



# Unintended GMO Health Risks

**Genetically modified foods:  
YES, you are already eating them.  
NO, they are not safe to eat.**

***Did you know...*** since 1996 Americans have been eating genetically modified (GM) ingredients in most processed foods.

***Did you know...*** GM plants, such as soybean, corn, cottonseed, and canola have had foreign genes forced into their DNA. And the inserted genes come from species, such as bacteria and viruses, that have never been in the human food supply.

***Did you know...*** genetically modified organisms (GMOs) are not safe. They have been linked to thousands of toxic and allergic reactions, thousands of sick, sterile, and dead livestock, and damage to virtually every organ and system studied in lab animals.

***Find out what the risks are and  
start protecting yourself and  
your family today!***

## Why isn't the FDA protecting us?

In 1992, the Food and Drug Administration claimed that they had no information showing that GM foods were substantially different from conventionally grown foods and therefore were safe to eat. But internal memos made public by a lawsuit reveal that their position was staged by political appointees under orders from the White House to promote GMOs. FDA scientists, on the other hand, warned that GMOs can create unpredictable, hard-to-detect side effects, including allergies, toxins, new diseases, and nutritional problems. They urged long-term safety studies, but were ignored. ***The FDA does not require any safety evaluations for GMOs.***

Instead, biotech companies, who have been found guilty of hiding toxic effects of their chemical products, are now in charge of determining whether their GM foods are safe. (The FDA official in charge of creating this policy was Michael Taylor, Monsanto's former attorney and later their vice president.)

Although these biotech companies participate in a voluntary consultation process with the FDA, it is a meaningless exercise. The summaries of the superficial research they submit cannot identify most of the health risks of GMOs.

## Genetic modification is radically different from natural breeding

In contrast to the statements of biotech advocates, FDA scientists and others affirm that genetic modification is *not* just an extension of the conventional breeding techniques that have been used by farmers for millennia. Genetic engineering transfers genes across natural species barriers, using imprecise laboratory techniques that bear no resemblance to natural breeding. Furthermore, the technology is based on outdated concepts of how genes and cells work.

## Widespread, unpredictable changes

Gene insertion is done either by shooting genes from a "gene gun" into a plate of cells or by using bacteria to invade the cell with foreign DNA. The altered cell is then cloned into a plant. These processes create massive collateral damage, causing mutations in hundreds or thousands of locations throughout the plant's DNA. Natural genes can be deleted or permanently turned on or off, and hundreds may change their levels of expression.

### ***In addition:***

- The inserted gene is often rearranged;
- It may transfer from the food into our body's cells or into the DNA of bacteria inside us; and
- The GM protein produced by the gene may have unintended properties or effects.

## GM foods on the market

The primary reason companies genetically engineer plants is to make them tolerant to their brand of herbicide. The four major GM plants, **soy**, **corn**, **canola**, and **cotton**, are designed to survive an otherwise deadly dose of weed killer. These crops have much higher residues of toxic herbicides. About 68% of GM crops are herbicide tolerant.

The second GM trait is a built-in pesticide. A gene from the soil bacterium called *Bt* (for *Bacillus thuringiensis*) is inserted into corn and cotton DNA, where it secretes the insect-killing *Bt*-toxin in every cell. About 19% of GM crops produce their own pesticide. Another 13% produce a pesticide **and** are herbicide tolerant.

There is also **Hawaiian papaya** and a small amount of **zucchini** and **yellow crookneck squash**, which are engineered to resist a plant virus.

**Help stop the introduction of GM sugar in late 2008. Send a letter to top companies on our website.**

# Growing evidence of harm from GMOs

## GM soy and allergic reactions

- Soy allergies skyrocketed by 50% in the UK, soon after GM soy was introduced.
- A human subject showed a skin prick allergic-type reaction to GM soy, but not to natural soy.
- The level of one known soy allergen is as much as 7-times higher in cooked GM soy compared to non-GM soy.
- GM soy also contains an unexpected allergen-type protein not found in natural soy.

## Bt corn and cotton linked to allergies

The biotech industry claims that *Bt*-toxin is harmless to humans and mammals because the natural bacteria version has been used as a spray by farmers for years. In reality, hundreds of people exposed to *Bt* spray had allergic-type symptoms, and mice fed *Bt* had powerful immune responses and damaged intestines.

**Moreover, *Bt* in GM crops is designed to be more toxic than the natural spray and is thousands of times more concentrated.**

Hundreds of laborers in India report allergic reactions from handling *Bt* cotton. Their symptoms are identical to those exposed to *Bt* spray.

## GMOs fail allergy tests

No tests can guarantee that a GMO will not cause allergies. Although the World Health Organization recommends a protein screening protocol, the GM soy, corn, and papaya in our food supply fail those tests — because they have properties of known allergens.

## GMOs cause immune reactions to non-GM foods

- If proteins “digest” slowly, there is more time for allergic reactions. Because GM soy reduces digestive enzymes in mice, it may slow protein digestion and promote allergies to many foods.

- Mice not only reacted to *Bt*-toxin, they had immune responses to formerly harmless compounds.
- Similarly, a mouse test indicated that people eating GM peas could develop allergies both to the peas and to a range of other foods. The peas had already passed all the allergy tests normally used to get GMOs on the market. It took this advanced mouse test, which was never used on the GMOs we eat, to discover that the peas could be deadly.

## GMOs and liver problems

- Rats fed GM potatoes had smaller, partially atrophied livers.
- The livers of rats fed GM canola were 12-16% heavier.
- GM soy altered mouse liver cells in ways that suggest a toxic insult. The changes reversed after their diet switched to non-GM soy.

## GM soy, reproductive problems, and infant mortality

- More than half the offspring of mother rats fed GM soy died within three weeks.
- Male rats and mice fed GM soy showed changes in their testicles; the mice had altered young sperm cells.
- The DNA of mouse embryos whose parents ate GM soy functioned differently than those whose parents ate non-GM soy.



*Many offspring of female rats fed GM soy were considerably smaller, and more than half died within three weeks (compared to 10% of the non-GM soy controls).*

## **Bt crops linked to sterility, disease, and death**

- When sheep grazed on *Bt* cotton plants after harvest, within a week 1 in 4 died. Shepherds estimate 10,000 sheep deaths in one region of India.
- Farmers in Europe and Asia say that cows, water buffaloes, chickens, and horses died from eating *Bt* corn varieties.
- About two dozen US farmers report that *Bt* corn varieties caused widespread sterility in pigs or cows.
- Filipinos in at least five villages fell sick when a nearby *Bt* corn variety was pollinating.

**Non-GM**



**GM**



*The stomach lining of rats fed GM potatoes showed excessive cell growth (photo on right), a condition that may be a precursor to cancer. Rats also had damaged organs and immune systems.*

## **Functioning GM genes remain inside you**

Unlike safety evaluations for drugs, there are no human clinical trials of GM foods. The only published human feeding experiment verified that genetic material inserted into GM soy transfers into the DNA of intestinal bacteria and continues to function. This means that long after we stop eating GM foods, we may still have their GM proteins produced continuously inside us.

- If the antibiotic gene inserted into most GM crops were to transfer, it could create super diseases, resistant to antibiotics.
- If the gene that creates *Bt*-toxin in GM corn were to transfer, it might turn our intestinal flora into living pesticide factories.
- Animal studies show that DNA in food can travel into organs throughout the body, even into the fetus.

## **GM food supplement caused deadly epidemic**

In the 1980s, a contaminated brand of a food supplement called L-tryptophan killed about 100 Americans and caused sickness and disability in another 5,000-10,000 people. The source of contaminants was almost certainly the genetic engineering process used in its production. The disease took years to find and was almost overlooked. It was only identified because the symptoms were unique, acute, and fast-acting. If all three characteristics were not in place, the deadly GM supplement might never have been identified or removed.

If GM foods on the market are causing common diseases or if their effects appear only after long-term exposure, we may not be able to identify the source of the problem for decades, if at all. There is no monitoring of GMO-related problems and no long-term animal studies. **Heavily invested biotech corporations are gambling away the health of our nation for profit.**

## **Help end the genetic engineering of our food supply**

When the tipping point of consumer concern about GMOs was achieved in Europe in 1999, within a single week virtually all major food manufacturers committed to remove GM ingredients. **The Campaign for Healthier Eating in America** is designed to reach a similar tipping point in the US before the end of 2009.

Our growing network of manufacturers, retailers, healthcare practitioners, organizations, and the media, is informing consumers of the health risks of GMOs and helping them select healthier non-GMO alternatives.

Go to [www.responsibletechnology.org](http://www.responsibletechnology.org) to get involved and learn how to avoid GMOs. Look for our Non-GMO Shopping Guide in summer 2008.



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The health information is from the book *Genetic Roulette: The Documented Health Risk of Genetically Engineered Foods*, by Jeffrey M. Smith. A fully referenced version of this pamphlet is available at [www.responsibletechnology.org](http://www.responsibletechnology.org).

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