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Health Matters

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Genetically Modified (GM) Foods

*We are pleased to feature guest contributor Jeffrey Smith, international best-selling author (*Seeds of Deception *and* Genetic Roulette*), concerned citizen, and activist who tirelessly campaigns to bring the risks of GM foods to the attention of all people. NIH scientist Candice Pert states Smith is the "leading world expert in the understanding and communication of the health issues surrounding genetically modified foods." -Ed.*

Introducing Frankenfoods

The genetic modification of food has occurred largely outside of the awareness of most Americans. And no surprise—GM foods don't look different from non-GM foods. Learning about the alteration of Mother Nature's time-tested designs with genetically modified organisms (GMOs) may be prudent for anyone trying to stay healthy or become healthy.

Genetic Modification Simplified

Genetic modification (aka "genetic engineering") involves the forcing of genes from one species into another species to attain traits that are not possible with natural breeding. Two examples include Arctic fish genes that have been inserted into tomatoes and strawberries to give them frost tolerance (these are *not* on the market), and the insertion of growth hormone-producing genes from a larger Chinook salmon into smaller farm-raised Atlantic salmon to induce rapid growth. Scientists and concerned citizens fear the impact on human and environmental ecology of this yet-to-be-approved fish.

The process of insertion is uncontrolled and random, and can create numerous unanticipated changes in the plants' composition. Studies have identified new or increased levels of allergens, toxins, and anti-nutrients (compounds that block absorption of nutrients).

Most GM crops also contain antibiotic resistant genes that are used during the insertion process. The medical community is quite concerned about their potential to contribute to the increase of antibiotic-resistant diseases.

About 80% of GM crops are engineered to survive direct spraying of herbicides. For example, Roundup Ready™ crops, for example, survive Roundup herbicide. Nearly all other GM crops produce their own pesticide.

Most Prevalent GM Foods

The four most prevalent GM foods grown in the United States and the percentage of each that are genetically modified are: soy (91%), canola (80-85%), cottonseed (88%), and corn (75%). Half of all sugar beets grown in 2008 (expected to be 90 percent in 2009) were genetically modified to be Roundup™ resistant. Despite protests, contracts have been signed by major food processors to use GM sugar in their foods.

Scientists and Physicians Speak Out

In May 2009, the American Academy of Environmental Medicine (AAEM) called for a moratorium on GM foods, long-term independent studies of GM foods, and mandatory labeling of GM foods.

World-renowned biologist Pushpa M. Bhargava reviewed more than 600 scientific journals and concluded that GMOs are major contributors to Americans' sharply deteriorating health.

Animal Study Findings

When GM soy was fed to female rats, most of their pups died within three weeks, compared to a 10 percent death rate among the group fed natural soy. Pups of GM-fed rats were smaller and had difficulty reproducing.

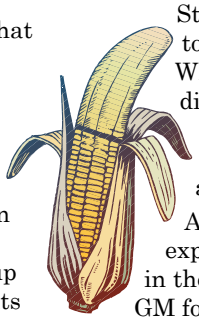
The testicles of rats fed GM soy changed from their normal pink color to dark blue. Mice fed GM soy developed altered sperm. Even the embryos of mice fed GM feed had significant DNA changes. In an Austrian government study, mice fed GM corn had fewer and smaller offspring.

Investigations in the state of Haryana, India, revealed that most buffalo that ate GM cottonseed had complications, including infertility, miscarriages, premature deliveries, and prolapsed uteruses, in addition to deaths of their calves. In the United States, about two dozen farmers reported that thousands of pigs became sterile after being fed certain GM corn varieties.

Food Designed to Produce Toxins

GM corn and cotton are engineered to produce their own built-in pesticide in every cell. Biotech companies claim that the pesticide called Bt (produced from the soil bacterium Bacillus thuringiensis), a non-GM bacterial spray used for natural insect control by organic farmers, has a history of reported safe use.

Genetic engineers insert Bt genes into corn and cotton to enable the plants' cells to produce their own Bt toxin. The Bt toxin produced in GM plants, however, is thousands of times more concentrated than natural Bt spray, is designed to be more toxic, has allergenic properties, and cannot be washed off the plant.



Studies confirm that even the less toxic natural Bt spray is harmful. When the *non-GM* Bt spray was dispersed by planes to kill gypsy moths in the Pacific Northwest, about 500 people reported allergy or flu-like symptoms.

According to GM food safety expert Dr. Arpad Pusztai, changes in the immune status of animals fed GM foods are "a consistent feature of all the studies."

Genetically Modified Foods, cont.

Even Monsanto's own research showed significant immune system changes in rats fed Bt corn. A November 2008 study by the Italian government also found that mice have an immune reaction to Bt corn.

The body's main detoxifier, the liver, is affected by GM foods. Compared to rats fed non-GM food, 1) rats fed GM potatoes had smaller, partially atrophied livers, 2) rats fed GM corn engineered to produce Bt-toxin had liver lesions, 3) livers of rats fed GM canola were 12-16 percent heavier, an indication of liver disease or inflammation, and 4) changes in liver cells of mice fed GM-soy suggested a toxic insult (these changes reversed after their diets were switched to non-GM soy).

GM soy contains two new proteins with allergenic properties, and has up to seven times more trypsin inhibitor—a known soy allergen. Skin prick tests show that some people react to GM soy, but not to non-GM soy. Soon after GM soy was introduced to the UK, soy allergies skyrocketed by 50 percent. Could genetic manipulation be the cause of the U.S. epidemic of food allergies and asthma?

Animals Deaths

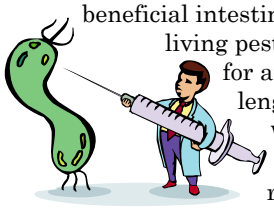
In India, animals graze on cotton plants after harvest. But when they grazed on Bt cotton plants, thousands of sheep died. Postmortem exams showed severe irritation and black patches in the liver and intestines, plus enlarged bile ducts.

FlavrSavr™ tomatoes were the first and only GM food to have detailed research data submitted to the FDA—summaries and conclusions of *industry* research have been the norm since. GM tomatoes were force fed for 28 days to rats that had refused to eat them. Of the forty rats studied, seven of the 20 female rats developed stomach bleeding. Seven of all the rats died and were "replaced," an unacceptable practice in research. Still, the FDA did not block approval of the tomatoes for consumption. FlavrSavrs have since been taken off the market.

GMOs R Us

The only published human feeding study revealed what may be the most dangerous problem from GM foods. The gene inserted into GM soy transfers into the DNA of bacteria living inside the intestines *and continues to function*. This means that long after GM foods are no longer eaten, potentially harmful GM proteins may be continuously produced in the intestines of those who ate them.

Put more plainly, eating a corn chip produced from Bt corn can transform beneficial intestinal bacteria into living pesticide factories for an undetermined length of time.



When evidence of gene transfer is reported at medical conferences in the United States, doctors often respond by citing the significant increase of gastrointestinal problems among their patients during the last decade. GM foods may be colonizing gut flora.

Politics R Us

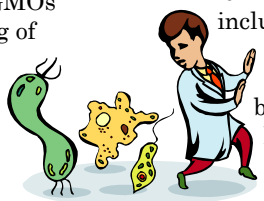
Scientists at the Food and Drug Administration (FDA) warned about these concerns as early as the 1990s. According to documents released from a lawsuit, the scientific consensus at the agency was that GM foods were inherently dangerous, and might create hard-to-detect allergies, poisons, gene transfer to gut bacteria, new diseases, and nutritional problems.

Don't Test, Don't Tell

They urged their superiors to require rigorous long-term tests. But the White House had ordered the agency to promote biotechnology and the FDA responded by recruiting Michael Taylor, Monsanto's former attorney, to head up the formation of GMO policy. That policy, which is in effect today, denies being aware of scientists' concerns and declares that no safety studies on GMOs are required. Monsanto and the other biotech companies now determine if their foods are safe. Mr. Taylor later became Monsanto's vice president.

Lack of Clinical Data

A 2007 review of published scientific literature on the "potential toxic effects/health risks of GM plants" revealed that " . . . experimental data are very scarce." There are no published human clinical trials on GMOs and there is no monitoring of the population on the health effects. Without sufficient research, it makes it difficult to know if GM foods are contributing to the rise of autism, asthma, obesity, reproductive problems, cancer, allergies, or any other health problem now plaguing Americans.



Given that animals fed GM feed have had such a wide variety of health problems, it may by telling that in the nine years following large scale introduction of GM crops in 1996, the incidence of people with three or more chronic diseases nearly doubled, from 7 percent to 13 percent.

One epidemic was clearly linked to a GM product in the late 1980s when a Japanese manufactured GM L-Tryptophan (an amino acid sold as a nutritional supplement) created a new disease that killed about 100 Americans and caused 5,000-10,000 people to become permanently sick or disabled. Even though the symptoms were acute and fast acting, and included a signature overproduction of eosinophils (a type of white blood cell), the cause of the outbreak took more than four years to identify and nearly escaped detection.

Precaution is Wise

The legacy of GM foods includes known and unknown health risks for people and animals, irreversible spread of GM-genes through cross pollination of plants and cross-breeding of GM animals, and increased exposure of the environment and humans to pesticides from the use of pesticide-tolerant and pesticide creating crops. There's ample reason to use precaution by educating oneself and avoiding GM-foods as much as possible, especially the four top suspects: corn, soy, canola, and cottonseed (oil), in addition to beet sugar.

Despite a 2001 Rutgers University poll showing that more than 90 percent of Americans want GM foods labeled, the United States is one of few industrialized nations that do not require labeling. Most Americans are surprised to learn that they are very likely unknowingly eating GM foods every day. Fifty percent of the world's GM crops are grown in the United States.

Visit www.ResponsibleTechnology.org for information on all aspects of GM foods, including ways to address this invisible threat to health (non-GMO shopping lists, tools to help readers be politically active, and tips to help keep GM foods out of schools), the relationship between organic foods and GM foods, and more.