

## INTRODUCTION

# FOOD SAFETY IS POLITICAL

FOOD SAFETY IS A MATTER OF INTENSE PUBLIC CONCERN, AND for good reason. Food “poisonings,” some causing death, raise alarm not only about the food served in restaurants and fast-food outlets but also about the food bought in supermarkets. The introduction in the 1990s of genetically modified foods—immediately dubbed “Frankenfoods”—only added to the general sense of unease. Finally, the September 11, 2001, terrorist attacks on the World Trade Center and Pentagon further heightened such concerns by exposing the vulnerability of food and water supplies to food bioterrorism.

Discussions of food safety in the media and elsewhere tend to focus on scientific aspects: the number of illnesses or deaths, the level of risk, or the probability that a food might cause harm. Such discussions overlook a central fact: food safety is a highly political issue. Preventing food-borne illness involves much more than washing hands or cooking foods to higher temperatures. It involves the interests of huge and powerful industries that use every means at their disposal to maximize income and reduce expenses, whether or not these means are in the interest of public health. Like other businesses, food businesses put the interests of stockholders first. Because food is produced, processed, distributed, sold, and cooked before it is eaten, its safety is a shared responsibility, meaning that blame also can be shared. Any one company in the food chain can deny responsibility and pass accountability along to another. Furthermore, food companies can and do use their considerable financial power to influence government regulations that might affect balance sheets, again whether or not such influence is in the public interest. Although consumer groups

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concerned about food safety also participate in these political processes, they rarely have equivalent resources or the ability to gain similar levels of attention. In this book, we will see how conflicts between business and consumer interests involve politics in three areas of food safety: foodborne illness, food biotechnology, and food bioterrorism.

To illustrate the many ways in which food safety is as much a matter of politics as it is of science, I begin this book with a familiar example: the front-page disclosure late in 2000 that a prohibited variety of genetically engineered corn—StarLink—had turned up in supermarket taco shells. The StarLink example reveals many of the themes that recur throughout this book and sets the stage for the rest of our discussion.

## THE STARLINK CORN AFFAIR

Our story opens on September 18, 2000, with a report from the *Washington Post*: a group called Genetically Engineered Food Alert discovered genetic traces of StarLink corn in taco shells made by Taco Bell. StarLink was not supposed to be in the human food supply. Two years earlier, the Environmental Protection Agency (EPA) allowed Aventis CropScience, the owner of the genetic engineering technology for this corn, to grow StarLink—but only for animal feed. The EPA wanted Aventis to prove that StarLink corn would not cause allergic reactions before allowing it in the human food supply. If supermarket foods contained StarLink, something had gone wrong with the regulatory system.

As events unfolded, the StarLink affair displayed all the hallmarks of classic political scandals: new information dribbling out one fragment at a time, lies, cover-ups, and finger-pointing. During the next year or so, international trading partners refused to buy U.S. corn, farmers hesitated to plant genetically modified corn varieties, and Canada spent nearly a million dollars to keep StarLink out of its food supply. Aventis took StarLink off the market, sold off its agricultural division, and owed millions of dollars in lawsuit settlements. Anyone following these events could see that genetically modified corn not only pervaded the U.S. food supply but also grew in places where it was not supposed to be—in fields of conventional corn, organically grown corn, and native corn grown in remote regions of Mexico. The StarLink affair had political consequences.

The StarLink affair also had political causes. For reasons of politics, federal regulatory agencies operate under policies designed to promote the food biotechnology industry, not to obstruct it with demands for extensive safety testing before products get into the food supply or for la-

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belonging of these products. In a different regulatory environment, the fact that the key protein in StarLink corn appeared similar to other proteins known to cause allergic reactions (allergenic proteins, or allergens) might have forced Aventis to find out whether this corn caused allergic reactions before allowing it anywhere near the food supply. Instead, the EPA authorized StarLink corn to be grown as food for animals. EPA officials reasoned that animals would be likely to digest the protein and destroy its function; they did not think the intact protein would get into meat. In splitting its decision, however, the EPA assumed that corn grown for animal feed could be segregated—kept separate—from corn intended for human consumption. As later chapters explain, the EPA should have known better, and its decision to permit StarLink to be grown at all suggested that the agency was partial to the interests of Aventis. Because this history is complicated, table 1 provides a chronological outline of the more important events.<sup>1</sup>

To understand why the safety of a genetically engineered corn might be political, we must look back to the early 1990s, when federal agencies ruled that such crops did not raise any special safety considerations and permitted them to be widely grown (chapter 7 discusses these decisions in some detail). Among the more successful of such crops is corn engineered to contain a gene from a species of common soil bacteria, *Bacillus thuringiensis* (*Bt*). The *Bt* gene provides the information needed to make a crystalline protein that is toxic to insect pests. Organic farmers have used the *Bt* protein toxin for decades in the form of a spray that washes off in the rain and decomposes rapidly. Agricultural biotechnologists thought the *Bt* toxin might work even better if it could be genetically engineered into the tissues of the plant. In the mid-1990s, a Belgian firm, Plant Genetic Systems, developed the trademarked StarLink variety of corn. StarLink contains the gene for a novel form of the *Bt* toxin—called Cry9C (for crystalline protein #9C)—that is especially effective against moths, corn borers, bollworms, cutworms, and other destructive insects in their larval stages.<sup>2</sup>

As a reporter from *Fortune* explained, corporate life at that time must have been difficult for the scientists who were developing StarLink. International joint ventures, mergers, and acquisitions put control of the technology successively in the hands of Belgian, German, and French companies, as illustrated in figure 1 (page 7). As StarLink corn was wending its way into the human food supply, the German company AgrEvo, itself formed by a joint venture of Hoechst and Schering, acquired Plant Genetic Systems. By September 2001, when the StarLink gene turned up

TABLE 1. Key events in the political history of StarLink corn,\* 1995 to 2002

Year	Month	Selected Events
1995		Plant Genetic Systems (Belgium) develops StarLink (Cry9C) variety of <i>Bt</i> corn. EPA grants registrations to other <i>Bt</i> varieties for 5 years.
1996		Companies plant non-StarLink <i>Bt</i> corn varieties.
1997		Plant Genetic Systems applies for EPA registration of StarLink. EPA grants permit for experimental plantings on 3,000 acres in 28 states.
1998		EPA limits registration for StarLink as a plant pesticide, permits use only for animal feed. Farmers plant StarLink on 10,000 acres in United States; registration transferred to AgrEvo.
1999		StarLink planted on 250,000 acres in United States. AgrEvo petitions for extension of registration to human food. EPA seeks comment on StarLink allergenicity.
2000	January to August	EPA panel reviews AgrEvo petition. StarLink is available from 15 seed companies in 33 varieties and is planted by 2,500 farmers on 300,000 acres; registration transferred to Aventis CropScience. Consumer group, Genetically Engineered Food Alert, announces campaign to require testing and labeling of genetically modified ingredients in food products. FDA receives reports of allergic reactions to StarLink corn products.
	September	Genetically Engineered Food Alert reports evidence of StarLink gene (not protein) in Taco Bell taco shells, owned by Kraft Foods. Kraft confirms tests, recalls 2.5 million boxes. Aventis blocks further sales of seeds, announces agreement with government to buy remaining seeds to use for animal feed. Consumers file lawsuit claiming allergic reactions.
	October	FDA confirms presence of StarLink in taco shells and announces plans to test food samples. Consumer groups identify StarLink in Safeway taco shells; Safeway issues recall. Aventis “voluntarily” withdraws EPA registration of StarLink. Mission Foods recalls 298 products distributed in the United States, Canada, and Korea; other companies also issue recalls. Kellogg closes U.S. factory because its supplier mills have no corn. Aventis petitions EPA to permit StarLink in existing foods on basis that amounts are too low to cause allergies; EPA asks for comments. USDA says it has traced all but 1.2 million bushels (1.5%) of StarLink produced in 2000. Japan finds StarLink in imported U.S. corn.
	November	Aventis says it will sell its CropScience division, reports “traces” of StarLink protein in conventional corn produced in 1998. American Seed Trade Association says it cannot guarantee that corn is free of genetic modification, asks USDA to approve a tolerance level of 1%. USDA tells EPA advisory committee that it cannot locate 7 million bushels (11%) of StarLink corn. More than 40 people report allergic reactions to StarLink corn products. EPA committee says StarLink protein has “medium likelihood” of being allergenic but “low probability” of causing problems from food.

TABLE 1. (continued)

Year	Month	Selected Events
2000	December	EPA is reported to know since 1997 that StarLink is in the human food supply. Farmers file class action suit against Aventis for not warning them that StarLink was restricted to animal feed. Japan finds 28,000 tons of StarLink corn in food supply.
2001	February	Aventis fires president, vice-president, and chief counsel of CropScience division; company says the StarLink recall cost nearly \$100 million.
	March	Aventis reports that 430 million bushels of stored corn from 1999 contain traces of StarLink. USDA reports traces of StarLink in non-StarLink seeds intended for planting in 2001. EPA says it will never issue another split registration. Greenpeace finds StarLink in Kellogg products, demands recall; Kellogg complies.
	April	Aventis asks EPA to set tolerance limit on the amount of StarLink permitted in the human food supply.
	June	CDC and FDA find no evidence of antibodies to StarLink protein in stored blood samples from people who reported allergic reactions. FDA finds no evidence of StarLink gene in yellow corn products but does find the gene in one sample of white corn tortilla chips.
	July	EPA advisory panel confirms December 2000 judgment that StarLink could be allergenic. Corn growers reduce acres planted in genetically modified seeds.
	September	Bayer said to be buying Aventis CropScience for \$5 billion and to assume \$1.7 billion in debt. U.S. consumer group, Center for Food Safety, obtains Freedom of Information Act information that Aventis knew in 1999—and told EPA in January 2000—that farmers were selling StarLink for use in human food.
	December	Canada reports that keeping StarLink out of its food supply cost its government nearly \$1 million.
2002	March	Federal judge approves \$9 million settlement of farmers' class-action suit against companies involved in StarLink production and distribution.
	June	Bayer completes purchase of Aventis CropScience; forms Bayer CropScience; divests interests in Starlink.
	October	GeneScan Australia reports traces of StarLink in one-third of test food samples.

SOURCES: *Food Traceability Report. StarLink: Lessons Learned*. Washington, DC: FCN Publishing, 2001. Taylor MR, Tick JS. *The StarLink Case: Issues for the Future*. Washington, DC: Pew Initiative on Food and Biotechnology, October 2001. Online: [www.pewagbiotech.org](http://www.pewagbiotech.org). Also: various reports from the *New York Times*, the *Washington Post*, *Food Chemical News*, and the Environmental Protection Agency ([www.epa.gov/scipoly/sap](http://www.epa.gov/scipoly/sap)).

\*StarLink™ is corn genetically engineered to contain a protein called Cry9C from a species of bacteria, *Bacillus thuringiensis* (Bt), toxic to corn borers and other insect pests.

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in taco shells, that company had merged into Aventis CropScience, an agricultural division of the French drug company Aventis, which in turn had been formed by the merger of Hoechst with Rhône-Poulenc.<sup>3</sup> This dizzyingly complex ownership history was typical of corporate dynamics at the turn of the twenty-first century.

To return to our story: in 1997, Plant Genetic Systems (soon to be AgrEvo) applied to the EPA for a “registration”—a planting license—for StarLink corn. Because company data indicated that the StarLink Cry9C *Bt* protein toxin appeared similar in structure to proteins known to cause human allergies, the EPA did something unprecedented: it issued a limited registration. The agency licensed AgrEvo to grow StarLink corn, but *only* for animal feed or industrial purposes.

Following approval, plantings of StarLink increased rapidly. Farmers grew the corn on about 10,000 acres in 1998, 250,000 acres in 1999, and 300,000 acres in 2000—still just a small fraction of the 80 million U.S. acres planted with corn in any given year.<sup>4</sup>

Once harvested, StarLink corn soon worked its way into the food production and distribution system. Figure 2, which illustrates the principal components of the StarLink food chain, immediately reveals why the question, “how did StarLink get into the human food supply?” is not the one to ask. The real question is how it could possibly have been kept out.

The chain of production begins with Aventis CropScience, the owner of the StarLink technology at the time the gene appeared in taco shells. Aventis does not sell seeds; it licenses the technology to seed companies to grow the plants. In this case, Garst Seeds was the principal (but not the only) licensed company. Garst, in turn, sold StarLink seeds to about 2,500 farmers who grew the corn throughout the Midwest, mainly (40%) in Iowa. The farmers harvested the corn and transported it to about 350 grain elevators. From the elevators, corn seeds traveled to Azteca Milling in Plainview, Texas, to be converted into corn flour. In turn, the flour traveled to Mexico (and other places) to be made into taco shells and corn products distributed throughout the world. Corn plants look alike, and corn seeds are either yellow or white. StarLink is yellow corn and looks no different from any other yellow corn. Unless StarLink is carefully segregated from other varieties, it can easily become mixed with conventional corn at any stage of production—in the fields or in trucks, grain elevators, or processing plants.

During the summer of 2000, Larry Bohlen of Friends of the Earth, one of the groups participating in Genetically Engineered Food Alert, learned

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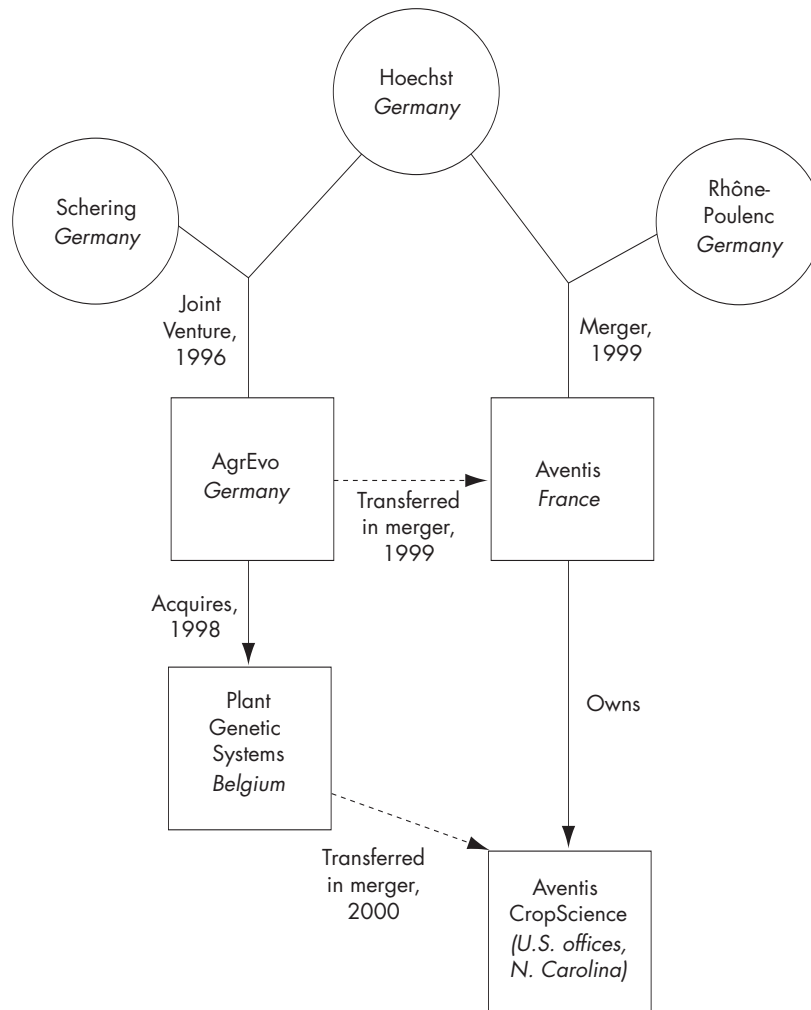


FIGURE 1. The multinational origins of Aventis CropScience, owner of the genetic engineering technology for StarLink corn in 2000, when its gene “illegally” appeared in supermarket taco shells. Bayer (*Germany*) bought Aventis CropScience in 2002.

that neither the growers of StarLink nor the owners of grain elevators were making any special effort to segregate the genetically modified corn from conventional varieties. He knew of a test developed by GeneticID, a company in Iowa, that could identify “foreign” genes in genetically modified foods. Using that test, Friends of the Earth examined corn

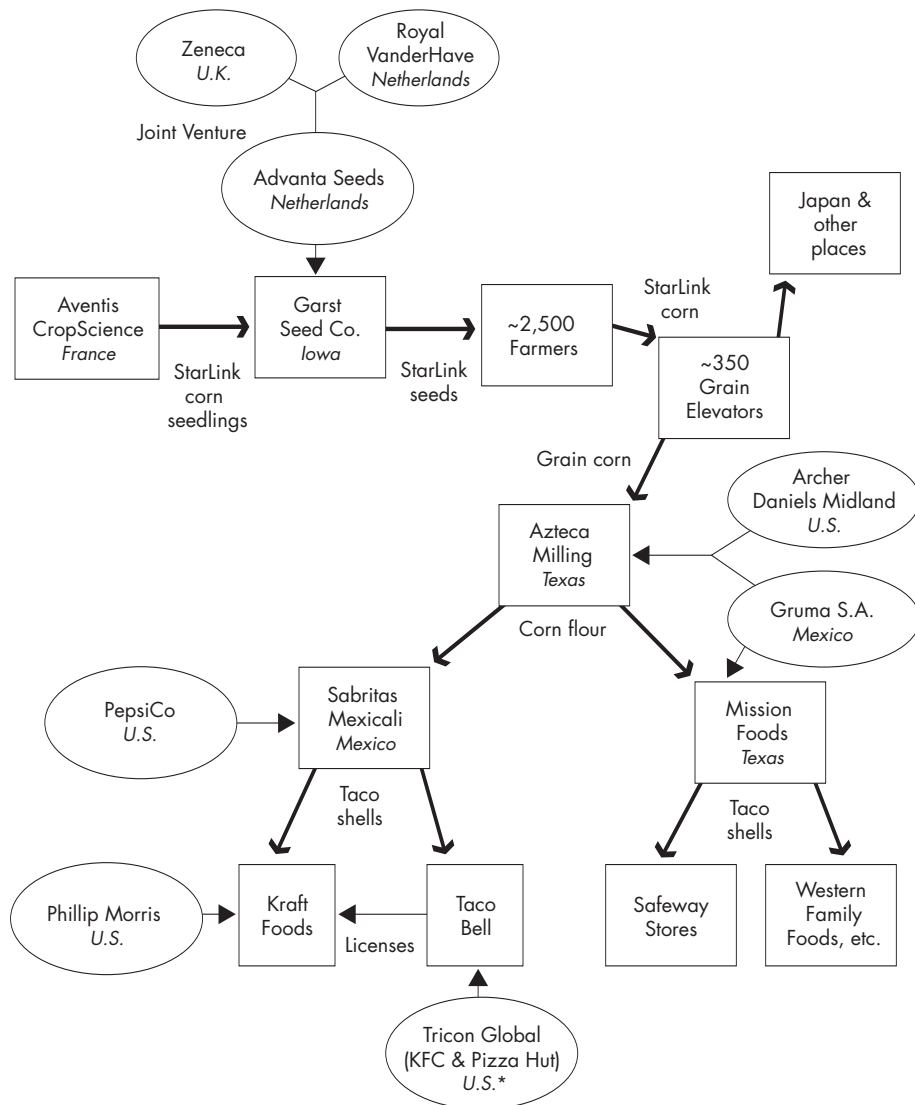


FIGURE 2. The chain of production, distribution, and marketing of StarLink corn through the food system in 2000. Square boxes contain the principal elements in this chain. Ovals indicate corporate ownership. The diagram reveals the difficulties of keeping StarLink corn separated from conventional corn during growth, harvest, storage, and processing.

\*Tricon Global changed its name to Yum! Brands, Inc. in 2002.



products on supermarket shelves and hit the jackpot with the shells made by Taco Bell (owned by Kraft Foods, then a division of Philip Morris). Further testing revealed signs of the StarLink gene in other foods: vegetarian corn dogs, seed corn from conventionally grown plants, seeds from other types of genetically modified corn, corn shipped to Japan, and white as well as yellow corn. Because StarLink was not permitted in these products, it would have to be removed—a challenging and costly process involving product recalls, purchases of stored corn, closures of manufacturing plants, testing of samples, legal fees, bail-out funds, loss of sales, lost jobs, lost exports, and, eventually, judgments in class-action lawsuits. Not least, the StarLink affair contributed to further loss of confidence in the food biotechnology industry and in the ability of government agencies to protect the public by regulating genetically modified foods.

### *The Safety Issue: Allergenicity*

The driving force behind these events was the idea that some people might be allergic to the StarLink protein. Food allergies, although rare, can be extremely dangerous and sometimes fatal to susceptible individuals. In the months following the taco shell disclosure, the Food and Drug Administration (FDA) collected accounts from people who said they experienced allergic reactions to products made with StarLink corn, and the EPA asked its Scientific Advisory Panel to advise the agency about scientific issues related to the allergenicity of the StarLink protein.

The panel's responses to the EPA surely constitute the most thorough evaluation of a food allergen ever conducted and provide a vivid example of how difficult it is to make policy decisions based on science that is incomplete and uncertain (which so often is the case). Panel members said they were "uncomfortable with the available data" and did not have enough information to decide whether the StarLink protein could cause allergic reactions. They knew that proteins are strings of amino acids arranged in a particular sequence, and that whether a protein provokes an allergic response depends on how that sequence folds—its structure and shape. Only some proteins are allergenic, but it is not yet possible to predict the structural features that induce allergic reactions. The panel members had to make educated guesses about the size, digestibility, and stability to heat of the Cry9C protein, and about the prevalence of this protein in the food supply.

One reason the Cry9C protein is toxic to insects is that they cannot easily digest it—break it down—to its constituent amino acids; the struc-

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ture of the protein survives the digestive processes more or less intact. The Cry9C protein also is relatively stable to heat, so cooking might not destroy its ability to cause allergic reactions. Furthermore, preliminary feeding studies showed that the Cry9C protein appeared intact in the blood of rats and provoked immune responses, meaning that rats could not digest it and destroy its allergenicity. No such studies had been conducted in humans, however. Thus, panel members could not dismiss the possibility that the StarLink protein *might* be allergenic to humans. They judged the StarLink protein to have a “medium” likelihood of being allergenic, mainly because its potential to induce allergic reactions could not be disproved. Because processing and cooking were likely to destroy some of the Cry9C proteins, and the amounts were quite small to begin with, they judged Cry9C to have a “low” probability of actually causing allergic reactions in the population. These judgments supported the EPA’s precautionary decision not to allow StarLink to enter the human food supply.<sup>5</sup>

A further complication is the question of whether people actually experience allergic reactions when they eat StarLink products. As it turns out, this connection is not easy to prove. Just because people feel sick after eating a food does not necessarily mean that the food—and not something else—caused the illness. Finding the StarLink *gene* in a food does not necessarily mean that the protein it specifies will cause allergic reactions. Like other genes, the StarLink gene is made of DNA (deoxyribonucleic acid), and its constituent components are common to all living species (see appendix). DNA and genes do not induce allergic reactions, but they specify the structure of proteins. Proteins (but not all of them) cause allergies. To prove that the StarLink protein is allergenic, scientists have to show that people reporting allergic reactions ate foods containing the StarLink corn protein and displayed immune responses to the StarLink protein in their blood. To investigate these matters, the FDA had to develop new testing materials and methods, and quickly. By June 2001, 63 people complained to the FDA about allergic reactions to StarLink and agency scientists collected food and blood samples from about 10 of them.

Using the new methods, FDA scientists tested the food samples but could not detect the StarLink *gene* in any of them. They also failed to find the StarLink protein in the foods, although the test was inconclusive in one sample. In the meantime, scientists from the Centers for Disease Control and Prevention (CDC) tested the blood samples for evidence of immune responses to the StarLink protein; they found none. These re-

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sults led the agencies to conclude that the reported illnesses must have been caused by something other than an allergic reaction to the StarLink protein.<sup>6</sup>

With these results in hand, the EPA Scientific Advisory Panel met again in July 2001 to continue debating issues related to StarLink allergenicity. By this time, the EPA had canceled the StarLink registration, thereby prohibiting further plantings. The U.S. Department of Agriculture (USDA) joined with Aventis to buy the remaining mixtures of conventional and StarLink corn to use for animal feed or industrial uses. Corn handlers, millers, and food processors began testing to see whether their stocks contained the StarLink Cry9C protein, and began selling off the commingled corn.

In the meantime, EPA panel members continued to raise questions about the reliability of the FDA and CDC testing methods and said that they still could not exclude the possibility that StarLink might be allergenic. They saw no reason to change their previous conclusion that the Cry9C protein had a medium chance of being allergenic but a low chance of actually causing allergic reactions in the population. Instead, they said it was time to ask *political* questions: “What went right? What went wrong? What have we learned? How did Cry9C penetrate the human food supply? Why was the adulteration detected by a public interest group rather than through a more formal surveillance program (e.g., Federal agencies or regulated industry)?”<sup>7</sup>

*Implications for Stakeholders*

The answers to such political questions depend on the point of view—and, therefore, the interests—of the various stakeholders in food safety: the food industry, the government, consumer advocacy groups, and the general public. The StarLink affair revealed how these interests affect opinions and actions related to safety matters.

We can begin by looking at the reactions of the food industry—in this instance, the companies that produce, process, and sell StarLink corn or its products. As indicated in figures 1 and 2, large national and international corporations own many of the companies involved in the StarLink chain of production and distribution. These companies are businesses that must respond to the demands of directors and stockholders, and it seems likely that their managers had more immediate matters to worry about than whether corn intended for animal feed was commingling with conventional corn.

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Aventis officials behaved as if they had no doubt that the EPA would approve StarLink for human consumption and would allow it to remain in the food supply. They began with denials and finger-pointing, starting with an attempt to discredit the accuracy of the GeneticID test. When subsequent testing confirmed the presence of the Cry9C gene in supermarket foods, Aventis “volunteered” to give up its right to plant StarLink, reportedly because the EPA threatened to revoke its registration.<sup>8</sup> The company also tried another tack; it petitioned the EPA to allow StarLink to remain in supermarket foods for four more years until virtually all commingled products would be sold. Aventis officials argued that the amounts in food were too small to harm consumers and that having to remove foods containing StarLink from corn supplies and supermarket shelves would greatly disrupt the food system. Indeed, disruptions were likely to be considerable, since the commingled corn for the 2000 crop amounted to 124 million bushels, and Japan and South Korea had rules forbidding any genetically modified corn from entering their countries. For all of these reasons, the Grocery Manufacturers of America and other food industry trade associations strongly supported the Aventis petitions.

Using yet another tactic, Aventis asked the EPA to set a “tolerance” limit for StarLink—a level below which regulatory agencies would ignore traces of the Cry9C gene or protein in food. Aventis warned corn processors that StarLink was so thoroughly commingled in the corn supply that the only way to deal with that situation was to *accept* it: “Will there ever be an end to this? Unfortunately, as of right now, the answer is ‘no’—there will never be an ‘end’ as long as there is zero tolerance for Cry9C in food.”<sup>9</sup>

These events led critics to ask the questions raised in any political scandal: What did Aventis and the EPA know, and when did they know it? Reports soon trickled out that both company and government officials knew—perhaps as early as 1997 and certainly by 1998—that StarLink was commingled with conventional corn. At a meeting late in 2000, I heard an official of the EPA say—unfortunately not for direct quotation—that Aventis had worked hard to lobby the White House Office of Science and Technology Policy, the State Department, and the FDA, USDA, and EPA during the months prior to the taco shell disclosure in an effort to convince federal officials that StarLink was not going to cause safety problems. Because Aventis officials acted as if StarLink were demonstrably safe, they were vulnerable to criticism from consumer groups like Friends of the Earth: “Aventis can’t possibly have enough information to conclude that StarLink is safe at any level in our food.”<sup>10</sup>

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Other companies in the StarLink chain joined Aventis in further denial and blame. Officials of Garst Seed said that farmers knew they were supposed to separate StarLink from other corn, and “it’s unfortunate some customers say they weren’t informed about the program. . . . But we worked hard to get that message out.”<sup>11</sup> Farmers, however, denied they had been told to segregate StarLink and filed lawsuits for damages. Operators of grain elevators also denied hearing anything about the need for crop segregation, and at least half of them had forwarded commingled corn for unapproved uses. Overall, the various companies in the chain of production and distribution assumed that their customers would not much care about this issue. As an analyst for J. P. Morgan explained, “If you’re eating at Taco Bell, health consciousness is not high on your list of concerns.”<sup>12</sup>

The government also is a major stakeholder in food safety, and its responses reflected the peculiar way in which regulatory authority is distributed among no less than three major agencies—the EPA, FDA, and USDA (see chapter 1). EPA officials criticized Aventis for claiming innocence about how StarLink might have gotten into the human food supply, for insufficiently informing growers about the need for crop segregation, and for flagrantly ignoring the terms of the restricted registration. The FDA at first seemed unconcerned; StarLink corn was the EPA’s problem, and the taco shells, which do fall under FDA jurisdiction, seemed unlikely to be harmful. One FDA official reassured the *New York Times*, “This is not a case where we have illnesses or health problems.”<sup>13</sup> When the FDA had to ask Friends of the Earth for a sample of the taco shells in order to conduct its own after-the-fact testing, however, it seemed clear that the agency was giving “inadequate oversight and attention to a serious matter of public health.”<sup>14</sup> The secretary of the USDA blamed Aventis: “Some might argue that the StarLink episode will lead to greater government involvement. . . . It’s important to remember that this problem may not have occurred had industry complied with the terms of its license.”<sup>15</sup> Nevertheless, the USDA agreed to spend \$20 million to buy back commingled seed in an effort to prevent disruption of the corn market.

Consumer advocacy groups used the potential allergenicity of StarLink to bolster their demands that genetically modified foods be tested before entering the food supply and labeled so people can protect themselves against foods to which they might be allergic. They viewed the events as evidence that neither government nor industry were looking out for the public interest. Representatives from Friends of the Earth and Consumers Union argued, “There is no way the taxpayer should bail out

Aventis for the genetic pollution they created,” and “EPA should not reward Aventis for their failure to follow the law.”<sup>16</sup> Even business commentators were dismayed: “Almost everybody involved screwed up. . . . The promises made by StarLink’s inventors proved worthless, falling prey to managerial inattention, corporate mergers, blind faith, misplaced hope, woeful ignorance, political activism, and probably greedy farmers too, if you can imagine such a thing.”<sup>3</sup> Whether or not StarLink really is allergenic (a food safety issue) its unlabeled presence in processed foods did nothing to encourage trust in the food supply, and these events revealed the markedly different ways in which the various stakeholders view matters of food safety risk.

### *Implications for Food Safety Politics: Themes*

With StarLink products recalled and class action suits settled, we now turn to the food safety interests of the general public. As consumers, we want food to be safe—or safe enough—and we expect the food industry and government to make sure that it is. We also are part of the political equation. As stakeholders in the food system, however, our influence depends on the extent to which we recognize the political forces at work in safety matters. Enhancing that understanding is a principal aim of this book. If the StarLink episode teaches us anything, it is that ensuring food safety is a matter of politics as well as science. In conveying this lesson, the StarLink story illustrates several of the themes that recur throughout the chapters that follow.

The first theme is the fragmented, overlapping, and confusing distribution of authority among the federal agencies concerned with food safety: the EPA, FDA, and USDA. All three agencies were in some way responsible for making sure that StarLink did not get into the human food supply, yet the system failed to ensure that food companies followed rules designed to protect public health. We will see how this divided authority complicates federal oversight of microbial contaminants in food, genetically engineered foods, and protection of the food supply against potential threats of bioterrorism.

A second theme is the food industry’s promotion of economic self-interest at the expense of public health and safety. We have just seen how the developers of StarLink assumed that the corn was safe to eat, made little effort to keep it out of the human food supply, and blamed other parts of the food distribution chain for its appearance in taco shells. The StarLink affair is just one example of what *Sierra* magazine calls “Brave



FIGURE 3. Environmental groups recognize political influences on science when they ask what happens when “biology meets big business,” as in this cover story from *Sierra*, July/August 2001. (Courtesy of *Sierra* magazine and the photographer, Philip Kaake. Reprinted with permission.)

New Nature—What Happens When Biology Meets Big Business?” (see figure 3). This book provides further examples of situations in which food companies deny responsibility and blame others in matters of food safety, and oppose, resist, and undermine food safety guidelines, following them only when forced to do so by government action or public opinion.