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To Live as Natives, Free of Fear: What Citizens Should Require from Animal Biotechnology

Floodwood, Minnesota, the little town near my farm, can barely keep a feed store going today, but it led the nation in dairy technology 55 years ago. In 1937 at Island Farm, on the flat marsh west of town, technicians performed the first-ever insemination of a dairy cow with frozen semen (Goodrich, 1988). Into the early 1960s, the roads around Floodwood were lined with dairy farms and Floodwood had three car dealers, two tractor dealers and a cooperative creamery owned by local farmers. Today, we have to drive 40 miles to buy a new car or tractor and the only cooperative creamery left in all of northeastern Minnesota is the Duluth Division of Associated Milk Producers, Incorporated—a cooperative owned by farmers from Minnesota to Texas. During the Reagan years, half the farmers who shipped milk to that last local creamery quit dairying (Hunter, 1989).

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Considering America's agricultural history, it is not surprising that farmers and other citizens who follow agricultural events ask hard questions and look with cynicism at the promises made for genetically engineered animal products such as bovine growth hormone and porcine growth hormone, and humanly created, patented species. To Floodwood farmers, biotechnology looks like one more unit in a long parade of agricultural technologies—technologies which were sold to us as benefits, but which led to the displacement of our neighbors and the decline of our towns.

We are wary of new technologies because of our experiences. Besides the hurt heaped on family farmers by technology-driven economic upheaval, we have witnessed the hurt heaped on everyone by technology-driven environmental upheaval. Jim Davidson, soil scientist and research dean at the University of Florida, did a good job of articulating the reasons nonfarming citizens are wary in his 1989 address to the Agronomy Administrator's Round table. Davidson said:

The distrust on the part of nonagricultural groups is well justified. With the publication of Rachel Carson's book entitled *Silent Spring*,

we in agriculture loudly and in unison stated that pesticides did not contaminate the environment. *We now admit that they do.* When confronted with the presence of nitrates in groundwater we responded that it was not possible for nitrates from commercial fertilizer to reach groundwater in excess of 10 parts per million under normal productive agricultural systems. *We now admit that they do.* When questioned about the presence of pesticides in food and food quality, we assured the public that if a pesticide was applied in compliance with the label, agricultural products would be free of pesticides. *We now admit that they're not* (Kirschenmann, 1992).

Since informed citizens have such good reasons to be wary of promises made for new technologies, it is a challenge to find avenues of communication between them and the proponents of animal product biotechnologies. My job in this essay is to suggest some possibilities. I am not going to dwell on the bovine growth hormone (BGH) experience, but I *am* going to use it as a springboard, an element in a true story that illustrates why citizens have learned to require honesty, patience and respect from the proponents of new animal biotechnologies.

As a dairy farmer in the mid 1980s I started following news about BGH in farm magazines. In 1988, I joined a year-long biotechnology study group through a membership organization called the Minnesota Food Association. In 1990, after I had sold my cows, a farm woman who sits on the advisory board of our local agricultural experiment station called and asked me to attend the station's meeting on BGH. "I know you'll ask good questions," she said. I called another friend, a young woman who is taking over her father's dairy farm, and on a cold day in January, we met about halfway to Grand Rapids, at the Swan River truck stop, and drove the next twenty miles together.

In a basement room, two animal science researchers from the University of Minnesota presented a six-hour lecture program on the hormone they called "BST" (bovine somatotrophin). During the morning, I took notes and asked a few questions including who had provided funding for the research. The public had provided some money, it turned out, but most had come from Monsanto and American Cyanamid, two pharmaceutical companies that planned to market BGH/BST. At the end of the morning session, one of the researchers waved me over and asked whether I meant to imply that he was "in the pocket" of the pharmaceutical companies. I told him it was not that simple in my mind, but I thought that we all ought to consider what it means when universities choose research projects based of the amount of money the research can solicit from private industry. We had a long, friendly discussion which cut into the lunch hour.

My friend and I were pushing plastic trays down the cafeteria line when the other researcher approached us and spat, in an exasperated voice, "What

is it that you're afraid of?" Caught off guard, I spat back something like, "The destruction of our farms and our communities." I meant to go on, hoping to make the uncomfortable exchange evolve into a more civil one, but when I paused for breath, the man twirled on his heel and hurried away. I felt my face flush with insult.

In the pickup on the way home, I thought about his question. He had misused it by trying to intimidate me, but it was a surprisingly deep question. It occurred to me that we ought to examine our fears more often. Fears are not just embarrassing details; they are essential pieces of human equipment. What other basis do we have for respectful, careful deliberation in the face of danger? How else can we define safety, except to say that it means the absence of good honest reasons for fear? Everyone seems to agree that safety is the one thing which citizens have a right to expect from products of animal biotechnology. The researcher's question was right on the mark: *What is it that I am afraid of?*

First, I am afraid that animal biotechnologies will be just like other agricultural technologies, pushing along existing trends that benefit agribusiness industries but damage the environment, farmers and rural communities. I am afraid animal biotechnologies may be piecemeal solutions that do not take into account ecological or social systems. I am afraid they will decrease normal, healthy variation within and among breeds. I am afraid they will hurt people in the Third World whose economies are already threatened by genetically engineered plant products such as sugar substitutes, vanilla flavoring and cocoa butter (Jamal, 1988).

I am even more afraid that animal product biotechnologies will be unlike previously known technologies. I am afraid of disasters like the 1989 L-tryptophan poisoning which so far has left 31 Americans dead and 1,500 sick from a blood disease linked to a mysterious double molecule in a genetically engineered food supplement (Raphals, 1990a,b,c; National Wildlife Federation, 1990). If we know all we need to know about the safety of genetic engineering, it is hard for me to understand what went wrong in the L-tryptophan incident. I am also afraid of monster animals like the giant cloned-calves that could not be born vaginally, a failed experiment that drove Grenada Biosciences of Houston into receivership (Hodgkinson, 1992).

I am afraid of one more thing: human ignorance. Technologies are not inherently evil, but if recent history is any guide (See Dean Davidson's list above for just three examples), we humans are not yet sophisticated enough to predict the impact of singular changes on large, interconnected systems. My own particular ignorance scares me, too. It may be that biotechnology is "going to require more of us as citizens than we can handle," as Kansas geneticist, Wes Jackson, predicted (Eisenberg, 1989). The issues are so complex—not just scientific and technical, but ecological, ethical, economic, social and political. To even begin to understand them, ordinary citizens need a

crash course. Fortunately, some of us have been able to get that from non-profit organizations like the Minnesota Food Association, the National Wildlife Federation and the Rural Advancement Fund International.

The Minnesota Food Association's biotechnology study group, in which I participated, makes an effective model for citizen study groups. The Association is a membership organization of people interested in food and agricultural issues. Members identified biotechnology as an important upcoming issue in 1987, and decided to convene a study group. Association staff provided research and support, and they organized a series of informational meetings between study group members and various experts. Study group members included farmers, writers, a veterinarian, a biologist and a futurist. Experts included legislators, ecologists, ethicists, scientists, university administrators and representatives of businesses involved in biotechnology. The group met twice a month and heard from three experts at each meeting. After a year of study (including the meetings as well as the reading of relevant materials) staff and members collaborated to write and publish a report, *Food and Agricultural Biotechnology in Minnesota: A Citizens' Perspective* (Minnesota Food Association, 1988). The report helped spur the Minnesota Legislature into passing one of only two state laws in the country that regulate environmental releases of genetically engineered organisms.

We heard later that some of the scientists who met with the study group felt affronted to have their research questioned by nonscientists. Some of the nonscientists felt affronted by what they judged to be condescension from some of the scientists. No one yelled or was injured. We can bear such small, nonviolent discomforts. They are prerequisites for real communication among equals who do not necessarily agree.

In contrast, one-sided events, like the bovine growth hormone meeting described above, are not real communication. Today's wary citizens know that. We have learned something from three decades of watching television commercials. We know that real communication is not a one-way street, not "reaching" someone with a message, the way public relations firms try to do. Real communication takes place between equals at an intersection with many points of view and many ways to go. Only through real communication can anyone hope to convince us that a product of animal biotechnology is safe—if, in fact, it is.

Consider the bovine growth hormone experience. Neither farmers nor consumers asked for BGH in the first place. That was the first mistake—to develop a product that met no clearly defined need. Neither farmers nor milk drinkers wanted it. Forty-six percent of Minnesota farmers have said they would never use it (Crooker and Otterby, 1990). Eighty-two percent of rural nonfarm North Carolina residents said they were very concerned or somewhat concerned about it (Sorenson, 1990). BGH is a textbook example of how not to develop a technology. Let us learn something.

When considering new genetically engineered animal products in the future, we should ask these fundamental questions: Who wants the technology that might result from this research? Do we hear citizens asking for this technology or will we have to try to manufacture their need for it through one-sided promotional events? Who will profit? Who will pay?

Given current citizen activism and wariness, no one should expect to develop a new technology without public comment, particularly if public funds are involved and if the research is being conducted at land grant universities that have inherent public interests. One thing is clear from the Minnesota experience: the nature of the public comment is negotiable. People can dialogue with structure and moderation, hearing many voices or they can monologue in strife and chaos, employing secrecy, name-calling, moratoriums and protracted battles over legislation and regulation.

Again, the Minnesota Food Association provides a model. In February, 1992, members entered into a moderated dialogue with Gene Allen, a University of Minnesota Vice President who had signed testimony opposing regulations that would implement Minnesota's biotechnology law. This was the same law that the Minnesota Food Association's biotechnology report had helped to pass three years earlier. People on both sides were apprehensive going into the dialogue, but coming out, Dean Allen quipped that, "We are formed by those whom we meet with, and thank God, I don't meet only with vice presidents." (Northern Tier Land Grant Accountability Project, 1992) Further, he invited members of the Minnesota Food Association to meet with the University's Council of Biological Deans who, he allowed, were better suited to answer the members' questions.

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I hope that other proponents of biotechnology will open themselves to dialogue with citizens who have joined membership organizations and taken the trouble to educate themselves about biotechnology. Such dialogue is not just public spirited, it is also practical. Citizens already involved in the biotechnology issue are the ones who are likely to cause trouble in the future should some technology look unsafe or ethically cloudy. By hearing their concerns in advance, biotechnology proponents can head off future disagreements like the ones that have hobbled BGH.

Industry executives could also head off future trouble by implementing real communication. Instead, they are being secretive—withholding data that the companies judge to be "Confidential Business Information." Take the case of Frito-Lay, the potato chip company. Under the Freedom of Information Act, the National Wildlife Federation (NWF) has obtained nine of Frito-Lay's USDA applications for environmental releases of genetically engineered organisms. In six of those applications, according to the NWF, Frito-Lay withheld the identity of added genes and other information needed to assess environmental risks involved in the releases (National Wildlife Federation, 1992).

Citizens are tired of being kept in the dark and we do not want to "be reached" by proponents of biotechnologies before we have a chance to say whether we need the technologies or their products. Right from the start, we want a chance to ask questions and express our fears. We want to know if a new technology is going to be like every other technology—if it is going to add to corporate balance sheets and subtract from the balance sheets of American farmers and Third World citizens. We want to know if the new technology is going to be unlike every other technology—if it has the potential to damage society or the environment in unforeseen ways. We want to know how we can educate ourselves so that we can participate as equals in political decisions being made about biotechnology. We want to know that people in the universities are there to listen and to help us get truly educated and that they are not trying to sell us technologies or products.

Minnesota writer and ethicist, Carol Bly, set a practical benchmark in her foreword to my oral history collection, *Breaking Hard Ground* (Hunter, 1991). She wrote, "What we all want is a world in which small operators who like their work can live without any insult and injustice, can live in the places which are native to them and can consort with those they do business with without fear."

With that ethic in mind, let us respect one another, study together and take all the time we need to arrive at careful decisions. Let us not give in to the profit-driven rush to develop genetically engineered animal products. We humans have been practicing animal husbandry for at least 10,000 years (Lerner, 1986). We are not likely to hurt ourselves if we take another 10 or 15 years to carefully test and deliberately study a new product. We might even move a step or two up the evolutionary ladder if we learn to manage a prolonged, civil discourse among disagreeing parties.

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