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## Genetically Modified Foods

These may be more prevalent than you realize. Hot dogs and protein bars with genetically modified (GM) soy protein, yogurt made with rbGH-injected (a genetic growth hormone) milk from cows, macaroni and cheese mixes or mayonnaise with GM canola oil, breakfast cereals and soda with GM corn syrup, and on and on.

### Genetically Modified Food Overview

The seeds for genetically modified foods are altered by technologies that insert foreign genes from other species into the DNA of the target species. This alteration gives the plant characteristics that may benefit growers, such as resistance to a particular pest or disease, or the ability to withstand higher or lower temperatures, or other properties. In the case of genetic growth hormones, the serum is injected into an animal to cause higher milk or egg production and/or cause an animal to grow larger faster.

### Potential Toxicity, Social, and Environmental Issues

Some argue, especially Monsanto and other seed producers, that there are negligible health or environmental concerns with genetically engineered (GE) or genetically modified (GM) crops and that these products will help solve food scarcity challenges. There is also the ongoing opportunity for Monsanto and the peers to continue making huge profits whilst taking over more and more of the market share for seeds. Although not yet approved by the federal Food and Drug Administration (FDA), Monsanto is even developing a "terminator seed", which prohibits a mature plant from producing seeds/seed heads (#Kimbrell, 2003). This would prohibit farmers and growers from being able to collect seed for future years and force them to buy seeds each year, from these companies. A big question mark here is whether the pollen from this type of plant can "drift" to other crops, impacting seed development for non-GM crops, especially heirloom and organic seeds.

Aside from an environmental and social justice issues that GM crops pose - WHICH ARE-, polls show 90% of Americans want labels showing if food is genetically engineered. Despite a clear public call for labeling, the FDA has continually waived any requirement to label GM products, or to conduct adequate human health studies. Also, with pressure from the industry, they have failed to establish any mandatory regulations on GM foods (#Kimbrell, 2003).

### Lack of Studies

Publications on GM food toxicity are scarce, as witnessed in the title of the *Science* article "Health Risks of Genetically Modified Foods: Many Opinions but Few Data" (#Domingo, 2000). In fact, no peer-reviewed publications of clinical studies on the human health effects of GM food exist. Therefore, what

happens to humans when we eat GM grain or food is unknown. Dr. Martha Herbert (M.D., PhD) states that GM food is "one of the largest uncontrolled experiments in human history". Human health effects have not been seriously studied (#Kimbrell, 2003). Without adequate safety studies for human consumption, and the fact that 75% of processed foods contain at least one GM ingredient as well as 70% of corn and 80% of soy grown, it is certainly worth being more aware of potential health and environmental impacts (#USDA). Adding to that concern is that animal tests that have been conducted to date, show some potentially toxic effects.

### **Digestive Problems**

Some tests indicate that GM foods may actually "reactivate" and produce Herbicides in our intestinal tract (#Shubbert, et al, 1994, #Mercer, et al, 1999, #Bremmer and Leist, 1997, #Huang and Smith, 1995). GM foods may affect the delicate balance of the 'good' gut bacteria, needed to support general health and a strong immune system. Molecular geneticist Ricarda Steinbrecher states that, "data obtained strongly suggest that the balance of gut bacteria will be affected" by the herbicide reactivation in the gastrointestinal tract (#Steinbracher, 2002). In addition, "gut bacteria can take up genes and GM plasmids", opening up the possibility of the spread of antibiotic resistance (#Mercer, et al, 1999).

### **Allergies**

Thirty years ago, food allergies were fairly rare, but today they affect an estimated 11 million Americans, including 6-8% of all children. In a nationwide telephone survey of 400 elementary school nurses, 44% reported an increase in children with food allergies in their schools over the last five years. Rates of peanut allergies alone doubled between 1997 and 2002 (#Weiss, et al, 2004). Though reasons for this are poorly understood, the prevalence of food allergies and associated anaphylaxis appears to be on the rise and some studies indicate that GM foods and pollen may be contributing to allergies, for example:

- In 1999, an annual study of food allergens in the U.K. found that soy allergies had increased 50% over the previous year. This trend coincided with the first imports of GM soy from the U.S., which led scientists to strongly suspect a connection (#Smith).
- Rats fed Monsanto's GM corn had a significant increase in blood cells related to the immune system (which the company was forced to reveal through legal action) (#Burns, 2002).
- GM potatoes caused the immune system of rats to respond more slowly (#Pusztai, 2002).
- A harmless protein transformed into a potentially deadly allergen when produced within GM peas (#Prescott, 2005).
- Mice fed a diet rich in GM soy had significantly lower levels of pancreatic enzymes, which are needed to break down proteins in the digestive tract. When proteins last longer in the body, they're more likely to provoke an allergic response.

### **Unknowns**

Here are just a few open-ended questions and concerns relating to consumer rights and environmental impacts of GM crops and foods.

1. The FDA approved gene-altered foods and also refused to mandate labeling. Why have they deprived the public of their right to know what is being consumed?
2. Some foreign countries have banned U.S. imports of certain (or all) GM crops, and any imports are must meet strict labeling requirements and traceability. Several countries do not even allow GM crops

to be grown on land in the country. Is this a hint for caution?

3. Weeds (for which the GM seed was designed to repel) have now grown resistant to some GM (herbicide tolerant) crops. Are some GM crops actually increasing the need for Herbicides?
4. Are these crops toxic to wildlife, including bees, birds, and butterflies, let alone other animals?
5. Will the continued development of GM crops allow more and more of a potential for monopoly of seed crops by a few companies: e.g., Monsanto, DuPont, Dow, Syngenta, Bayer CropScience?
6. How can GM contamination to non-GM crops be controlled? GM "drift" can cause non-GM and even organic crops to be contaminated with GM organisms. This has already caused serious economic losses for producers in lost sales and exports. There are examples in the US and elsewhere of genes from GM varieties not yet cleared for human consumption getting into nearby food crops and hence the human food chain (#Kimbrell, 2003).

### How to Avoid GM Foods

If you want to avoid GM foods currently on the market, here are some tips.

Avoid the following foods, or their derivatives, or ingredients in foods unless they are specifically labeled organic, "non-GMO" or "non-GE". (By law, a product labeled "USDA Organic" is not allowed to contain genetically engineered organisms):

- Soy (including edamame, "health food bars" or processed foods that contain soy, soy lecithin, hydrolyzed soy protein, etc.)
- Corn (including corn syrup, maltodextrin, dextrose, corn flour, corn starch, etc.)
- Canola
- Cottonseed
- Papaya (if grown in Hawaii)
- Dairy products produced by animals who receive rbGH or rbST (genetically engineered hormone)
- Zucchini and yellow crookneck squash
- Sugar from GM sugar beets (sugar beets are the newest GM crop approved by the USDA and is expected to be marketed for the 2008 growing season). Three companies are expected to sell it in 2008, including the American Crystal Sugar Company. Consumers who wish to avoid GM sugar should look for the words "pure cane sugar" on product labels. To be a GM purist, avoid meat or eggs produced by animals that eat GM grains, or receive growth hormones.

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