiency demands as any other conventionally raised commodity and, as such, is not exempt from harboring and transmitting industrially crafted organisms that cause serious and widespread illness. For Natural Selection Foods, the largest organic label in the US, organic is little more than a commodity attribute, not a way of relating to the soil or a “right livelihood.”

We know little about how the approximately 2000 grass-fed animals on Paicines Ranch were raised. This information was not available in the California CDC/FDA report or on the ranch website. Without data to the contrary, we must assume that these animals were raised according to ecologically sound practices. We do not know why *E. coli* O157:H7 was found in water, soil, cattle, and wild pig feces in the vicinity nearly a mile south of Kramm’s spinach plot. Neither does anyone else. More concerning still, no one seems to be asking basic questions (or publicizing the findings if they have) such as: Why is *E. coli* O157:H7 in the ground water? Why was *E. coli* O157:H7 found on three other spinach farms in the area? How close are these spinach farms to CAFOs? Are there health implications associated with the size (i.e., scale) of commercial grass-fed operations? As a result, the consumer is left to think that organic or grass-fed products are uniform in their constitution (i.e., there is one organic or grass-fed standard); and, to make matters worse, are not what they claim to be (i.e., healthy, safe). For the consumer, this becomes another apparent deception in an increasingly dangerous world.

Denying diversity

The tendency to essentialize and decontextualize food safety problems, in turn, is consistent with, if it doesn’t dictate, the need to find the culprit and the cure. As a result, the FDA and news reports focused on Kramm’s spinach operation and an “exact” DNA match, while little was said about common conditions on all the *E. coli* O157:H7 contaminated farms. Likewise, few questioned why *E. coli* O157:H7 seemed so prevalent on the Paicines Ranch but not on other grass-fed operations. Nor was there any concerted effort to study the foodborne illnesses associated

with alternative systems of growing, processing, and distributing fresh spinach or why those purchasing fresh spinach at farmers markets in California or elsewhere around the country from August 2006 through March 2007 did not succumb to *E. coli* O157:H7 poisoning.

Diversity and the maintenance of diversity enable resilience and the ability of populations to survive as conditions change. For human populations, biodiversity is inseparable from cultural diversity. Both are mutually constituted and constituting. Landscapes we once thought of as natural or pristine we now know were shaped by deliberate human use and management over long periods of time. Not only did our global ancestors create biodiversity, agrobiodiversity in particular, but the greatest biodiversity appears to exist in those places where people have lived the longest (Moffi 2001; Nabhan 1997). In other words, diversity is site-specific, embedded in the shared wisdom, decision making, and daily interactions of people in places. We know from the work of ecologists, biologists, and anthropologists that bodies, foods, and landscapes fit together, the result of mutual cultural and biological recognition and accommodation (Cone and Martin 1998; Nabhan 2004; Nazarea 1998; Nazarea 2005; TOCA nd; Waltner-Toews 1996).

Like diversity, health also exists in context: The former protects populations, the latter individuals. Our immunity depends on our body's ability to know what is self and safe (and what is not).⁵ Thus, while necessary for survival, food is hardly harmless (Cone and Martin 1998; Waltner-Toews 1996). Especially when taken out of context, something that is becoming the global rule rather than the local exception, food can be decidedly dangerous and has been implicated in the increases in allergies and immune deficiency diseases. The point, then, is not to eliminate the danger, but to manage it. It is not to take our food (and ourselves) out of context—to sanitize, standardize, and codify—but to keep it (and us) in context, in situ and continually adjusting. Not one language, not one creation myth, not one outcome, but many. This is our security.

The closest we can come to food safety is to know who we are, where we are, and what we are eating. In essence, this means knowing at a variety of levels our ecological niches and the other life forms, pathogens included, that dwell there. This sort of safety depends as much on place-

based knowledge and collective awareness as it does on science. Furthermore, it comes with no guarantees. The best we can do is to be adaptable, and our adaptability depends on our diversity, a shared responsibility. Ultimately, as Waltner-Toews (1996, 184) suggests, we need to reconcile ourselves to the fact that our health will require us to tolerate

some level of exposure to infectious agents ... to maintain the resilience of our immune system, so we may want to tolerate the smaller disease outbreaks that come with a more decentralized agrifood system based on smaller units. . . . In this sense at least, a bit of food poisoning is probably a good thing. It helps us to keep up our personal immunity as well as our capacity to respond to outbreaks, and serves the crucial role of reminding all participants in this shortened, more visible, food chain about the inherent risks of eating our environments.

The proposed solution

Consolidating oversight

The spinach scare (like most scares, before and since) could have prompted an inquiry into the nature and importance of differential scale on foodborne illness and the ecological fit of *E. coli* O157:H7 to industrial niches. It might have led to critical musings like those posed by Andre (2007, np).

Small farming families have historically had there [sic] vegetable gardens close to cattle farm yard. They have used well rotted manure as fertilizer for centuries (sometimes even not well rotted). Driving through the French country side, I was even surprised to see farm homes actually attached to barns! My question is, why does there not seem to be a historic problem with the boogie-germ *E. coli* O157:H7? Maybe pre-technical society wouldn't be able to specifically identify the problem germ, but their ancient methods seemed to quite often identify what was acceptable hygiene to maintain health and what wasn't. So what has changed? Why do we now have this problem?

But, scale and context were not seriously considered. Rather, the ultimate solution was felt to lie in creating a singular federal agency—a Food Safety Administration—to eliminate “the huge gaps in the nation's century-old and highly dysfunctional food safety system” (Nestle 2006, np). The case for such unified and centralized oversight and authority was clearly presented by Marion Nestle (2006) in an opinion piece in the *Mercury News*. As she explained,

⁵ As one reviewer pointed out, considerable debate surrounds the “self-nonsel” model of the immune system. Many immunologists now feel that the “danger model,” “which suggests that the immune system is more concerned with damage than with foreignness,” has greater and more nuanced explanatory power (Matzinger 2002). This debate is clearly beyond the scope of the current paper and the expertise of its authors. Nevertheless, regardless of the mechanisms involved, immunity and health are closely dependent upon context (both immediate and evolutionary) and the maintenance of diversity.

Oversight in this area is shared largely between two agencies, the USDA for food animals and the FDA for food plants. Neither has much jurisdiction over farms. The FDA in particular has little enforcement authority. It can do little more than issue warnings and ask for voluntary recalls and action plans.

How many people have to be sickened or die, and how many crops and livelihoods have to be destroyed before it becomes obvious that voluntary is not good enough? If ever a situation called for a unified farm-to-table food safety system—with real regulations, inspection, and enforcement—the recent *E. coli* outbreak is it.

Nestle's position is echoed in GAO reports (2005, 2007) as well as in the legislation proposed by Durbin and DeLauro. They each represent factual and logical responses to the foodborne crisis if the safety of industrial-scale food production and processing is to be improved. We agree that it is not reasonable to leave the industry to police itself, or to have one government agency responsible for whole eggs and another for broken ones (or one for fresh spinach and one for bagged spinach), or to expect compliance without the legal authority and resources to enforce it (GAO 2005, 2007). In this regard, we might even wonder why the newly acquired San Juan Batista plant that processed the contaminated spinach had no proper operating permit (CADHS and FDA 2007). All told, it is quite clear that the industrial food system is deeply flawed and that we don't need to wait for terrorists. We are quite capable of causing major food and illness disasters all by ourselves. Industrial agriculture does have to be closely regulated, held in check and accountable. We could not agree more.

What we are questioning is the assumption that this is *all* that needs to be done and that industrial-scale solutions are the default mode—possibly the only mode for practical, problem-solving behavior. To be fair, Nestle does note that “industrial agriculture has its down side.” Yet the implication is that this is a cross we will have to bear—the price of cheap food—and “[i]f we want to continue this system, we need better food safety procedure.” (2006, np). But, the “if” goes unexplored and is quite rhetorical. “Certainly,” she recognizes, “calling for more regulations is not a popular stance. Regulations are difficult to follow, generate cost, and are not always applied fairly or consistently. But nothing less has worked. If California wants the nation to keep buying its spinach and other crops grown there—and if Californians want the produce they eat to be safe—then the system must be fixed” (2006, np; see also Akst 2006). We contend that how the proposed “fix” differentially affects scale and how the loss of smaller-scale operations and markets, reinforce and ultimately guarantee, the *E. coli* O157:H7 habitat is worth equal consideration.

According to the legislation proposed by Durbin and DeLauro, a Food Safety Administration would assume the responsibilities of some ten existing agencies⁶ and be responsible for registering all food processors and retailers (excluding farms and restaurants), developing “science-based process controls” (including but not limited to HACCP), determining standards performance, sampling, inspection (of domestic products and imports), conducting cooperative research, and educating the food consumer. The Durbin DeLauro legislation requires that all slaughterhouses, food processing, storage, and distribution facilities be registered with the federal government and inspected prior to the delivery of food for retail sale. “Preventative processing controls; standards for sanitation; performance standards for contaminants; record keeping to monitor compliance; and sampling to ensure that process controls are effective” all will be established (Safe Food Act of 2007). Such expanded paperwork and oversight have proven to be far more burdensome financially and procedurally for smaller processors than for larger ones—HACCP itself being a classic example (Ten Eyck et al. 2006).

While ostensibly efficient from a management standpoint, provided there is sufficient and consistent funding (a questionable assumption as several critics note (Harvard Law Review 2007; Kita 2007), such centralized authority is a double-edged sword and not without problems of its own. Political and economic influence, instrumental problem solving, and the absence of redundancy have implications for scale and for democratic process. We have only to look at how a number of programs under the auspices of the Office of Homeland Security have been managed to recognize that transparency can be easily sacrificed, that data of any kind can be collected for “precautionary” purposes, that state and local rights can be appropriated, and that property and persons can be seized for probable cause in a

⁶ (1) the Food Safety and Inspection Service of the Department of Agriculture; (2) the Center for Food Safety and Applied Nutrition of the Food and Drug Administration; (3) the part of the Agriculture Marketing Service that administers shell egg surveillance services established under the Egg Products Inspection Act; (4) the resources and facilities of the Office of Regulatory Affairs of the Food and Drug Administration that administer and conduct inspections of food establishments and imports; (5) the resources and facilities of the Office of the Commissioner of the Food and Drug Administration that support—(A) the Center for Food Safety and Applied Nutrition; (B) the Center for Veterinary Medicine; and (C) the Office of Regulatory Affairs; (6) the Center for Veterinary Medicine of the Food and Drug Administration; (7) the resources and facilities of the Environmental Protection Agency that control and regulate pesticide residues in food; (8) the part of the Research, Education, and Economics mission area of the Department of Agriculture related to food safety and animal feed research; (9) the part of the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration of the Department of Commerce that administers the seafood inspection program; (10) the Animal and Plant Inspection Health Service of the Department of Agriculture” (H.R. 1148, 2007).

tightly controlled top-down system. With regard to food safety, we already know that such cause can be a matter of interpretation (or reinterpretation), often framed by the revolving door that exists between government and industry (Krebs 1991; Mattera 2004). National organic standards, for example, continue to be adjusted (others might say, eroded) to make them, and the organic label, more compatible with the needs of large-scale growers and processors (Brady 2006; Lavigne 2006; Weinraub 2003; Whitney 2007). However familiar and problematic such concerns may be, the centralization and consolidation of power remains largely unchallenged when it is used to confront a crisis—when immediate remedial action is required. That this response frequently feeds future crises by eliminating alternative institutional forms and practices too often is recognized only after the fact.

Eliminating options

It is also worth mentioning that small farmers and processors typically are poorly represented when it comes to promulgating best practices (DeLind 1995). In California, the Community Alliance with Family Farmers (CAFF) recently advertised for a part-time “campaign coordinator” to represent and negotiate “the interests of small-scale and limited resource growers and processors of leafy greens in the discussions around food safety taking place in California and at the national level” (CAFF 2007, np). Farm Bureau, by contrast, has a fleet of well-paid, full-time policy analysts, lawyers, and lobbyists to represent their interests at both the state and national levels.

That smaller operators lack the acreage, the person-power, and the state of the art technology to meet “trace back” demands is hardly a new observation; indeed, this is a major reason why these operations have become endangered species. We already know that family dairies have succumbed to costly health and safety requirements (Davidson and Schwarzweller 1995). The requirements now being proposed for other sectors to “ensure the lowest level or incidence of contamination that is reasonably achievable using the best available processing technology, interventions, and practices” (Safe Food Act of 2007) will have a similar effect. We already know that USDA certified slaughterhouses have become fewer in number and are located farther apart. Those that remain are often unwilling to process the animals of even those small-scale or organic farmers able to manage the logistics and transportation costs (Buckham 2006; Wright 2007). Likewise, the “up to \$10,000” penalty proposed by Durbin and DeLauro for “violating a food safety law” (\$100,000 and three years jail time if intent to defraud was established) (2007, np) is a far greater barrier to the small producer or processor than to

the well-insured, large one. The law (and penalty) is not unlike one preventing people from sleeping on park benches. While applied uniformly, it will hardly inconvenience anyone with a secure place to sleep at night. And, indeed, it wasn’t meant to.

Faced with such restrictions, smaller operators either disappear or create alternative, quasi-legal, and/or totally underground solutions—farmers markets, CSAs, cow shares, seed exchanges, food cooperatives, and other forms of direct marketing and place-based economic strategies. It is ironic that centralized legislation can catalyze these decentralized, creative (and sometime wholly desperate) forms of survival and resistance. It is equally ironic that when a new and unregulated form causes illness (which it certainly can do), the incident confirms the need for uniformity and control (for designating diverse, local arrangements illegal rather than ensuring their legality). Yet when an alternative marketing arrangement grows successful, as in the case of farmers markets, it is increasingly regularized—reframed to respond to external management demands and capital efficiencies rather than to the ecological and sociocultural niches that enabled their appearance in the first place. Vendors in many large farmers markets, for example, now are required to carry liability insurance and to have their farms annually inspected, for a fee, by market management—bureaucratic protections that slowly eliminate the smaller, more marginal (but not necessarily less safe) farming enterprises.

Finally, we might note that the proposed Durbin and DeLauro legislation was not designed to restore food quality as much as it was designed to establish legal parameters and protections. It still will supply consumers with a protracted set of precautions for handling raw chicken while prosecuting the small grower whose birds, though uninspected, are salmonella-free. Likewise, it still will continue to seize raw milk and equipment from farms whose animals and products provide known health benefits but are acting outside the law (Cole 2007; Glencolton Farms 2007). We are left to question why this is happening and why so many people who are in a position to know better remain so committed to solutions that have the capacity to undermine their own (and our own) welfare.

Accumulation and legitimation

Theories of monopoly capital suggest that given the tendency for economic power to concentrate and centralize, state interventions will favor the largest firms in a given industry (Baran and Sweezy 1966). This disproportionate influence results in injustices for smaller capitalist firms, not just the public. Big businesses accrue benefits from (1) regulations (whether by design, or through administrative

rule-making or enforcement); (2) direct government subsidies; and (3) indirect subsidies (state supported research, etc.). These benefits, we argue, are embedded within and may well be facilitated by the proposal to create a single agency to oversee and regulate national food safety. Exceptions can occur. But these are found primarily in cases where the interests of large-scale firms are not threatened by an appearance of fairness, or in response to tremendous popular pressure (although inequity often returns when this pressure subsides). An example might be found in the public's response to the USDA's first draft of national organic standards (Vos 2000). Even so, operational loopholes for industrial producers and processors have grown increasingly common (e.g., animal confinement, organic seed and feed labeling, synthetic and non-organic ingredients) despite what appears to be a uniformly applied and a socially and environmentally responsible commodity chain (Allen and Kovach 2000; Guthman 2004).

The spinach scare and its subsequent handling—rather than being a collection of confused or misdirected responses—is consistent with the state's need to protect industry (and the source and logic of capital) and respond to public distress by framing reality; thus the way the public understands what is going on.⁷ There are already indications that calling for more regulation will do more to legitimate (and consolidate) existing practices and players than to address the underlying causes of the contamination episodes. For instance, Tom Stenzel, chief executive of United Fresh Produce Association, allowed that “One of the most frustrating things about the most recent recalls is the fact the companies involved were among those who are *as good as it gets* in terms of commitments to food safety. And if it can happen to them, it can happen to anybody” (Major 2007, 54, emphasis added). His message, a challenge as well as a defense, implied that what really needed

to change was public perception. In a strangely corroborating statement, the sons of a woman who died from the contaminated spinach said, “Our problem with just following this approach [new marketing arrangements] is that the company's spinach our mother ate, according to their own news release, ‘has always used good agriculture practices in all its growing operations’” (Marler Clark 2007, np). Sadly, realities can be enabled as well as buried under regulation.

But, there is also evidence that proposed regulations can eliminate competition and increase scale. We might note that the immediate response of the produce industry (i.e., Western Growers Association (WGA), Produce Marketing Association, and the United Fresh Produce Association) was to work with the state of California to develop a voluntary leafy green marketing agreement, while also demanding enforceable state and federal regulations. Such a marketing agreement would allow members of the industry to develop state of the art, publicly palliative guidelines that would become mandatory once the agreement was signed. Members also would be able to opt out of the agreement at any time, as long as they didn't mind leaving themselves economically and politically exposed. Industry leaders clearly recognized the potential such regulations had (and have) for driving smaller firms out of business. Tim York, president of a buying group based in Salinas applauded the voluntary guidelines, saying that “The regulations are going to be expensive, and some growers may not be able to do this, which may well change the nature of WGA's membership” (Major 2007, 58). It is hardly tangential to mention that WGA members supply “90% of the fresh fruits, nuts, and vegetables in California and 75% in Arizona (roughly one half of the nation's fresh produce)” (Palmer 2007, 28). California Certified Organic Farmers, recognizing the same pattern but responding in a manner far less sanguine, raised concerns that small, organic growers would not have the financial capital required to conform to the proposed marketing agreement and that the regulations were being developed with a lack of transparency (CCOF 2007).

Within months of the spinach scare, industry (with the tacit approval of the state) assumed a major role in its own regulation and legitimation. While Habermas (1973) and O'Connor (1973) argue that legitimation is principally a role of the state, corporations increasingly are engaged in actions that garner public support for their industries and for capitalism in general (Boyd 2000). This happens as state power and resources are claimed by and subordinated to the interests of transnational entities in an ever expanding and demanding global economy (Bonnano 2004). Confronted by this regime change as well as by the public injuries inflicted by disaffected corporate interests, the state has grown increasingly encumbered (e.g., fewer inspectors, less infrastructure, less testing) and the

⁷ US food safety regulations illustrate both state support for accumulation, particularly for the largest firms, and state and corporate engagement in legitimation. Kolko (1963) suggests that the regulations passed in the Progressive Era, such as the Pure Food and Drugs Act, and the Meat Inspection Act, were welcomed by big business as a means to reduce competition. This view contrasts sharply with accounts that describe these laws as victories of a Progressive movement on behalf of the public. Less contentious is evidence that these laws were implemented and enforced in ways that were most amenable to the largest firms (Law 2005). Regulations solved a legitimation problem for big business by regaining public trust in the food system that had been eroded by the muckrakers. At the same time, they effectively provided a competitive advantage to the large firms that could more easily afford the expense of compliance. They also facilitated what is in effect a state-sanctioned cartel, by enforcing an agreement among the largest firms to avoid competing in the arena of food safety (Carson 2007). Milk pasteurization laws passed in 1914 and 1915, for example, led to the demise of numerous small milk distributors in cities including Detroit, Chicago, Boston, and Milwaukee as well as to the rise of two national holding companies, Borden's and Sealtest (Levenstein 1988).

accumulation process has become increasingly vulnerable to disruption in its final stage—the transformation of commodities back into money (Bonnano 2004). In response, many of the state’s traditional functions are now performed by non-state organizations. One example of this is the development of private grades and standards for food products (i.e., safety, environmental, and ethical criteria) (Busch and Bain 2004). Likewise, third party certification has emerged as a means of enforcing as well as legitimizing private regulations, the aforementioned California Leafy Green Products Handler Marketing Agreement (CADFA 2007) being a case in point.

A frequently touted advantage of such a move is that private regulations and the private sector generally can be more responsive to changing consumer demands than can government regulations. While this remains debatable, it is hardly surprisingly that such regulations have developed in ways that privilege the largest firms (Reardon et al. 2001). Equally problematic is the recognition that industry standards and regulations can identify and operationalize the criteria or issues of paramount concern, a discrimination that can ultimately eliminate competition and assist accumulation. In the case of spinach, despite the crisis and its overt health concerns, food safety may well cease to be an area of competition among those firms that remain. In a *USA Today* feature following the spinach recall, Fresh Express, a Chiquita subsidiary that controls 40% of supermarket sales of bagged salads, claimed to have the leafy green industry’s most stringent food safety practices (Schmit 2006b). Apparently, in direct response to this claim, Fresh Express’ sales increased relative to their major competitors in the last months of 2006 (Major 2007). Rather than attempting to improve on Fresh Express practices, the rest of the industry sought regulations to contain this competitive advantage, with Tim Chelling, a spokesperson for the WGA, emphasizing that “We need uniformity” (Major 2007, 58). Once again, industry seems to have defined, or redefined, the terms of a public, foodborne health crisis.

Ideologies of legitimation

It is time now to return to the second half of the question posed earlier: Why is the public-at-large so willing to embrace (indeed, advocate for) solutions that concentrate authority, regularize processes and products, and eliminate competition as a way to ensure protection? Certainly part of the answer resides in the way the public sees and understands reality, and popular ideologies assist the state in legitimating—keeping under wraps—its increasingly unwieldy and crisis-prone function of capital accumulation (Gramsci 1971). Here, we briefly consider three interrelated and mutually reinforcing ideologies or perspectives

that we feel have helped to shape the spinach scare (1) the value of the individual, (2) the value of science and technology, and (3) the value of complete control.

The value of the individual

The spinach scare, like most other recent food-related scares, focused on a breach of trust between the US food system and “the people.” The latter, however, represented not society at large or a cultural ethic or tradition, but rather individuals. While it was never made clear just who had done the breaching, the media was quick to enumerate, again and again, who felt the impact—over 200 people were made sick; three people died. What these people had in common, and apparently the only thing they had in common apart from eating contaminated spinach, was their existence as individual consumers. Despite the depth and breadth of their lives, they were defined by this rather singular, one-dimensional, and rather passive characteristic. Their primary relationship was to the marketplace, and their primary job was to consume, something they had been doing in good faith when they were senselessly struck down.

The popular attention that focused on the individual is quite useful for supporting state legitimation efforts. First, it strips a group of people of most of their sociocultural relationships or connections. Within the context of the spinach scare, they were not seen as belonging to (or being defined by) places or processes or responsibilities greater than themselves or their immediate families. Second, it served to reinforce an apparently universal and insular condition. We are all individuals, each and every one of us, and our primary concern must be to look out for ourselves. Third, because such abstractions are easy to manipulate, individuals not only were cast as victims, but restitution needed to be made (and satisfaction guaranteed) to individuals.

Decontextualizing the individual and conflating individuals and consumers is an effective strategy for keeping people dependent and focused on self interest; two conditions, which if properly managed, will cause little sustained systemic disruption. Even consumer advocacy organizations, which actively seek to represent the interests of the consuming public, rest squarely on the value of the individual—the individual consumer, in particular. In some ways their very existence is useful to the state because they serve as bellwethers of mounting consumer unrest. They also serve as translators and diffusers, conduits through which the state may address potential disruption, not by making processes more transparent or structurally equitable, but by providing additional guarantees that particular products, their constituent parts and processes will be more

stringently managed. They broker the accommodation of individual consumers (a.k.a. victims) and the continued accumulation of capital rather than the empowerment of consuming citizens or the limits of consumption itself.

The value of science and technology

It is hardly necessary to argue that science and technology are social constructions, that every major scientific breakthrough or application produces both benefits and disadvantages, and that these are never equitably distributed. Others have made these arguments (Feenberg 1991; Winner 1986). Still it is interesting to note that the spinach crisis provided an opportunity to showcase the value of science and technology as much, if not more, than it was able to elucidate the breakdown of an over-industrialized biologically based system. Much media coverage was given to the CDC's ability to identify and ultimately to track the *E. coli* O157:H7 held responsible for the contaminated spinach. The ability to obtain an 'exact' biological signature and trace its origins back to the Paines Ranch was touted as a scientific triumph, something that would not have been possible even a generation ago. The prevailing message was that science can handle whatever nature throws at it. The tools for managing the crisis are at hand, and the public should be reassured.

The emphasis on science and the trust placed in science were useful for enabling state legitimation for several reasons. First, with attention focused on discrete scientific details, on truly spectacular minutia, it was possible to mask or deflect public attention from larger, more critical concerns. Media coverage, for instance, did not question why other (less publicized) strains of the deadly *E. coli* O157:H7 bacteria were found in the bagged spinach or the fact that today's scientific prowess would have been unnecessary several generations ago. Ultimately as was mentioned earlier, despite all the scientific evidence, it has not been possible to explain *how* the contamination took place, a question of considerable significance. In Orr's (1991) words, we are taught to value cleverness rather than knowledge.

Second, the public is being asked to trust not in its own experience and collective wisdoms, but in expert knowledge. And as this expert knowledge grows increasingly more segmented and specialized, so does the distance between those who really know what's happening and those who don't. Despite its many benefits, science also functions to keep individuals in check—beholden and dependent. One of the more recent solutions to the entire *E. coli* problem is a human vaccination against the bacteria (One also is being proposed for cattle) (Pollack 2007). Not only is this a solution designed for the individual and

individual welfare, but it reinforces consumption as well as social and mental isolation. The world, as a consequence, becomes an increasingly hostile place, requiring the public to seek protections and the next proffered remedy, however partial it may be. There is little incentive to publicly disclose the fact that each new solution or bit of technology makes its own demands or that we, contextually and collectively, create most of our own problems.

There are those who are skeptical, of course. Michael T. Osterholm, director of the Center for Infectious Disease Research and Policy at the University of Minnesota cautioned, "What really is a concern to me about this [spinach] issue is we always have a tendency to want high-tech responses to what in many cases are common-sense low-tech solutions" (Pollack 2007, F-1). He tends to be the exception that proves the rule.

Third, the public is encouraged to understand the problem, however defined and addressed, as part of a unidirectional process called progress. The implication is that things could not be otherwise. Certainly they could not be otherwise and keep all the comforts and securities that individuals deserve and have come to expect. In the case of the spinach scare, this is precisely how most advocates for a centralized agency and uniform oversight and regulation argue their case. It is assumed that no other options are viable without reverting to more troubled times or a lesser quality of life. A belief in social Darwinism lies just below the surface, as evident in a recent article in *Supermarket Fresh Food Business*. Here WGA's spokesman, Tim Chelling is quoted as saying, the produce industry will require a "Darwinian process" of adaptation, and that "anyone with a lick of common sense is going to have the highest possible food safety standards going forward. And anyone who does not will be out of business" (Major 2007, 59). What is good for a scientized and highly capitalized industry is good for the state and the nation; all others need not apply.

The value of control

What made the spinach scare scary for so many was the public's loss of control over something as ubiquitous and as unquestioned as the food supply. In absolute terms, the numbers of illnesses and deaths associated with eating contaminated spinach, while certainly troubling for the nation and devastating for the individuals and families involved, were not all that large. More people become ill from eating peanuts, and more highway workers are injured or killed on the job each year, than were directly involved in the spinach crisis. But, the spinach numbers were endlessly publicized, few news reports failed to mention the illness and the death, and they quickly took on a deeper meaning. The average person (as distinct from someone

allergic to peanuts or employed by the road commission) understood that s/he was not safe—in fact was at risk—when negotiating something as seemingly benign as a salad.

Implicit in the news coverage and in the proposed solutions was the elimination of risk as a prerequisite for safety and as an individual entitlement. Once again the individual and individual rights (as distinct from individual and collective responsibilities) were thrown into high relief. Such notions were fully consistent with the consumer's belief in, to use Lang's brilliant phrase, "a cornucopia without consequences" (2003, 566) and the unquestioned sanctity of the consumer. The belief in the possibility of infinite choice and infinite consumption together with the consumer's ability to relinquish all connection to (and knowledge of) the people, places, and processes that permit and define such choice is a recipe for external control. As a (failed) teachable moment, the crisis was managed and publicized in ways that did not invite the public to rethink industrial agriculture or the agrifood system as a whole but rather to reinforce a sense of personal vulnerability and through it state responsibility. That this environment allowed the state (and industry as a proxy for the state) to more easily exercise control over the outcome, while attending to the twin jobs of accumulation and legitimation, can be seen in a number of ways.

First, the spinach scare like most proclaimed crises in the US relied heavily on sensationalism, on hastily and superficially gathered data conducive to panic. With little in-depth investigative reporting, people were left to respond in the only way they knew: by not eating spinach and leafy greens—an immediately effective, if negative and closed reaction. Second, assisted by panic, individuals (a.k.a. consumers) were easily cast as victims and the public-at-large as desperate for guarantees, the more uniform and absolute the better. Attention focused not on the nature of the consumer but on the nature of the thing consumed. Third, guaranteeing personal safety was synonymous with transforming the nature of food (i.e., the thing consumed) from a living, life-sustaining, but potentially dangerous substance into something harmless and universally beneficial, clean, spotless, and measurable (Green 2001). This transformation has continued as major processors dictate increasingly restrictive field management guidelines to growers. According to a recent news report, Fresh Express

Will not accept produce from fields grown within a mile of a cattle feed lot or dairy operation, or if they are within 150 yards of rivers or habitats that attract wildlife. Fields that show evidence of wild pig visitation cannot be harvested for two years. The company also demands fences and rodent traps every 50 feet around field perimeters.

"If we find animal tracks in a field," Lugg told me, "then we don't believe that the product is safe to harvest." That means, he said, any animals—from frogs to dogs. "We don't like to see animals in a field of lettuce. We don't think people like the idea" (Nargin 2007, np).

With this as the logical solution, it became only reasonable for expert systems, like those of science and technology, to decide which questions were worth research attention and which data were credible. This knowledge and the reality it represents can endorse and be endorsed by a centralized authority through the rigorous application of HACCP-type regulations for the protection of a typically uninformed and at-risk public (Green 2001; TenEyke 2006). Fourth, the belief in the need to eliminate risk—and in the best of all possible worlds, all risk—not only tends to be self-perpetuating (i.e., each new crisis argues for the need for tighter controls, fewer options, less tolerance), but it tends to treat each crisis as an independent occurrence, to disguise the fact that uniformity and atomization, whether biological or sociocultural, are themselves extremely dangerous. Rhetoric on behalf of food variety and choice aside, this is essentially a denial of the value of diversity and the life-affirming uncertainties (i.e., dangers) that accompany long-term survival. It is a public denial of something as simple as "don't put all your eggs in one basket" and as complex as the biosphere.

By dictating, if not manufacturing, the dangers to be controlled, the state obscures the fact that danger and diversity are essential elements of life. They define each other and their continual accommodation is the closest we will ever come to absolute safety. Said somewhat differently, bio-terrorism inflamed by the administration and a climate of fear more generally provide convenient cover under which to hide the myriad relationships, problems, and solutions that exist within the food system, including those of infectious foodborne illness. Far from eliminating all risk, it keeps us desperate and in perpetual need of protection.

Toward scaled alternatives

Is there a way out of this double bind of privileging safety regulations that ultimately reinforce the very problems they purportedly address? Clearly, we advocate policies that do not assume an ideal form of food production or market structure but recognize the value of multiple forms, their strengths and weaknesses. We feel that regulations need to be scaled according to production volume and geographic scope—situating food safety practices within ecological contexts and market extent, and situating oversight and

enforcement within differing levels of public jurisdiction. Instead of an endless proliferation of industry-vetted standards, marks, and labels, we might look to the creation of local and regional networks for food production, processing, and distribution—substituting biocultural diversity for superficial variation. Such a system would necessitate considerable redundancy. Funding and regulatory authority would need to be liberally shared, accessible to residents and democratic institutions at multiple levels. Such a deliberate distribution of resources and responsibilities surely would deter the possibility of a nation-wide foodborne illness or terrorist attack on the nation's food supply far better than any uniform and bureaucratically centralized regulatory defense.

Our preferred option, then, would be to implement subsidiarity, which is the principle that decisions should be made at the smallest and simplest level of organization. We suggest that decisions be made in accordance with guiding universal principles, interpreted to fit scaled realities, using scaled regulations and standards. The intercession of larger governmental entities and hypertechnology and science, if needed, would be the last, not the first, resort (Føllesdal 1998). Although knowing when to accede to a central governing authority would obviously be a very contentious process, even the ideal of autonomy is far from being espoused by those currently in power in the United States.⁸

In the absence of true subsidiarity, food safety regulations that favor small-scale producers for their inherent decentralization of foodborne disease risks as well as to address the historical inequities they have faced would be an improvement. However, the logic of accumulation and legitimation suggests that enacting such policies would be contrary to the state's interests in supporting monopoly capital. Therefore, we are not optimistic about achieving this goal without being able to catalyze or mobilize sufficient public pressure to threaten the legitimacy of the state. Such pressure is not currently evident. Epidemics of foodborne disease have so far failed to stimulate widespread and sustained public discourse that ranks food system safety or public engagement above profit.

This is not to say that the next crisis won't provide another opportunity to raise these issues. Contamination of commercial dog and cat foods, for example, has led to an increase in homemade pet foods as well as a broader and more critical public discussion of the supposed need to import large amounts of food from China (Goodnow 2007; Henderson 2007). However, to engage larger segments of the public in a movement to reverse consolidation in the food system, with its attendant safety risks, will require

more efforts to demystify this process and the ideologies that support it. It will also require a less passive approach to food safety issues, rather than naively trusting government oversight of the food industry.

One promising area for building alternatives lies within the budding movement called "peer production" (Benkler 2006) or "mass collaboration" (Tapscott and Williams 2006). These movements involve voluntary, decentralized participation in projects without the expectation of direct monetary rewards or intellectual property protections. Examples include contributions to the online encyclopedia Wikipedia and programming open source software or operating systems, such as OpenOffice and Linux. This "wisdom of crowds" is a common result when diverse, decentralized groups of people make independent contributions to an aggregated project (Surowiecki 2004).

Peer production could be used to improve surveillance of foodborne disease outbreaks. Whoisick.org is a website that allows anyone to anonymously report symptoms of their illness. The data are mapped, and visitors to the site can make queries by geography, symptoms, time period, age, and gender. The project could easily be extended to include the reporting of food items eaten before the onset of symptoms. This would provide more information, more quickly, and at finer geographic scales than is possible from government agencies such as the CDC (foodborne illnesses are greatly under-reported, particularly when symptoms are relatively mild). The potential source of epidemics might be identified more rapidly as a result. Peer production also could be involved in publicizing significant epidemics and product recalls. A user-generated database, accessible by camera phone (to read a product bar code) could provide up-to-the-minute information on any disease risks suspected from the product (as well as other information, such as boycotts, social and environmental impacts, etc.).

These approaches also may challenge the hegemonies of individualism and command and control systems of management. Every success provides evidence that cooperative, bottom-up approaches are capable of solving problems as well as or better than those that are rigidly hierarchical and proprietary. They may even challenge the hegemony of scientism, as participation in solving problems where experts have failed leads to questioning the current reliance on reductionist approaches.

Although we advocate peer production, we recognize the inequity inherent in the digital divide and the fact that not everyone will have the time or the will to contribute to virtual data collection and management. We maintain a healthy skepticism toward the technological innovations that are making this strategy easier to implement. We suggest avoiding an over-reliance on technology for peer-to-peer communication. It is vulnerable to disruption whether through the loss of electrical power or the

⁸ The European Union uses the word subsidiarity in its constitution, but it is implemented in ways that privilege powerful interests (Hirschl 2005).

intervention of the state.⁹ Ultimately, we must find ways to talk to and be with our neighbors, making it as comfortable and as open a process as the one that now characterizes many online projects.

Here another promising strategy is to look at the actions and motivations of people who are already resisting food safety regulations that pose barriers to small-scale producers. For example, a tiny minority of chefs has established unlicensed restaurants out of their homes, and small-scale farmers and processors have developed underground markets at secret locations (DeFao 2006; Katz 2006). They could not do this without the support of others willing to bend or break the law (even if some are simply in search of better tasting food rather than explicitly practicing civil disobedience). Such renegade actions may encourage people to question the legitimacy of food safety regulations, despite regulatory agency claims that to engage in these actions puts them at greater risk for foodborne disease. In fact, some of the consumers of illegal raw milk in Maryland reportedly work for the CDC, FDA, USDA, and NIH (Gienow 2007). Even within the agencies responsible for maintaining agrifood regulation, there are those who appear to be willing to flout it, albeit on a surreptitious and individual basis.

A safer food system will require much more decentralization and democratic input than exists currently. The logic of accumulation and legitimation suggests such a transformation will be strongly resisted by powerful state and corporate interests that benefit from the status quo. We can expect every crisis to be exploited to increase industrialization and consolidation, which in addition to enriching its proponents serves to reinforce food safety problems. Because this struggle is primarily ideological the main task for industry and government is to keep real alternatives from entering public discourse. Online and, better yet, offline, peer to peer communication has the potential to mobilize huge numbers of people to improve food safety and perhaps undermine hegemonic ideologies and democratize the political economy. Just as a little food poisoning is a good thing, a way of strengthening our individual and collective immune systems, a little civil disobedience is also a good thing—a way of strengthening our individual and collective political will.

⁹ State-level disruption is not just a hypothetical possibility—governments have been found to engage in internet censorship in 25 of 41 countries recently surveyed by researchers at Harvard, Oxford, Cambridge, and Toronto (Davies 2007). In the US, telecommunications companies are currently working to privatize the online commons. They are lobbying Congress to enact legislation that would allow them to discriminate against non-commercial data, either sending it much more slowly or removing it entirely (Chester 2006).

References

- Akst, D. 2006. Big farms will keep spinach on the table. *The New York Times*, October 15: 3–4.
- Allen, P., and M. Kovach. 2000. The capitalist composition of organic: The potential of markets in fulfilling the promise of organic agriculture. *Agriculture and Human Values* 17 (3): 221–232.
- Altekruse, S.F., M.L. Cohen, and D.L. Swerdlow. 1997. Emerging foodborne diseases. *Emerging Infectious Disease* 3 (3): 285–293.
- Andre, M. 2007. Comment in response to Pecarich, F. 2007. Hiding the ball on *E. coli*: What we now know about spinach and other leafy vegetables grown in California. *California Progress Report*, March 23. http://www.californiaprogressreport.com/2007/03/hiding_the_ball.html. Accessed 27 May 2007.
- Bailey, B. 2007. *E. coli* that tainted spinach traced to San Benito County cattle ranch. *San Jose Mercury News*, March 23. <http://www.tinyurl.com/2vefr9>. Accessed 25 March 2007.
- Bailey, L.H. 1988/1915. *The holy earth*. Columbus, Ohio: The National United Methodist Rural Fellowship.
- Bailey, T.M., and P. Schantz. 1988. Trichinosis surveillance, United States, 1986. *Morbidity and Mortality Weekly Report* 37 (SS–5): 1–8.
- Baran, P.A., and P.M. Sweezy. 1966. *Monopoly capital: An essay on the American economic and social order*. New York: Monthly Review Press.
- Benbrook, C. 2005. *State of science review: elevating antioxidant levels in food through organic farming and food processing*. Troy, Oregon: The Organic Center. http://www.organic-center.org/science.antiox.php?action=view&report_id=3. Accessed 7 May 2007.
- Benbrook, C. 2006a. *State of science review: Published research on the sources and spread of E. coli O157*. Troy, Oregon: The Organic Center. http://www.organic-center.org/science.safety.php?action=view&report_id=61. Accessed 20 March 2007.
- Benbrook, C. 2006b. *Critical issue report: E. coli O157:H7 frequently asked questions*. Troy, Oregon: The Organic Center. http://www.organic-center.org/reportfiles/e_coli_final.pdf. Accessed 17 February 2007.
- Bengtsson, J., J. Ahnstrom, and A-C Weibull. 2005. The effects of organic agriculture on biodiversity and abundance: A meta-analysis. *Journal of Applied Ecology* 42 (2): 261–269.
- Benkler, Y. 2006. *The wealth of networks: How social production transforms markets and freedom*. New Haven, Connecticut: Yale University Press.
- Bonnano, A. 2004. Globalization, transnational corporations, the state and democracy. *International Journal of Sociology of Agriculture and Food* 11 (1): 37–48.
- Boyd, J. 2000. Actional legitimation: no crisis necessary. *Journal of Public Relations Research* 12 (4): 341–353.
- Brady, D. 2006. The organic myth: pastoral ideals are getting trampled as organic food goes mass market. *Business Week*, October 16. http://www.businessweek.com/magazine/content/06_42/b4005001.htm?chan=top+news_top+news+index_top+story. Accessed 17 October 2006.
- Buckham, E. 2006. Ag Stewardship Committee holds state meat inspection meeting. *MIFFS Memo* 12 (3): 12. East Lansing, Michigan: Michigan Food and Farming Systems.
- Busch, L., and C. Bain. 2004. New! Improved? The transformation of the global food system. *Rural Sociology* 69 (3): 321–346.
- California Certified Organic Farmers (CCOF). 2007. CCOF urges organic participation in leafy green product marketing agreement. Press release, January 22. <http://www.ccof.org/pr012207.php>. Accessed 23 January 2007.

- California Department of Health Services (CDHS) and the US Food and Drug Administration (FDA). 2007. *Investigation of an Escherichia coli O157:H7 outbreak associated with Dole pre-packaged spinach*. Sacramento and Alameda, California: CDHS and FDA. <http://www.tinyurl.com/28lf2k>. Accessed 25 March 2007.
- Carson, K.A. 2007. *Studies in mutualist political economy*. Charleston, South Carolina: Book Surge Publishing.
- Centers for Disease Control and Prevention (CDC). 2006. Multistate outbreak of *E. coli* O157 infections, November-December 2006. December 7. <http://www.cdc.gov/ecoli/2006/december/120706.htm>. Accessed 14 December 2006.
- Chediak, M. 2007. How safe is your food? *Orlando Sentinel*, February 27. <http://www.tinyurl.com/2nmqdc>. Accessed 1 March 2007.
- Chester, J. 2006. The end of the internet? *The Nation* (online). <http://www.thenation.com/doc/20060213/chester>. Accessed 11 April 2007.
- Cole, W. 2007. Got raw milk? Be very quiet. *Time*, March 13. <http://www.time.com/time/printout/0,8816,1598525,00.html>. Accessed 14 March 2007.
- Community Alliance with Family Farmers (CAFF). 2007. CAFF leafy greens campaign coordinator supervised by: Executive director (with board president and legislative representative). Position description. <http://www.tinyurl.com/39psje>. Accessed 23 March 2007.
- Congress of the United States. 2007. Durbin, DeLauro introduce new food safety bill in wake of widening recalls. *Congress of the United States*, Press release. May 1. http://www.house.gov/delauro/press/2007/May/Food_Safety_Intro_05_01_07.html. Accessed 12 May 2007.
- Cone, M. and R-G Lin II. 2007. Tainted spinach tied to cattle ranch. *Los Angeles Times*, March 24, 2007. <http://www.tinyurl.com/2pajnj>. Accessed 7 May 2007.
- Cone, R.A., and E. Martin. 1998. Corporeal flows: The immune system, global economies of food, and new implications for health. In *The visible woman: Imagining technologies, gender, and science*, ed. P.A. Treichler, L. Cartwright, and C. Penley, 321–359. New York: New York University Press.
- Cuite, C., S.C. Condry, M.L. Nucci, and W.K. Hallman. 2007. *Public response to the contaminated spinach recall of 2006*. New Brunswick, New Jersey: Rutgers University, Food Policy Institute.
- Cummins, R. 2006. OCA statement on nationwide outbreak of *E. coli* poisoning from bagged spinach. September 18. http://www.organicconsumers.org/articles/article_2407.cfm. Accessed 3 October 2006.
- Davidson, A.P., and H.K. Schwarzweller. 1995. Marginality and uneven development: The decline of dairying in Michigan's north country. *Sociologia Ruralis* 35: 40–66.
- Davies, F. 2007. Internet censorship growing globally. *San Jose Mercury News*, May 18, 2007. http://www.mercurynews.com/business/ci_5925661. Accessed 20 May 2007.
- DeFao, J. 2006. Speakeasy cuisine: guided by word-of-mouth, diners flock to unlicensed restaurants for good food at bargain-basement prices. *San Francisco Chronicle* January 22: A-1.
- DeLind, L.B. 1995. The state, hog hotels, and the 'right to farm': A curious relationship. *Agriculture and Human Values* 12 (3): 34–44.
- Diez-Gonzales F., T.R. Callaway, M.G. Kizoulis, and J.B. Russell. 1998. Grain feeding and the dissemination of acid-resistant *Escherichia coli* from cattle. *Science* 281: 1666–1668.
- Diez-Gonzales, F. 2006. Microbial safety of organic fruits and vegetables. NC-SARE Report. Project# LNC03-231.
- Downing, J. 2006. Irradiation back on the table: Food related illnesses renew call for controversial process. *The Sacramento Bee*, December 19.
- Engel, M., and Rong-Gong Lin II. 2007. Processing may spread *E. coli*. *Los Angeles Times*, January 20. <http://www.tinyurl.com/22jknx>. Accessed 12 May 2007.
- Federal Drug Administration (FDA) 2006. FDA statement on foodborne *E. coli* O157:H7 outbreak in spinach. October 6. <http://www.fda.gov/bbs/topics/NEWS/2006/NEW01486.html>. Accessed 7 March 2007.
- Feenberg, A. 1991. *Critical theory of technology*. New York: Oxford University Press.
- Finz, S., and E. Allday. 2006. Spinach growers were warned about produce safety. *San Francisco Chronicle* September 19: A-10.
- Føllesdal, A. 1998. Survey article: subsidiarity. *Journal of Political Philosophy* 6 (2): 190–218.
- Gienow, M. 2007. Raw deal: Notes from the Amish dairy underground. *Baltimore City Paper*, March 7. <http://www.citypaper.com/news/story.asp?id=13361>. Accessed 3 May 2007.
- Glausiusz, J. 2007. Toxic salad: what are fecal bacteria doing on our dinner plates? *Discover* (April): 58–59, 74.
- Glencolton Farms. 2007. <http://www.glencoltonfarms.com/>. Accessed 28 February 2007.
- Goodnow, C. 2007. What's safe to put in your pet's bowl? Weeks after tainted food killed dogs and cats, trust shaken but few answers. *Seattle Post-Intelligencer* May 6: A-1.
- Government Accountability Office (GAO). 2005. *Overseeing the US food supply: Steps to be taken to reduce overlapping inspections and related activities*. Washington, DC: Government Accounting Office, GAO-05-549T.
- Government Accountability Office (GAO). 2007. *Federal oversight of food safety: High risk designation can bring needed attention to a fragmented system*. No. GAO-07-569CG. Washington, DC: GAO.
- Gramsci, A. 1971. *Selections from the prison notebooks of Antonio Gramsci*. Q. Hoare and G. Nowell-Smith (trans. and eds.). New York: International Publishers.
- Green, E. 2001. Gone for good? *Los Angeles Times* January 3.
- Guthman, J. 2004. *Agrarian dreams: The paradox of organic farming in California*. Berkeley, California: University of California Press.
- Ha, A. 2007. Settlements made in *E. coli* outbreak. *Hollister Free Lance*, April 24. <http://www.hollisterfreelance.com/news/contentview.asp?c=212333>. Accessed 10 May 2007.
- Habermas, J. 1973. *Legitimation crisis*. Boston, Massachusetts: Beacon Press.
- Harvard Law Review. 2007. Reforming the food safety system: What if consolidation isn't enough? *Harvard Law Review* 120 (5): 1345–1366.
- Henderson, D. 2007. Chicken from China? Questionable farming practices fuel skepticism of US plan to import poultry. *The Boston Globe*, May 9. http://www.boston.com/business/articles/2007/05/09/chicken_from_china/. Accessed 10 May 2007.
- Hirsch, J. 2007. Spinach sales still struggling as a result of *E. coli* scare. *Los Angeles Times*, March 23. <http://www.tinyurl.com/296z6p>. Accessed 25 March 2007.
- Hirschl, R. 2005. Preserving hegemony? Assessing the political origins of the EU Constitution. *International Journal of Constitutional Law* 3: 269–292.
- Hole, D.G., A.J. Perkins, J.D. Wilson, I.H. Alexander, P.V. Grice, and A.D. Evans. 2005. Does organic farming benefit biodiversity? *Biological Conservation* 122: 113–130.
- Katz, S. 2006. *The revolution will not be microwaved: Inside America's underground food movements*. White River Junction, Vermont: Chelsea Green.
- Kita, P. 2007. FDA builds on history, tangles with food-safety politics. *AXcess News*, April 17. <http://www.axcessnews.com/user.php/articles/show/id/10795>. Accessed 23 April 2007.

- Kolko, G. 1963. *The triumph of conservatism: A reinterpretation of American history, 1900–1916*. New York: The Free Press.
- Krebs, A.V. 1991. *The corporate reapers*. Washington, DC: Essential Books.
- Lang, T. 2003. Food industrialization and food power: Implications for food governance. *Development Policy Review* 21 (5–5): 555–568.
- Lavigne, P. 2006. Is organic food the real deal? *The Dallas Morning News*, August 19. <http://www.tinyurl.com/25nlsj>. Accessed 20 September 2006.
- Law, M.T. 2005. How do regulators regulate? Enforcement of the Pure Food and Drugs Act, 1907–38. *Journal of Law, Economics and Organization* 22 (2): 459–489.
- Levenstein, H.A. 1988. *Revolution at the table: The transformation of the American diet*. New York: Oxford University Press.
- Lu, C., K. Toepel, R. Irish, R. Fenske, D. Barr, and R. Bravo. 2006. Organic diets significantly lower children's dietary exposure to organophosphorous pesticides. *Environmental Health Perspectives* 114 (2): 260–263.
- Major, M. 2007. Highly perishable. *Progressive Grocer* January 1: 50–59.
- Marler Clark. 2007. Son of woman killed by *E. coli* testifies: Legislature must go further than industry-led marketing agreement. <http://www.tinyurl.com/2anfks>. Accessed 7 April 2007.
- Marriot, E.E., and M.M. Wander. 2006. Total and labile soil organic matter in organic and conventional farming systems. *Soil Science Society of America Journal* 70: 950–959.
- Mattera, P. 2004. *USDA Inc.: How agribusiness has hijacked regulatory policy at the U.S. Department of Agriculture*. Washington, DC: Agribusiness Accountability Initiative and Good Jobs First Corporate Research Project.
- Matzinger, P. 2002. The danger model: A renewed sense of self. *Science* 296 (5566): 301–305.
- McDonald, K.L., M.I. Cohen, and P.A. Blake. 1986. The changing epidemiology of adult botulism in the United States. *American Journal of Epidemiology* 124 (5): 794–799.
- Moffi, L. 2001. *On biocultural diversity*. Washington, DC: Smithsonian Press.
- Nabhan, G.P. 2004. *Why some like it hot*. Washington, DC: Island Press.
- Nabhan, G.P. 1997. *Cultures of habitat: On nature, culture, and story*. Washington, DC: Counterpoint.
- National Food Safety and Toxicology Center (NFSTC). 2004. *First world congress on organic food – proceedings*, March 29–31, 2004. East Lansing, Michigan: Michigan State University.
- Nazarea, V.D. 2005. *Heirloom seeds and their keepers*. Tucson, Arizona: The University of Arizona Press.
- Nazarea, V.D. 1998. *Cultural memory and biodiversity*. Tucson, Arizona: The University of Arizona Press.
- Nestle, M. 2002. *Food politics*. Berkeley, CA: University of California Press.
- Nestle, M. 2006. The *E. coli* outbreak demonstrates why America's food safety system needs an overhaul. *The Mercury News*, October 22. <http://www.foodpolitics.com/pdf/spinachfal.pdf>. Accessed 25 October 2006.
- O'Connor, James 1973. *The fiscal crisis of the state*. New York: St. Martin's Press.
- Organic Trade Association (OTA). 2006. *E. coli* facts. <http://www.ota.com/organic/foodsafety/ecoli.html>. Accessed 8 October 2006.
- Orr, D. 1991. What is education for? In *Context* (Winter), 52.
- Palmer, S. 2007. The *E. coli* outbreak – lettuce learn a lesson. *Today's Dietitian* 9 (1): 28.
- Pimentel, D. 2006. *State of science review: Impacts of organic farming on the efficiency of energy use in agriculture*: Troy, Oregon: The Organic Center. http://www.organic-center.org/reportfiles/ENERGY_SSR.pdf. Accessed 14 May 2007.
- Planck, N. 2006. Leafy green sewage. *New York Times*, September 21: A-31.
- Pollack, A. 2007. Scientists look to vaccines in the war on *E. coli*. *New York Times*. May 1: F-1.
- Pollan, M. 2006. The vegetable-industrial complex. *New York Times Magazine* October 15: 17.
- Reardon, T., J-M. Codron, L. Busch, J. Bingen, and C. Harris. 2001. Global change in agrifood grades and standards: Agribusiness strategic responses in developing countries. *International Food and Agribusiness Management Review* 2 (3/4): 421–435.
- Safe Food Act of 2007. H.R. 1148. <http://www.thomas.loc.gov/cgi-bin/bdquery/z?d110:h1148>. Accessed 21 May 2007.
- Sander, L. 2006. Source of deadly *E. coli* is found at California ranch. *The New York Times*, October 13: A-20.
- Schlosser, E. 2006. Has politics contaminated the food supply? *The New York Times*, December 11: A-27.
- Schmit, J. 2006a. Spinach producers take financial hit. *USA Today*, September 19. http://www.usatoday.com/money/industries/food/2006-09-19-spinach-usat_x.htm. Accessed 12 March 2007.
- Schmit, J. 2006b. Fresh Express leads the pack in produce safety. *USA Today*, October 22. http://www.usatoday.com/money/industries/food/2006-10-22-fresh-express-usat_x.htm. Accessed 9 April 2007.
- Siegel, M. 2006. The truth about the *E. coli* outbreak. *Salon.com*, September 22. http://www.aslom.co/news/feature/2006/09/22/e_coli/index_np.html. Accessed 8 October 2006.
- Steele, J.W. 2006. Tainted spinach could aid Neogen. *Lansing State Journal*, September 27: 1A.
- Surowiecki, J. 2004. *The wisdom of crowds: Why the many are smarter than the few and how collective wisdom shapes business, economics, societies and nations*. New York: Little Brown.
- Tapscott, D., and A.D. Williams. 2006. *Wikinomics: How mass collaboration changes everything*. New York: Portfolio.
- Ten Eyck, T., D. Thede, G. Bode, and L. Bourquin 2006. Is HACCP nothing? A disjoint constitution between inspectors, processors, and consumers and the cider industry in Michigan. *Agriculture and Human Values* 23 (2): 205–214.
- Tohono O'odham Community Action (TOCA) and Tohono O'odham Community College. nd. *Community attitudes toward traditional Tohono O'odham foods*. <http://www.tocaonline.org/Programs/Food%20system/images/usdareport.pdf>. Accessed December 29, 2004.
- Vos, T. 2000. Visions of the middle landscape: organic farming and the politics of nature. *Agriculture and Human Values* 17 (3): 245–256.
- Waltner-Toews, D. 1996. An agroecosystem perspective on food-borne illnesses. *Ecosystem Health* 2 (3): 177–185.
- Weinraub, J. 2003. Chicken feed politics: Who pulled a fast one on the organic industry? *The Washington Post*, March 19: F1.
- Whitney, J. 2007. Organic erosion: Will the term organic still mean anything when it's adopted whole hog by behemoths such as Wal-Mart? *San Francisco Chronicle*, January 28: CM-13.
- Winner, L. 1986. *The whale and the reactor: A search for limits in an age of high technology*. Chicago, Illinois: University of Chicago Press.
- Withers, D. 2007. Grower details his side of outbreak link. *The Salinas Californian*. March 17. <http://www.tinyurl.com/2kcthz>. Accessed 25 March 2007.
- Wolfe, A. 1977. *The limits of legitimacy: Political contradictions of contemporary capitalism*. New York: Free Press.
- Wood, D.B. 2006. *E. coli* cases prompt calls to regulate farm practices. *The Christian Science Monitor*, September 18. <http://www.csmonitor.com/2006/0918/p02s01-usgn.html>. Accessed 30 September 2006.

Wright, L. 2007. Slaughterhouse thrive. *Burlington Free Press*, March 18. <http://www.tinyurl.com/2ufncg>. Accessed 2 May 2007.

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