TALKING TO CONSUMERS about GMOs

Merck Animal Health is committed to improving the health and well-being of animals through science. Our three pillars: Leading with Prevention, Innovating with Science and Advancing Animal Well-Being, are the underpinning of our portfolio of products and services that help deliver a safe, affordable and sustainable food supply to meet the world's growing demand for animal protein. Long-term consumer acceptance of farm technologies like Genetically Modified Organisms (GMOs) improve sustainability and allow farmers to adapt to changing global conditions.

3 things to know about GMOs

GMOs are safe.[1,2]

Major medical associations agree: Consuming foods that contain GMOs poses no greater risk to humans or livestock than non-GMO foods.[3,4]

GMOs have been studied extensively, and there is ongoing regulation and oversight by the Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA) and the Environmental Protection Agency (EPA).[2]

GMOs are used in fewer crops than you might think.

Currently, only 10 crops have commercial GMO applications.[6]

Consumer confusion is created when food marketers label products as "non-GMO," when GMO ingredients aren't even an option. GMO-free strawberries, for example.

Corn, soybeans, canola and sugar beats are among the most common GMOs in the U.S.

Additional GMO crops include:[6]

- Cotton
- Rainbow Papaya
- Select varieties of potatoes, apples, and squash
- Alfalfa for animal feed

GMOs help farmers raise sustainable food.

GMOs allow plant breeders to take a desirable trait found in nature and transfer it from one plant or organism to the plant they want to improve.

Other GMO benefits include:[5]

Disease and insect resistance – plants fight pests from the inside.

Drought tolerance – plants retain moisture better, reducing irrigation needs and saving water.

Herbicide tolerance – plants tolerate herbicide applications for weed control, reducing the number of applications needed.

Enhanced nutritional content – some soybean seeds have improved oils that are healthier and last longer.

Reduced food waste – less browning in apples and potatoes reduces spoilage.

Improved manufacturing processes – some corn varieties are easier to process and reduce water and energy used for processing.

[1]Genetic Literacy Project. With 2000+ global studies affirming safety, GM foods among most analyzed subjects in science, Jon Entine & JoAnna Wendel 2013. https://geneticliteracyproject.org/2013/10/08/with-2000-global-studiesconfirming-safety-gm-foods-among-most-analyzed-subject-in-science/. Accessed January 1, 2021.

[2]The National Academies of Sciences, Engineering, Medicine. Genetically Engineered Crops: Experiences and Prospects 2016. https://www.nap.edu/catalog/23395/genetically-engineered-crops-experiences-and-prospects. Accessed January 2, 2021.

[3]U.S. Food & Drug Administration (FDA). How GMOs Are Regulated for Food and Plant Safety in the United States. https://www.fda.gov/food/agricultural-biotechnology/how-gmos-are-regulated-food-and-plant-safety-united-states. Accessed January 2, 2021.

[4]World Health Organization (WHO). Modern Biotechnology, Human Health and Development: An evidence-based study 2005. https://www.who.int/foodsafety/publications/biotech/biotech_en.pdf. Accessed January 2, 2021.

[5]GMO Answers. Council for Biotechnology Information. What Is A GMO? 2013-2017. https://gmoanswers.com/what-gmo. Accessed January 2, 2021.

[6]GMO Answers. Council for Biotechnology Information. Current GMO Crops. 2013-2017. https://gmoanswers.com/current-gmo-crops. Accessed January 2, 2021.

[7]Forbes 2014.The Debate About GMO Safety Is Over,ThanksTo A NewTrillion-Meal Study. https://www.forbes.com/sites/jonentine/2014/09/17/the-debate-about-gmo-safety-is-over-thanks-to-a-new-trillion-meal-study/?sh=31dad3c88a63. Accessed January 2, 2021.

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We understand consumers have questions about GMOs and their impact on food safety, long-term health and the environment. It is important to help consumers understand the progress we are making in agriculture to deliver a safe, sustainable and affordable food supply.

CONSUMER: What is a GMO?

That's a great place to begin this conversation because there is a lot of misunderstanding about what a GMO (genetically modified organism) is, and isn't. GMO ingredients in our food today involve crops, so let's use that example. A GMO results from a plant breeder identifying a specific, desirable trait already found in nature, such as disease or insect resistance, and inserting that trait into another seed.[5] Genetic modification is not new. For hundreds of thousands of years, farmers have used specific plant breeding techniques to select the most desirable traits.[5] The use of GMO technology today speeds up that process, making it more precise and replicable. GMOs allow farmers to grow more food on less land using fewer chemicals, which helps keep food affordable for us all.

CONSUMER: Are GMOs safe?

Like me, I'm sure you've heard lots of claims against GMOs. Here's what I know that might ease your concerns.

GMOs have been a part of our food supply for more than 20 years. In that time, trillions of meals across the world have been consumed with no reported adverse effects.[7] More than 2,000 studies have concluded GMOs pose no additional risk to humans compared to non-GMO food ingredients, and a broad range of regulatory agencies agree, including the USDA, FDA and EPA, along with the American Medical Association (AMA) and World Health Organization.[1,2] Future applications of GM technology could offer even more specific food and health benefits, such as soybean oil with no trans fat[8] and mosquitoes that don't spread disease.[9]

CONSUMER: Do meat and milk from animals fed GMO crops contain GMOs?

I want the food my family eats to be safe, too, and understand why you might ask the question. Foods that contain GMO ingredients have the same makeup and nutritional value as non-GMO options.[10] Therefore, animals that eat GMO grains produce meat, milk and eggs that are no different than those who eat non-GMO grains. More than 100 digestion and feeding studies examined the effects of feeding GMO crops to various food-producing animal species and found performance, health and nutrient use by farm animals are similar when fed either conventional or biotechnology-derived crops.[11] GMO or not, your food is safe.[3,4]

CONSUMER: Why are GMOs able to be used in the U.S. but not other countries?

Great question, and the answer may surprise you. There are actually more political factors that go into an individual country's decision to grow or allow GMOs. Most nations that prohibit growing GMO crops still allow GMO products – particularly animal feed – to be imported. Decisions to ban GMO products are, for the most part, not driven by science, but by factors such as trade protection, pressure from activists or public uneasiness.[12] The sciencearound GMO safety is sound, and hopefully additional countries will recognize how specific benefits, such as Vitamin A in GMO Golden Rice, can improve lives.

CONSUMER: Do GMO crops contaminate organic crops?

I want to have confidence in what I buy, too. Farmers today grow both GMO and organic crops, and both farming methods can co-exist with attention to production practices and good communication. For example, staggered planting times is one solution, so crops pollinated by wind aren't maturing at the same exact time.[13] Farmers understand that attention to detail and timing can minimize pollen drift and prevent problems. For crops that will be labeled certified organic (GMO-free by definition), farmers and manufacturers have processes in place to keep those crops separate from any GMO crops.

CONSUMER: Do GMO crops mean more use of chemicals? What about the environment?

Like you, I want to do what I can to protect our planet. One key benefit of GMOs is they allow the farmer to use less chemicals overall. A good example is sugar beets. Thanks to GMO seeds, sugar beet farmers are using fewer herbicides, resulting in a 90 percent lower environmental impact.[14] Fewer herbicides applied means fewer trips across the field, less fuel used, improved soil health and reduced carbon emissions. These sustainability benefits are among the main reasons GMOs have widespread adoption by farmers.

CONSUMER: This has all been very helpful. Thanks for your time.

My pleasure. We understand that transparency in food production is important to consumers like you, and I enjoy these conversations and the open dialogue. We all want to make choices that allow us to feel good about our food and the impact it has on our world.

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[8]Genetic Literacy Project. Gene editing used to produce soybean oil with less trans fats. https://geneticliteracyproject.org/2016/10/20/gene-editing- used-to-produce-soybean-oil-with-less-trans-fats/. Accessed January 2, 2021.

[9]MIT Technology Review. Inside the Mosquito Factory That Could Stop Dengue and Zika. https://www.technologyreview.com/s/600821/inside-the- mosquito-factory-that-could-stop-dengue-and-zika/. Accessed January 2, 2021.

[10]Van Eenennaam, A.L. and Young, A.E. Prevalence and impact of genetically engineered feedstuffs on livestock populations. J. Anim. Sci. 2014. 92(10):4255-4278. https://pubmed.ncbi.nlm.nih.gov/25184846/. Accessed January 2, 2021.

[11]GMO Answers. Genetic Engineering and Animal Feed. https://gmoanswers.com/genetic-engineering-and-animal-feed. Accessed January 2, 2021.

[12]Genetic Literacy Project. Where are GMOs grown and banned? https://gmo.geneticliteracyproject.org/FAQ/where-are-gmos-grown-and-banned. Accessed January 2, 2021.

[13] GMO Answers. Are GMOs Contaminating Organic Food Crops? https://gmoanswers.com/week-5-are-gmos-contaminating-organic-food-crops.Accessed January 2, 2021.

[14]U.S. Farmers & Ranchers Alliance. Agriculture in America Sustainability Report 2017. https://soygrowers.com/wp-content/uploads/2018/05/USFRA-Ag-sustainability-report-2017.pdf. Accessed January 1, 2021.

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