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American Opinions of GM Food: Awareness, Knowledge, and Implications for Education

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Agricultural biotechnology is a controversial science that typically involves removing the genes from one plant or animal and inserting them into the genes of another plant or animal to exploit beneficial characteristics of the donor organism (like pest resistance or increased productivity). Genetically modified crops have been adopted at an extraordinary rate over the past decade, and this proliferation of transgenic science, particularly genetically modified (GM) food, continues to rouse apprehension among many consumers around the globe. Public policy toward GM food tends to reflect consumer sentiment and those countries with strict regulation or bans tend to have constituencies that are against the adoption of such products. Where disputes over commodity trading are concerned, it is difficult to name an issue that has created a deeper international schism.

The United States is a powerhouse of GM productivity. The United States is the largest producer of food biotechnology products, harvesting about two-thirds (63%) of the world's GM crops. Most of the soy, canola, and cotton, and almost half of the corn produced in the United States and Canada consist of GM varieties (Pew, 2003a). Because these crops are the source of some of the most common ingredients used by American food processors (such as corn syrup, soy protein, canola, and cottonseed oil), and because GM varieties are often mixed with ordinary varieties during shipping, processing, and storage, most estimates suggest that between 60% and 70% of processed foods on American shelves contain ingredients derived at least in part from GM crops (GEO-PIE, 2003).

The American public, however, is unaware that we use these products every day. Funded by the United States Department of Agriculture (USDA) under its Initiative for Future Agriculture and Food Systems program, Rutgers University's Food Policy Institute conducted three public opinion surveys (Hallman, Adelaja, Schilling, & Lang, 2002; Hallman, Hebden, Aquino, Cuite, & Lang, 2003; Hallman, Hebden, Cuite, Aquino, & Lang, 2004) that found Americans are generally uninformed about GM food and largely unaware of its presence in the food system and their own diets. This did not prevent them from offering opinions and thoughts about the technology, however, and this article discusses several of these findings. Sampling methodology, sample sizes, and survey instruments for all three surveys can be found at www.foodpolicyinstitute.org.

Knowledge and Awareness

About three-quarters of Americans are indeed aware that methods of modifying genes exist (not necessarily in food). About half of Americans say they have heard or read some or a great deal about GM foods, but the majority of Americans have never had a discussion about it, suggesting that is a topic about which, most people are ill-equipped to converse.

While the American public may possess a rudimentary notion that the technology exists and a vague recollection that it has indeed been used in food, they are largely unaware of the prevalence of GM ingredients in everyday food products. Fewer than half of the respondents in the latest Food Policy Institute (Hallman et al., 2004) study realized that foods containing GM ingredients are available in supermarkets and fewer than one in three believed they had personally consumed GM foods. Though it is technically possible for one to have avoided eating GM foods, this would entail a level of specialized knowledge that the average consumer is unlikely to possess; Americans are eating GM foods in massive quantity without knowing it. There is evidence, however, that awareness has been slowly and steadily increasing since 2001, and despite their lack of awareness, U.S. consumers do seem to have a

vague understanding of how long these products have been available.

Those who were aware that some products in supermarkets contain GM ingredients (fewer than half of the sample) were confused as to which products are actually available. While the majority appropriately recognized the availability of either GM corn or GM soy products and a little more than half correctly acknowledged that both are currently on the market, many respondents incorrectly reported that GM rice or GM chicken are currently available.

Most striking was the widespread belief in the availability of GM tomatoes.

Though tomatoes were the GM food product most often identified by respondents as being available in the marketplace, no GM tomatoes are currently for sale in the United States.

It is quite possible that these respondents were exhibiting an indistinct recollection for the highly visible Flavr Savr tomato that was extensively marketed by Calgene and covered widely by the news media before being removed from the shelves in 1997 due to production and transportation problems (Martineau, 2001). Indeed, when respondents participated in a word association exercise in the 2003 study, tomatoes were often mentioned as one of the first thoughts or images they associated with the terms "genetic engineering" and "genetic modification."

It is clear from these studies that Americans are generally uninformed about the GM foods they consume every day, and most have only a vague understanding of the presence of GM products in the food system. This data paints a picture of a consumer who has heard of genetic modification in some form, understands that it may be used in foods, but has no clue as to how, where, why, or in what products they might find genetically modified material.

In addition, Americans do not appear to possess the tools needed to completely understand and evaluate the technology or its products. To assess consumer knowledge, respondents were asked to evaluate a series of true/false statements designed to gauge their comprehension of the basic scientific concepts underlying the science. These included such statements as "There are bacteria that live on wastewater," and "By eating a genetically modified food a person's genes could also become modified." In the most recent FPI study (Hallman et al., 2004) study, less than 50% of respondents could provide a correct answer to more than half of these questions, and nine out of ten "failed" the quiz (less than 70% correct answers). However, Americans do not overestimate their knowledge. The majority readily admit to knowing little or nothing at all about the science.

Media accounts of GM food do not appear to have had substantial impacts on American consumers. Only about one in five Americans can remember reading or seeing a news story about GM food and less than 1% could recall specific details about a story. When asked directly about seven stories that had been circulated in the media to some extent over the past decade, such as the Starlink corn incident (Kalaitzandonakes, Marks, & Vickner, 2004), none seemed to have caught the attention of many American consumers.

Americans also know little about the laws and regulations dealing with GM food. While most Americans understand which government bodies are responsible for regulating these products (FDA, USDA, EPA), only about a third knew that GM foods are not required to be labeled, and three out of four did not know these products were tested for human and environmental safety.

Opinions

Considering that American consumers know little about the science, laws, prevalence, or events surrounding GM food, it is no surprise that they also have uncrystallized and highly malleable opinions about the technology.

Although over the past three years American opinions toward plant-based GM food products seem split between the roughly half who approve, roughly two in five who disapprove, and the one in ten who have no opinion, the Food Policy Institute's study (Hallman et al., 2003) showed that consumers can easily be persuaded to change their opinions when presented with new information about benefits and risks. For example, many of those who said they are strongly opposed to the technology said they would buy GM food products if it reduced pesticide use (the most common application of the science).

Previous studies (Hossain & Onyango, 2004; Macnaghten, 2004; Pew, 2003b), as well as all three Food Policy Institute studies (Hallman et al., 2002; Hallman et al., 2003; Hebden et al., 2004) showed that Americans are far less approving of the use of genetic modification techniques that involve animals, though it should be noted that animal-based applications are not currently in use other than in an experimental context.

A Need for Education

Both proponents and opponents of the technology believe that there is a

need to educate consumers about GM food, and the good news is that Americans claim to be a receptive audience.

When asked to rate their interest in several hypothetical television shows related to GM food, Americans replied enthusiastically. These included such topics as "who regulates and monitors GM food," "how GM food might affect the environment," "whether GM food will affect world hunger," "the potential benefits of eating GM food on personal and family health," "which foods or brands of food contain GM ingredients," "whether genetic modification affects the cost of food for consumers," and "whether GM food affects the farmers' cost of producing food," among others. All of these topics received high ratings of interest from American consumers, particularly those topics related to human health. Respondents claimed to be most interested in whether there is a potential for GM foods to harm humans and whether anyone has ever fallen ill from eating it.

While American consumers are potentially receptive to passively watching television shows about these topics, most have never actively sought information about these issues. Nine out of ten respondents said they had never looked for information about GM food, suggesting that the remainder of those who said they had heard or read something about it (about one in five) probably did so as a result of their habitual media consumption. When asked where they might go for information, if they desired it, most respondents said they would search the Internet for information, while one in ten respondents said they would go to the library for information.

These results suggest that outreach via the Internet, where the majority of discourse about GM food seems to be contained, has missed the average American consumer. The nature of the Internet is such that one must actively search for information to find it, and American consumers typically have not searched for such information. Successful outreach therefore, must also be targeted at media such as television and newspapers where the information can be regularly digested within the context of consumers' normal media consumption.

In sum, Americans are unaware of the presence of GM foods in their lives and diets and uninformed about the science, regulation, and events surrounding it. Americans have not yet made up their minds about GM food largely because they have not yet thought about the issue. This doesn't mean that Americans lack opinions about the issues, or that they are unwilling to express them. However, as a whole, American opinions about the technology are weakly held, poorly formed, and highly malleable. Americans say they are highly interested in the topic of GM food, but to date it doesn't appear to have been a very high priority for most consumers. Few have actively sought information about it, and few have talked with anyone about the issues. As such, efforts to educate about GM foods are most likely to reach an uninformed and easily influenced audience: the American food consumer.

For More Information

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