

## **PUBLIC PERCEPTIONS AND UNDERSTANDING OF AGRICULTURAL BIOTECHNOLOGY**

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*Consumer perceptions and understanding of agricultural biotechnology have been strongly influenced by the type of information provided by the media, confidence in governmental safeguards, and cultural preferences, says Thomas J. Hoban. However, research indicates that consumers from different parts of the world have very different perceptions and understanding of agricultural biotechnology. In this article, Hoban, who has studied this issue for the past decade, discusses consumer perceptions about biotechnology in food production and provides guidelines for meeting consumer information needs.*

The first agricultural products of biotechnology have reached world markets. These products have received a frosty response in some parts of the world. But despite some recent sensational headlines in the press, North American markets have so far remained calm as foods containing ingredients developed through biotechnology have started arriving in stores. It is clear from a review of consumer surveys conducted in the United States, Japan, and Europe that consumer perceptions about biotech foods are strongly influenced by type of information, confidence in government, and cultural preferences.

### **VARYING VIEWPOINTS**

In general, consumers worldwide see considerable value in human genetic testing, the development of new medicines to combat disease, and the use of biotechnology to develop new types of insect-resistant crop plants. Consumers are less likely to accept the use of biotechnology with animals (even to enhance human health), and they appear less accepting of food products developed through biotechnology, compared to crop plants, which some consumers don't even directly connect with food. The most acceptable applications are those that offer a clear consumer benefit, as well as those that are perceived to be ethical and safe.

However, public attitudes about agricultural biotechnology vary considerably among countries. Consumers from Canada, Finland, Italy, Japan, the Netherlands, Portugal, and the United States are more positive about biotechnology than most other countries. Support for biotechnology is much lower in Austria, Denmark, Germany, and Sweden.

Two countries -- the United Kingdom and France -- used to be quite positive toward biotechnology but have become more hostile in the past year or so. The United Kingdom has become more negative for a number of reasons, including fallout from mad cow disease, anti-biotechnology comments made by Prince Charles, food retailer panic, and an effective network of activist groups. France has become more negative partly due to French farmers' opposition to American grain imports and a broader French cultural opposition to what they see as the

globalization (that is, Americanization) of the food supply.

Surveys in the United States (as recently as the spring of 1999) have consistently shown that between two-thirds and three-quarters of American consumers are positive about biotechnology, and about three-quarters have consistently expressed a willingness to buy insect-protected produce developed through biotechnology. One of the reasons cited for this willingness is that these products require fewer chemical pesticides. Support is highest among men and people with more formal education.

This is not to say that consumers don't have questions. Consumer groups have raised a number of concerns about agricultural biotechnology, particularly that it might somehow involve long-term or unexpected effects. Environmentalists often focus on possible ecological impacts from the use of biotechnology. While these raise important questions, they are not usually on the top of an average consumer's mind. Furthermore, consumers usually associate ethical issues with human or animal genetics, rather than with plants.

### **AN INFORMED PUBLIC?**

Surveys indicate fairly high awareness of biotechnology in Austria, Denmark, Luxembourg, and Sweden. But these are exceptions. In the United States, surveys since 1992 show that only about one-third of U.S. consumers have heard or read much about biotechnology -- except for a brief period in 1997, when increased media attention on the cloning of a sheep raised awareness to almost 50 percent. Only about one-third of Japanese consumers reported much awareness of biotechnology in 1995 or 1998. Awareness in France and the United Kingdom (as measured a couple years ago) was comparable to that in the United States, but it has risen for reasons discussed earlier.

Most people get their information on biotechnology from media coverage. If the media do not cover a particular story, the public tends to ignore that issue. The tone of information in the media has an important impact on consumer perceptions. Up until now, media coverage in the United States has tended to be positive and balanced (which helps account for the relatively high levels of acceptance of biotechnology).

This is a sharp contrast to the media coverage in the European Union. In fact, media coverage in the United Kingdom has taken on the characteristics of sensational tabloid journalism. The British media tend to rely on the use of emotional terms such as "Frankenfood." They also have been quick to jump on any negative allegations even when scientific consensus refutes the charge (as was the case with a controversy over the safety of insect-protected potatoes). That accounts for some of the negative consumer and food industry response in the United Kingdom.

Contributing to misinformation on biotechnology is the low knowledge in most countries of basic agricultural and biological sciences. This lack of understanding generates concern, especially when coupled with negative media coverage. There also appears to be a lack of understanding about traditional plant breeding. Countries with the highest levels of knowledge are Canada, the Netherlands, Sweden, and the United States. Countries with the least knowledge include Austria, Greece, Ireland, Portugal, and Spain. Survey results show that providing factual information increases consumer acceptance (at least in the United States, Canada, and Japan).

However, surveys also show that the source of the information may be an important factor in consumer preferences, and that a source trusted in one country is discredited in another. North

American consumers have the most trust in independent health and scientific experts. In particular, acceptance increases significantly when American consumers learn that groups such as the American Medical Association, the U.S. Food and Drug Administration (FDA), and others have determined that the foods from biotechnology are safe. Japanese consumers also report high levels of trust in third-party scientific information sources. On the other hand, European consumers express the most trust in consumer and environmental groups. Their trust in government and industry is much lower than in North America.

### **LABELING FOR WHOM?**

The most challenging issues surrounding agricultural biotechnology involve labeling. European consumers have generally been encouraged by consumer activists to demand labels identifying foods that have been developed through biotechnology. Several food retailers (especially in the United Kingdom) have tried to exploit the public concern as a marketing tool. Europe has labeling policies in place, but they have not yet been able to establish workable regulations or procedures. They are now grappling with difficult technical issues such as which methods to use to identify traces of biotechnology-derived ingredients. They also are trying to determine what percent of ingredients in processed foods can be derived from biotechnology and still allow the food to qualify as "biotechnology-free."

For the U.S. consumer, the Food and Drug Administration, an agency within the U.S. Department of Health and Human Services, has determined that a food product should be labeled as a product of biotechnology only if it has been changed in a significant way. FDA policy, supported by over 75 percent of U.S. consumers according to two national surveys, ensures product availability while providing consumers with relevant information about food safety and nutritional changes.

Recent focus groups in the United States also have demonstrated that the wording on labels has a significant effect on consumer understanding and acceptance of biotechnology. Many U.S. consumers are already overwhelmed by the level of detail on food labels and do not really want more information that has no scientific justification. Consumers want to know how a product has been changed and whether it has been approved by a government agency. Any label information needs to be simple, relevant, and clear.

The labeling of processed foods presents a number of logistical challenges and costs for everyone involved. For example, U.S. consumers have reported little need to label a bottle of ketchup that includes tomatoes developed through biotechnology in addition to traditionally bred varieties. In fact, most people don't even understand that different varieties of vegetables or fruits are currently blended during processing. In addition, consumers are not willing to pay extra to have foods labeled as a product of biotechnology (especially when this information has no meaning). Consumers want meaningful choices that are truly different. The "organic" market niche already provides a viable opportunity for consumers who do not want to consume foods developed through biotechnology, for whatever reason.

### **WHERE TO FROM HERE?**

Biotechnology is at a crossroads in terms of public acceptance. Actions and statements by industry, government, and scientists over the next year will have a major influence on the long-term viability of the agricultural biotechnology enterprise. Without a major commitment to consumer education and informed choice, opposition will continue to grow. Such efforts must be based upon ongoing research into the knowledge and attitudes held by consumers and opinion leaders.

Different parts of the world clearly require different approaches.

Research results to date suggest that biotechnology should not become a controversial issue for most North American consumers. Most U.S. consumers (as well as others around the world) remain cautiously optimistic about the benefits of biotechnology. They will accept the products if they see a benefit to themselves or society and if the price is right. In fact, we are finding that consumers' responses to foods developed through biotechnology are basically the same as for any other food. Taste, nutrition, price, safety, and convenience are the major considerations. How seeds and food ingredients are produced will be relevant only for a small group of concerned "organic" consumers.

In countries where consumers are more negative about biotechnology -- Austria, Denmark, Germany, and Sweden -- media coverage and activist opposition have been more pronounced. In these four countries, discussion of the benefits of biotechnology has generally been ignored, while the potential risks have been emphasized. Basic social values and cultural beliefs also explain much of the differences in responses between countries. These are not necessarily amenable to educational efforts.

There also are a number of fundamental cultural differences. For example, consumers' attitudes about biotechnology are closely related to their general beliefs about science, technology, and food. European consumers tend to view farms as public natural areas where they can visit on weekends. Farms in the United States tend to be concentrated in the midsection of the country, far away from the urban population centers. Also in the United States, there has always been strong public support for and appreciation of new technology. Such support has not been as strong in parts of Europe. Some Europeans tend to view their food with an almost spiritual reverence, which is quite different from the common American view of food as fuel. These and other issues need more careful attention.

Another reason for the sustained U.S. support for biotechnology has been a long-term commitment to the education of opinion leaders and consumers. There has been an unprecedented partnership between the government, industry, universities, and third-party groups (such as the American Dietetic Association) to understand and address public concerns well before the products of agricultural biotechnology are released. There is a critical need to renew that commitment to education, information, and social science research.

Our experience in the United States provides some guidelines for a global program of information and education. Consumers need to recognize the existing benefits and future promises of biotechnology. The opportunity that biotechnology provides for feeding the world (while protecting the environment) will be compelling for many consumers. It is also important to build trust in government and scientists to serve the public interest. This requires that farmers, scientists, government officials, and others work together to ensure that consumer decisions are based on balanced information.

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**Note: The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.**