

Escherichia coli, Corporate Discipline and the Failure of the Sewer State

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Abstract. Recent panics over adulterated beef have led the US federal government to institute what it calls a ‘risk-based, science-based’ approach to food safety. Rather than having federal inspectors monitoring carcasses for microbial contamination, the USDA has implemented a system known as HACCP that asks firms to regulate their own production processes. HACCP is an incidence of audit, a new method of governmentality widely used by state agencies. This paper argues that although ‘sewer states’ try to create trust in government by eliminating contamination, audit-based systems paradoxically create anxiety by highlighting overflows of filth and ‘zones of wildness’ where contamination is rampant.

The bourgeois is obligated to . . . hire experts to relieve him of his mass of filth; or, face the the looming threat of the loss of his property and, by extension, his virtual disqualification as a subject. He is forced to redeem himself, to escape his shameful odor, in the shelter of the State, whose laundering treasury keeps no record of foul origins (Laporte, 2000, p. 64).

It was mid-summer in Colorado, the time when children were eating hamburgers at picnics and families were slapping steaks on the grill. Suddenly, the newspapers were full of headlines about beef produced by a local meatpacking plant. “*E. COLI* SCARE PROMPTS CONAGRA TO RECALL MEAT” wrote the *Rocky Mountain News* (Good, 2002). While the local papers printed stories about the victims of *E. coli* O157:H7, a deadly pathogen contained in meat contaminated with faeces, the amount of beef recalled grew and grew. “CONAGRA BEEF RECALL EXPANDS: 18.6 MILLION POUNDS NOW AFFECTED” was the headline on the *Denver Post’s* front page (McAllister and Migoya, 2002).

In the days and weeks that followed, journalists and activists wrote vivid prose about the ConAgra outbreak and about meat safety in general. Eric Schlosser, author of the best-selling *Fast Food Nation*, summoned up spectres of the September 11 attacks and the AIDS epidemic when he wrote

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While many Americans fret about the risks of bioterrorism, a much more immediate threat comes from the all-American meal. Until fundamental changes are made in our food safety system, enjoying your hamburgers medium rare will remain a form of high risk behaviour (Schlosser, 2002).

Nancy Donley, the founder of a food safety activist group called Safe Tables Our Priority (STOP), took an even stronger line and demanded that food safety issues be included in the War on Terror. In a dramatic letter to President Bush, she wrote

You stated that you were concerned about “this nation leading the world to rout out terror wherever it exists so our children and grandchildren can live in freedom”. For 330 000 Americans and their families each year, terror begins after consuming government inspected food purchased at their local grocery store, or after dining at a neighbourhood restaurant, or even after eating a government purchased school lunch. **Mr. President, food should not be allowed to continue as a vector for terror** (Donley 2002, p. 1; original emphasis).

The ConAgra scare was one of a series of food safety panics—from fears related to other *E. coli* outbreaks to anxiety about *salmonella*, ‘mad cow’ disease and *listeria*—that made food safety a more potent political issue in America than at any time since the publication of Upton Sinclair’s *The Jungle*, the powerful and gut-wrenching *exposé* of the Chicago meatpacking industry, in 1906. Consumers all over America heard graphic messages about the dangers of beef in books like *Fast Food Nation*, in episodes of television shows like *Frontline* and in news reports about outbreaks linked to fast food restaurants and grocery stores. Meat—and the excrement that contaminated it—seemed to be one of the most hazardous substances around.

The odd thing about the panic, though, was that deaths from meat contaminated with *E. coli* O157:H7 were actually quite rare. Although activists tossed around numbers in the hundreds of thousands to illustrate the effects of foodborne illness, the Centres for Disease Control estimated that only 61 people per year die from *E. coli* O157:H7—fewer than the average number of people who die each year from lightning strikes (Mead *et al.*, 1999). Even considering fatalities from all foodborne pathogens, foodborne illness posed nowhere near the threat of tobacco usage, car accidents or even homicide.

Why, then, did a hamburger and fries suddenly take on such an ominous air? Was the public’s only beef really with beef? Or do contemporary worries over microbiological pathogens like *E. coli* show deep public discomfort with more than just food? As Freidberg (2004) has shown, from the first panics over food adulteration in 19th-century England, the public has often used the issue of tainted food to question the state’s ability to govern the unruly market and to ensure the well-being of its citizens. Today’s food panics, I argue, show similar doubts about the state’s ability to regulate business and bodies. Food safety panics point to fundamental problems with a particular form of governmentality in which the state, ‘civil society’ and industry work co-operatively to regulate one another (Kazancigil, 1998, p. 70). By critiquing the administrative practices used to create safe food, food panics enter into the ways that “human beings deliberate on the problem of regulating, managing or governing their world, the conduct and the capacities of others and their interrelations” (Rose, 1993, p. 297). In doing so, they also cast doubt on similar practices used to regulate

more disparate domains, including corporate accounting, public education, and international development.

In this paper, I examine the Hazards Analysis of Critical Control Points (HACCP) programme, a technique mandated by the US Department of Agriculture for eliminating foodborne pathogens. I draw on approximately 30 interviews with government policy-makers, epidemiologists, food safety activists and managers from the beef industry, as well as attendance at a training course for slaughterhouse managers, a meat-industry exposition and three conferences designed to bring these diverse professionals together in order to discuss how best to regulate the production of beef. HACCP is significant not only because it is the US' front-line defence against foodborne epidemics, but because in relying on audit to coerce companies into policing themselves, it shares a fundamental regulatory technique used by many other US government agencies, including the Securities and Exchange Commission, the Department of Defense and the Environmental Protection Agency. The use of audit in these agencies marks a profound shift in the practices of power and regulation throughout the modern state and illuminates the way that 'audit culture' has come to permeate not only the regulation of finance, but the regulation of many other domains including medicine, environmental protection, agriculture, industrial production and education (Power, 1997; Strathern, 2000; Shore and Wright, 2000; Barry, 2001; Strathern, 2006). HACCP makes an ideal case for analysing the strengths and the weaknesses of this new form of regulation, because it comes with a material tracer: the *E. coli* organism.

I argue that by tracking the presence of *E. coli*, it is possible to see both how audit regulates and how it constantly produces what I call a 'domain of wildness', or a physical and conceptual space beyond the control of audit where corruption is rampant. In doing so, it is possible to see how this particular mode of power, which is based on the detection of risk, impels the new 'security state' not only to respond to external crises, but continually to seek out such crises in order to prove its own ability to provide security and to convince the population of the need for regulation. Ironically, this illuminates not only the on-going process of state-building and the ways that states become powerful (Murdoch and Ward, 1997), but also the ways in which the state reproduces its own weakness and enters into domains where its power can be contested. Successful discipline is thus not only an ever-expanding problem, but a problem continually of its own making.¹

From Control to Audit

The USDA first began using audit to control foodborne illness in the wake of an outbreak that centred around Jack-in-the-Box restaurants in Seattle, Washington. Victims developed fevers, severe intestinal cramps and bloody diarrhoea (Fox, 1997, p. 244). The disease seemed to affect children particularly badly and several died of haemolytic uraemic syndrome, a disease in which internal organs turn gangrenous and are eventually liquified. In the end, 195 people were hospitalised and four died (Fox, 1997, p. 249).

The Centers for Disease Control eventually tracked the outbreak to *E. coli* O157:H7, a virulent mutation of a bacterium commonly found in the intestines of both humans and animals. O157 appeared especially dangerous because it was a pathogen spread by industrialised agriculture. A single infected cow could release bacteria into one of the massive plants owned by one of the four

companies that together control over 85 per cent of the American meat supply. Because the workers in these plants slaughter over 400 animals an hour, it is easy for a worker to accidentally smear some of the filth that sticks to cows' hides onto carcasses as they skin animals, or accidentally to nick the intestines as they gut them, spilling faeces onto what will become raw meat. Each of these small slips opens up the possibility that the meat will be tainted with the bacteria. It is impossible to know which pieces of meat are contaminated without laboratory testing.

When trim—the scraps of meat from these carcasses—is turned into ground beef, the problem becomes even more acute. The meat of up to 3000 different animals might be mixed into a single combo (combination) bin, which is then sent to a grinder that processes meat into a continuous flowing stream of hamburger.² As they enter the river of meat, bacteria from a single animal can contaminate literally millions of pounds of product shipped to supermarkets and restaurants. This is what happened at Jack-in-the-Box, where contaminated meat processed by a single plant was formed into 77 000 patties and served to consumers in four states (Fox, 1997, p. 245).

The Clinton administration, then responsible for overseeing the USDA, took strong action in the wake of the Jack-in-the-Box outbreak. Clinton himself called victims' families to apologise and pushed the USDA to devise rapidly a system to prevent further outbreaks. USDA's answer, unveiled in 1996, was the Hazards Analysis of Critical Control Points (HACCP) programme. Before HACCP, the USDA relied on a meat inspection system developed in 1906, when the Federal Meat Inspection Act mandated that the USDA visually inspect each and every carcass that passed down the line in the meatpacking plant. For almost 90 years, USDA inspectors spun each carcass around on its hook to look at it, feel it and sniff it. These sensory methods—known as organoleptic testing—were designed to get carcasses with open sores, pustulent cysts or decomposing flesh out of the meat supply. However, as the Jack-in-the-Box outbreak showed, organoleptic testing was powerless to spot microbial contamination.

The USDA billed HACCP as a revolution in the way meat was produced and inspected, and as a means to combat microbiological pathogens (Nestor and Lovera, n.d.). "We are proposing to reinvent the meat and poultry inspection system, which is currently based primarily on sight, touch and smell, by utilising science and the latest technology", said Richard Rominger, the Acting Secretary of Agriculture. "[HACCP] will fundamentally reform our inspection program into a science-based system—a system which will ensure an even safer food supply" (Rominger, 1995).

Although HACCP was billed as a means for the state to regulate industry practices more tightly, it paradoxically introduced a high degree of *self-regulation* into the industry. To create a HACCP plan, meatpackers themselves were required to analyse their production processes for potential hazards, places where pathogens might be introduced, or steps where pathogens might be killed (such as a cooking step where the meat is raised to temperatures that destroy the bacteria). Packers were then supposed to label these steps as 'critical control points', or CCPs, and establish 'critical limits' for each of them. It was important that these critical limits be things that could be measured and documented, such as the minimum cooking temperature for the meat, because the packers then had to establish on-going monitoring procedures to ensure that each CCP was contained within

critical limits. If the CCP was 'cooking', for example, each packer had to have a plan for regularly monitoring the thermometer that registered cooking temperature and a record-keeping procedure for logging the results. The packers also had to devise corrective actions, or a plan for what to do if the CCP fell outside the critical limit (for example, if the cooking temperature was too low to kill bacteria). Finally, the packers had to 'verify' the steps in the HACCP plan or demonstrate that each element of the plan was 'science-based' and effective according to scientific literature. Although the USDA had to approve the final plan, packers were essentially allowed to regulate themselves. They could decide whether to wash carcasses with lactic acid, run them through a steam cabinet, cook them or implement other procedures designed to kill microbes, all without prior USDA approval, as long as they had a plan for destroying pathogens.

HACCP not only allowed packers to design their own food safety systems, but made them responsible for them on a day-to-day basis. It was up to the packers themselves, not the USDA, to document when a critical limit had been violated and to take corrective action. Increasing numbers of USDA inspectors, who once focused on personally inspecting each carcass, were shifted to the task of inspecting HACCP plans and the plant's own production logs. A special cadre of new USDA inspectors, known as Consumer Safety Officers (CSOs), dipped in and out of the records, reviewing a sample of them, but they did not examine each and every measurement nor ensure that appropriate corrective action was taken when meat was potentially contaminated. Only the packers themselves knew if the HACCP plans were being followed, if food safety interventions were effective, or if food was contaminated.³

These elements—sampling, documenting, partial inspection of records—show that HACCP is, at root, an *audit system*. Like the audit systems designed to regulate corporate finance, HACCP is a system in which a firm systematically measures its own performance and documents what it does in order to create a picture of its activities that can be reviewed by an outsider (see Power, 1997). These systems supposedly force firms to become 'accountable' by literally demanding that they create detailed accounts of themselves. Just as corporate accountants have to create auditable books to prove they have not committed fraud, school districts have to create a set of auditable student test results for federal authorities and departments at state universities have to create auditable reports of their research and teaching activities to display to state commissions on higher education, meat-packing firms have to create intricate portraits of what they do to each piece of meat that passes through in order to prove they have not contaminated them (see Shore and Wright, 2000).

The creation of the job of Consumer Safety Officer showed just how sweeping the change in the mode of power was. CSOs examined the *self-representation* of the production process that packers create when they create a HACCP plan, ensuring conformance with the final HACCP regulations. In the words of Michael Power (1997), a theorist of financial audit, the CSOs were 'checking checking'—that is, they were monitoring the processes through which the plant monitored the meat. This sampling made the HACCP logs, like all auditable documents, into an instrument of discipline and gave HACCP its claims to effective regulatory power. Because an auditor might look at any given record, the production logs were supposed to become devices that would force firms to discipline themselves rather than relying on government agents constantly to discipline them.

This reliance on self-discipline is, of course, a key element in governmentality and an instrument of political power. By using technologies like audit, the state can regulate individuals and businesses without abrogating the rights of ostensibly 'free' agents acting in the private sphere of 'civil society' or violating norms of the market, which emphasise corporate independence and freedom of choice (see Hann and Dunn, 1996; Miller and Rose, 1990). By forcing firms to produce auditable documents, the state makes places and activities that were formerly invisible—such as the kill floor or the processing techniques used on the slaughter line—visible. It also makes them amenable to intervention by framing the context for economic decision-making and the calculation of risk (see Callon, 1998). In this case, controlling the field in which packers make business decisions allows the USDA to compel packers to make a certain *category* of investments—in this case, investments in food safety technologies—without violating packers' rights to make specific decisions about their own production processes.

The illusion of self-regulation led most packers to support HACCP when it was introduced in 1996. They initially agreed with the USDA that HACCP meant that

[The USDA's Food Safety Inspection Service] is shifting from an extensive reliance on command-and-control regulations, which generally prescribe *how* desired objectives are to be achieved, to a much greater reliance on performance standards, which generally express the objectives but do not specify the means for achieving it (FSIS Final Rule, 1996).

However, packers soon discovered that, by requiring certain forms of self-representation, the USDA was exercising a new form of power over the industry. By using statistical representation and audit to make the inside of the slaughterhouse visible, the state is clearly attempting to "shape, channel, direct and control events and persons distant from it in both space and time" (Murdoch and Ward, 1997, p. 308). As shown by a conversation between a packer and a former USDA official at an industry-sponsored HACCP workshop that I attended, those subject to state power perceived it very clearly

Packer: Are you implying that it [HACCP] is just a different system of command-and-control?

Ex-USDA official: No, I'm saying it's a *better* system of command-and-control!

The state claims that this mode of power is objective, transparent and politically neutral, just as it does in the many other fields where audit is deployed (Shore and Wright, 2000, p. 61; Dreyfus and Rabinow, 1982, p. 196). At the USDA, these claims are encapsulated in the phrase 'science-based', which USDA officials repeat like a mantra. Dr Merle Pierson, the Deputy Undersecretary for Food Safety, peppered his speech to the National Meat Association with invocations of science

My background as a researcher and extension specialist in food safety has shown me the importance of science and how it should influence regulatory policy ... In order to ensure that our nation's food supply remains the safest in the world, we will continue our emphasis on science in developing policies designed to protect public health ... Enhancing the scientific foundation of existing food safety policies and systems is very important (Pierson, 2003).

Other USDA officials also made copious declarations about how ‘scientific’ HACCP was. In a 2002 speech, Secretary of Agriculture Ann Veneman, used the words ‘science’, ‘scientist’, or ‘scientific’ 15 times in 1316 words, or about once every other sentence (Veneman, 2002). USDA Undersecretary for Food Safety Elsa Murano used the words ‘science’ or ‘scientific’ 24 times in 79 sentences, or literally every third sentence in one of her speeches (Murano, 2002a). She repeated statements such as “my number one priority was to ensure that food safety policies are science-based” over and over in the speech. One particularly well-studded paragraph used the term three times in two sentences

FSIS is making changes in its workforce to increase the proportion of public health and scientific professionals and make available more front-line personnel with scientific and technical expertise. Having such expertise is critical to a science-based program (Murano, 2002a).

HACCP’s status as a *scientific* or *science-based* approach to regulation was important to the USDA because it was the key to the claim that HACCP created objective facts that were not susceptible to negotiation, interpretation or quarrel. *Scientific*, for the USDA, was the opposite of *political*.⁴ In this sense, the trope of science made HACCP into what Foucault called a ‘rationalising discourse’, or a discourse that conceals power relations beneath a veneer of Enlightenment-style means–ends rationality (Foucault, 1977). Within HACCP, the goal was defined as the detection and eradication of microbes and the yardstick for measuring efficacy was both documentary (in the sense of the firm’s ability to produce the required documents and to adhere to the USDA’s rules for the form the documents should take), and microbiological (insofar as laboratory testing was done). This reliance on ‘science’ made HACCP into what Ferguson (1994) has called an ‘anti-politics machine’, or a device that hides the expansion of state power under a veil of expertise and pure technique (see also Mitchell, 2002).

USDA officials hoped that producing facts that were supposedly apolitical would remove the agency from the uncomfortable limelight of public scrutiny. As Elsa Murano said

This Administration [the Bush administration] has been accused of acquiescing to the Supreme Beef decision, trying to do away with zero tolerance standards for pathogens, and ineffectively implementing HACCP. It’s time to set the record straight on each of these key issues. In particular, I am concerned that the volume of this publicity is interfering with our ability to pursue our science-based, food-safety strategy (Murano, 2002b).

The trope of science did more than shield the USDA from accusations of playing politics, however. It was the main element in the USDA’s claim to efficacy. By invoking the modernist belief in the powers of science and technology and claiming the ability to make both the product and the production process legible (Scott, 1998), the state could claim that its HACCP audits could rid the meat of faeces. In doing so, the state claimed the ability to use science to remove what was corrupt and contaminating. It claimed the power to *purify*.⁵ This was just one instance of one of the most important bases of state power: the state’s ability to act as sewer.

Modern nation-states base their claims to power on the ability to create civilisation, to control nature and to turn it to human purposes (Dunn, n.d.; Agrawal, 2005). They do so at least in part by allocating to themselves not just the right to

rationalise nature, as Scott (1998) points out in his masterful discussion of forestry and agriculture, but also through the ability to bound, contain and remove waste. The making of decontaminated spaces, free of physical contaminants like offal, manure, hazardous chemicals and radioactive materials, as well as supposedly 'contaminating' social forces like beggars, vagrants, the unemployed and racially marginalised groups, is an integral function of the state and a crucial part of a state's claim to power. As Laporte (2000) shows in his study of the formation of the French state, the ability to regulate where excrement can be deposited and stored, whether it can remain in the house or the garden, and whether it should be allowed to exist in the city or should be carried beyond city walls and left in the countryside is one of the fundamental tasks of state rule

Surely, the State is the Sewer. Not just because it spews divine law from its ravenous mouth, but because it reigns as the law of cleanliness above its sewers. Cleanliness, order and beauty, defined by Freud as the cornerstones of civilization, are elevated to new heights when embodied by the State. "Civilisation", says Lacan, "is the spoils: the *cloaca maxima*": We could easily substitute State here for civilization ... The proposition "civilization is the spoils" only holds if amended by a second: "the State is the Sewer" (Laporte, 2000).

In very literal terms, the modern state promises to be the equivalent of the *cloaca maxima*, the ancient Roman sewer that removed waste from the heart of the empire. The state promises to remove excrement from the streets and manure from the meat (see, for example, EPA 2003a). It also promises to remove less literal forms of excrement. The Environmental Protection Agency uses audits to ensure that businesses do not dump chlorine, ammonia and other hazardous substances (EPA, 2003b, 2002). Up until 2001, the Securities and Exchange Commission assured investors that outside audits would remove the taint of managerial misdeeds from corporate books. In the wake of the Enron scandal, which appeared to prove the ineffectiveness of auditors-for-hire like Arthur Anderson as well as the SEC's own audits, Congress and the SEC made stringent attempts to remedy the problem—not by finding alternatives to audit, but by enhancing the state's ability to audit the auditors that audited publicly traded companies.⁶ In states around the US, 'accountability in education' legislation created educational standards to purify the schools of supposedly frivolous teaching and to force classroom teachers to focus on 'the basics'. Even the USDA uses audits to clear away metaphorical contamination: the Grain Inspection Packers and Stockyards Act division (GIPSA) audits packers' financial records to prevent them from engaging in illegal practices such as captive supply arrangements that contaminate the pure operation of the market.

Audits engender a sense of trust in those who invest in corporations, send their children to school or buy beef, because the self-representations contained in auditable documents are supposed to create 'transparency'. That is, they purport to have a one-to-one correspondence with what actually goes on in a firm or an organisation, thereby granting the auditors (and, by proxy, those who trust the auditors) the ability to look into the firm and see what actually happens there. However, these representations are clearly only simplified models of what actually takes place (Strathern, 1998). They efface the social negotiations that take place between auditors and the people they audit before the 'facts' are written down (see Poovey, 1998; Dunn, 2004a). By creating categories of actions that

'count', they also create residual categories of actions that become invisible, seemingly unimportant and uncounted. By rewarding those who orient their action towards the marked categories and who willingly change their behaviour in order to fit the standards the categories impose, audit pushes subjects to internalise new norms and to manage themselves (Shore and Wright, 2000, p. 61; Dunn, 2004b). These self-managing agents are supposed to turn away from action that is unassessed (and hence, seemingly unimportant), or actively discouraged. Audits thus are an important tool in instilling the kind of self-regulating power that Foucault (1977) so aptly described.

However, the sewer state is thus driving to do more than make its subjects visible and legible when it monitors corporate financial records, children's test scores, or packers' production logs. The documents it requires function as more than paper panopticons. By using audit, the state is both channelling what is desirable and seemingly purging what is unwanted from both the record and reality, constantly making real life more closely approximate the model contained in the documents and records that auditors inspect. Modern power is thus based on more than the gaze, on more than the watchful eye and on more than mere surveillance and punishment: it is based on the ability to purify, to remove excess, corruption and putrefaction from view and sweep it away. This suggests that understanding contemporary state power requires more than the Marxian perspective, which sees power as stemming from the act of production, or the framework of cultural studies, which often analyses power as it is manifests through consumption. To understand how modern states manage their populations, we also need a theoretical framework that incorporates the ways that states control, remove and circulate waste.⁷

The removal of waste is part of a larger state project, one that Michel Callon (1998) calls 'framing'. For Callon, the act of framing is the act of creating a mutually agreed upon set of rules, standards, expectations and conventions. Framing, in his view, creates the social spaces in which actors can make calculable decisions and hence is one of the fundamental bases of a market economy. In creating a set of rules that help firms to create purified ideal-typical models of their own production processes, such as the ones contained in HACCP models, the state sets the ground for negotiations between inspectors and producers, limits firms' liability for defective product and helps firms to plan investments and calculate future returns. It also creates a substantial barrier between firms and activist critics of the industry, who are pressured into debates about whether a given HACCP plan was followed—that is, into debates that are inside the frame the rule system creates, rather than into debates that question it. As the Supreme Beef case showed, audit systems like HACCP have the power to bracket the material world outside and focus dissent into the narrow ground circumscribed by the rules themselves (see Callon, 1998, p. 248). By framing the terms of the food safety crisis, the USDA creates a much more stable and predictable environment for firms to invest, produce and realise profit. Through its acts of purification, the sewer state creates trustworthy spaces for the circulation of capital and provides the means by which manure is literally and metaphorically transformed into gold (Laporte, 2000).

There is only one flaw in this mode of power: the state as sewer is constantly overflowing. The complexity of actual practice always exceeds the simplifications of governmentality and the blood and excrement of everyday life constantly threaten to overflow the purified model contained in auditable documents. The

conditions under which loss is converted into profit are continually being challenged by factors outside the control of either the state or the firms that seek to operate in the sector.

Overflows and the Sewer State

The USDA is confident in its own ability to remove excrement from meat by acting at a distance. In a press release from September 2003, the USDA announced that rates of *E. coli* O157:H7 contamination in samples it tested had decreased from 0.84 per cent in 2001 to 0.32 in 2003. Garry L. McKee, the Food Safety Inspection Service's administrator, showed USDA's belief in the efficacy of HACCP

The Agency's sampling data suggests that initiatives begun in the past year are beginning to pay dividends. We have examined the HACCP plans at more than 1,000 beef establishments and ended a 1998 program that exempted some establishments from random FSIS testing. We are also examining all plant generated data to better detect future problems. We are far from satisfied, but the arrow is clearly pointing in the right direction (FSIS, 2003).

In a similar press release announcing a 66 per cent decline in rates of *Salmonella* infection in meat and poultry products, Undersecretary for Agriculture Elsa Murano said

These figures demonstrate that strong, science based enforcement of food safety rules is driving down the rate of *Salmonella*. These data validate our scientific approach to protecting public health through safer food (FSIS 2003a).

Despite the USDA's triumphant declarations, it was not clear that HACCP had, in fact, reduced either food contamination or foodborne illness. The studies that the USDA's own figures were based on were flawed: the *E. coli* study, for example, relied on only 7000 one-pound samples out of the 27 billion pounds of beef produced by American firms each year.⁸ The samples were apparently not taken randomly and there was no rigorous sampling scheme to account for differences in the time of year and the plant size. Without a better study design, such a small sample was statistically meaningless.⁹ Other measures complicated the picture. The Centres for Disease Control reported a slight increase in the number of outbreaks of human illnesses related *E. coli* O157:H7 over the time-period from 1996, when HACCP was introduced, to 2001 (see Table 1).

Recalls, another possible indicator of *E. coli* contamination, also suggested that the incidence of the disease had not been reduced as significantly as the USDA claimed. Victoria Salin and her colleagues analysed the amount of time that

Table 1. Morbidity and Mortality due to *E. coli* O157:H7

| Years | 2001 | 2000 | 1999 | 1998 | 1997 | 1996 | 1995 |
|-----------|------|-----------------|------|------|------|------|------|
| Outbreaks | 36 | 69 ^a | 38 | 42 | 22 | 29 | 32 |
| Illnesses | 925 | 1564 | 1897 | 777 | 298 | n.a. | n.a. |
| Deaths | 2 | 4 | 4 | 3 | n.a. | n.a. | n.a. |

^aThe increase in the number of reported outbreaks for 2000 may be related to the introduction in state health departments of a more sensitive test for the bacteria.

meat and poultry firms produced before having to recall product. Although the study did not break out beef producers specifically, the study found that the risk of recall had actually *increased* since the introduction of HACCP, suggesting that the incidence of microbiological pathogens had not decreased. She and her colleagues concluded that “survival data analysis supports the concern that the food supply is becoming less safe, in spite of implementation of the HACCP system” (Salin *et al.*, 2003).

Why has HACCP apparently failed to eradicate foodborne pathogens? Answering that question contains within it the possibility of understanding other high-publicity failures of audit, such as the collapse of Enron, because it leads to a critique of governmentality itself. Using HACCP to explore the weaknesses of governmentality, however, presents one concrete advantage. Unlike the governmentality of stock markets or school districts, the governmentality of meatpackers comes with its own diagnostic tool. *E. coli* can be used as a tracer, since whatever environment *E. coli* is found in is thus a place where the state has literally failed to remove the excrement. *E. coli* thus holds the possibility of doing literally what Callon suggested metaphorically: providing a “cartographical outline of overflows in progress” (Callon, 1998, p. 258).

In the years since the introduction of HACCP, overflow zones have proliferated. Initially, packers and critics alike assumed that *E. coli* entered the meat supply when workers who split the carcass in half accidentally nicked an intestine (Schlosser 2002). As packers had to confront recall after recall, however, they began to look more intensely at the ‘reservoirs of disease’, or the spaces where the pathogen was found. These spaces proliferated dramatically. At first, the new spaces were in the end product itself, as HACCP spurred packers to test their own output. As the theory of ‘critical control points’ dictated, the packers responded by finding a number of new sites along the production line where *E. coli* could be found and eradicated. They introduced lactic acid washes, steam cabinets and other mechanical interventions in an attempt to create environments hostile to the pathogen. The monitoring step for *E. coli*, however, required that packers conduct microbiological tests at these sites to determine whether the interventions were working.

When the desire to create auditable records about the effectiveness of lactic acid washes and steam cabinets led packers to look at sites upstream from the finished product, what they found was no surprise: more pathogens. Frustrated at their own inability to find a single step that would eradicate microbiological pathogens, packers and animal scientists began talking about the need to ‘stop searching for the silver bullet’, or a single step that would eradicate all pathogens at once, and to embrace a ‘log kill’ or ‘multiple hurdles’ approach in which successive interventions each reduced the percentage of bacteria in the product (Ransom *et al.*, 2001, pp. 13–19; American Meat Institute, 2003). Each of the new procedures was quickly defined as a ‘critical control point’ and measurements were introduced to determine its effectiveness. As the number of critical control points proliferated, though, the stations in the production process where bacteria were visibly located proliferated as well and, at each site, bacteria routinely surpassed the ability of the system to contain them.

Between 2000 and 2002, packers began to argue that the only way their interventions on the disassembly line would be effective was if the cattle brought fewer pathogens into the confines of the factory. At the behest of industry officials, scientists at agricultural universities began examining not just the innards of the

animals, but their surfaces and crevices in an attempt to find the spaces where O157:H7 lurked. As they did, the spaces on the body of the cow that became subject to audit began to multiply. O157 was found on the hides of the cows, in dried dung that had been powdered to dust and blown through the air. It was found on cows' noses, where they might transmit it to animals from other herds by nosing them through the fences that separated them at the feedlot. It was found on their anuses and, since animals often touched face-to-rump, often in their mouths. Scientists found O157 not only in excrement, but in saliva and vomitus. Where before, both the USDA and the industry believed that *E. coli* was contained by the cow's intestine, all of the sudden, the pathogen appeared to overflow this all-too-fragile membrane.

The contract scientists who work at the behest of the industry labour diligently to find new means of controlling the bacteria. They are in the process of testing vaccines, medicines and prophylactic drugs such as 'probiotics', bacteria-like lactobacillus that might inhabit the same ecological niches as O157 and, by outcompeting it, drive the deadly pathogen from the places where it hides. Other scientists are redesigning the water troughs cattle drink from in the feedyards to prevent vomit and saliva from being transferred among animals, the trucks animals are carried to the packing plant in, and the lairages where animals from different herds and feedyards are mixed together as they await their turn to climb the 'stairway to heaven' into the plant. Clearly, as excrement and bacteria overflow the cow's intestine, they also overflow the confines of the packing plant and into less governable spaces of production.

At conferences held by the USDA, consumer groups and the industry, people concerned with foodborne illness are looking beyond the packing plant and into the feedyard and the farm in an attempt to control pathogens throughout the food chain. Controlling these new spaces of production is difficult, however, both in terms of technology and in terms of rule-making. None of the proposed ways of reducing *E. coli* O157:H7 colonisation in live cattle—not probiotics, nor new trough designs, nor feed additives—has yet been proved effective. More importantly, however, even if these interventions were effective, the *regulatory* technology for controlling live cattle does not exist. The obvious answer from a technocratic viewpoint is to force HACCP back onto the feedyards and ranches. However, FSIS does not have the legislative authority to control these spaces of production. Its authority is confined to processing facilities and does not extend to farms, ranches or other sites where live animals are contained. Moreover, even if the USDA could demand that feedlot owners and ranchers create a critical control plan and an audit trail, the mechanics of how this might be done are unclear, since a single cow may 'shed' O157 for 3–5 weeks, then test negative and then become reinfected. The process of repeatedly testing individual cattle and creating auditable 'biographies' for them is complicated by the fact that tracking technologies such as numbered ear tags are unreliable, since they fall off or are damaged, making it impossible to identify uniquely each animal. Swift and Company, which now owns the ConAgra plant in Greeley, is attempting to overcome this problem by introducing Optibrand, a system which creates retinal scans of each animal and links them in a database with the animal's location (recorded by GPS), vaccination records, medical records and ownership information. Even if each animal can be tracked from birth to death, however, the audit chain stops at the packing plant: once an animal is killed, dehided and split, parts of its body are sent down three separate lines for further disassembly. In the case of ground beef,

the meat from one animal might be mixed with the meat from up to 3000 other animals to make a single hamburger patty. It has proved impossible to maintain an identifiable link between the meat we eat and the animals that provided it, much less to track human illness from a batch of meat to a single infected animal and the feedyard that housed it.

Clearly, *E. coli*'s ability to proliferate in space exceeds the state's ability to control it. Just as *E. coli* is being seen now as overflowing the intestine, the container which bounds excrement, so too is *E. coli* and the excrement that bears it overflowing the audit system, the system the state claims is a sewer which could transmute excrement into numbers, contain disease and carry away pathogenic waste. Packers complain that HACCP's audit methodology does not reduce pathogens, but merely makes more of them visible. As one packer said in a HACCP training class, "The more you look, the more you find". Each time the audit system is extended or tightened up—as it was in 2002, when the USDA issued new regulations demanding that each plant's HACCP plans address *E. coli* O157:H7 prevention directly—the pathogen appears to flow beyond the boundaries the system sets up, becoming endemic. Overflow is not an occasional occurrence, or an indicator that the system has failed. It is a regular, endemic, integral part of a system that restlessly seeks dangers beyond its control, expands to encompass and regularise those dangers and begins the cycle of seeking and expansion again when it discovers dangers that have overflowed the system's parameters.

Failure in the System: Diagnosing Audit

The USDA continues to claim that HACCP works. As Gary McKee, FSIS administrator, said

I'm confident that when we put the U.S.D.A. mark of inspection on a product that goes to the consumer that we're sure it is safe. The system is working (quoted in Peterson and Drew, 2003).

Others disagree, alleging that the USDA has failed to ensure the safety of the American meat supply. The USDA's critics, however, usually claim that the problem is underenforcement, not a flaw inherent in the HACCP system. Sometimes they allege that the problem rests with USDA inspectors, who do not test carefully enough or review HACCP plans thoroughly enough (for example, Nestor and Lovera, n.d.). Other critics argue that, even when inspectors flag problems and issue non-compliance reports, the USDA does little to stop plants from flagrantly violating the rules or producing tainted product (for example, Peterson and Drew, 2003). The problem, they allege, is that the USDA simply does not shut down the lines at uncompliant plants (de Waal, 2002). Because they are working within the frame set the by USDA, none of the industry's vehement critics asks whether HACCP itself is intrinsically flawed. But what if audit itself is not only unable to control pathogens, but responsible for their apparent proliferation? What if audit is a sewer that produces its own excrement? The implications for the use of audit as a technology of governmentality, and for our understanding of how states expand into new domains of social life, would be significant.

Understanding audit's failures begins by examining the social construction of zoonotic diseases. Diseases which affect animals are often thought of as belonging to the realm of 'nature'. USDA's claim that its programmes to eradicate the pathogens that cause these diseases are 'science based' presumes not only an

objective way of looking at problem, but that the object of study is 'out there', existing independently of the scientific or bureaucratic gaze. However, zoonotic diseases and pathogenic organisms are as much products of society as they are of nature. They are intrinsic to the same system that produces the technologies for viewing them and the scientists and bureaucrats who continually seek to make them visible.

E. coli O157:H7 is a case in point. To begin with, it is the product of a particular agro-industrial configuration which is highly concentrated and which produces an astronomical amount of food. It is unclear when the generic form of *E. coli* mutated into the specific sub-type O157:H7—it could be a new mutation, or one around for decades—but it only became visible in 1983, when the first cases of haemorrhagic colitis linked to the consumption of beef spurred medical researchers to investigate and to define O157:H7 as a 'new' organism (see Wells *et al.*, 1983; Pai *et al.*, 1984). Until the Jack-in-the-box outbreak, however, haemorrhagic colitis associated with O157:H7 was seen as a 'rare' disease. The pathogen only became prevalent in cattle because millions of cattle from herds around the country were congregated in centralised feedlots and forced to stand nose to nose and mouth to anus, bathed in the dust from each other's faeces. The disease caused by the pathogen only became (relatively more) prevalent in humans when meat from thousands of those cattle a day passed through the same plants.

More importantly, though, *E. coli* O157:H7 is, in many ways, a product of audit, the regulatory tool designed to eradicate it. Audit systems work by prodding people into producing auditable performance (action) which is supposedly perfectly represented (as symbol) in auditable documents. That is the basis of the state's claim to produce transparency. As Power (1997) points out, the illusion of transparency makes it seem as if the state has the power of surveillance within the firm—that it can see how the firm works and what people are doing inside it. That, in turn, is supposed to engender a sense of trust and comfort in the citizen/consumers that the state claims to represent, not only because they are supposed to believe that increased surveillance will reveal uncleanness and risk, but because it ostensibly forces managers to police themselves (Power, 1997). The state thus sets up transparency as a proxy for external governance, because the firm supposedly internalises governance and regulates itself. However, firms subject to audit often go far beyond the regulation that direct inspection by the state once provided. Audit systems force firms into a state of hypervigilance. Like hypervigilant individuals, whose past traumas make them obsessively scan the environment for threats, the hypervigilant firm's managerial 'nervous system' forces it to search constantly for potential risk. Not surprisingly, as firms constantly seek out threats, they find them: microbes once unseen appear to proliferate, bacteriological testing shows that spaces once thought clean are besmirched and meat once seen as healthy becomes a vector of danger and potential disease.

The irony is that corporate hypervigilance is appealing to states precisely because it is supposed to create comfort. The notion that the process—whatever it is—is always being checked is very appealing to regulatory bodies in democratic societies which must continually demonstrate their responsiveness to the wishes of their citizens/consumers. This is clearly the source of HACCP's appeal to the USDA, which sees in it the possibility of satisfying activists and consumers as well as the powerful food processing industry. Other regulatory bodies, from the World Bank to the US military, see the same promise of regulating while

satisfying diverse constituencies.¹⁰ They audit not only financial records, but projects and processes—everything from contractors' books to ammunition destruction exercises to the treatment of children in foster care.¹¹ In each case, the state's claim is 'what we can see, we can find, and what we can find, we can remove'. Visibility is supposed to produce verity, and surveillance sanctification.

To produce truth and purity, though, the system requires ever-better modes of looking. The claim to 'continuous improvement' which is contained in audit systems requires a continuous cycle of looking for problems, finding them and then setting a new monitoring point (or 'critical control point') which in turn generates a new sub-process of looking for problems. The continued drive to *find* means that the system is always restlessly in search of new spaces to examine, colonise and control. This is what drives audit out of the domain of finance and into new contexts and forces the term 'audit' to expand in novel and unpredictable directions (Shore and Wright, 2000, p. 58). Audit is forever seeking complex systems it can absorb into its own matrix and make simple. Seen from this perspective, the constant overflows of audit are not failures of the system, but an integral part of it.

The companies and individuals who are subject to this kind of governmentality may object at first, but they find strong incentives to participate in the regulatory process. In the meat industry, HACCP programmes and FSIS audits of them provide a defence against lawsuits that might occur if a consumer eats tainted meat and gets sick. By showing that it has policies and procedures in place to mitigate against the risk of pathogens, a meatpacking company can show 'due diligence' and thereby argue that it is not liable for damages. In other contexts, audit similarly acts as a form of 'bulletproofing', a way of deflecting criticism and attacks from outsiders (Strathern, 2006; see also Poovey, 1998, ch. 2). Audit is a way of creating a barrier that defends against risk.

Successful bulletproofing, though, requires bullets. Audit cannot create trust where there is no risk of impropriety, dishonesty, corruption or impurity. HACCP only makes sense in cases where pathogens are likely to be present and each CCP has to be defined in terms of the risk it mitigates. However, as long as the USDA defines pathogens like *E. coli* O157:H7 as 'hazards reasonably likely to occur' and as long as there is no 'silver bullet' which can eradicate 100 per cent of the bacteria at any one stage, a finding of 'zero *E. coli* O157:H7' cannot produce the comfort that the system is designed to create. For a HACCP audit to produce trust, the auditors must believe that checking works. Repeated absences of a risk factor likely to occur introduce doubt about transparency and cause auditors to question whether the symbolic representation on the auditable document corresponds to reality. Complete 'success', then, only succeeds in introducing anxiety and unease, not comfort—and that is the ultimate failure. By making production appear more risky, audit reshapes the field upon which investment takes place and makes economic action less, not more, calculable.

Conclusion: Efficacies and Anxieties

Like people who study other systems of governmentality, Marilyn Strathern sees audit's drive to extend its reach as evidence of its power. "The whole audit apparatus . . . amounts to a self-organising system which can take on any other"

(Strathern, 2006). This drive to colonise and rationalise is one of the primary engines in the growth and dispersal of state function and—as the tentacles of state power shape individuals and their everyday conduct—in the transformation of government to governmentality. Systems of governmentality are always seeking new domains.

The drive to expand may be the source of audit's power but it may also be the source of audit's weakness. As hard as the HACCP system tries to capture every incidence of *E. coli* O157 (or the SEC tries to capture every incidence of accounting fraud, or the EPA attempts to capture every incidence of toxic dumping), some part of the complex environment that gives rise to these 'pathogens' overflows, polluting the purity of the audit system just as faeces pollute meat. Because these overflows are an artifact of the process of simplification itself, the more the state looks, the more it finds. No matter how vehemently the state claims to be able to remove corruption (in its function as sewer), it find and produces more and more overflow, until finally waste is pouring out in the street. If the state attempts to control *E. coli* O157:H7 in packinghouses, it finds it in the feed-yards. When the state creates new rules to prevent corrupt accounting practices like those used by Enron, it finds new rottenness in the mutual fund companies and discovers that the CEO of a healthcare company has cheated the shareholders. For every instance of contamination exposed and controlled, tens of others are revealed.

Governmentality thus requires *zones of wildness*. It depends not only on having spaces that are controlled, regulated and ordered, but also on spaces that are beyond the borders of control, which defy rules and which introduce chaos. Risk, filth and disorder are essential parts of any programme to rationalise and rule. Zones of wildness are, to use a post-modernist term, the 'other' which defines *governable* spaces as much as Black defines White or the Occidental defines the Oriental in systems of racial classification (see Said, 1978). This is easy to miss for students of governmentality who focus on what Foucault called the 'grid' of power and the ways in which surveillance, classification and documentary forms of evidence make social spaces legible. By focusing only on the productive, positive face of governmentality, they often tend either to see the iron bars of the Foucauldian grid as virtually unbreakable, or to see the only alternative to power as 'resistance' (for example, Scott, 1985). This black–white dichotomy between 'power' and 'resistance' or 'discipline' and 'freedom', however, obscures the grey space in the zone of wildness, which is a space characterised by chaos, not freedom. By failing to see the important role that zones of wildness play in the expansion of power, it is difficult to see how and why modes of seeing and organising, like audit, are able to reproduce across space and time.

Zones of wildness matter to governmentality because technologies of governmentality must continually reveal the very things they are supposed to eradicate, whether or not there are agents actively resisting state power. To justify their own existence and to replicate themselves, they must continually point out the places they do not control and cast light on the pollution that nobody yet fears. To create discipline, audit must first create anxiety, and to create security, audit must first create danger. This means that the power audit engenders must, of necessity, always be partial. To achieve complete safety is to eliminate the audit society's characteristic mode of being and the vehicle through which the security state reproduces and expands its own power.

When the newspapers are full of worries about a disease that affects relatively few people, or a stock scandal that costs most investors only a few pennies, the panics index much deeper worries. In the case of meatpacking, fears of *E. coli* O157:H7 highlight a system that produces anxiety as well as trust and forever reminds us of the uncontrollably complex world outside itself. Food panics are the product of a sewer state that produces its own excrement.

Notes

1. I owe this felicitous phrasing to Ronan Paddison and one of *Space & Polity's* anonymous reviewers.
2. Gary Smith, an academic specialising in meat production, conducted tests showing that any given hamburger patty may contain meat from as many as 3000 animals. He gave this estimate in a speech at the Petry Workshop, 12 December 2003.
3. The USDA did do some limited testing of meat to determine whether it was contaminated with *Salmonella* or generic *E. coli*. When the HACCP programme was first announced in 1997, the USDA intended to test for both *Salmonella* and generic *E. coli* (a non-hazardous form of the bacteria) as a means of assessing the effectiveness of a plant's self-designed HACCP measures. However, in a 2001 case known as *Supreme Beef v. Glickman*, the US Fifth Circuit Court of Appeals ruled that the USDA could not use *Salmonella* testing as legitimate grounds for closing a plant because the bacteria did not constitute an adulterant. The Fifth Circuit asserted that the presence of *Salmonella* did not necessarily indicate that the plant was insanitary, even if a large proportion of the meat was contaminated. Only documented deviations from the HACCP programme could be used to stop the processing line in a plant, regardless of the bacterial loads of such organisms.
4. Politics seeped into many speeches by USDA officials, nonetheless. In the same speech where he invoked science repeatedly, Pierson ended by saying, "Finally, I would like to say that it is a distinct privilege and honor to be a part of the Bush Administration" (Pierson, 2003).
5. Barry (2001, p. 43) suggests that the state's drive to purify has an explicitly geographical dimension, because it creates homogeneous technological zones within nations or regions. By reducing complexity, technologies of governmentality also reduce regional or local difference and hence make the spaces the state controls appear to be more uniform than they are.
6. The Sarbanes-Oxley Act of 2002 created a Public Company Accounting Oversight Board whose purpose was to audit the auditors of publicly traded companies. This meta-checking was supposed to enable the SEC to close accounting loopholes more rapidly and prevent collusion between firms and their accounting auditors. For more detailed information, see American Institute of Certified Public Accountants (n.d.).
7. I owe this provocative point to Risa Whitson.
8. The statistic on annual beef production comes from the USDA's agricultural statistics database.
9. *E. coli* is more prevalent in the summer than in the winter, possibly due to the spread of dried faeces as dust in drier months. Although the USDA did not specify when the samples were taken for the *E. coli* study in question, other sources suggest that the USDA samples in an erratic manner which would fail to control for seasonal differences (see Nestor and Lovera, n.d.) Firm size is also a factor that should be controlled for, given that a single infected cow can contaminate huge volumes of beef in a large plant.
10. For example, the US government's Defense Contract Audit Agency audits defence contracts for financial problems, but it also conducts audits to ensure that contractors are complying with the Truth in Negotiation Act.
11. See the US Army Auditor's website at http://www.hqda.army.mil/aaaweb/carop_pix.htm for photographs of auditors in Humvees inspecting demolitions at weapons depots. For more information on the federal government's audits of state foster care systems (known as Child and Family Service Reviews) that federal law requires, see <http://www.acf.hhs.gov/programs/cb/cwrp/staterpt/index.htm>.

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