

Know GMOs 101

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What are Genetically Engineered Foods / GMOs?

Genetically modified organisms (GMOs) are made by forcing genes from one species, such as bacteria, viruses, animals, or humans, into the DNA of a food crop or animal to introduce a new trait.

- *ResponsibleTechnology.org*

<http://justlabelit.org> (The below info was pieced together from multiple pages from this site.)

Plants or animals that have had their genetic makeup altered to exhibit traits that are not naturally theirs.

-From the glossary on the Monsanto website.

Organisms in which the genetic material (DNA) has been altered in a way that does not occur naturally.

-World Health Organization

“Genetically Engineered Foods”, “Genetically modified organisms,” or GMOs, are organisms that have been created through application of transgenic, gene-splicing techniques that are part of biotechnology. These transgenic methods for moving genes around are also called “genetic engineering,” or GE.

The mixing of genes from different species that have never shared genes in the past is what makes GMOs and GE crops so unique. It is impossible to create such transgenic organisms through traditional crossbreeding methods.

[There are 3 kinds of GMOs:

Frankenfoods The mixing of 2 species together that would never occur in nature: spider genes with a goat, tomato with the fish, etc.

GMO herbicide-tolerant crops These plants (corn, soy, cotton, canola, sugar beets, alfalfa) are genetically altered so they can be resistant to being sprayed with RoundUp (main ingredient is glyphosate) to kill weeds.

GMO pesticide producing crops Utilizes Bt toxin (e.g., Bt corn) to produce pesticide inside the plant itself, so when an insect goes to eat the plant/corn, it kills the bug by exploding its abdomen. Use of GMO Bt toxin causes leaky gut permeability in animals, and may be affect humans as well.

It is plausible (with Bt toxin) that GMO interspecies genes cause inflammation, allergies and carcinogens in the humans that eat the animals or animal products that were raised on GMO foods. The incidence of illness, infertility and pre-mature aging amongst animals grown on GMO feed has alarmed scientists, farmers and veterinarians around the world. In America they are calling for significant, unbiased human studies on the health effects of GMOs. Monsanto and the FDA have been blocking this.]¹

¹ This bracketed section is paraphrased from the documentary [Genetic Roulette](#).

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How Common Are Genetically Engineered Foods?

(This section has added info from <http://labelityourself.org/>)

The Nine GE Crops on the Market in the U.S.:

- Corn (including derivatives made from corn: Corn Syrup, Corn Starch, Corn oil, Cornmeal, Fructose (HFCS – High Fructose Corn Syrup), Dextrose, Glucose, Vegetable oil, Modified Food Starch)
- Soybeans (including Soy meal, Lecithin, Isoflavin, Tofu, Soy Protein Isolate, TVP (textured vegetable protein), Vitamin E, Xanthan gum, Tempeh)
- Canola [Rapeseed] (Vegetable oil)
- Cotton (Cottonseed Oil)
- Sugar Beets [i.e., Sugar, pure sugar, including brown sugar, unless it says pure **cane** sugar, which is from sugar cane & is not a GE crop]
- Alfalfa
- Hawaiian Papaya
- Zucchini
- Yellow Crookneck Squash

For a complete list of the many “invisible” GM ingredients, visit:

nongmoshoppingguide.com

You can purchase or download (to an iPhone) the pocket non-GMO shopping guide

Three GE crops account for the vast majority of acres planted to GMOs around the world – corn, soybeans, and cotton. Five countries produce 90% of the world’s genetically engineered crops: Argentina, Brazil, Canada, India and the United States [because of Monsanto and other such companies].

While the animals themselves are not genetically engineered, the majority of the livestock Americans consume have been raised on, or fattened with, genetically engineered grains. This is because the two most prevalent genetically engineered crops are corn and soy which are used in many processed foods and most animal feeds. To this list we can now add alfalfa.

[As of 11/17/12] A genetically engineered salmon is pending FDA approval. The GE Atlantic salmon being considered was developed by artificially combining growth hormone genes from an eelpout. This modification causes production of growth-hormone year-round, creating a fish that grows at twice the normal rate. If approved, it will be the first genetically engineered animal on supermarket shelves in the U.S.

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The Debate

The debate about the benefits and risks of GE crops may go on for a long time. Meanwhile, an entire generation will have grown up consuming them. We should all have a choice about whether we want to participate in this grand experiment with our bodies and our environment. We have a right to know what's in our food.

SAFETY & HEALTH

The safety of GE crops for human consumption has not been adequately assured. Several National Academy of Sciences studies have affirmed that genetically engineered crops have the potential to introduce new toxins or allergens into our food and environment. Yet unlike the strict safety evaluations for approval of new drugs, there are no mandatory human clinical trials of genetically engineered crops, no tests for carcinogenicity or harm to fetuses, no long-term testing for human health risks, no requirement for long-term testing on animals, and limited testing for allergenicity. There have been no epidemiological studies of the possible impacts of the consumption of GE crops on health.

Studies have confirmed that there is reason for caution. For example, scientists recently found that the insecticide in GE corn is now showing up in our bloodstream and the umbilical cord blood of pregnant women. More research needs to be done to confirm these results and determine whether consumption of GE crops is introducing new toxins into our bodies.

There are no regulatory requirements for long-term testing for human health risks. Until we know without a doubt that GE crops are safe to eat, we should have a choice about whether we want to eat them.

PESTICIDES

Three-quarters of the GE crop acres around the world are devoted to herbicide tolerant (HT) crops. These genetically engineered crops mean more herbicides can be used without harming the crop. The GE herbicide tolerant crops are patented and sold by the same companies that sell the herbicides. Genetically engineered crops have been credited with an increase of 383 million pounds of herbicide use in the U.S. over the first 13 years of commercial use (1996- 2008). In August of 2011, the US Geological Survey (USGS) reported that glyphosate (the active ingredient in the herbicide "Roundup") is now a common component of the air and rain in the Midwest during the spring and summer.

As a direct result of widespread use of genetically modified herbicide tolerant crops, populations of weeds ("superweeds") have developed resistance to herbicides and are now present in 26 states. Not surprisingly, farmers have increasingly needed to revert to using older and more toxic herbicides like dicamba and 2,4-D (one of the ingredients in the Vietnam War era defoliant Agent Orange). These herbicides are known to cause reproductive problems, birth defects, and increased risk of cancer.

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FEEDING THE WORLD

The PR machines from the biotech industry are performing far better than the actual results of the crops. According to Failure to Yield, a report by the Union of Concerned Scientists (UCS), despite 20 years of research and 13 years of commercialization, genetic engineering has failed to significantly increase U.S. crop yields.

Alternatives such as conventional breeding and modern non-GE breeding methods that use improved understanding of crop biology, as well as newer production methods, have demonstrated that collectively, they are capable of increasing crop yields far more than GE has yet managed to do.

However, public funding for conventional breeding has not kept up with the need for improved crops as resources have been channeled toward GE research and development.

Globally, a series of recent reports reveal that non-GMO, low input, sustainable farming practices can alleviate hunger, reduce dependency on fossil fuels and chemicals, use resources efficiently, and create healthier communities.

- The Government Office for Science in the U.K.
- The National Research Council in the United States
- Food and Agriculture Organization of the U.N.

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<http://www.nongmoproject.org> (The below info was pieced together from multiple pages from this site.)

The “Non-GMO Project Verified” Seal (This is the gold standard for non-GMO certification.)

Helping you make informed shopping decisions



The retailers who started the Non-GMO Project were motivated by a simple idea. They believed that consumers in North America should have access to clearly-labeled non-GMO food and products, now and in the future. That conviction continues to guide the Non-GMO Project. And while the Non-GMO Project’s verification seal is not a “GMO free” claim, it *is* trustworthy, defensible, transparent, and North America’s *only independent verification* for products made according to best practices for GMO avoidance.

What does “Non-GMO Project Verified seal” mean?

The verification seal indicates that the product bearing the seal has gone through our verification process. Our verification is an assurance that a product has been produced according to consensus-based best practices for GMO avoidance:

- We require ongoing testing of all at-risk ingredients—any ingredient being grown commercially in GMO form must be tested prior to use in a verified product.
- We use an Action Threshold of 0.9%. This is in alignment with laws in the European Union, where any product containing more than 0.9% GMO must be labeled. Unfortunately, “GMO free” and similar claims are not legally or scientifically defensible due to limitations of testing methodology. In addition, the risk of contamination to seeds, crops, ingredients and products is too high to reliably claim that a product is “GMO free.”
- Absence of all GMOs is the target for all Non-GMO Project Standard compliant products. Continuous improvement practices toward achieving this goal must be part of the Participant’s quality management systems.
- After the test, we require rigorous traceability and segregation practices to be followed in order to ensure ingredient integrity through to the finished product.
- For low-risk ingredients, we conduct a thorough review of ingredient specification sheets to determine absence of GMO risk.
- Verification is maintained through an annual audit, along with onsite inspections for high-risk products.

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What about the other products that I see on the store shelf that claim they are “GMO free?”

While you may see other claims regarding GMO status (e.g. “GMO free”), these are really not legally or scientifically defensible, and they are not verified by a third party. The Non-GMO Project is the only organization offering independent verification of testing and GMO controls for products in the U.S. and Canada. Buying products that are verified by our program is the best way to support the sustained availability of non-GMO choices in North America.

Does purchasing “Non-GMO Project Verified” products help make a difference?

Yes! As a non-profit organization, we are committed not only to verifying and labeling products, but also to supporting and coordinating efforts between seed breeders, farmers, processors and manufacturers. These efforts are allowing us to protect and even expand the availability of non-GMO seeds, ingredients and products.

Learn more about the:

- nongmoproject.org/product-verification/non-gmo-project-standard/
- nongmoproject.org/product-verification/
- To download our 123 page pdf “GMO Myths & Truths”, visit nongmoproject.org/wp-content/uploads/2010/08/GMO_Myths_and_Truths_1.31.pdf

If you have questions, nongmoproject.org/contact/ We love hearing from you and are happy to help in any way we can.

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<http://www.ams.usda.gov> (The below info was pieced together from multiple pages.)

National Organic Program



What is organic?

Organic is a labeling term that indicates that the food or other agricultural product has been produced through approved methods that integrate cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity. Synthetic fertilizers, sewage sludge, irradiation, **and genetic engineering may not be used.** Consumer Information.

Organic Standards

The organic standards describe the specific requirements that must be verified by a USDA-accredited certifying agent before products can be labeled USDA organic. Overall, organic operations must demonstrate that they are protecting natural resources, conserving biodiversity, and using only approved substances

How Do I Know if My Food Is Organic?

Look at the label. If you see the USDA organic seal, the product is certified organic and has 95 percent or more organic content. For multi-ingredient products such as bread or soup, if the label claims that it is made with specified organic ingredients, you can be confident that those specific ingredients have been certified organic. . A brief summary is provided below. View regulations.

Organic crops. The USDA organic seal verifies that irradiation, sewage sludge, synthetic fertilizers, prohibited pesticides, and genetically modified organisms were not used.

Organic livestock. The USDA organic seal verifies that producers met animal health and welfare standards, did not use antibiotics or growth hormones, used 100% organic feed, and provided animals with access to the outdoors.

Organic multi-ingredient foods. The USDA organic seal verifies that the product has 95% or more certified organic content. If the label claims that it was made with specified organic ingredients, you can be sure that those specific ingredients are certified organic.

What About Other Labels?

There are other voluntary labels for livestock products, such as meat and eggs. Animal raising claims must be truthful and not misleading. USDA's Food Safety Inspection Service verifies the truthfulness of these claims:

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Free-range. This label indicates that the flock was provided shelter in a building, room, or area with unlimited access to food, fresh water, and continuous access to the outdoors during their production cycle. The outdoor area may or may not be fenced and/or covered with netting-like material. This label is regulated by the USDA.

Cage-free. This label indicates that the flock was able to freely roam a building, room, or enclosed area with unlimited access to food and fresh water during their production cycle.

Natural. As required by USDA, meat, poultry, and egg products labeled as “natural” must be minimally processed and contain no artificial ingredients. However, the natural label does not include any standards regarding farm practices and only applies to processing of meat and egg products. There are no standards or regulations for the labeling of natural food products if they do not contain meat or eggs.

Grass-fed. Grass-fed animals receive a majority of their nutrients from grass throughout their life, while organic animals’ pasture diet may be supplemented with grain. Also USDA regulated, the grass-fed label does not limit the use of antibiotics, hormones, or pesticides. Meat products may be labeled as grass-fed organic.

Pasture-raised. Due to the number of variables involved in pasture-raised agricultural systems, the USDA has not developed a federal definition for pasture-raised products.

Humane. Multiple labeling programs make claims that animals were treated humanely during the production cycle, but the verification of these claims varies widely. These labeling programs are not regulated under a single USDA definition.

No added hormones. A similar claim includes “Raised without Hormones.” Federal regulations have never permitted hormones or steroids in poultry, pork, or goat.

Regulatory Process

The NOP develops the laws that regulate the creation, production, handling, labeling, trade, and enforcement of all USDA organic products. This process, commonly referred to as rulemaking, involves input from the National Organic Standards Board (a Federal Advisory Committee made up of fifteen members of the public) and the public. Learn more.

Protecting Organic Integrity

30,000 on-site inspections per year by certifying agents to monitor compliance with USDA organic standards. Certifying agent audits to ensure appropriate monitoring. Residue testing program to verify that prohibited pesticides aren’t being applied to organic crops. Robust compliance and enforcement activities . Issue-based investigations (e.g. country- or commodity-specific).

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Ina's top GMO action steps:

1. **Keep it livable.** GMO's are nearly ubiquitous, and it may feel daunting to eliminate them from all of your foods. Prioritize by what you eat MOST often, for replacement with NON-GMO varieties and certified organic foods. The more the better, but don't sabotage yourself by feeling defeated if you cannot eliminate 100%. (NonGMOShoppingGuide.com)
2. **Be a squeaky wheel!** What better way to make a difference than through the bottom line with our wallets? Let your grocery store know that you want food options that are labeled NON-GMO Project Certified. Also, it is highly effective to return your unopened GMO products to your grocery store! Simply go to the customer service desk; nicely inform them that you've learned these products contain GMO ingredients and that you'd like to return them for store credit. Let them know you'll no longer be purchasing these products.
3. **Ask** your local, state and federal politicians to commit to truth-in-labeling and consumers' right to know by supporting mandatory GMO food labels.
4. **SHARE any of this information with others.**
5. **WATCH and share Genetic Roulette** which can be purchased or streamed on your computer from *ResponsibleTechnology.org*