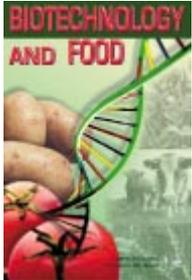


Biotechnology and Food (Second Edition)

By ACSH Staff — September 1, 2000



[1] EXECUTIVE SUMMARY

Modern biotechnology greatly benefits the quality and quantity of food, human and animal health, and the environment. Unfortunately, misinformation and misunderstandings about biotechnology in the popular media make it difficult for consumers to make informed assessments. This booklet explains the facts behind genetic modification (GM) and explores some of the issues surrounding the increasingly contentious debate over its use in food production.

Traditional biotechnology has given us almost all of our foods, from corn and beef to bread and wine. In the 1970s, modern biotechnology (i.e. genetic modification, genetic engineering, recombinant DNA or rDNA, gene splicing, etc.) started giving us lifesaving drugs such as Humulin (human insulin). In the past several years, the same technology has been applied to enhance agriculture and food production. Gene modification is a natural event. Many of our traditional foods are products of natural mutations or genetic recombinations. Nature is constantly mutating genes and even moving them from one species to another. With biotechnology, humans can direct genetic changes to benefit human endeavors.

Agricultural scientists have already produced GM crops with:

- herbicide resistance, allowing farmers to use fewer chemicals and obtain weed-free crops;
- insect resistance to control insect pests feeding on the crops, while leaving non-pest insects alone;
- disease resistance to limit crop losses from epidemics;
- delayed ripening fruits that maintain their freshness longer;
- healthier vegetable oils, with lower saturated fat content.

New products under development include:

Agricultural

- Crops tolerant of environmental stresses such as drought, flooding, soil salinity, and frost;
- Crops with greater protection from insects, diseases and weeds.

Consumer-oriented

More consumer-oriented GM products will appear on our shelves, including

- Nutritionally enhanced foods;
- Lower calorie sugar (fructans) from GM sugar beets;
- Foods from which naturally occurring allergenic and antinutritional compounds have been eliminated.

Animal Husbandry

- GM medicines and vaccines can be delivered to animals via their feed, saving the expense of sick animals and veterinary bills;
- Quick-growing game fish;
- Important and valuable chemicals might be produced in GM goats' milk, where they can be readily separated and purified.

Other Products

- Biomaterials such as biodegradable plastics made from GM plant starch;
- GM plants to make diesel fuel;
- Cotton and linen modified to increase quality and durability;
- Textiles and fabrics with built in dyes.

Assistance to developing nations. Rice, the major food staple throughout the developing world, has been nutritionally enhanced for increased iron and beta-carotene (provitamin A) content and increased yields. Cassava, another major food staple, can be protected from viral and other diseases through biotechnology. Inexpensive vitamins, minerals, medicines, and vaccines may soon be delivered to the ill and malnourished via GM fruit.

Public concerns over the safety of GM remain an issue of debate. However, most scientists conversant with GM technology are supporters; they know GM products are not inherently hazardous. **Three hundred million North American consumers have been eating several dozen GM foods grown on hundreds of millions of acres since 1994, with no documented adverse effects.**

Some widespread myths and misconceptions, which may cause consumer concern, include:

- GM potatoes being toxic to rats;
- GM soy becoming allergenic;
- GM corn killing butterflies.

All of these are readily refuted by the facts in each case.

FDA regulations already require answers to crucial safety questions:

- Does the food contain genes from known allergenic sources?
- Does it contain genes from toxic sources?
- Are the concentrations of natural toxic substances increased?
- Is the fat, cholesterol or other nutrient content changed?

- Does the food contain a substance that is new to the food supply?

Like all foods, GM foods bear labels if they carry allergens or toxins, or if they are substantially altered in nutritional composition, so consumers will be able to identify such foods.

Conclusion Current regulatory scrutiny, plus the excellent track record of GM food safety, gives us confidence that GM foods are rigorously scrutinized and that the technology is safe. Consumers and farmers can expect a wide variety of beneficial new products in the not-too-distant future to augment those currently on the market.

[Biotechnology and Food](#) [2]

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