

Biotechnology: Curse

or cure?



ILLUSTRATION: SKIP OLSON

Consumers' and farmers' concerns over genetically modified foods – called “Frankenfood” by some – is causing states to take a second look at this thriving, emerging technology.

Coffee plants that yield naturally decaffeinated coffee beans. Citrus crops resistant to freezing temperatures. Shrubs that produce naturally sweetened strawberries. These and other crops of the future are being created through genetic engineering, revolutionizing the food industry.

However, unbeknownst to many consumers, many genetically modified foods have been on the market since 1994, when the Flav'r Sav'r™ slow-ripening tomato became the first GM food approved by the U.S. government for sale. Today, many crops grown in the United States are genetically al-

tered, and some of the most common processed foods, including breakfast cereals, soft drinks, tortilla chips and margarine, contain GM ingredients.

GM foods are creating an international stir among consumers in Europe, Japan, India, Australia and New Zealand over the possible dangers they

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A restaurant in Scotland assures customers it doesn't serve "Frankenfood."

pose to the environment and human health. Many companies fear American consumers, who have virtually been unaware they were eating GM foods, are awakening to the controversy — particularly following a flurry of publicity surrounding a recent study published in the May 1999 issue of *Nature*. The study concluded that pollen from GM corn may kill larvae of Monarch butterflies. The increased concern in this country is prompting state policymakers to begin addressing these issues.

GM foods on the rise

Genetic engineering provides the ability to deliver a desired trait to an organism by cutting and splicing specific genetic fragments from another organism. The technology can be used to produce foods with longer shelf-life, greater taste and more cosmetic appeal. Agriculture biotechnology companies also are using genetic engineering to improve the efficiency and profitabil-

ity of farming operations. They are creating crops resistant to pests, weed killers and other agricultural plights to help reduce chemical use and increase crop yields.

Today, the federal government has approved more than 50 genetically engineered crop plants covering 90 million acres, or one-fourth of U.S. cropland, according to a September 1999 article in *Consumer Reports*. More than 35 percent of all corn and nearly 55 percent of all soybeans are genetically engineered. Also, about one-third of all dairy cattle are given hormones produced by

biotechnology to increase milk production, according to the article.

In the future, biotech companies intend to produce foods that are nutritionally enhanced or modified to fight cancer through genetic engineering. More significantly, with its ability to increase crop yields, some assert that biotechnology could solve world hunger. With these extraordinary possibilities, why is GM food so controversial?

Environmental and health risks

Although studies performed so far are inconclusive, opponents of GM food question the long-term consequences of GM foods to the earth's biodiversity. GM crops, it is feared, may upset the natural-selection process and become weeds invading and damaging natural ecosystems, or genes may escape to wild relatives creating uncontrollable "superweeds." In addition, insects that are overexposed to pest-resistant crops engineered with genes

from a natural bacterium may develop resistance to environmentally friendly pesticides. The most significant concern, however, is the unknown dangers GM crops pose to other organisms, such as the Monarch butterfly.

Concerns also exist over potential human health risks of GM foods. Some researchers worry that humans may be exposed to higher levels of natural plant toxins inadvertently enhanced through genetic manipulation, or that people may unknowingly be exposed to foreign proteins to which they may be allergic. In addition, some believe that consumption of GM foods may contribute to the growing concern over antibiotic resistance. Scientists often link a "marker gene" resistant to antibiotics together with the desired trait to assess whether a genetic engineering attempt is successful. Some believe bacteria living in the human gut may develop resistance to antibiotics from ingesting foods with these marker genes.

Regulation of GM foods

Despite these risks, federal regulators have determined that GM foods are no different than foods produced through traditional breeding techniques and that they are safe for human consumption and the environment. Therefore, the federal policy toward biotechnology essentially has been to promote new developments by relying largely on industry self-reporting and minimal regulatory oversight by three agencies — the Food and Drug Administration, the Department of Agriculture, and the Environmental Protection Agency. Critics claim this patchwork regulatory approach has too many loopholes and leaves the profit-oriented industry virtually unregulated despite the



New Hampshire Rep. Marie Rabideau

unknown risks.

States, too, have viewed the biotech industry as a lucrative economic development opportunity, and have promoted the industry's growth through tax incentives and funding programs for research and development. However, some states have also attempted to address concerns over emerging biotechnology developments.

Maine, for example, established a Commission on Biotechnology and Genetic Engineering. The commission is authorized to assess risks to the public and the environment, study the adequacy of state and federal laws governing releases of GM organisms into the environment through field trials and establish permitting standards for releases. Other states, including Florida, Minnesota, Oklahoma and Washington, instituted permitting requirements for releases of GM foods and crops. West Virginia and Nebraska also have permitting programs, but they exempt from state permit requirements environmental releases for which a federal permit has been issued. Other states, including Wisconsin and Illinois, merely require notification of a release.

More recently, legislators in New England are considering more far-reaching proposals. Maine Rep. Joanne Twomey submitted a bill for the upcoming 2000 session to impose a moratorium on the use of genetically altered seeds or plants in that state. "There is a multitude of health and environmental concerns, and we can't wait for the federal government to act," she said.



Some believe that consumption of GM foods may contribute to the growing concern over antibiotic resistance.

"A key question in Maine is who is going to be responsible for cross-pollination that occurs with crops grown by organic farmers?"

Twenty-five percent of the farms in Maine are certified organic growers, and they could lose their certification should GM genes escape into their crops.

In the 1999 session, legislators in Vermont and New Hampshire addressed specific concerns over "terminator" technology, developed for GM crops by several companies to produce sterile seeds after one use so as to prevent piracy. Although the Vermont House Resolution, HR 116, was not adopted, the New Hampshire bill, HB 291, was enacted. New

Hampshire established a three-year committee to study "the threat to biodiversity as a result of the sterility trait flowing via pollen from 'terminator' crops to surrounding plants, rendering them sterile." The committee filed its first report in October.

New Hampshire Rep. Marie Rabideau said she introduced the legislation because she was concerned "the use of any type of this technology would threaten farmers that save seeds as well as species in the wild that cross breed [with crop plants]."

She said, "Because of this legislation, more and more people are asking questions about GM foods in general



Maine Rep. Joanne Twomey

World Wide Web sites

More information on the issues in this article is available on the following sites:

Industry

www.monsanto.com
www.pioneer.com
www.novartis.com
www.dupont.com
www.mycogen.com
www.astrazeneca.com
www.bio.org/welcome.html
www.acpa.org

Federal agencies

U. S. Food and Drug Administration Center for Food Safety and Applied Nutrition — vm.cfsan.fda.gov/~lrd/biotechm.html
U.S. Department of Agriculture — www.nal.usda.gov/bic/
U.S. Environmental Protection Agency — www.epa.gov/

Other

Union of Concerned Scientists — www.ucsusa.org/agriculture/biotech.html
Greenpeace — www.greenpeace.org/~geneng
Mothers for Natural Law — www.safe-food.org/-campaign/about.html

and the [related] health concerns.”

She is considering introducing legislation for the 2000 session to require that GM foods be labeled as such.

Labeling GM foods

Despite urging by consumers groups for labeling of all GM foods, the FDA requires no labeling unless the foods contain known allergens. Some states have attempted to impose their own labeling requirements, but these efforts so far have been unsuccessful. A labeling bill, LD 713, introduced in Maine in the 1999 session was defeated. A 1994 Vermont law enacted to require labels for dairy products from cows treated with hormones was overturned in 1996 in federal court, *International Dairy Foods Assn. vs. Amestoy*, on the grounds that labeling regulation merely to satisfy consumer concern is a constitutional violation of commercial free speech. Recently, the USDA promoted voluntary labeling to help

defuse the controversy. However, it is unclear whether the industry will engage in voluntary labeling, because labels may scare consumers into not buying their products.

International response

In contrast to U.S. policy, many other countries have imposed mandatory labeling requirements in response to the international consumer uproar. The European Union has effectively imposed a moratorium on the import of GM crops. Because about one-third of American crops are exported, the trade implications of these actions are enormous, and are before the World Trade Organization.

Corporations around the world are changing their policies in response to trade threats and consumer criticism. In April, British food production companies, Unilever (UK) and Nestlé (UK), along with Tesco, the largest grocery store chain, announced that

they would phase out foods made from GM crops. The two largest American baby food companies, Gerber and H.J. Heinz Co., announced they would not use GM corn or soy ingredients in their products. Kirin Brewery Company and Sapporo Breweries in Japan declared they would use only non-GM corn in making their beer. And Archer-Daniels-Midland Co., the self-proclaimed “supermarket to the world,” in September announced that it will require segregation of GM and conventional crops.

Markets exist for most of the GM corn and soy crops being harvested this season. However, these recent industry decisions create doubt for the viability of next year’s GM products for both the foreign and domestic markets. These issues merely add to the precarious economic future for agriculture in the United States. Policy-makers will increasingly face concerns over GM foods from farmers and consumers as these issues continue to gain national and international attention. ★

CSG resources

A plenary session at the 1999 CSG Annual Meeting and Leadership Forum in Québec on Dec. 6 discussed agriculture in the Seattle Round of the World Trade Organization negotiation and exports of genetically modified food products. For more on the session, contact Cindy Lackey at CSG, (606) 244-8163.

To develop a basic understanding of sound science, legislators can turn to *A State Official’s Guide to Sound Science* (Order #C191-9800). It is available for \$20 by calling the CSG publication sales department at (800) 800-1910 or visiting the CSG online store at www.csg.org.