Non GMO Ingredients

Our ingredients have been certified by our ingredient suppliers to be Non GMO *(they Do Not contain Genetically Modified Organisms)*

Learn the Importance of Protecting Our Pets From GMOs and Pesticides

No GMO Ingredients
in Gentle Giants Pet Foods

What is a GMO?

A GMO (genetically modified organism) is the result of a laboratory process where genes from the DNA of one species are extracted and artificially forced into the genes of an unrelated plant or animal. The foreign genes may come from bacteria, viruses, insects, animals or even humans. Because this involves the transfer of genes, GMOs are also known as "transgenic" organisms. This process may be called either Genetic Engineering (GE) or Genetic Modification (GM); they are one and the same.

GMOs. Are you still feeding your pets GMOs?

GMOs. Are you still feeding your pets GMOs? Many pet owners and veterinarians report that when they switch their pets to a non-GMO organic food, the health of their pet improves dramatically. Many pet owners have connected the increased usage of GMOs with what appears to be an increased amount of tumors in dogs and cats and increased health issues.

Many farmers report similar improvements in their animals taken off GMOs.

Studies reveal that lab animals fed GMOs and Roundup herbicide (which is sprayed on most GMOs) suffer from numerous health conditions or their precursors. A close look at the side effects of the genetic engineering process, the built in insecticide in GMO corn, and the Roundup herbicide residues on GMO foods, provide ample reasons why these foods may be promoting disorders.

It's unfortunate that we often see lower quality ingredients in pet food but that doesn't mean we have to compromise our best buds and feed them potentially dangerous foods containing GMOs and pesticides/herbicides that could harm their health. There are healthier options.

The Dangers of Genetically Modified Ingredients in Pet Food— *Dr. Karen Becker*
For those of you still feeding your dog or cat a commercial pet food with corn-based ingredients – which includes most inexpensive pet foods on the market today – here's a big heads-up and another reason to reconsider the diet you're offering your four-legged companion. Chances are the corn products in your pet's food are genetically modified (GM). This means the seeds have been chemically altered to produce plants that can withstand repeated spraying with Monsanto's Roundup weed killer.

Genetically Modified (GM) Ingredients in Pet foods: Dogs & Cats at Risk

By Dr. Michael W. Fox*
Dogs and cats, like the proverbial canaries down the mine shafts, have become our sentinels. They alert us to

health hazards in the home-environments we share and in the products and by-products of the same agribusiness food industry that feeds most of us and them. In the mid 1990s I began to suspect diet may play a role in a "cluster" of health problems not seen nearly as often as when dogs and cats were being fed conventional corn and soy. Since that time I have formed the professional opinion that there is sufficient proof from evidence based medicine that dietary ingredients derived from GM crops are not safe for companion animals, and by extension, for human consumers either.

Widespread use of GMO crops

In the mid 90s, more and more genetically engineered corn and soy were being used in pet foods and fed to farmed animals. As a nationally syndicated veterinary newspaper columnist, I began to receive an increase in letters from cat and dog owners whose animals were suffering from this cluster of health problems. In the 40 years that I've been writing that column, I've benefited from a wide-angled and historical perspective that I would never have realized running a conventional veterinary clinic. The thousands of letters that I receive from across the U.S. keep me informed about new and emerging health problems and veterinarians' responses to the same.

During this timeframe in the 90s, people often wrote to report of failed treatments and harmful side effects to prescribed remedies e.g. steroids, as well as problems with various manufactured prescription diets after their attending veterinarians diagnosed their animals with allergies, asthma, atopic dermatitis and other skin problems, irritable bowel syndrome, leaky gut syndrome, inflammatory bowel disease, colitis, recurrent diarrhea, vomiting, indigestion, along with abnormalities in liver, pancreatic and immune system functions.

A similar picture was developing in human health. It is surely no coincidence that the US Centers for Disease Control and Prevention reported, in Oct. 2008, an 18% increase in allergies in children under the age of 18 years, between 1997-2007. This ties in with the time-frame of when GM ingredients were first introduced into the food chain and then subsequently in greater amounts. Some 3 million children now suffer from food and/or digestive allergies or intolerance. Their symptoms including vomiting, skin rashes, and breathing problems. They take longer to outgrow milk and egg allergies, and show a doubling of adverse reactions to peanuts.

Research Evidence of Harms

In the creation of GM crops like corn and soy bean, novel proteins are created that can cause allergies and assault the immune system. This in turn creates illness, especially in the offspring of mothers fed such foods, and to their young fed diets containing GM ingredients. The genetic modification of such food crops can also lower their nutrient content, elevate potential toxins, and also create novel RNA variations. The latter are not destroyed by digestion, and so called micro RNA has been found in mammalian tissues where they can exert influences on gene expression and therefore affect health across generations, (Zhang et al, 2011). These kinds of problems are in part due to the inherent genetic instability of GM plants that can result in spontaneous and unpredictable mutations, (Wilson et al 2006).

In their detailed review of animal safety studies of GM foods, Dona & Arvanitoyannis (2009) conclude that "The results of most of the rather few studies conducted with GM foods indicate that they may cause hepatic, pancreatic, renal, and reproductive effects and may alter hematological, biochemical, and immunologic parameters the significance of which remains unknown." Altered DNA from GM foods can be incorporated by gut bacteria and may alter their behavior and ecology in the digestive tract. Likewise the bacterial incorporation of genetic material from antibiotic resistance genes used to identify some varieties of GM food crops could have serious health implications, (see Smith 2007 and Traavik & Heinemann, 2007).

Three varieties of Monsanto's GM corn, approved for consumption by US, European and several other national food safety authorities, caused liver, kidney and other internal organ damage when fed to rats, (J.S.de Vendomois et al 2009). A subsequent 2-year feeding trial by Seralini et al (2012) reported that rats fed on a diet containing NK603 Roundup tolerant GM corn or given water containing Roundup, at levels permitted in drinking water and GM crops in the US, developed cancers faster and died earlier than rats fed on a standard diet. Females developed significant and numerous mammary tumors, pituitary and kidney problems. Males died mostly from severe liver and kidney chronic deficiencies.

The insecticide Bt (from the inserted genes of Bacillus thuringiensis) produced by several varieties of GM corn may create allergies and illness. Bt-toxin from genetically engineered corn sources has been found in the blood

of pregnant women and their babies, as well as in non-pregnant women. Bt-toxins, which have been shown to damage human kidney cells, may cause leaky gut syndrome in newborns, the passage of undigested foods and toxins into the blood from the intestines leading to food allergies and autoimmune diseases. Also, since the blood-brain barrier is not developed in newborns, toxins may enter the brain and cause serious cognitive problems. Some health care practitioners and scientists are convinced that this is the apparent mechanism for autism.

Where does that leave us?
Genetically engineered foods, derived from GM crops, have never been proven safe for human consumption but have been on the market for the last two decades.

SUMMARY - FOR PET OWNERS

Dr. Michael Fox who had a syndicated column called "Animal Doctor" that had 25 to 30 million readers started receiving letter after letter from pet owners saying that their dog or cat now had digestive problems, diarrhea, itching, and allergies. He wrote them all back and said, "Take your animal off of GMOs." He said he has a file drawer filled with response letters saying it worked.

Other veterinarians who were active prior to the introduction of GMOs in the food supply, also noticed a change in the pets soon after GMOs were introduced. Greater amounts of *cancer* among other things – *digestive problems, skin conditions, allergies, itching, etc.*

Veterinarian Barbara Royal said that the first thing she does now is to put the animals on healthier food and that resolves the problems for most of them. She says that by the time they come to their second visit, 80% are now managing well, 40% completely gone and the other 40% are managing the issue. Only 20% have not really responded to the change. So changing the animal's diet is critical.

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10 Reasons to Avoid GMOs

1. GMOs are unhealthy.
The American Academy of Environmental Medicine (AAEM) urges doctors to prescribe non-GMO diets for all patients. They cite animal studies showing organ damage, gastrointestinal and immune system disorders, accelerated aging, and infertility. Human studies show how genetically modified (GM) food can leave material behind inside us, possibly causing long-term problems. Genes inserted into GM soy, for example, can transfer into the DNA of bacteria living inside us, and that the toxic insecticide produced by GM corn was found in the blood of pregnant women and their unborn fetuses.
Numerous health problems increased after GMOs were introduced in 1996. The percentage of Americans with three or more chronic illnesses jumped from 7% to 13% in just 9 years; food allergies skyrocketed, and disorders such as autism, reproductive disorders, digestive problems, and others are on the rise. Although there is not sufficient research to confirm that GMOs are a contributing factor, doctors groups such as the AAEM tell us not to wait before we start protecting ourselves, and especially our children who are most at risk.
The American Public Health Association and American Nurses Association are among many medical groups that condemn the use of GM bovine growth hormone, because the milk from treated cows has more of the hormone IGF-1 (insulin-like growth factor 1)—which is linked to cancer.

2. GMOs contaminate—forever.
GMOs cross pollinate and their seeds can travel. It is impossible to fully clean up our contaminated gene pool. Self-propagating GMO pollution will outlast the effects of global warming and nuclear waste. The potential impact is huge, threatening the health of future generations. GMO contamination has also caused economic losses for organic and non-GMO farmers who often struggle to keep their crops pure.

3. GMOs increase herbicide use.
Most GM crops are engineered to be "herbicide tolerant"—they deadly weed killer. Monsanto, for example, sells Roundup Ready crops, designed to survive applications of their Roundup herbicide.

Between 1996 and 2008, US farmers sprayed an extra 383 million pounds of herbicide on GMOs. Overuse of Roundup results in "superweeds," resistant to the herbicide. This is causing farmers to use even more toxic herbicides every year. Not only does this create environmental harm, GM foods contain higher residues of toxic herbicides. Roundup, for example, is linked with sterility, hormone disruption, birth defects, and cancer.

4. Genetic engineering creates dangerous side effects.
By mixing genes from totally unrelated species, genetic engineering unleashes a host of unpredictable side effects. Moreover, irrespective of the type of genes that are inserted, the very process of creating a GM plant can result in massive collateral damage that produces new toxins, allergens, carcinogens, and nutritional deficiencies.

5. Government oversight is dangerously lax.
Most of the health and environmental risks of GMOs are ignored by governments' superficial regulations and safety assessments. The reason for this tragedy is largely political. The US Food and Drug Administration (FDA), for example, doesn't require a single safety study, does not mandate labeling of GMOs, and allows companies to put their GM foods onto the market without even notifying the agency. Their justification was the claim that they had no information showing that GM foods were substantially different. But this was a lie. Secret agency memos made public by a lawsuit show that the overwhelming consensus even among the FDA's own scientists was that GMOs can create unpredictable, hard-to-detect side effects. They urged long-term safety studies. But the White House had instructed the FDA to promote biotechnology, and the agency official in charge of policy was Michael Taylor, Monsanto's former attorney, later their vice president. He's now the US Food Safety Czar.

6. The biotech industry uses "tobacco science" to claim product safety.
Biotech companies like Monsanto told us that Agent Orange, PCBs, and DDT were safe. They are now using the same type of superficial, rigged research to try and convince us that GMOs are safe. Independent scientists, however, have caught the spin-masters red-handed, demonstrating without doubt how industry-funded research is designed to avoid finding problems, and how adverse findings are distorted or denied.

7. Independent research and reporting is attacked and suppressed.
Scientists who discover problems with GMOs have been attacked, gagged, fired, threatened, and denied funding. The journal Nature acknowledged that a "large block of scientists . . . denigrate research by other legitimate scientists in a knee-jerk, partisan, emotional way that is not helpful in advancing knowledge." Attempts by media to expose problems are also often censored.

8. GMOs harm the environment.
GM crops and their associated herbicides can harm birds, insects, amphibians, marine ecosystems, and soil organisms. They reduce bio-diversity, pollute water resources, and are unsustainable. For example, GM crops are eliminating habitat for monarch butterflies, whose populations are down 50% in the US. Roundup herbicide has been shown to cause birth defects in amphibians, embryonic deaths and endocrine disruptions, and organ damage in animals even at very low doses. GM canola has been found growing wild in North Dakota and California, threatening to pass on its herbicide tolerant genes on to weeds.

9. GMOs do not increase yields, and work against feeding a hungry world.
Whereas sustainable non-GMO agricultural methods used in developing countries have conclusively resulted in yield increases of 79% and higher, GMOs do not, on average, increase yields at all. This was evident in the Union of Concerned Scientists' 2009 report Failure to Yield—the definitive study to date on GM crops and yield.
The International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) report, authored by more than 400 scientists and backed by 58 governments, stated that GM crop yields were "highly variable" and in some cases, "yields declined." The report noted, "Assessment of the technology lags behind its development, information is anecdotal and contradictory, and uncertainty about possible benefits and damage is unavoidable." They determined that the current GMOs have nothing to offer the goals of reducing hunger and poverty, improving nutrition, health and rural livelihoods, and facilitating social and environmental sustainability.
On the contrary, GMOs divert money and resources that would otherwise be spent on more safe, reliable, and appropriate technologies.

10. By avoiding GMOs, you contribute to the coming tipping point of consumer rejection, forcing them out of our food supply.

Because GMOs give no consumer benefits, if even a small percentage of us start rejecting brands that contain them, GM ingredients will become a marketing liability. Food companies will kick them out. In Europe, for example, the tipping point was achieved in 1999, just after a high profile GMO safety scandal hit the papers and alerted citizens to the potential dangers. In the US, a consumer rebellion against GM bovine growth hormone has also reached a tipping point, kicked the cow drug out of dairy products by Wal-Mart, Starbucks, Dannon, Yoplait, and most of America's dairies.

NOTE: As an additional motivation to avoid GMOs, you may wish to take a lesson from the animals. Eyewitness reports from around the world describe several situations where animals, when given a choice, avoid genetically modified food. These include cows, pigs, geese, elk, deer, raccoons, mice, rats, squirrels, chicken, and buffalo. We're pretty sure the animals didn't read the above 10 reasons.

The Campaign for Healthier Eating in America is designed to achieve a tipping point against GMOs in the US. The number of non-GMO shoppers needed is probably just 5% of the population. The key is to educate consumers about the documented health dangers.

Crops such as Bt cotton produce pesticides inside the plant. This kills or deters insects, saving the farmer from having to spray pesticides. The plants themselves are toxic, and not just to insects. Farmers in India, who let their sheep graze on Bt cotton plants after the harvest, saw thousands of sheep die!

Herbicide tolerance lets the farmer spray weed-killer *directly* on the crop without killing it. Comparative studies on the toxic residues in foods from such crops have not yet been done.

Pollen from GM crops can contaminate nearby crops of the same type, except for soy, which does not cross-pollinate. In fact, virtually all heritage varieties of corn in Mexico (the origin of all corn) have been found to have some contamination. Canola and cotton also cross-pollinate. The long-term effects on the environment could be disastrous.

GMO Studies Showing Damage

"Several animal studies indicate serious health risks associated with genetically modified (GM) food (AAEM 2009)," including infertility, immune problems, accelerated aging, faulty insulin regulation, and changes in major organs and the gastrointestinal system. The AAEM has asked physicians to advise all patients to avoid GM foods.

Starting in 1996, Americans have been eating genetically modified (GM) ingredients in most processed foods. Why isn't the FDA protecting us?

In 1992, the Food and Drug Administration claimed they had no information showing that GM foods were substantially different from conventionally grown foods. Therefore they are safe to eat, and absolutely no safety studies were required. But internal memos made public by a lawsuit reveal that their position was staged by political appointees who were under orders from the White House to promote GMOs. In addition, the FDA official in charge of creating this policy was Michael Taylor, the former attorney for Monsanto, the largest biotech company, and later their vice president. In reality, FDA scientists had repeatedly warned that GM foods 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.

Today, the same biotech companies who have been found guilty of hiding toxic effects of their chemical products are in charge of determining whether their GM foods are safe. Industry-funded GMO safety studies are too superficial to find most of the potential dangers, and their voluntary consultations with the FDA are widely criticized as a meaningless façade.

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

Genetic engineering transfers genes across natural species barriers.

It uses imprecise laboratory techniques that bear no resemblance to natural breeding, and is based on outdated concepts of how genes and cells work. 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.

Widespread, unpredictable changes

The genetic engineering process creates 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 behavior. Even the inserted gene can be damaged or rearranged, and may create proteins that can trigger allergies or promote disease.

Genetically modified foods on the market

Major commodity crops raised from GMO seed include: corn (92%*), soybeans (94%*), and cotton (94%*). Almost 98% of Canadian grown canola is genetically engineered for herbicide resistance. U.S. sugar beet production is estimated to be over 95% genetically modified for herbicide resistance. GMO sweet corn, papaya, zucchini, and yellow summer squash are also for sale in grocery stores, but in lesser amounts. Genetically modified alfalfa is grown for use as hay and forage for animals.

***percentages are based on U.S. acreage as of 2015 (USDA)**

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 skin prick allergy test shows that some people react to GM soy, but not to wild natural soy.**
- **Cooked GM soy contains as much as 7-times the amount of a known soy allergen.**
- **GM soy also contains a new unexpected allergen, not found in wild 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, the Bt in GM crops is designed to be more toxic than the natural spray and is thousands of times more concentrated. Farm workers throughout India are getting the same allergic reactions from handling Bt cotton as those who reacted to Bt spray. Mice and rats fed Bt corn also showed immune responses.

GMOs fail allergy tests

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

GMOs may make you allergic to non-GM foods

- **GM soy drastically reduces digestive enzymes in mice. If it also impairs your digestion, you may become sensitive and allergic to a variety of foods.**
- **Mice fed Bt-toxin started having immune reactions to formerly harmless foods.**
- **Mice fed experimental GM peas also started reacting to a range of other foods. (The peas had already passed all the allergy tests normally done before a GMO gets on the market. Only this advanced test, which is never used on the GMOs we eat, revealed that the peas could actually 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 they switched to non-GM soy.**

GMOs, reproductive problems, and infant mortality

- More than half the babies of mother rats fed GM soy died within three weeks.
- Male rats and mice fed GM soy had changed testicles, including altered young sperm cells in the mice.
- The DNA of mouse embryos functioned differently when their parents ate GM soy
- The longer mice were fed GM corn, the less babies they had, and the smaller their babies were.
- Babies 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).
- Female rats fed GM soy showed changes in their ovaries and uterus.
- By the third generation, most hamsters fed GM soy were unable to have babies.

Bt crops linked to sterility, disease, and death

- Thousands of sheep, buffalo, and goats in India died after grazing on Bt cotton plants after harvest. Others suffered poor health and reproductive problems.
- 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.
- The stomach lining of rats fed GM potatoes showed excessive cell growth, a condition that may lead 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 revealed that the genetic material inserted into GM soy transfers into bacteria living inside our intestines 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 bacteria 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 illnesses and no long-term animal studies. Heavily invested biotech corporations are gambling with the health of our nation for their profit.

The health information featured on this page is excerpted from *Genetic Roulette: The Documented Health Risk of Genetically Engineered Foods*, by Jeffrey M. Smith.

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65 HEALTH RISKS OF GM FOODS

The Documented Health Risks of Genetically Engineered Foods

65 HEALTH RISKS OF GM FOODS – SECTION 1

Section 1: Evidence of reactions in animals and humans

1.1 GM potatoes damaged rats

1. Rats were fed potatoes engineered to produce their own insecticide.

2. They developed potentially precancerous cell growth in the digestive tract, inhibited development of their brains, livers and testicles, partial atrophy of the liver, enlarged pancreases and intestines and immune system damage.

3. The cause was not the insecticide, but in all likelihood was the process of genetic engineering.

4. GM foods on the market—which were created with the same process—have not been subject to such an extensive testing protocol.

1.2 Rats fed GM tomatoes got bleeding stomachs, several died

1. Rats were fed the GM FlavrSavr tomato for 28 days.

2. Seven of 20 rats developed stomach lesions (bleeding stomachs); another 7 of 40 died within two weeks and were replaced in the study.

3. The tomato was approved despite unresolved safety questions by FDA scientists.

1.3 Rats fed Bt corn had multiple health problems

1. Rats were fed Monsanto's Mon 863 Bt corn for 90 days.

2. They showed significant changes in their blood cells, livers and kidneys, which might indicate disease.

3. Although experts demanded follow-up, Monsanto used unscientific, contradictory arguments to dismiss concerns.

1.4 Mice fed GM Bt potatoes had intestinal damage

1. Mice were fed either GM potatoes engineered to produce the Bt-toxin or natural potatoes spiked with Bt-toxin.

2. Both diets created abnormal and excessive cell growth in the lower part of their small intestine (ileum).

3. Similar damage to the human small intestine might result in incontinence or flu-like symptoms, and may be precancerous.

4. This study overturns the assumptions that Bt-toxin is destroyed during digestion and is not biologically active in mammals.

1.5 Workers exposed to Bt cotton developed allergies

1. Agricultural laborers in six villages who picked or loaded Bt cotton reported reactions of the skin, eyes and upper respiratory tract.

2. Some laborers required hospitalization.

3. Employees at a cotton gin factory take antihistamines everyday.

4. One doctor treated about 250 cotton laborers

1.6 Sheep died after grazing in Bt cotton fields

1. After the cotton harvest in parts of India, sheep herds grazed continuously on Bt cotton plants.

2. Reports from four villages revealed that about 25% of the sheep died within a week.

3. Post mortem studies suggest a toxic reaction.

1.7 Inhaled Bt corn pollen may have triggered disease in humans

1. In 2003, approximately 100 people living next to a Bt cornfield in the Philippines developed skin, respiratory, intestinal reactions and other symptoms while the corn was shedding pollen.

2. Blood tests of 39 people showed an antibody response to Bt-toxin, which supports—but does not prove—a link.

3. The symptoms reappeared in 2004 in at least four other villages that planted the same corn variety.

4. Villagers also attribute several animal deaths to the corn.

1.8 Farmers report pigs and cows became sterile from GM corn

1. More than 20 farmers in North America report that pigs fed GM corn varieties had low conception rates, false pregnancies or gave birth to bags of water.
2. Both male and female pigs became sterile.
3. Some farmers also report sterility among cows.

1.9 Twelve cows in Germany died mysteriously when fed Bt corn

1. Twelve dairy cows died on a farm in Hesse Germany, after being fed a diet with significant amounts of a single GM corn variety, Bt 176.
2. Other cows in the herd had to be killed due to some mysterious illness.
3. Syngenta, the producers of Bt 176, compensated the farmer for part of his losses, but did not admit responsibility for the cow deaths.
4. In spite of demands by the farmer and even public protests, no detailed autopsy reports were made available.

1.10 Mice fed Roundup Ready soy had liver cell problems

1. The liver cells of mice fed Roundup Ready soybeans showed significant changes.
2. Irregularly shaped nuclei and nucleoli, an increased number of nuclear pores and other changes, all suggest higher metabolism and altered patterns of gene expression.
3. The changes may be in response to a toxin.
4. Most of the effects disappeared when GM soy was removed from the diet.

1.11 Mice fed Roundup Ready soy had problems with the pancreas

1. Mice fed GM soy showed changes in the synthesis and processing of digestive enzymes.
2. The production of alpha-amylase, a major digestive enzyme, dropped by as much as 77%.
3. This, combined with other pancreatic changes, suggests that GM soy may interfere with digestion and assimilation, as well as alter gene expression.

1.12 Mice fed Roundup Ready soy had unexplained changes in testicular cells

1. The structure and gene expression pattern of testicle cells of mice fed Roundup Ready soybeans changed significantly.
2. The cause for the changes is unknown, but the testicles are sensitive indicators of toxins.
3. Some of the changes might possibly influence adult fertility as well as the health of the offspring.
4. Mouse embryos from GM-fed mothers did show a temporary decrease in gene expression.

1.13 Roundup Ready Soy Changed Cell Metabolism in Rabbit Organs

1. Rabbits fed GM soy for about 40 days showed significant differences in the amounts of certain enzymes in their kidneys, hearts and livers.
2. A rise in LDH1 levels in all three organs suggests an increase in cellular metabolism.
3. Changes in other enzymes point to other alterations in the organs.

1.14 Most offspring of rats fed Roundup Ready soy died within three weeks

1. Female rats were fed Roundup Ready soy starting before conception and continuing through pregnancy and weaning.
2. Of the offspring, 55.6% died within three weeks compared to 9% from non-GM soy controls.
3. Some pups from GM-fed mothers were significantly smaller and both mothers and pups were more aggressive.
4. In a separate study, after a lab began feeding rats a commercial diet containing GM soy, offspring mortality reached 55.3%.
5. When offspring from GM-fed rats were mated together, they were unable to conceive.

1.15 Soy allergies skyrocketed in the UK, soon after GM soy was introduced

1. In a single year, 1999, soy allergies in the UK jumped from 10% to 15% of the sampled population.
2. GM soy was imported into the country shortly before 1999.
3. Antibody tests verify that some individuals react differently to GM and non-GM soy varieties.
4. GM soy also has an increased concentration of a known allergen

1.16 Rats fed Roundup Ready canola had heavier livers

1. The livers of rats fed GM canola were 12-16% heavier than those fed non-GM varieties.
2. The liver is a chemical factory and primary detoxifier for the body.
3. Heavier livers may indicate liver disease or inflammation.
4. If this were caused by oil-soluble toxins, they may be present in canola oil.

1.17 Twice the number of chickens died when fed Liberty Link corn

1. The death rate for chickens fed Chardon LL GM corn for 42 days was 7%, compared to 3.5% for controls.
2. GM-fed chickens also had more erratic body weight and food intake, and less weight gain overall.

3. The study was designed so that only huge differences would be statistically significant.
4. The results were therefore dismissed without follow-up.

1.18 GM peas generated an allergic-type inflammatory response in mice

1. In advanced tests not normally part of GM crop evaluations, protein produced by GM peas generated a dangerous immune response in mice.
2. That "same" protein, when produced naturally in beans, had no effect.
3. The GM peas produced a subtle, hard-to-detect difference in the way sugar molecules attached to the protein, which likely caused the problem.
4. The response in mice suggested that the GM peas could provoke inflammatory or allergic reactions in humans; commercialization of the peas was therefore cancelled.
5. This type of subtle but dangerous change in the GM protein would rarely, if ever, be detected in the safety assessments typically used to approve GM crops.

1.19 Eyewitness reports: Animals avoid GMOs

1. When given a choice, several animals avoided eating GM food.
2. In farmer-run tests, cows and pigs repeatedly passed up GM corn.
3. Animals that avoided GM food include cows, pigs, geese, squirrels, elk, deer, raccoons, mice and rats.

1.20 A GM food supplement killed about 100 people and caused 5,000-10,000 to fall sick

1. One brand of the supplement L-tryptophan created a deadly US epidemic in the 1980s
2. The company genetically engineered bacteria to produce the supplement more economically.
3. Their product contained many contaminants, five or six of which were suspected as the cause of the disease.
4. Discovering the epidemic required multiple coincidences, suggesting that adverse reactions to GM foods may be hard to identify.

65 HEALTH RISKS OF GM FOODS – SECTION 2

Section 2: Gene insertion disrupts the DNA and can create unpredictable health problems

2.1 Foreign genes disrupt the DNA at the insertion site

1. When genes are inserted at random in the DNA, their location can influence their function, as well as the function of natural genes.
2. "Insertion mutations" can scramble, delete or relocate the genetic code near the insertion site.
3. Evaluation of insertion sites have shown relocations of up to 40,000 DNA base pairs, mixing together of foreign and host DNA, large scale deletions of more than a dozen genes and multiple random insertions of foreign DNA fragments.

2.2 Growing GM crops using tissue culture can create hundreds or thousands of DNA mutations

1. The process of growing plant cells into GM plants may create hundreds or thousands of mutations throughout the genome.
2. While a change in a single base pair may have serious consequences, widespread changes in the genome can have multiple, interacting effects.
3. Most scientists working in the field are unaware of the extent of these mutations, and no studies have examined genome-wide changes in commercialized GM plants.

2.3 Gene insertion creates genome-wide changes in gene expression

1. One study using a micro-array gene chip found that 5% of the host's genes changed their levels of expression after a single gene was inserted.
2. The changes, which are in addition to the deletions and mutations already discussed, are not predictable and have not been fully investigated in the GM crops on the market.
3. These massive changes may have multiple health-related effects.

2.4 The promoter may accidentally switch on harmful genes

1. Promoters are switches that turn on genes.
2. The promoter used in nearly all GM crops is designed to permanently turn on the foreign gene at high output.
3. Although scientists had claimed that the promoter would only turn on the foreign gene, it can accidentally turn on other natural plant genes—permanently.
4. These genes may overproduce an allergen, toxin, carcinogen or antinutrient, or regulators that block other genes.

2.5 The promoter might switch on a dormant virus in plants

1. When certain viruses infect an organism, they splice themselves into the host's DNA.
2. These embedded viral sequences can be passed on to future generations and even inherited by future species.
3. Most ancient embedded viral sequences become mutated over time, but some may be intact, just not switched

on.
4. If the GM promoter is inserted in the vicinity of a dormant virus, it might switch it on, resulting in virus production and a potential catastrophe.

2.6 The promoter might create genetic instability and mutations

1. Evidence suggests that the CaMV promoter, used in most GM foods, containsa recombination hotspot.
2. If confirmed, this might result in breakup and recombination of the gene sequence.
3. This instability of the inserted gene material might create unpredicted effects.

2.7 Genetic engineering activates mobile DNA, called transposons, which generate mutations

1. In plant DNA, mobile elements called transposons move from place to place, and can lead to mutations.
2. The tissue culture process used in genetic engineering activates transposons, and is a major factor for the resulting genome-wide mutations.
3. Transgenes in commercial GM crops tend to be inserted near transposons.
4. This insertion might alter the transgene expression.

2.8 Novel RNA may be harmful to humans and their offspring

1. Small RNA sequences can regulate gene expression, most commonly by silencing genes.
2. RNA is stable, survives digestion and can impact gene expression in mammals that ingest it.
3. The impact can be passed on to future generations.
4. Genetic modification introduces new DNA combinations and mutations, which increase the likelihood that harmful regulatory RNA will be accidentally produced.

2.9 Roundup Ready soybeans produce unintentional RNA variations

1. A “stop signal” is placed after the transgene, telling the cell, “STOP TRANSCRIBING AT THIS POINT.”
2. The stop is ignored in GM soy, resulting in longer than intended RNA.
3. It is transcribed from a combination of the transgene, an adjacent transgene fragment and a mutated sequence of DNA.
4. The RNA is further rearranged into four variations, any of which may be harmful.
5. The faulty “stop” signal may have triggered the rearrangements.
6. The same “stop” signal is used in other crops, and might lead to similar “read-throughs” and RNA processing.

2.10 Changes in proteins can alter thousands of natural chemicals in plants, increasing toxins or reducing phytonutrients

1. Plants produce thousands of chemicals which, if ingested, may fight disease, influence behavior or be toxic.
2. The genome changes described in this section can alter the composition and concentration of these chemicals.
3. GM soybeans, for example, produce less cancer-fighting isoflavones.
4. Most GM-induced changes in these natural products go undetected.

2.11 GM crops have altered levels of nutrients and toxins

1. Numerous studies on GMOs reveal unintended changes in nutrients, toxins, allergens and small molecule products of metabolism.
2. These demonstrate the risks associated with unintended changes that occur due to genetic engineering.
3. Safety assessments are not adequate to guard against potential health risks associated with these changes.

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Section 3: The protein produced by the inserted gene may create problems

3.1 A gene from a Brazil nut carried allergies into soybeans

1. A gene from a Brazil nut was inserted into soybeans.
2. When tests verified that people allergic to Brazil nuts would react to the GM soy, the project was canceled.
3. This research verified that genetic engineering can transfer allergenic proteins into crops.

3.2 GM proteins in soy, corn and papaya may be allergens

1. Tests cannot guarantee that a GM protein will not cause allergies.
2. The WHO and FAO offer criteria that help minimize the likelihood that allergenic GM crops are approved.
3. GM soybeans, corn, and papaya fail those criteria.
4. The GM proteins from these foods are too similar to known allergens.
5. This evidence was ignored by regulators, who approved the crops.

3.3 Bt crops may create allergies and illness

1. Soil bacteria (Bt) create a natural pesticide that has been used in spray form for years.
2. Genes from the bacteria are inserted into crop DNA, so the plant produces Bt-toxin.

3. Approvals of Bt crops are based on the claim that the spray is harmless and Bt-toxin does not react with mammals.

4. In reality, Bt spray is linked to allergies and illness in humans and mammals.

5. Bt-toxins also elicit immune responses in mice.

3.4 The Bt in crops is more toxic than the Bt spray

1. The excuse that the Bt toxin is safe because Bt spray is safe is further contradicted by differences in the concentration and form of the protein.

2. Bt sprays are used intermittently and degrade in the environment.

3. The Bt toxin in crops is thousands of times more concentrated and is continuously produced in every cell.

4. The form of the Bt toxin protein in GM crops is also more toxic.

3.5 StarLink corn's built-in pesticide has a "medium likelihood" of being an allergen

1. StarLink corn, considered potentially allergenic by the US EPA, was approved as animal feed but not for human consumption.

2. The tiny amount planted in the US nonetheless contaminated the food supply,
prompting massive food recalls.

3. Thousands reported health effects, including life threatening episodes they thought may be related to StarLink.

4. The FDA was unable to create a test to rule out allergenicity and experts say it has a "medium likelihood" of being an allergen.

5. A small amount still remains in the food supply.

3.6 Pollen-sterilizing barnase in GM crops may cause kidney damage

1. Corn and canola are engineered to produce a pollen-sterilizing toxin called barnase.

2. Barnase is toxic to human cells and causes kidney damage in rats.

3. Although the GM plants were designed to produce the toxin in a non-food part of the

4. plant, some of the toxin is likely to be produced in all parts of the plant.

5. A small amount still remains in the food supply.

3.7 High lysine corn contains increased toxins and may retard growth

1. Monsanto produced corn with higher levels of lysine.

2. If consumed in high quantities, the elevated lysine may adversely affect human health in unpredictable ways.

3. The corn also contains increased amounts of known toxins and other potentially harmful substances.

4. The growth rate of chickens fed high-lysine corn was inexplicably less than those fed corn plus lysine.

3.8 Cooking high lysine corn may create disease-promoting toxins

1. A GM corn variety is engineered to produce high levels of lysine.

2. When such corn is cooked and processed, it may produce toxic compounds associated with symptoms of Alzheimer's, diabetes, allergies, kidney disease and with normal aging and cancer.

3.9 Disease-resistant crops may promote human viruses and other diseases

1. Viral genes inserted into disease-resistant crops produce "viral" proteins.

2. Consuming these may suppress the body's defense against viral infections, particularly in the gut.

3. The proteins may also be toxic and lead to disease.

4. Viral transgenes also produce RNA, which might influence gene expression in humans in unpredicted ways.

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The foreign protein may be different than what is intended.

65 HEALTH RISKS OF GM FOODS – SECTION 5

Transfer of genes to gut bacteria, internal organs, or viruses.

65 HEALTH RISKS OF GM FOODS – SECTION 6

6.1 Glufosinate-tolerant crops may produce herbicide "inside" our intestines

1. Some crops are engineered to withstand glufosinate-based herbicide.

2. The crops transform the herbicide into a compound regarded as nontoxic, called NAG, which remains in the plant.

3. Once humans or animals consume NAG, gut bacteria can revert some NAG back into toxic herbicide.

4. The herbicide has known toxic effects, acts as an antibiotic and may kill off or disturb gut micro-flora.

5. If the herbicide-tolerant gene transfers to gut bacteria, it could magnify the problems.

6.2 Herbicide-tolerant crops increase herbicide use and residues in food

1. Herbicide-tolerant crops increase the use of their associated herbicides.
2. Increased herbicide residues in crops can promote the toxic effects of these chemicals on humans, animals and their offspring.
3. Increased herbicide use can also alter nutrient content, such as flavonoids, making GM crops less nutritious.
4. The accelerated emergence of herbicide-resistant weeds has resulted in the increased use of even more toxic varieties of herbicides.

6.3 Tiny amounts of herbicide may act as endocrine disruptors

1. Certain chemicals may disrupt endocrine function at extremely low concentrations.
2. Research on Roundup suggests it may be such a chemical, disrupting endocrine activity related to human sex hormone production, but more research on this and other herbicides is needed.
3. The increased use of Liberty and Roundup, due to GM crops, may expose the population through food and water to these low-dose effects.

6.4 GM crops may accumulate environmental toxins or concentrate toxins in milk and meat of GM-fed animals

1. FDA scientists warned that GM crops may concentrate toxins, such as heavy metals and herbicides, from the environment.
2. There is evidence of heavy metals in GM soybean oil.
3. FDA scientists also said that toxins in GM feed might concentrate in milk or meat.
4. GM DNA fragments were found in milk.
5. While very little research has been done on this, small amounts of Roundup may be retained in the body of animals and affect sperm quality.
6. The overuse of Roundup and Liberty herbicides on GM crops magnifies these types of risks.

6.5 Disease-resistant crops may promote new plant viruses, which carry risks for humans

1. Virus-resistant transgenes protect crops from one target virus, but may increase susceptibility to other plant viruses.
2. Infected plants put humans at risk due to increased pesticide use.
3. They may also lead to increased consumption of potentially harmful viral proteins.

65 HEALTH RISKS OF GM FOODS – SECTION 7

Section 7: Other types of GM foods carry risks

7.1 Milk from rbGH treated cows may increase risk of cancer and other diseases

1. Monsanto's genetically engineered bovine growth hormone is injected into dairy cows in US and elsewhere, to increase milk production.Milk from treated cows has much higher levels of IGF-1, a hormone considered to be a high risk factor for breast, prostate, colon, lung and other cancers. The milk also has lowered nutritional value, increased antibiotics and more pus from infected udders.
2. Milk from treated cows has much higher levels of IGF-1, a hormone considered to be a high risk factor for breast, prostate, colon, lung and other cancers.
3. The milk also has lowered nutritional value, increased antibiotics and more pus from infected udders.

7.2 Milk from rbGH-treated cows likely increases the rate of twin births

1. Higher IGF-1 levels increase the rate of twin births.
2. Since milk drinkers increase their IGF-1, correspondingly they have higher twinning rates.
3. Milk from cows injected with bovine growth hormone has higher IGF-1 levels.
4. Drinking milk from injected cows should increase the twinning rate even more.
5. The number of twins grew at twice the rate in the US compared to the UK, where rbGH is banned.

7.3 Food additives created from GM microorganisms pose health risks

1. Certain food ingredients and processing agents are derived from GM bacteria, fungus or yeast.
2. Even if the transgene is not found in the food, the GM process still carries risks.
3. The GM protein may be unhealthy, have altered properties or react with other compounds in unpredictable ways.
4. The gene insertion process might also disrupt normal gene expression of the microorganisms.

GMOs in Food: In the U.S., three major commodity crops are raised predominantly from GMO seed: field corn (92%*), soybeans (94%*), and cotton (94%*). *percentages are based on U.S. acreage as of 2015 (USDA). Almost 98% of Canadian grown Canola is genetically engineered for herbicide resistance. U.S. sugar beet production is estimated to be over 95% genetically modified for herbicide resistance. GMO sweet corn, papaya, zucchini, and yellow summer squash are also for sale in grocery stores, but in far lesser amounts. Genetically modified alfalfa is grown for use as hay and forage for animals.

'White Russet' brand potatoes, genetically modified to resist bruising were introduced to some grocery stores in

2015. Genetically engineered non-browning ‘Arctic’ apples have been deregulated by the USDA and have been on the market since 2016.

Other Sources of GMOs:

- **Dairy products from cows injected with the GM hormone rbGH**
- **Food additives, enzymes, flavorings, and processing agents, including the sweetener aspartame (NutraSweetï¿½) and rennet used to make hard cheeses**
- **Meat, eggs, and dairy products from animals that have eaten GM feed**
- **Honey and bee pollen that may have GM sources of pollen**
- **Contamination or pollination caused by GM seeds or pollen**

Some of the Ingredients That May Be Genetically Modified: Vegetable oil, vegetable fat and margarines (made with soy, corn, cottonseed, and/or canola)
Ingredients derived from soybeans: Soy flour, soy protein, soy isolates, soy isoflavones, soy lecithin, vegetable proteins, textured vegetable protein (TVP), tofu, tamari, tempeh, and soy protein supplements.
Ingredients derived from corn: Corn flour, corn gluten, corn masa, corn starch, corn syrup, cornmeal, and High-Fructose Corn Syrup (HFCS).

Complete List of Invisible Ingredients:
GM Ingredients Processed foods often have hidden GM sources (unless they are organic or declared non-GMO).
The following are ingredients that may be made from GMOs. Aspartame (also called AminoSweet®, NutraSweet®, Equal Spoonful®, Canderel®, BeneVia®)

Some of the Foods That May Contain GM Ingredients:

- **Infant formula**
- **Salad dressing**
- **Bread**
- **Cereal**
- **Hamburgers and hotdogs**
- **Margarine**
- **Mayonnaise**
- **Crackers**
- **Cookies**
- **Chocolate**
- **Candy**
- **Fried food**
- **Chips**
- **Veggie burgers**
- **Meat substitutes**
- **Ice cream**
- **Frozen yogurt**
- **Tofu**
- **Tamari and Soy sauce**
- **Soy cheese**
- **Tomato sauce**
- **Protein powder**
- **Baking powder**
- **Any sugar not 100% Cane**
- **Confectioner’s glaze**
- **Alcohol**
- **Vanilla (may contain corn syrup)**
- **Peanut butter**
- **Enriched flour**

- **Pasta**
- **Malt**
- **White vinegar**

Where are they?
In your food! First introduced into the food supply in the mid-1990s, GMOs are now present in the vast majority of processed foods in the US. While they are banned as food ingredients in Europe and elsewhere, the FDA does not even require the labeling of GMOs in food ingredient lists.

Although there have been attempts to increase nutritional benefits or productivity, the two main traits that have been added to date are herbicide tolerance and the ability of the plant to produce its own pesticide. These results have no health benefit, only economic benefit.

What foods are GM? Currently commercialized GM crops in the U.S. include soy (94%), cotton (90%), canola (90%), sugar beets (95%), corn (88%), Hawaiian papaya (more than 50%), zucchini and yellow squash (over 24,000 acres).
Products derived from the above, including oils from all four, soy protein, soy lecithin, cornstarch, corn syrup and high fructose corn syrup among others. There are also many "invisible ingredients," derived from GM crops that are not obviously from corn or soy.

Why should you care? Genetically modified foods have been linked to toxic and allergic reactions, sick, sterile, and dead livestock, and damage to virtually every organ studied in lab animals. The effects on humans of consuming these new combinations of proteins produced in GMOs are unknown and have not been studied.

The Genetic Engineering Process

GMO Education:
What is a GMO?
A GMO (genetically modified organism) is the result of a laboratory process where genes from the DNA of one species are extracted and artificially forced into the genes of an unrelated plant or animal. The foreign genes may come from bacteria, viruses, insects, animals or even humans. Because this involves the transfer of genes, GMOs are also known as "transgenic" organisms.
This process may be called either Genetic Engineering (GE) or Genetic Modification (GM); they are one and the same.

What is a gene?
Every plant and animal is made of cells, each of which has a center called a nucleus. Inside every nucleus there are strings of DNA, half of which is normally inherited from the mother and half from the father. Short sequences of DNA are called genes. These genes operate in complex networks that are finely regulated to enable the processes of living organisms to happen in the right place and at the right time.
How is genetic engineering done? Because living organisms have natural barriers to protect themselves against the introduction of DNA from a different species, genetic engineers must force the DNA from one organism into another. Their methods include:

- **Using viruses or bacteria to "infect" animal or plant cells with the new DNA.**
- **Coating DNA onto tiny metal pellets, and firing it with a special gun into the cells.**
- **Injecting the new DNA into fertilized eggs with a very fine needle.**
- **Using electric shocks to create holes in the membrane covering sperm, and then forcing the new DNA into the sperm through these holes.**

Is genetic engineering precise?
The technology of genetic engineering is currently very crude. It is not possible to insert a new gene with any accuracy, and the transfer of new genes can disrupt the finely controlled network of DNA in an organism. Current understanding of the way in which DNA works is extremely limited, and any change to the DNA of an organism at any point can have side effects that are impossible to predict or control. The new gene could, for example, alter chemical reactions within the cell or disturb cell functions. This could lead to instability, the

creation of new toxins or allergens, and changes in nutritional value.

But haven't growers been grafting trees, breeding animals, and hybridizing seeds for years?

Genetic engineering is completely different from traditional breeding and carries unique risks.

In traditional breeding it is possible to mate a pig with another pig to get a new variety, but is not possible to mate a pig with a potato or a mouse. Even when species that may seem to be closely related do succeed in breeding, the offspring are usually infertile—a horse, for example, can mate with a donkey, but the offspring (a mule) is sterile.

With genetic engineering, scientists can breach species barriers set up by nature. For example, they have spliced fish genes into tomatoes. The results are plants (or animals) with traits that would be virtually impossible to obtain with natural processes, such as crossbreeding or grafting.

What combinations have been tried?

It is now possible for plants to be engineered with genes taken from bacteria, viruses, insects, animals or even humans. Scientists have worked on some interesting combinations:

- **Spider genes were inserted into goat DNA, in hopes that the goat milk would contain spider web protein for use in bulletproof vests.**
- **Cow genes turned pigskins into cowhides.**
- **Jellyfish genes lit up pigs' noses in the dark.**
- **Artic fish genes gave tomatoes and strawberries tolerance to frost.**

Field trials have included:

- **Corn engineered with human genes (Dow)**
- **Sugarcane engineered with human genes (Hawaii Agriculture Research Center)**
- **Corn engineered with jellyfish genes (Stanford University)**
- **Tobacco engineered with lettuce genes (University of Hawaii)**
- **Rice engineered with human genes (Applied Phytologics)**
- **Corn engineered with hepatitis virus genes (Prodigene)**
- **Potatoes that glowed in the dark when they needed watering.**
- **Human genes were inserted into corn to produce spermicide.**

Does the biotech industry hold any promise?

Genetic modification of plants is not the only biotechnology. The study of DNA does hold promise for many potential applications, including medicine. However, the current technology of GM foods is based on obsolete information and theory, and is prone to dangerous side effects. Economic interests have pushed it onto the market too soon.

Moreover, molecular marker technologies – so called Marker Assisted Selection (MAS) used with conventional breeding – show much promise for developing improved crop varieties, without the potentially dangerous side effects of direct genetic modification.

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