



"Improve the economic well-being of agriculture and enrich the quality of farm family life."

Let's Talk About: *Biotechnology and GMOs*

For hundreds of years, biotechnology has been used to improve food, medicine, and other processes and is now a major part of our everyday lives. This technology is used to make foods such as bread, dairy products, and cheese and to ferment beer and wine. Biotechnology is a part of the clothes we wear every day, medicines we use to keep us healthy and the fuel we use to take us where we need to go.ⁱ

From Ancient Egyptians using biological processes in wine fermentation to Gregor Mendel cross-breeding garden peas in the mid-1800s, innovations in agriculture and seed technologies have allowed farmers around the world to continue to produce reliable and abundant yields to provide food to the world's families.ⁱⁱ

Modern biotechnology is "a group of technologies that work with living cells and their molecules and have a wide range of practical uses that can improve our lives."ⁱⁱⁱ Genetically modified organisms (or GMOs) are a well-known application of modern biotechnology. The most common GMOs are genetically modified crops including corn, soybeans, canola, cotton, sugar beets and wheat.

Some consumers and interest groups remain skeptical of the safety and benefits of biotechnology. More than a decade of safe and successful biotech use has put most of the concerns to rest, but biotechnology and the organisms produced and used through these processes still face criticism.

Illinois Farm Bureau Policy

The Illinois Farm Bureau ("IFB") supports "Increased efforts through biotechnology to more rapidly develop traits which have recognized consumer benefits in order to: Increase the marketability of our products, enhance the environment, increase net farm income, improve product quality, enhance U.S. agriculture's competitiveness in the world market and ensure worldwide consumers of stable, ample, safe and nutritious U.S. products."^{iv}

Dispelling Myths about Biotechnology

- **Biotech crops are irrelevant to feeding the world.**
 - To provide safe food, feed, fuel and fiber for 9 billion people by 2050 biotechnology remains a critical farming tool.^v
 - Around the world, policymakers focused on combating hunger, keeping food costs affordable, protecting the environment, and mitigating climate change are encouraging the adoption of agricultural biotechnology and embracing the solutions that it provides.^{vi}

- Biotech varieties of many of the staple food crops that developing nations depend on have been developed. GM cassava, rice, maize, and potatoes that are more resistant to disease, nutritious, and productive, help minimize crop loss and lead to more bountiful harvests.^{vii}
- **Biotechnology and genetic engineering produce unnatural organisms. Production of these organisms does not occur in nature.**
 - Horizontal gene transfer between both related and unrelated species are “considered to be a significant source of molecular variability and a driver of evolution.”^{viii}
 - Sweet potatoes have been found to contain one or more transferred DNA sequences that belong to *Agrobacterium*. Scientists have not genetically modified sweet potatoes; this change has taken place through natural, wild, evolution.^{ix}
- **Genetically modified crops induce allergic reactions.**
 - While some genetically modified foods do contain allergens, these foods are the same types of foods that contain allergens in their non-GM alternatives.
 - Often the proteins used in genetically modified organisms come from microbial sources. The microbial proteins do not have the same structure as known food allergens and are not resistant to digestive processes.^x
 - 90% of proteins causing allergic reactions in the U.S. have been identified. Companies avoid the addition of these proteins into genetically modified crops.^{xi}
 - At this time, there have been no confirmed cases of allergic reactions caused by genetically modified crops.^{xii}
- **Biotech crop regulation is not thorough enough to protect consumers from risks.**
 - The EPA, FDA, and USDA work together to regulate genetically engineered crops.
 - “USDA’s Animal and Plant Health Inspection Service is responsible for protecting agriculture from pests and disease, including making sure that all new genetically engineered plant varieties pose no pest risk to other plants.”^{xiii}
 - “EPA regulates pesticides, including those bioengineered into food crops, to make sure that pesticides are safe for human and animal consumption and do not pose unreasonable risks of harm to human health or the environment.”^{xiv}
 - The same requirements apply to genetically engineered crops as non-genetically engineered crops. Developers of genetically-engineered crops are encouraged to consult the FDA before marketing their product. Also, the developer produces a safety assessment.^{xv}
- **Biotech crops increase pesticide use and harm the environment.**
 - The analysis of field tests and farm surveys have shown genetically engineered crops lead to “reduced pesticide use and/or to the use of pesticides with lower toxicity compared to those used on conventional crops.”^{xvi}
 - Conservation tillage reduces erosion and deposition of sediments, chemicals and nutrients into water sources. By 2006, 86% of genetically engineered herbicide-tolerant crops were planted no-till, and only 36% of conventional crops were planted no-till.^{xvii}
- **Biotech crops have the same or smaller yields as non-Biotech crops.**
 - Pest and drought resistance are two common beneficial traits produced via precise genetic changes afforded by biotechnology.
 - Seeds genetically engineered to protect the crop from pests results in a higher yield than conventional crops when pests are present.^{xviii}

- An increased yield equates to more food produced on less acreage. More people can be fed using less energy and resources.
- **Genetically Modified Crops promote poverty.**
 - The introduction of Bt cotton (Bt is a form of natural insecticide produced by *Bacillus thuringiensis*) in India has been shown to decrease insecticide use, increase yields, create employment and increase income among the poor.^{xix}
 - Gains in cotton profits from GM cotton are greater in developing countries than in the U.S.. “60% of the gains accrue to the extremely and moderately poor.”^{xx}
 - The introduction of Golden Rice, beta-carotene enhanced rice, to the market would reduce the incidence of death and decreased health due to Vitamin A deficiency in millions of men, women, and children.^{xxi}

For more information on Biotechnology and GMOs please see: [Let's Talk About: GM Labeling](#)
[Let's Talk About: Anti-GMO](#)

Studies

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- ⁱⁱ “US Farmers Continue to Prefer Biotech Crop Varieties.” *AgProfessional*. Last Updated: July 15, 2013. Retrieved July 16, 2013. Web.
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- ^v “US Farmers Continue to Prefer Biotech Crops.” *AgProfessional*. 15 July 2013. Web. 16 July 2013.
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- ^{xi} Anita Bakshi. “Potential Adverse Health Effects of Genetically Modified Crops.” *Journal of Toxicology and Environmental Health*. 2003. Web 8 June 2015.
- ^{xii} “Genetically Modified Organisms (GMO). *University of Minnesota School of Public Health*. 2003. Web 8 June 2015.
- ^{xiii} FDA. “FDA’s Role in Regulating Safety of GE Foods.” *FDA.gov*. N.p.. 20 March 2015. Web. 10 June 2015.
- ^{xiv} FDA. “FDA’s Role in Regulating Safety of GE Foods.” *FDA.gov*. N.p.. 20 March 2015. Web. 10 June 2015.
- ^{xv} FDA. “FDA’s Role in Regulating Safety of GE Foods.” *FDA.gov*. N.p.. 20 March 2015. Web. 10 June 2015.
- ^{xvi} Fernandez-Cornejo, Jorge, Wechsler, Seth James & Livingston, Michael. “Adoption of Genetically Engineered Crops by U.S. Farmers Has Increased Steadily for Over 15 Years.” *United States Department of Agriculture Economic Research Service*. N.p.. 04 March 2014. Web. 10 June 2015.
- ^{xvii} Fernandez-Cornejo, Jorge, Wechsler, Seth James & Livingston, Michael. “Adoption of Genetically Engineered Crops by U.S. Farmers Has Increased Steadily for Over 15 Years.” *United States Department of Agriculture Economic Research Service*. N.p.. 04 March 2014. Web. 10 June 2015.
- ^{xviii} Fernandez-Cornejo, Jorge, Wechsler, Seth James & Livingston, Michael. “Adoption of Genetically Engineered Crops by U.S. Farmers Has Increased Steadily for Over 15 Years.” *United States Department of Agriculture Economic Research Service*. N.p.. 04 March 2014. Web. 10 June 2015.
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- ^{xx} Quiam, Matin. “Benefits of genetically modified crops for the poor: household income, nutrition and health.” *New Biotechnology*. Volume 27, Number 5. November 2010. Web. 10 June 2015.
- ^{xxi} Quiam, Matin. “Benefits of genetically modified crops for the poor: household income, nutrition and health.” *New Biotechnology*. Volume 27, Number 5. November 2010. Web. 10 June 2015.