

- **Can you tell us briefly about the dangers of GMOs to both humans and animals shown by studies?**

Lab animals fed GM diets show damage to virtually every system studied and thousands of sick, sterile and dead animals are traced to GM feed.

Out of 20 female rats fed a GM tomato, 7 developed stomach lesions.¹ Another 7 of 40 rats died within two weeks.² Mice fed potatoes engineered to produce an insecticide called Bt-toxin showed abnormal and damaged intestinal cells and proliferative cell growth.³ Rats fed potatoes engineered to produce a different type of insecticide also showed potentially precancerous cell growth in both the stomach and intestinal walls, as well as smaller brains, livers and testicles, partial atrophy of the liver and a damaged immune system.⁴ Rats fed Monsanto's Mon 863 corn, engineered to produce Bt-toxin, had indications of liver and kidney toxicity.⁵ Rabbits fed GM soy showed altered enzyme production in their livers as well as higher metabolic activity.⁶ The livers of rats fed Roundup Ready canola were 12%–16% heavier, possibly due to liver disease or inflammation.⁷ And microscopic analysis of the livers of mice fed Roundup Ready soybeans revealed altered gene expression and structural and functional changes.⁸ Chickens fed the herbicide tolerant "Liberty Link" corn died at twice the rate of those fed natural corn.⁹ The cells in the pancreas of mice fed Roundup Ready soy had profound changes and produced significantly less digestive enzymes;¹⁰ in rats fed a GM potato, the pancreas was enlarged.¹¹ In various analyses of kidneys, GM-fed animals showed lesions, toxicity, altered enzyme production or inflammation. Enzyme production in the hearts of mice was altered by GM soy.¹²

Reproductive failures and infant mortality

In both mice and rats fed Roundup Ready soybeans, their testicles showed dramatic changes. In rats, the organs were dark blue instead of pink.¹³ In mice, young sperm cells were altered.¹⁴ Embryos of GM soy-fed mice also showed temporary changes in their DNA function, compared to those whose parents were fed non-GM soy.¹⁵

More dramatic results were discovered by a leading scientist at the Russian National Academy of sciences. Female rats were fed GM soy, starting two weeks before they were mated. Over a series of three experiments, 51.6 percent of the offspring from the GM-fed group died within the first three weeks, compared to 10 percent from the non-GM soy group, and 8.1 percent for non-soy controls. The average size and weight of the GM-fed offspring was quite a bit smaller.¹⁶ And in a preliminary study, the GM-fed offspring were unable to conceive.¹⁷

After the three feeding trials, the supplier of rat food used at the Russian laboratory began using GM soy in their formulation. Since all the rats housed at the facility were now eating GM soy, no non-GM fed controls were available for subsequent GM feeding trials; follow-up studies were canceled. *After two months on the GM soy diet, however, the infant mortality rate of rats throughout the facility had skyrocketed to 55.3 percent (99 of 179).*¹⁸

Farmers report livestock sterility and deaths

About two dozen farmers reported that thousands of their pigs had reproductive problems when fed certain varieties of Bt corn. Pigs were sterile, had false pregnancies, or gave birth to bags of water. Some cows and bulls also became sterile. Bt corn was also implicated by farmers in the deaths of cows, horses, water buffaloes, and chickens.¹⁹

When Indian shepherds let their sheep graze continuously on Bt cotton plants, within 5-7 days, one out of four sheep died. There was an estimated 10,000 sheep deaths in the region in 2006, with more reported in 2007.

- **Can you comment on the highlights of and the profound implications of allergic reactions, especially from GM soybeans (HGT) and corn?**

Soon after GM soy was introduced to the UK, soy allergies skyrocketed by 50 percent.²⁰ There are plenty of ways in which genetic manipulation can boost allergies. GM soy currently consumed in the US contains a gene from bacteria. The inserted gene creates a protein that was never before part of the human food supply, and might be allergenic. Sections of that protein are identical to those found in shrimp and dust mite allergens.²¹ According to criteria recommended by the World Health Organization (WHO), this fact should have disqualified GM soy from approval. A common allergen in soy is called trypsin inhibitor. GM soy contains significantly more of this compared with natural soy.²² Levels in cooked GM soy were nearly as high as those found in raw soy, and up to seven times higher when compared to cooked non-GM soy.²³ Another study verified that GM soybeans contain a unique, unexpected protein, not found in non-GM soy controls. Moreover, scientist tested the protein and determined that it reacted with the antibody called IgE, which suggests that the protein might lead to dangerous allergic reactions. using a skin-prick test—an evaluation used often by allergy doctors. Eight subjects showed a reaction to GM soy; but one of these did not *also* react to non-GM soy. And using a skin-prick test, at least one human subject reacted to GM soy but not to non-GM.

About 20% of GM crops are engineered to produce their own pesticides, called Bt (*Bacillus thuringiensis*). When bugs take a bite of the GM plant, the toxin splits open their stomach and kills them. Biotech companies contend that the pesticide, which is produced naturally from a soil bacterium, has a history of safe use. Organic farmers, for example, have used solutions containing the natural bacteria for years as a method of insect control. Genetic engineers remove the gene that produces the Bt in bacteria and then insert it into the DNA of corn and cotton plants. But studies show that the natural Bt spray is dangerous to humans. For example, when used over areas around Vancouver and Washington State to fight gypsy moths, about 500 people reported reactions—mostly allergy or flu-like symptoms.^{24,25} In addition, mice fed Bt-toxin showed significant immune responses—as potent as cholera toxin. In addition, the Bt caused their immune system to become sensitive to formerly harmless compounds This suggests that exposure might make a person allergic to a wide range of substances.^{26,27}

The Bt-toxin produced in GM crops is different than the natural version. GM plants produce about 3,000-5,000 times the amount of toxin as the sprays and are also designed to be more toxic.

Bt cotton triggers allergic reactions

A 2005 report by medical investigators in India describes hundreds of agricultural workers that developed allergic reactions when exposed to Bt cotton. This includes those picking cotton, loading it, cleaning it, or even leaning against it. Some at a ginning factory must take antihistamines daily, in order to go to work. Reactions are *only* triggered with the Bt varieties.²⁸ Furthermore, the symptoms are virtually identical to those described by the 500 people in Vancouver and Washington who were sprayed with Bt. (see table).

	Upper respiratory	Eyes	Skin	Overall
Bt Spray	Sneezing, runny nose, exacerbations of asthma	Watery, red	Itching, burning, inflammation, red, swelling	Fever, some in hospital
Bt cotton	Sneezing, runny nose	Watery, red	Itching, burning, eruptions, red, swelling	Fever, some in hospital

The experience of the Indian workers begs the question, “How long does the Bt-toxin stay active in the cotton?” It there any risk using cotton diapers, tampons, or bandages.

Bt-toxin is produced in GM corn and can be eaten intact. It is also in pollen, which can be breathed in. In 2003, during the time when an adjacent Bt cornfield was pollinating, virtually an entire Filipino village of about 100 people were stricken by a disease. The symptoms included headaches, dizziness, extreme stomach pain, vomiting, chest pains, fever and allergies, as well as respiratory, intestinal, and skin reactions. The symptoms appeared first in those living closest to the field, and then progressed to others by proximity. Blood samples from 39 individuals showed antibodies in response to *Bt*-toxin; this supports, but does not prove a link to the symptoms. When the same corn was planted in four other villages the following year, however, the symptoms returned in all four areas—only during the time of pollination.

Since the only human feeding study confirmed that foreign inserted genes can transfer from GM food into the DNA of gut bacteria, if this also happens with Bt genes for corn chips, for example, than it might turn our intestinal flora into living pesticide factories, possibly for decades.

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