

## GMOs: Manna from Heaven or Frankenfood?



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There are certain technologies that seem to be lightning rods for controversy. One of these is food irradiation. Even though there are mountains of data that support the safety and potential value of the technology, many people seem to feel that if they consume irradiated foods, they may start glowing in the dark. Foods developed using genetically modified organisms (GMOs) also seem to produce fear and loathing in consumers. From the Flavr Savr tomato to Starlink corn to Roundup Ready soybeans to Golden Rice, whenever one of these products hit the news, they sparked a firestorm of controversy.

Several years ago, Sainsbury's Markets in the United Kingdom was considering adding GMO products to their offerings. They did due diligence with scientists from within and outside the company to evaluate the safety of these products. The end result of the deliberations was "GMO foods are safe, so let's put them into our stores." As soon as these items appeared in the stores, protestors appeared outside. The publicity from the protestors and the media was so negative that sales began to drop. So, the company decided to pull the GMO products from the shelves. Why is it that GMO foods spark such feelings?

Back in 2000, in this journal, Frank-Roman Lauter wrote, "It is generally believed that the reluctance of consumers to accept bio-engineered foods is without scientific basis. However, regulators and the agri-food industry must deal with consumer concerns" (1). It is rather ironic that consumers have such a fear of modern biotechnology, which entails the insertion of genes with specific characteristics into plants. Today's scientists have applied modern technology to speed up a process that has been around for almost 4,000 years. Traditional biotechnology processes include fermentation, which was discovered in ancient Egypt in 2000 B.C., and plant breeding. The latter has been applied to foods ever since mankind began domesticating wild seeds and grains. Modern day corn looks nothing like its ancient ancestor, teosinte. Our ancestors engineered plants to produce products with higher yields, greater flavor, more insect resistance, and greater ability to grow in different areas. This is really no different from what is being done using modern biotechnology. Among the products that have already been genetically engineered include: corn varieties that have increased disease resistance or that tolerate herbicides; potatoes that have enhanced resistance to viruses, improved insect resistance or higher levels of starch; and soybeans with greater virus resistance, improved nutritional composition, modified fatty acids levels, and resistance to herbicides.

The big questions are how will these products benefit mankind and can we overcome the fears. The push for modification stems

from a need to produce greater yields and improved characteristics that are desirable for growth, processing, or handling. The world population, especially in developing nations, continues to grow. Increasing yields can help increase the available supply of food and improving characteristics, such as insect resistance, could help reduce the amount of foods that spoil or are damaged in storage or transit. But again, people and governments must be willing to accept these products. Perhaps the saddest case of fear occurred a few years back in Africa when certain nations known to have a large population of malnourished persons refused to accept surplus grain because it was GMO.

But we need to overcome the fears, and the biggest way to do that is education. The message needs to get out to people and governments in a way that allows them to understand the technology, the safeguards that are built into it, and the potential benefits. Unfortunately, once myths get into the public domain, they tend to be perpetrated. Many people still believe genetically modified crops harm monarch butterflies, a charge later proven to be false. Foes of biotechnology continue to trot out the project in which a soybean was modified with a gene from a Brazil nut. The modified product elicited allergic reactions in people sensitive to Brazil nuts, so the product never made it to market. In other words, the controls worked, but people will always say "What if?" Many persons have concerns about genetically engineered crops crossing with traditional crops, thereby destroying the traditional plants. Others are concerned about all products of biotechnology, including those which are perfectly safe. As an example, the new engineered oils such as sunflower and soybean are generally refined, bleached, and deodorized. These processes remove all traces of protein, which are needed to elicit an allergic reaction. Work at the University of Nebraska has proven that these are non-allergens.

Again, the answer is education. Scientists need to gather the data to support safety, but maybe we, as an industry, need to look at professional communicators. Scientists often "talk down" to people or do not have the ability to distill a complex message into words and images to which people can understand or relate. So, who can do the communicating? University extension people? Television personalities? Marketing firms? Medical doctors? Finding the proper communicator may be the toughest part. The person must combine knowledge, trust, and that ability to connect. Where is Walter Cronkite when we need him?

### Reference

1. Lauter, F.-R. GMO labeling: The need for and status of GM-DNA quantification. *Cereal Foods World* 45(8):389-390, 2000.

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