
Understanding Organics, GMOs, and Pesticides

Part of a healthy lifestyle includes eating fresh, high-quality, minimally processed foods. When you begin to incorporate these foods into your diet, it can be hard to navigate the healthy claims made about organic foods, genetically-modified organisms (GMOs), and pesticides. What does it all mean?

Organic vs Conventional Foods

Organic foods are foods that are grown without the use of genetic engineering or synthetic (or man-made) fertilizers, pesticides, herbicides, irradiation, sewage sludge, hormones, and antibiotics. In order to be certified “organic” by the United States Department of Agriculture (USDA), organic farms are strictly prohibited from using these technologies and chemicals. In general, organic farms must demonstrate that they are protecting natural resources and conserving biodiversity as part of their operations.

Foods that don’t meet the USDA’s strict requirements for the USDA organic label – but still meet the standard requirements for food production—are referred to as **conventional** foods. The technologies and chemicals prohibited on organic farms are legal on conventional farms, and they make the farming process much less expensive. Because of this, conventional foods often cost much less than organic foods.

Conventionally-farmed foods are cheaper in the short-run, but they can contain hormones, antibiotics, synthetic fertilizers, and pesticides – all of which have associated health risks. Conventionally-farmed foods may also have lower concentrations of nutrients than organic foods, depending on how and where crops are planted each growing season.

What About “All Natural” Foods?

Foods and food products advertised as “all natural” contain no artificial colors, flavors, sweeteners, preservatives, or other additives. The ingredients in “all natural” foods may be conventionally or organically farmed.

What are GMOs?

In the context of food, a GMO is a plant, animal, or other organism whose genetic makeup has been modified by gene splicing, gene modification, or

genetic engineering. Plants have historically been genetically engineered to select for desirable traits like size, growth speed, sweetness, weather resistance, bug resistance, and so on. Most of the GMOs grown today have been engineered to resist herbicides, which are chemicals used to kill weeds. The result of genetic engineering and the heavy use of pesticides like herbicide have created herbicide-resistant "super weeds" and "super bugs", which can only be killed with more toxic poisons.

GMO crops require fewer chemicals and less time, machinery, and land than organic crops, but changing the DNA of an organism could have side effects that are impossible to control or predict. This relatively new science creates unstable combinations of plant, animal, bacterial and viral genes that do not occur in nature or through traditional crossbreeding methods. GMOs also pose a significant allergy risk. By splicing together unstable combinations of genes, we could create new allergens in foods that haven't caused allergies in people before. There's also the risk that foods with built-in antibiotic qualities could make antibiotics less effective on humans.

The bottom line is that there is not yet enough evidence to know what effect GMOs will have on us, or on the earth. Most developed nations do not consider GMOs to be safe, and have banned or restricted the production and sale of GMOs in their food supplies. However, the U.S. and Canadian governments have approved GMOs based on scientific studies, which have been funded or conducted by the corporations that create GMOs and profit from their sale.

The best bet is to limit GMOs in your diet until there is enough evidence-based research supporting their safety. At this stage, GMOs are not required to be labeled in the food supply, but many companies are labeling their food products that are verified as GMO-free.

The Danger of Pesticides

Pesticides are chemicals that are meant to kill pests, including weeds, microbes, fungi, insects, rodents, etc. Most pesticides protect plants during the growing season, but the potential health risks they pose far outweigh their benefits.

For all pesticides to be effective against the pests they are intended to control, they must be biologically active, or toxic. Pesticides used in conventional farming are made from fossil fuels. They are sprayed on produce to prevent destruction, but their chemical residue stays on the food. This food is then sold as fresh produce, or fed to livestock that become the meat we eat. Pesticides used in organic farming are made from natural substances and are less harmful to the environment.

Pesticides are meant to kill pests, but they end up harming other beneficial forms of life, like wildlife and bees. In humans, prolonged exposure to pesticides is known or suspected to cause birth defects, toxicity to a fetus, benign or malignant tumors, genetic changes, blood disorders, nerve disorders, endocrine disruption, and reproductive challenges.



Organic foods have less pesticide residue than conventional foods. If you want to limit your exposure to pesticides, begin by buying organic foods whenever possible. Washing your foods before eating or cooking will also help reduce your exposure.

Shopping for Organic, Non-GMO Foods

Grocery shopping can be a challenge when you're trying to avoid GMOs or conventionally-grown foods. When in doubt, look for the USDA Organic and Non-GMO Project verified labels. Use this information below to guide your food shopping choices.

Conventional

- No required labeling
- Use of synthetic fertilizers, pesticides, and irradiation allowed
- May contain GMO ingredients
- Animals may be confined with no outdoor access
- Animal feed may contain animal by-products, or may be grown with sewage sludge or GMOs
- Animals may be injected with growth hormones or antibiotics
- Artificial colors, flavors, and preservatives allowed
- Compliance with regulations must be verified by an independent agency
- Farming or food production practices subject to periodic review
- Price Look-Up Codes on produce: 4-digit code (standard) or 5-digit code beginning with 8 (GMO)

All Natural

- No required labeling
- Use of synthetic fertilizers, pesticides, and irradiation allowed
- May contain GMO ingredients
- Animals may be confined with no outdoor access
- Animal feed may contain animal by-products, or may be grown with sewage sludge or GMOs
- Animals may be injected with growth hormones or antibiotics

Organic

- Labeled USDA Organic
- Organic, non-GMO animal feed required
- Compliance with regulations must be verified by an independent agency
- Farming or food production practices subject to periodic review
- Price Look-Up (PLU) Codes on produce 5-digit code beginning with 9

Non-GMO

- Labeled Non-GMO Project Verified
- Organic, non-GMO animal feed required
- Compliance with regulations must be verified by an independent agency
- Farming or food production practices subject to periodic review

REFERENCES

1. Lorenz ES. Potential Health Effects of Pesticides (Pesticide Education). Pesticide Education (Penn State Extension). <http://extension.psu.edu/pests/pesticide-education/applicators/fact-sheets/pesticide-safety/potential-health-effects-of-pesticides>. Accessed January 13, 2017.
2. Organic and Conventionally Grown Food. National Pesticide Information Center. <http://npic.orst.edu/health/ovc.html>. Published October 16, 2015. Accessed January 13, 2017.
3. Organic Regulations. Agricultural Marketing Service. <https://www.ams.usda.gov/rules-regulations/organic>. Accessed January 13, 2017.
4. USDA Coexistence Fact Sheets Conventional Farming. USDA Office of Communications. <https://www.usda.gov/documents/coexistence-conventional-farming-factsheet.pdf>. Published February 2015. Accessed January 12, 2017.