



TOP 10 CONSUMER QUESTIONS ABOUT GMOS, ANSWERED.

GMO Answers and the Council for Biotechnology Information conducted a nationwide survey to answer consumers' most pressing questions about genetically modified organisms (GMOs). We compiled the top 10 questions and reached out to scientists, farmers, economists and other experts to provide answers. The following are abbreviated expert responses.



1. Do GMOs cause cancer?

No. There is no evidence that GM food causes cancer.

Dr. Kevin Folta from the University of Florida states it simply.

"The short answer is no, there is absolutely zero reputable evidence that GMO foods cause cancer."



2. Are GMOs safe for human consumption?

Yes, the health and safety of GMOs have been validated by many independent scientists and organizations around the world.

In the spring of 2016, The National Academies of Science, Engineering and Medicine (NAS) researched this very same question and concluded that GMOs are safe. After reviewing all available research studies on health effects from GE crops, the study found "no substantiated evidence of a difference in risks to human health between current commercially available genetically engineered crops and conventionally bred crops." More than 20 scientists, researchers, agricultural and industry experts reviewed over 20 years of data since GMOs were introduced, including nearly 900 studies and publications, animal studies, allergenicity testing and North American and European health data.



3. How much of our food in the U.S. is genetically modified?

While nearly all foods today have been genetically modified in some way over thousands of years through selective breeding, **there are only 10 commercially available GM crops in the U.S.: alfalfa, apples, canola, corn (field and sweet), cotton, papaya, potatoes, soybeans, squash and sugar beets.**

The majority of these crops, like alfalfa, field corn and soy are actually used for livestock feed. Other uses for these crops include common food ingredients, such as sugar, canola oil, cornstarch and soy lecithin. You may find only a few of these in your produce section: rainbow papaya, summer squash, sweet corn, potatoes and apples.

The GM AquAdvantage salmon is the first GM food animal to be approved by the FDA. The salmon was genetically modified to grow to market weight faster, utilize less feed and conserve wild fish populations.



4. Do GMOs have an impact on the environment?

GMOs and biotechnology are key assets in improving environmental sustainability in agriculture by allowing farmers to produce more crops, using less inputs. This can decrease agriculture's impact on habitats, while also conserving soil, water and energy. In agriculture, GMOs are one tool that allows farmers to take care of our land and environment while harvesting more and using fewer of these precious resources.

The use of GMOs in agriculture can: preserve biodiversity by sparing lands not intensely cultivated; increase productivity; reduce soil erosion; conserve water; and may lead to fewer pesticide applications.



5. Have long-term health studies been conducted on GMO crops?

Yes, many long-term health studies have been conducted on GMOs.² Aside from the fact that GMOs have a long and safe track record, GM crops are repeatedly and extensively tested for consumer and environmental safety, and those tests are reviewed in the U.S. by the Department of Agriculture (USDA), Environmental Protection Agency (EPA) and the Food and Drug Administration (FDA), and similar organizations internationally.

The European Commission states, "the main conclusion, after more than 130 research projects covering a period of more than 25 years of research and involving more than 500 independent research groups, is that biotechnology, in particular GMOs, are not per se more risky than, e.g., conventional plant breeding technologies."³



6. Do GMOs have an impact on allergies?

No. GMOs on the market today do not introduce any new allergens.

Lisa Katic, R.D., answered this question by explaining, "No commercially available crops contain allergens that have been created by genetically engineering a seed/plant. And the rigorous testing process ensures that will never happen." If a person is allergic to a non-GMO plant, like soy, for example, he or she will also be allergic to the plant's available GM counterpart.



7. If livestock eat genetically modified grain, will there be GMOs in my meat?

No. It has been estimated that over 70 percent of harvested GM crops are fed to food producing animals,⁴ making the world's livestock populations the largest consumers of the current generation of GM crops. **GMOs have never been detected in the milk, meat or eggs derived from animals fed GM feed.⁵**

According to Alison Van Eenennaam, Ph.D., extension specialist in animal genomics and biotechnology at the University of California, "Genetically engineered crops are digested by animals in the same way as conventional crops." The Federation of Animal Science Societies (FASS) compiled over 100 digestion and feeding studies⁶ examining the digestive fate of genetically engineered DNA and protein introduced into genetically engineered feed. Genetically engineered DNA, or the novel proteins encoded therein, have never been detected in the milk, meat or eggs derived from animals fed genetically engineered feedstuffs." Additionally, Allison Van Eenennaam said, "Evidence to date strongly suggests that feeding livestock with genetically engineered crops is equivalent to feeding unmodified feed sources in terms of nutrient composition, digestibility and feeding value."



8. Do GMOs have an impact on the price of food?

Yes. While the cost of food is impacted by various factors (the price of oil affects transportation costs; drought can affect yield and available supply; etc.), **GMOs play an important role in keeping food prices down.**

Dr. Stuart Smyth, assistant professor with the department of bioresource policy, business and economics at the University of Saskatchewan explains, "Typically, GM crops are the more efficient crops, and that means their price and costs as ingredients are less than non-GMOs."



9. Do seed companies have an influence on whether farmers grow GMOs?

No. Brian Scott, an Indiana farmer who grows corn and soybeans among other crops, answers this question simply, "I choose what seeds I plant every year. I'm not locked into buying seed from one company from one season to the next."



10. Do GMO crops have an impact on bees or butterflies?

The sudden and widespread disappearances of adult honey bees from hives, termed Colony Collapse Disorder (CCD), became a national concern almost 10 years ago.⁷ Claims have been circulated that insect protected GM crops harm bees, but these assertions have been refuted by the mainstream scientific community.

If a variety of factors are impacting bee health, could GMOs be one of them? Bee Ambassador for Bayer Chris Sansone, who has more than 30 years of experience as a professor and extension specialist at Texas A&M University, points to several scientific studies indicating this is not the case.

He notes that "genetically modified plants and their impact on honey bees have been widely studied, and the results indicate that GM plants are not harmful to bees."

¹ Distinction Between Genetic Engineering and Conventional Plant Breeding Becoming Less Clear, Says New Report on GE Crops, The National Academies of Sciences, Engineering and Medicine. Retrieved from <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=23395>.

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³ A Decade of EU-Funded GMO Research (2001-2010). Retrieved from https://ec.europa.eu/research/biosociety/pdf/a_decade_of_eu-funded_gmo_research.pdf.

⁴ Van Eenennaam, A. GMOs in animal agriculture: time to consider both costs and benefits in regulatory evaluations (2013). Retrieved from <https://jasbsci.biomedcentral.com/articles/10.1186/2049-1891-4-37>.

⁵ Van Eenennaam, A. Genetic Engineering and Animal Feed. Retrieved from <http://anrcatalog.ucanr.edu/pdf/8183.pdf>.

⁶ Van Eenennaam, A. Genetic Engineering and Animal Feed. Retrieved from <http://anrcatalog.ucanr.edu/pdf/8183.pdf>.

⁷ Report on the National Stakeholders Conference on Honey Bee Health. Retrieved from <http://www.usda.gov/documents/ReportHoneyBeeHealth.pdf>.