

GENETIC MODIFIED FOODS: ADVANTAGES AND DISADVANTAGES

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What are genetically-modified foods?

"Genetically modified foods" is the term most commonly used to refer to crop plants created for human or animal consumption, which have been modified in the laboratory to enhance desired traits or improved nutritional content. The enhancement of desired traits has traditionally been undertaken through breeding, but conventional plant breeding methods can be very time consuming and are often not very accurate. [Genetic engineering](#), on the other hand, can create plants with the exact desired trait very rapidly and with great accuracy.

Development.

GM foods were first put on the market in the early 1990s. Typically, genetically modified foods are plant products: soybean, corn, canola, and cotton seed oil, but animal products have been proposed.

The first commercially grown genetically modified whole food crop was the tomato puree (called FlavrSavr), which was made more resistant to rotting by Californian company [Calgene](#). Currently, there are a number of foods of which a genetically modified version exists.

What plants are involved?

Some foods have been modified to make them resistant to insects and viruses and more able to tolerate herbicides. Crops that have been modified for these purposes, with approval from the relevant authorities, in a number of countries, include: maize, soybean, oilseed rape (canola), chicory, squash, potato.

Some of the advantages of GM foods:

There is a need to produce inexpensive, safe and nutritious foods to help feed the world's growing population. Genetic modification may provide:

- Better quality food.
- Higher nutritional yields.
- Inexpensive and nutritious food, like carrots with more antioxidants.
- Foods with a greater shelf life, like tomatoes that taste better and last longer.
- Food with medicinal benefits, such as edible vaccines - for example, bananas with bacterial or rotavirus antigens.
- Crops and produce that require less chemical application, such as herbicide resistant canola.

Some of the disadvantages of GM foods:

Food regulatory authorities require that GM foods receive individual pre-market safety assessments. Also, the principle of 'substantial equivalence' is used. This means that an existing food is compared with its genetically modified counterpart to find any differences between the existing food and the new product. The assessment investigates:

- Toxicity (using similar methods to those used for conventional foods).
- Tendency to provoke any allergic reaction.
- Stability of the inserted gene.
- Whether there is any nutritional deficit or change in the GM food.
- Any other unintended effects of the gene insertion.

Economic concerns:

Bringing a GM food to market is a lengthy and costly process, and of course agri-biotech companies wish to ensure a profitable return on their investment. Many new plant genetic engineering technologies and GM plants have been patented, and patent infringement is a big concern of agribusiness. Yet consumer advocates are worried that patenting these new plant varieties will raise the price of seeds so high that small farmers and third world countries will not be able to afford seeds for GM crops, thus widening the gap between the wealthy and the poor.

One way to combat possible patent infringement is to introduce a "suicide gene" into GM plants. These plants would be viable for only one growing season and would produce sterile seeds that do not germinate. Farmers would need to buy a fresh supply of seeds each year. However, this would be financially disastrous for farmers in third world countries who cannot afford to buy seed each year and traditionally set aside a portion of their harvest to plant in the next growing season.

How are GM foods labeled?

Labeling of GM foods and food products is also a contentious issue. On the whole, agribusiness industries believe that labeling should be voluntary and influenced by the demands of the free market. If consumers show preference for labeled foods over non-labeled foods, then industry will have the incentive to regulate itself or risk alienating the customer.

There are many questions that must be answered if labeling of GM foods becomes mandatory such as; are consumers willing to absorb the cost of such an initiative? If the food production industry is required to label GM foods, factories will need to construct two separate processing streams and monitor the production lines accordingly. Farmers must be able to keep GM crops and non-GM crops from mixing during planting, harvesting and shipping. It is almost assured that industry will pass along these additional costs to consumers in the form of higher prices.

Food labels must be designed to clearly convey accurate information about the product in simple language that everyone can understand.

Conclusion:

Genetically-modified foods have the potential to solve many of the world's hunger and malnutrition problems, and to help protect and preserve the environment by increasing yield and reducing reliance upon chemical pesticides and herbicides. However, we must proceed with caution to avoid causing unintended harm to human health and the environment as a result of our enthusiasm for this powerful technology.