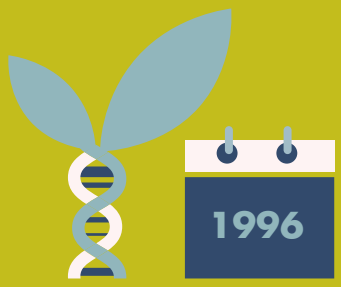
This infographic is based on information presented in a recent webinar : http://eatrightfoundation.org/toolkits-webinars/

THE NUTRITION PROFESSIONAL'S GUIDE TO GMOs

Genetic Engineering (GE) =

GMOs, or more accurately called Genetic Engineering (GE), builds on traditional plant cross breeding by allowing a more precise way to identify and transfer selected genes from one plant to another to create a desired characteristic. It's used to address agricultural challenges, and increasingly to provide direct consumer benefits.[1]

GENETICALLY ENGINEERED CROPS



1st trait commercialized in 1996 [2]

11 CROPS AVAILABLE COMMERCIALLY IN THE U.S. AND 28 OTHER NATIONS.[3]

FIELD CORN
SWEET CORN
SUMMER SQUASH
CANOLA
SUGAR BEET
ALFALFA
APPLES
RAINBOW PAPAYA
COTTON
POTATOES
SOYBEANS

*NOT ALL VERSIONS OF THESE CROPS ARE GE

Golden Rice has been genetically modified to increase its beta-carotene content, the source of vitamin A. It can help prevent Vitamin A deficiency (VAD), a leading cause of childhood blindness in developing countries. Under regulatory review. [4]

NON GE GE

Test marketing began in early 2017 for the Arctic® Golden, Arctic® Granny, and Arctic® Fuji apples for a non-browning trait when bitten, sliced or bruised. [5]

US REGULATIONS

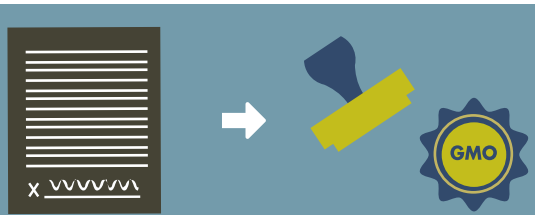
Three Federal agencies review under a coordinated framework to ensure human, animal, and environmental safety.

Food and Drug Administration (FDA)- safety and labeling of whole foods, food ingredients and additives [6]

United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA/APHIS)- biotech plants; field test inspection [7]

Environmental Protection Agency (EPA)- oversees pesticide-related traits [8]

LABELING



July 29, 2016, National Bioengineered Food Disclosure Law signed. USDA Agricultural Marketing Service is charged to develop criteria defining which ingredients count as "genetically engineered" and how the disclosure will be communicated to consumers. Proposed rule is to be completed within two years. This federal law supersedes current or future state-related mandates.[9]

WHY GENETIC ENGINEERING

There are many purposes for Genetic Engineering. A 2016 report from the National Academy of Sciences (NAS) identified the following future directions for crop breeding, including GE: "enhanced micronutrient content, reduced allergenicity, increased nutrient availability, improved flavonoid antioxidants, improved food safety traits, improved postharvest traits to reduce food waste, increased sustainability traits such as drought tolerance or more efficient crop uptake of fertilizer, and approaches that facilitate adoption of agroecological farming techniques."[10]

COMMON CONCERNS[11]

Most of the common consumer concerns about genetic engineering are focused on the human safety of genetically engineered foods. In addition to human safety, consumers also have questions about negative effects of GE on the environment, including native plants, insects and animals; weed and/or pest resistance; and farmer economics.

THE SCIENCE

The 2016 report released by the National Academies of Sciences, Engineering, and Medicine concluded "no differences have been found that implicate a higher risk to human health safety from GE foods than from their non-GE counterparts." These findings are consistent with the consensus of the mainstream scientific and global regulatory community, including the U.S. Food and Drug Administration, the World Health Organization and the European Commission. Work on the report encompassed more than two years and was conducted by a Committee of more than 50 scientists, researchers and agricultural and industry experts. The Committee reviewed more than 900 studies and data covering the 20 years since genetically modified crops were first introduced. And foods can be made safer with these tools by reducing allergens, and removing anti-nutrients or natural toxins.

Advances in GE technology are occurring rapidly using genomic, transcriptomic, proteomic, metabolomic and epigenomic processes. These have great potential to improve agricultural production, reduce food waste, enhance nutritional quality, and protect the environment. Scientists are actively working to develop crops that are tolerant of abiotic stresses associated with climate change, are resistant to pests and spoilage, contain bioavailable micronutrients, and produce their own fertilizer. Crops with enhanced nutritional quality containing beneficial nutrients including EPA and DHA, essential amino acids, anthocyanins and trace minerals are in development. And foods can be made safer with these tools by reducing allergens, and removing anti-nutrients or natural toxins such as acrylamide and solanine in potatoes.[12]

Genetically Engineered crops have had a positive impact on food availability and farm economics worldwide due to enhanced productivity and efficiency gains. Between 1996-2014, GE farm economics included significant gains in developing countries of Africa, Asia and Latin America.[13]

ADVICE FOR HAVING CONVERSATIONS ABOUT GE WITH THE PUBLIC[14, 15, 16]

Find shared values & common ground

Practice courteous discourse

Build on co-existence & cooperation to grow food that is abundant, affordable, and safe

Balance interests of all sides to ensure that farmers have options to make the best choices re: resources, consumers, and their livelihood

WHERE TO GO FOR MORE INFORMATION

Food & Agriculture Organization of the United Nations - www.fao.org/biotech
U.S. Department of Agriculture - www.aphis-usda.org
U.S. Department of Agriculture - www.ams.usda.gov
Food and Drug Administration - www.fda.gov
U.S. Environmental Protection Agency - www.epa.gov
World Health Organization - http://www.who.int/en/
The International Crops Research Institute for the Semi-Arid Tropics - http://www.icrisat.org
AgBiosafety - http://agbiosafety.unl.edu/
Council for Agricultural Science and Technology - www.cast-science.org
Genetic Literacy Project - http://www.geneticliteracyproject.org
Academy of Nutrition and Dietetics - www.eatright.org
Institute of Food Technologists - www.ift.org
Academy of Nutrition and Dietetics Evidence Analysis Library: Advanced Technology in Food Production - https://www.andeal.org/topic.cfm?menu=5021.
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eat right. Academy of Nutrition and Dietetics **Foundation**
Future of Food Initiative

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