

Tips for Communicating with Impact

(See Chapter 3 for further discussion of these tips.)

1. **Relate as a person, as well as a professional.**
2. **Show empathy for others and that you care about the issue.**
3. **Know your audience and prepare accordingly.**
4. **Be straightforward, clear, and concise.**
5. **Be confident in handling questions.**

"Our AMA recognizes the many potential benefits offered by bioengineered crops and foods, does not support a moratorium on planting bioengineered crops, and encourages ongoing research developments in food biotechnology."

American Medical Association,
Policy on Bioengineered (Genetically Engineered) Crops and Foods, 2012.

"There is no evidence at all that the current GE foods pose any risk to humans. The food-safety tests conducted by GE seed producers and others ... have not found any evidence of harm, including allergic reactions."

Greg Jaffe, *Center for Science in the Public Interest. Report: "Straight Talk on Genetically Engineered Foods: Answers to Frequently Asked Questions," April 2012.*

use to provide a food supply that is safe, affordable, plentiful, flavorful, nutritious, convenient, and sustainable.

- Check the IFIC Foundation website, www.foodinsight.org/foodbioguide.aspx, often for updates regarding research, regulation, product development, and product availability.

Second, the importance of word choice is explored, including consumer-tested food biotechnology **Words to Use and Words to Lose**.



Key Messages

MESSAGE ONE:

>> Food Safety

Foods produced using biotechnology that are currently available are safe for people and our planet, and in some cases the technology may be used to improve safety.

Supporting Talking Points

- Numerous studies conducted over the past three decades have supported the safety of foods produced through biotechnology.¹⁻⁷
- Consumers have been eating biotech foods safely since 1996, with no evidence of harm demonstrated anywhere in the world.⁵
- The U.S. Department of Agriculture (USDA), Food and Drug Administration (FDA), and Environmental Protection Agency (EPA) coordinate regulation and provide guidance on safety testing of agricultural crops and animals produced through biotechnology and the foods derived from them. This ensures the safety of the U.S. food supply. These regulations address impacts on human food, animal feed, and the environment.^{1,4,8}
- International scientific organizations, such as the World Health Organization (WHO) and Food and Agriculture Organization (FAO) of the United Nations, have evaluated evidence regarding the safety and benefits of food biotechnology and they each support the responsible use of biotechnology for its current and future positive impacts on addressing food insecurity, malnutrition, and sustainability.^{7,9}

- Foods developed through biotechnology have been studied extensively and judged safe by a broad range of regulatory agencies, scientists, health professionals, and other experts in the U.S. and around the world.^{1-5,7,8}
- Trusted health organizations such as the American Medical Association have endorsed the responsible use of biotechnology to enhance food production.^{2,7,9}
- Consuming foods produced through biotechnology is safe for children and women who are pregnant or nursing.¹
- For those with food allergies, the use of biotechnology itself will not increase the potential for a food to cause an allergic reaction or a new food allergy.¹ The food label is the best guide for consumers to avoid ingredients to which they are allergic.
 - o During FDA's extensive review of a new food product developed using biotechnology, if one or more of the eight major food allergens (milk, eggs, wheat, fish, shellfish, tree nuts, soy, or peanuts) were introduced, testing for the potential to cause allergic reactions is required.¹
 - o The FDA requires special labeling of any food, whether produced through biotechnology or not, if a protein from one or more of the major food allergens is present.¹
- Animal biotechnology is a safe technique for producing meat, milk, and eggs.
 - o *Background:* Animal biotechnology includes a number of advanced breeding practices, such as genetic engineering and cloning, as well as use of products such as the protein hormone recombinant bovine somatotropin (rbST) given to dairy cows.
 - o Food from genetically engineered animals is not currently marketed in the U.S. When new food products from animals bred using genetic engineering are proposed, federal regulators have a process in place to evaluate their safety on a case by case basis.^{10,11}
 - o The FDA has concluded that the use of cloning in breeding cows, goats, and pigs is a safe agricultural practice, and the meat and milk from these animals is the same as from other animals.^{12,13}
 - o The safety of milk and other dairy products from cows given rbST has been established and reinforced through decades of research.¹⁴
 - o Animal feed containing biotech crops is the same as feed derived from conventionally-grown crops, just as meat, milk, and eggs are the same, whether the animal is fed biotech or conventional feed.¹



- Biotechnology can help improve the safety of food by minimizing naturally occurring toxins and allergens in certain foods.
 - o Through biotechnology, scientists have developed a potato that produces less acrylamide when heated or cooked. This product is currently under review by U.S. regulatory authorities.¹⁵
 - o Low-lactose milk is now produced more efficiently with biotechnology-derived enzymes, an important benefit for people who suffer from lactose intolerance or sensitivity.¹⁶
 - o In the future, scientists may be able to remove proteins that cause allergic reactions to foods such as soy, milk, and peanuts, making the food supply safer for allergic individuals.¹⁷⁻¹⁹
- According to a 2012 IFIC Survey, the majority (69%) of U.S. consumers are confident about the safety of the U.S. food supply.²⁰
 - o When consumers share their food safety concerns, biotechnology is not a common response—only 2% of consumers mention any concern about biotechnology. In contrast, nearly one-third are concerned about foodborne illness and contamination (29%) and nearly one-quarter are concerned about poor food handling and preparation (21%).²⁰
 - o While about half (53%) of consumers are avoiding certain foods or ingredients, none report avoiding foods produced through biotechnology.²⁰



"I think it's all fascinating. There's no one-minute answer. The technology's here. If they can give us a better tomato, I'm for it."

Julia Child, *Toronto Star*,
October 27, 1999.

"For thousands of years we've been breeding plants ... so that we can have fruits and vegetables that are safe and healthy. We're now using the latest generation of biotechnology to ... make them even safer."

Ronald Kleinman, MD, *Physician in Chief, Massachusetts General Hospital for Children*, 2012.

MESSAGE TWO:

>> Consumer Benefits

Food biotechnology is being used to improve nutrition, enhance food safety and quality, and protect food crops and animals from diseases that would otherwise threaten our stable, affordable, and wholesome food supply.

Supporting Talking Points

- Improved crop disease protection through biotechnology provides a more reliable harvest, which keeps food consistently available and affordable for all consumers.²¹⁻²⁵
 - o The natural defenses of plants can be enhanced by biotechnology, resulting in hardier plants and increased yields. Examples include papaya protected from papaya ringspot virus (on the market today), as well as plums protected from plum pox virus and beans protected from bean golden mosaic virus (both currently under regulatory review).²⁶⁻²⁹
 - o Corn protected against insects is also protected against mold,
- which can otherwise grow in the holes created by plant pests and produce toxins that threaten food safety. Therefore, research with other crops, such as rice and sugar cane, is underway to provide this benefit across the food supply.^{24,30}
 - o In the 1990's, the Hawaiian papaya crop was nearly devastated by papaya ringspot virus, which would have eliminated the only U.S. supply of the fruit. While other approaches to controlling the virus failed, biotechnology saved the crop and Hawaii's papaya industry with the development of virus resistant papaya.³¹
- Through advanced breeding, scientists have developed foods and ingredients containing a higher proportion of healthful fats that can help to support heart, brain, and immune health. Other foods and ingredients are being developed.
 - o Advanced breeding and modern food production have been used to develop canola, soybean, and sunflower oils that do not produce trans fats.³²⁻³⁶

- o Soybean and canola oils are being developed with biotechnology to provide the specific omega-3 fats that are most protective for heart health. Existing soybean and canola are already high in omega-3 fats—these advancements are intended to provide additional heart-healthy options from plant-based foods.^{33,35-37}
- o Researchers have successfully bred both pigs and cows through cloning and genetic engineering to produce higher levels of omega-3 fats in the meat. If made available, consumers would have additional options for boosting levels of these healthful dietary fats.^{38,39}
- o According to a 2012 IFIC survey, the majority of consumers would likely purchase foods enhanced through biotechnology to provide better nutrition (69%), more healthful fats (71%), and less saturated fat (68%).²⁰
- Biotechnology is being used to improve nutrition in a variety of foods for the purpose of addressing serious malnutrition around the globe.⁴⁰ (See Feeding the World Message on page 10)
- Above all else, consumers want food that tastes good, and biotechnology research is underway to develop foods that taste better and remain fresh for longer periods of time.
 - o Scientists have developed tomatoes, melons, and papaya through biotechnology that ripen at the right time to deliver a fresh product with better flavor to consumers (not available in stores today).^{16,41}
 - o Researchers have developed apples and potatoes that keep their original color longer after slicing or rough handling (they don't bruise as easily), and stay crisp longer than their traditional counterparts. The gene that is responsible for browning is simply turned off, or "silenced" in these foods, making them more appealing to both suppliers and consumers.^{6,42} The apple is currently under review by USDA.
 - o According to a 2012 IFIC survey, a majority of consumers (69%) say they would buy foods enhanced through biotechnology to taste better.²⁰

"The application of modern biotechnology to food production presents new opportunities and challenges for human health and development ... improved quality and nutritional and processing characteristics, which can contribute directly to enhancing human health and development.

Department of Food Safety, World Health Organization, 2005.



"Advances in the genetic engineering of plants have provided enormous benefits to American farmers."

Barack Obama, *United States Presidential Candidate. Science Debate 2008.*



MESSAGE THREE:**>> Sustainability****Biotechnology supports the social, economic, and environmental sustainability of agriculture.***Supporting Talking Points*

- Biotechnology contributes to the environmental sustainability of agriculture by improving the safe and effective use of pesticides, reducing the amount of insecticide used on crops, reducing greenhouse gas emissions, preserving and improving soil quality, and reducing crop losses both in the field and after harvest.^{21,25,43-48}
- Biotechnology and other precision agricultural technologies (e.g., conservation tillage, integrated pest management [IPM], and automated farming equipment systems using computerized GPS [global positioning system] technology) help to increase the amount of food that can be harvested per acre of land or per animal, reducing the need to use more and more land to feed a growing population.



- o Herbicide-tolerant crops allow farmers to control weeds better, which allows crops to thrive.²¹
- o With insect-protected crops, farmers are able to harvest more healthy, damage-free crops per acre.⁴³
- o With the use of rbST and proper management, five cows can produce the same amount of milk that once took six cows, resulting in less feed used and less methane gas (a greenhouse gas) produced by dairy herds.⁴⁹
- o Biotechnology has played an important role in the reduction and more precise use of pesticides, and allowing for use of more environmentally friendly herbicides.^{44,45}
- o From 1996-2011, biotech crops have collectively reduced global pesticide applications by 1.04 billion pounds of the active ingredient.⁵⁰
- o Bacillus thuringiensis (Bt) crops are developed to target only the insects that eat those crops, rather than honey bees or natural predators of the crop pests, which is good for the ecosystem.⁴⁶
- o Because farmers can spray insecticide less often with Bt crops, farmers are protected from accidental poisoning.^{51,52}
- o Thanks to widespread planting of Bt corn, European Corn Borer (a major pest for corn crops) has been suppressed so effectively that the pest is no longer a threat, even to non-Bt corn in nearby fields.⁵³
- o With the adoption of herbicide-tolerant crops, farmers have more choices in sustainable weed management, and can select herbicides that break down more rapidly and therefore have less impact on the environment than older herbicides.²¹
- o Since crops were first domesticated centuries ago, insects, weeds, and plant diseases have adapted to farmers' efforts to manage them, whether crops are grown with organic, conventional, or biotechnology methods. New types of herbicide-tolerant corn and soy have been developed that help address ongoing challenges with herbicide resistance of certain weeds.⁵⁴
- Biotechnology and good agricultural practices improve soil quality and reduce pollution by allowing farmers to till (or mechanically work the soil) less often or not at all.^{25,48}
 - o *Background Point:* Tilling the soil, done in preparation for planting and for weed control, can cause top soil to blow away or harden. Hard soil does not

absorb water well, which causes sediment, fertilizer, and chemicals to run into ground water. Excessive tillage is also less suitable for growing healthy crops and reduces the ability of the land to support beneficial insects and microorganisms living in the soil.²⁵

- o Conservation tillage, which reduces the amount of soil disturbance, has been widely adopted, with 63% of all U.S. farmland being treated with this technique.^{25,47,48,55}
- o As of 2009, two-thirds (65%) of soybeans were being grown using conservation tillage, resulting in a 93% decline in soil erosion, and preserving an estimated 1 billion tons of top soil.⁴⁷
- o A practice known as “no-till farming”, which eliminates soil tillage, has increased 35% since the introduction of biotechnology. It is more easily adopted with herbicide-tolerant crops because they eliminate or greatly reduce the need to till for weed control.
- o Since the introduction of herbicide-tolerant soybeans, the percentage of U.S. soybean fields that were not tilled at all rose from 27 to 39%.²⁵
- o Thanks to the ability to apply pesticides less often with biotech crops, farmers do not have to drive their tractors over their fields as often, therefore avoiding packing and hardening of the soil.²⁵
- o Increased crop yields from biotechnology reduce the need to plant on land less suited for agriculture (e.g., hilly vs. flat land).



This land, as well as forests, can continue to serve as wildlife habitats.

- Biotechnology reduces agriculture’s “carbon footprint,” with less carbon released into the air and more carbon retained in the soil.
 - o Improved weed control with herbicide-tolerant crops allows farmers to leave residue from harvested crops on the ground, trapping carbon in the soil.⁴⁷
 - o Carbon emissions from fuel use are lower on farms that use biotechnology, as the ability to apply pesticides and till less often means that farmers do not have to drive their tractors over their fields as often. In 2011, resulting carbon dioxide reductions were estimated to be 4.19 billion pounds, equivalent to taking 800,000 cars off of the road.^{25,47,50}
 - o The adoption of both no-till and conservation tillage, supported by biotechnology, has prevented 46.5 billion pounds of carbon dioxide from being released from the soil into the atmosphere. That’s like taking 9.4 million cars off of the road.⁵⁰

“New science and technology, including the tools of biotechnology, will be needed to develop crops better able to withstand climatic stresses such as drought, heat and flooding. Such research will also contribute to helping the world prepare for future production effects anticipated from global warming.”

Norman Borlaug, plant scientist and Nobel Peace Prize winner. *Wall Street Journal*, 2007.



“We believe that biotechnology has a critical role to play in increasing agricultural productivity, particularly in light of climate change. We also believe it can help to improve the nutritional value of staple foods.”

Hillary Rodham Clinton, 67th U.S. Secretary of State and former Senator of New York. *World Food Day Conference Call*, October 16, 2009.

- Biotechnology and modern farming practices strengthen the economic sustainability of family farms in the U.S. and around the globe, regardless of the size of the farm.²¹
 - o Biotechnology allows for reduced farming costs, including labor, pesticides, fuel, and fertilizers. It also results in fewer crops lost to disease; fewer harvested foods lost to contamination during transportation and storage; and greater farm income through higher yields and disease free crops.²¹
 - o Farmers in developing countries have benefited economically from biotechnology through lower production costs and a more reliable harvest.⁴³
- Agricultural biotechnology efforts in developing nations are being pursued with the guidance of and in cooperation with the local communities to ensure a positive social impact.^{52,56-59}
 - o Food security (or regular access to food) is essential to a nation's overall stability. It has been suggested that increased food security, in part through the use of biotechnology, could help increase school attendance (because fewer children are needed to work on the farm and are being encouraged to attend school), leading to improvements in a country's overall infrastructure and stability.⁵²
 - o Projects such as Water Efficient Maize for Africa (WEMA) and Africa Biosorghum Project are examples of biotechnology projects led by and addressing the needs of resource-poor farmers and families in developing nations.^{58,60}

MESSAGE FOUR:

>> Feeding the World

Biotechnology has a role to play in ensuring that safe and abundant food can be produced on existing farm land to meet the increasing needs of the world's growing population.

Supporting Talking Points

- Biotechnology allows farmers to harvest more food using available farm land, vital for feeding a growing world population.
 - o The world population is expected to increase to 9 billion people by the year 2050, creating global food needs that will necessitate an increase in food production of 70%.^{61,62} It is important to use existing farm land and water more efficiently, while saving other land for wildlife.⁶³
 - o From 1996 to 2010, biotechnology led to the addition of 97.5 million more tons of soybeans and 159.4 million more tons of corn to the harvest, an increase that was needed to meet global food demands.²¹
- o Biotechnology has already been shown to increase yields by reducing crop loss to pests through the use of herbicide-tolerant and insect-protected crops.⁶²
- o Increasing yields of staple food crops in developing nations is critical to ensure that the most disadvantaged people around the world have greater access to food.^{18,63}
- Biotechnology has the potential to strengthen crops against extreme temperatures, drought, and poor soil conditions. These advancements are critical in developing nations, where crop losses can mean health and economic devastation.
 - o Research is being conducted to develop corn, wheat, and rice that can withstand changes in growing conditions brought about by climate change, aiming to protect the food supply against related declines in production and availability.¹⁸
 - o One-fifth of the world's population struggles with water scarcity and another one-fourth do not have the infrastructure to transport water to where it is





- needed.⁶⁴ Agriculture currently accounts for 70% of total global fresh water usage.⁶⁵ Biotechnology is being used to develop drought-tolerant soybeans, corn, and rice, which could improve food production, even when water is scarce.⁶⁶
- o 25 million acres of farmland have been lost to high salinity (salt content) conditions resulting from poor irrigation. Biotechnology is being employed in the development of salt-tolerant crops, which would thrive in salty soils.^{66,67}
 - Biotechnology scientists are seeking ways to fortify staple food crops (foods that contribute significantly to a community's intake) with key nutrients in order to improve overall public health.¹⁹
 - o *Background:* The WHO reports that 190 million pre-school children and 19 million young pregnant women have vitamin A deficiency (VAD). The incidence is highest in Asia, with more than one-third (33.5%) of all pre-school children having VAD.⁵⁹
 - o To address the issue of crippling blindness and death from severe VAD, two types of "Golden Rice" and a type of corn genetically engineered to provide more beta-carotene (which the body uses to make vitamin A) are in development.^{40,55,68} Golden Rice is expected to be approved in the Philippines by 2014. It is also currently under review in China, Vietnam, and Bangladesh.⁵⁰
 - o The Africa Biofortified Sorghum Project is working to nutritionally improve sorghum, one of Africa's most important staple crops, to address severe malnutrition. Conventional sorghum contains no vitamin A, and the minimal amounts of iron and zinc it does contain are poorly absorbed. Sorghum also has poorer protein quality than other grains. Through genetic engineering and other advanced breeding techniques, progress has been made towards increasing sorghum's vitamin A, iron, and zinc content, improving protein quality, and improving availability of nutrients to the body.⁵⁸



"We can help poor farmers sustainably increase their productivity so they can feed themselves and their families. By doing so, they will contribute to global food security."

Bill Gates, co-founder, *The Bill & Melinda Gates Foundation*. 2012 Annual Letter, January 2012.