

Testimony of David R. Just, Ph.D. *

before the

**U.S. House of Representatives
Committee on Agriculture
Subcommittee on Horticulture, Research, Biotechnology, and Foreign Agriculture**

Hearing on The Societal Benefits of Agricultural Biotechnology

July 9, 2014

I thank the Subcommittee for the invitation to testify regarding consumer perceptions and benefits of biotechnology, and commend you for giving your attention to this topic. I am David Just, Professor of Applied Economics and Management the Charles H. Dyson School of Applied Economics and Management at Cornell University and Co-Director of the Cornell Center for Behavioral Economics in Child Nutrition. For the past 16 years I have conducted research in the field of agricultural and food economics. I have published dozens of studies examining how consumers respond to the presentation of food including health claims. My work consists of direct studies of consumer responses to various food choices and the impact of food and agricultural policy on production and trade practices. I have conducted dozens of field experiments examining consumer choice and response to product descriptions. I have published a half dozen studies directly examining issues related to genetically modified organisms (GMOs), looking at both consumer attitudes toward GMOs and farmer responses to GMOs.

In general, we find a large and growing number of consumers who stigmatize GMOs. This stigma has long been a factor in Europe, and we see the same pattern emerging in the US. In consumer studies, we find that people tend to lump food that is labeled as having been genetically engineered together with categories of foods such as those that contain chemical preservatives or other ingredients with long names that sound overly technical, or foods that are highly processed and factory produced.¹ For example, one prominent study finds that consumers are generally willing to pay about 14% less for GMOs than similar products that are not GMOs.² Consumers tend to associate GMOs primarily with some unquantifiable health risk, similar to that posed by untested or poorly tested drugs or

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medication, though they also express some more minor concerns about environmental impacts. Moreover, consumers tend to consider GMOs as a monolithic technology with a single set of characteristics, rather than the thousands of differentiated modifications that now appear in the market. This misperception allows consumers to perceive GMOs in caricature, with each being equally risky and none possessing any particular benefits. Generally, when consumers consider GMOs, they tend to regard them in comparison to some hypothetical alternative food that is pristine and presents no perceived health risk. In essence, they consider it a question of GMO versus an ideal food.³ In reality, the non-GMO alternative generally presents a greater and quantifiable health risk. GMOs are often introduced specifically to eliminate the use of pesticides or other chemical treatments that can present a health risk. This is the case with Bt corn, one of the products consumers are most likely to encounter.

Consumers have developed misperceptions regarding the benefits of biotechnology in part because the industry does not explain those benefits to them. Industry has focused understandably on marketing the benefits of growing these crops to farmers, leaving consumers with a latent understanding of why genetic modifications are introduced into the food supply to begin with. Because consumers do not actively consider why these modifications have been introduced, they tend to ignore the health, cost, nutrition or other benefits of these foods. When given the choice between conventional foods and GMOs, consumers express a strong preference for conventional foods.⁴ However, my research has shown that when the same choice is presented in such a way that consumers can understand the reasons for genetic modification, they overwhelmingly choose GMOs. For example, consumers would rather buy poultry that has been genetically modified to resist diseases than chicken that has been fed antibiotics to accomplish the same purpose. In fact, almost 85% prefer genetic modification in this case. This preference is even stronger for those with a college education, in which case more than 90% would select the genetic modification.⁵ Supporting studies by other researchers find that consumers are enthusiastic about GMOs that have been introduced in order to enhance nutrition, safety or health, but a little more skeptical of those introduced primarily to address agricultural productivity.⁶ When consumers are presented with direct explanations of the direct benefits to consumers, they are much more willing to accept the technology.⁷

Consumers have also failed to grasp the benefits of biotechnology to society as a whole. GMOs have been instrumental in increasing agricultural productivity. This technology has reduced the price of commodities by 4% to 10%—a fact that is not understood by the typical consumer.⁸ Due to the labor, transportation and regulatory costs of food production in the US, the impact of this basic commodity price effect is much smaller at the highly processed retail level of most American food. However, this has had an important direct impact on consumers in the developing world. Given our era of historically high crop

prices, this technology is essential to providing low cost food, particularly in developing countries. Additionally, some of the most successful introductions of GMOs have occurred in developing countries, as these new technologies hold the promise to overcome generations of relatively low agricultural yields and high levels of disease. For example, genetically modified eggplant in India is helping to reduce pesticide use and to increase the yields of relatively poor farmers. Pesticide use has a known and measurable impact on the health and longevity of farmers. Genetically modified corn in Africa has helped reduce the prevalence of Mycotoxin Fumonisin in maize,⁹ which has been linked to esophageal cancer and birth defects. This new technology promises to make developing country agriculture competitive with the west, and to help reduce poverty worldwide. Developing countries have paid a very high price for consumer rejection of biotechnology in the European Union, forcing them to choose between sustainable productivity and access to markets.¹⁰ Poor nations will face a further dwindling of fortunes if we fail to convince U.S. consumers of the benefits.

Many of the consumers in the US who are most sensitive to GMO consumption are also those who list concern for developing countries among their highest priorities. Unfortunately, these consumers often look on developing country adoption of GMOs as evidence of large US corporations exploiting the poor. These corporations—despite wonderful cooperative efforts in developing countries—have failed to use their own goodwill efforts to connect with concerned constituencies in the US or Europe. If we are to turn the tide of irrational consumer fears regarding biotechnology, firms that produce GMOs must make a concerted effort to communicate both the direct health benefits to US consumers from reduced use of chemicals in food production, and the indirect benefits to developing country consumers of more abundant and lower-cost food. This effort will necessarily differentiate the various reasons for modification and should focus on branding the individual modifications rather than the entire technology. It is easy to stigmatize genetic modification as a benefit only to large agribusinesses, but it is difficult to stigmatize corn that is reducing the incidence of blindness in sub-Saharan Africa.

Again, I would like to thank the Subcommittee for inviting me to testify. I would be pleased to answer any questions you may have.

¹ Wansink, B. A. Tal and A. Brumberg. "Ingredient Based Food Fears and Avoidance: Antecedents and Antidotes." *Food Quality and Preference* 38(2014):40-48.

² Huffman, W.E., J.F. Shogren, M. Rousu and A. Tegene. "Consumer Willingness to Pay for Genetically Modified Food Labels in a Market with Diverse Information: Evidence from Experimental Auctions." *Journal of Agricultural and Resource Economics* 28(2003): 481-502.

³ Heiman, A., D.R. Just and D. Zilberman. "The Role of Socioeconomic Factors and Lifestyle Variables in Attitudes and the Demand for Genetically Modified Foods." *Journal of Agribusiness* 18(2000): 249-260.

⁴ Lusk, J.L., M. Jamal, L. Kurlander, M. Roucan and L. Taulman. "A Meta-Analysis of Genetically Modified Food Valuation Studies." *Journal of Agricultural and Resource Economics* 30(2005):28-44.

⁵ Heiman, A., D.R. Just and D. Zilberman. "The Role of Socioeconomic Factors and Lifestyle Variables in Attitudes and the Demand for Genetically Modified Foods." *Journal of Agribusiness* 18(2000): 249-260.

⁶ Hossain, F. and B. Onyango. "Product Attributes and Consumer Acceptance of Nutritionally Enhanced Genetically Modified Foods." *International Journal of Consumer Studies* 28(2004):255-267.

⁷ Wansink, B. A. Tal and A. Brumberg. "Ingredient Based Food Fears and Avoidance: Antecedents and Antidotes." *Food Quality and Preference* 38(2014):40-48.

⁸ Brookes, G., T-H. Yu, S. Tokgoz, A. Elobeid. "The Production and Price Impact of Biotech Crops." Center for Agricultural and Rural Development Working Paper, Iowa State University, January 2010.

⁹ Pray, C., J. Rheeder, M. Gouse, Y. Volkwyn, L. v.d. Westhuizen and G.S. Shephard. "Can Bt Maize Reduce Exposure to the Mycotoxin Fuminisin in South Africa?" Presented at the International Association of Agricultural Economists', Beijing China, 2009.

¹⁰ Evenson, R. E., "Status of Agricultural Biotechnology: An International Perspective." In Just, R.E., J. M. Alston and D. Zilberman (eds.), *Regulating Agricultural Biotechnology: Economics and Policy*. Springer: New York, 2006, pp. 103-123.