

# What you need to know about GMOS and GM crops

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Genetically modified (GM) crops and foods and ingredients made available with the techniques of modern biotechnology have recently been dominating food and agriculture news coverage in the United States. Food Technology magazine contributing editors Bruce Chassy, PhD, University of Illinois and Wayne Parrott, PhD, University of Georgia, and John Ruff, CFS, past IFT president dispel myths and clarify common consumer questions when it comes to GMOs.

## **Q: What are GMOs and GM crops?**

A: GMO stands for genetically modified organism; and GM [crops](#) have been developed with the use of modern [biotechnology](#). GM crops are varieties produced through introduction of pieces of DNA to give them specific desired traits (e.g., resistance to certain insects, herbicides, and viruses). Some more recently developed crop varieties (e.g., rice with increased beta-carotene levels and soybeans with more healthful fatty acid compositions) have traits of direct benefit for consumers.

## **Q: How long have crops been developed using the techniques of modern biotechnology?**

A: The first GM crops were planted in 1994. Although it's been just 20 years since crops have been developed through modern biotechnology, genetic modification has occurred for more than 10,000 years (Hancock, 2012). Farmers collected the seeds of edible wild plants and planted

them in managed fields in early agriculture. Farmers took notice of the plants that were the most edible, produced higher yields, or tasted better and saved them to plant the following season. The resulting new crop varieties often did not resemble their original wild versions. Bread wheat and strawberries, for example, were only made possible through the techniques of modern biotechnology.

**Q: What are some examples of crops and foods currently on the market that are from plants developed with modern biotechnology?**

A: Soybean, canola, sugar beets, papaya, squash, and sweet corn. Ingredients such as oils and starches that are used in a number of food products may be made from soybean, canola, corn, and [sugar beets](#).

**Q: Does the U.S. Food and Drug Administration (FDA) and U.S. Department of Agriculture (USDA) review these crop varieties and food-related applications?**

A: Yes. The FDA reviews new [crop varieties](#) developed via modern biotechnology, and the USDA reviews the new varieties prior to commercialization and marketing. In some instances (e.g., new varieties developed for insect resistance) the Environmental Protection Agency (EPA) also conducts a review.

**Q: Are crops and foods made possible by modern biotechnology only in the United States?**

A: No. Approximately 10 percent of the world's agricultural fields are now planted with these new varieties of crops. In 2012 alone, more than

17 million farmers in about 30 countries planted new, modern biotechnology varieties of crops on over 420 million acres. The cumulative area planted during the past 17 years is equivalent to the size of the United States and Mexico.

**Q: What are some positives attributed to these new varieties of crops?**

A: Crops developed using modern biotechnology have increased yields through decreased losses to pests and viruses, less labor and other input costs, less agricultural environmental impact, less impact on soil and water resources, and other environmental and sustainability gains. One of the major unanticipated benefits has been a reduction in greenhouse gas emissions from agriculture, equivalent to taking 22 million cars off the roads (Brookes and Barfoot, 2013).

With regard to foods and benefits of direct benefit to consumers, modern biotechnology is allowing improvement of color, flavor, nutritive value, and other traits. National and international expert panels around the globe have repeatedly concluded that it will be exceedingly difficult, if not impossible to meet the agriculture and food needs of future generations without the use of all available technologies including biotechnology (Solutions for Sustainable Agricultural and Food Systems, 2013).

**Q: Why are these new varieties of crops and foods made from them labeled in the European Union but not in the United States?**

A: In Europe, foods from crops developed with modern biotechnology techniques are labeled because a group of consumers insisted on the right to know. The FDA does not require labeling of foods from crops

developed with modern biotechnology unless there is a compositional difference (high oleic acid vegetable oils) between them and their conventional counterpart.

## **Q: Are there food safety concerns regarding GMOs?**

A: The Office of Science and Technology Policy asked the National Academy of Science to consider the safety of crops developed using the techniques of modern biotechnology and they responded by saying:

- Crops produced with modern biotechnology pose no novel risk.
- Safety assessment should be focused on the characteristics of the product rather than the process used to produce it
- No new laws were needed to ensure safety or address environmental concerns since risks are "the same in kind" as those of conventional methods

## **Q: If the science is clear, why is there so much controversy?**

A: Several websites proclaim harmful effects of consuming GM foods, pointing to a handful of studies to support their premise, and consistently ignoring the hundreds of studies to the contrary dismissing them as performed or paid for by industry, or performed by scientists sympathetic to industry. In addition, extreme claims about GM crops highlight the need to examine the expertise, objectivity, motives, and track record of the opponents making the anti-GM claims.

Provided by Institute of Food Technologists

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