

## **TRENDS IN CONSUMER ATTITUDES ABOUT AGRICULTURAL BIOTECHNOLOGY**

Thomas J. Hoban<sup>1</sup>

The benefits of agricultural biotechnology have been promised for almost two decades. That promise is becoming reality. A growing number of American farmers are raising crops developed through biotechnology that are protected from insects and require fewer pesticides. As with other commodities, these grains (such as corn and soybeans) are blended into processed foods. That use of biotechnology will be invisible to consumers. In the future, biotechnology will lead to more obvious improvements in the nutritional profiles and other qualities of many foods.

In light of these developments, industry and government need a better understanding of consumers' acceptance of biotechnology, especially in Europe. Despite the potential benefits, agricultural biotechnology has been controversial in some European countries. However, the American and Canadian markets have remained calm as the foods containing ingredients developed through biotechnology have started arriving in stores. The full benefits of biotechnology will only be realized if consumers and the food industry accept the use of these new technologies as safe and beneficial. This paper reviews several major research studies to provide a brief overview of international and temporal trends in consumers' awareness of, and attitudes about, agricultural biotechnology.

The main results come from several major United States (U.S.) telephone surveys that I and others have developed to examine public perceptions of agricultural biotechnology (Hoban & Kendall, 1993; Hoban, 1996a; Hoban & Katic 1998). Selected results are also presented from two U.S. surveys conducted in 1995 and 1996 by the Food Marketing Institute (Food Marketing Institute [FMI], 1996). Sample sizes ranged from 1,003 to 1,228 respondents. The European survey results come from interviews conducted with a sample of 12,849 European consumers for the Food Marketing Institute (Hoban, 1997). Results of Japanese research will also be considered (Hoban, 1996b).

This paper will also highlight, in a general way, selected results from several major surveys on public attitudes and knowledge of biotechnology conducted between 1996 and 1998. These surveys reflect the views of over 18,000 people from 15 European countries, as well as in the

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<sup>1</sup>*Thomas J. Hoban is a Professor in the Department of Sociology and Anthropology at North Carolina State University - Raleigh. © 1998 Thomas Hoban*

United States (Wagner *et al.*, 1997; Hoban & Miller, 1998). Collectively these represent the largest such effort ever undertaken. More information on those surveys will be available soon. The random samples for these studies are representative of the countries.

### **Consumer Acceptance Of Biotechnology**

Regardless of how we measure consumer perceptions, the surveys described above document that between two-thirds and three-quarters of American respondents are positive about plant biotechnology. Most people feel they either have benefited, or will benefit, from biotechnology. Consumers will accept foods when they recognize a benefit. For three years (1992, 1994, and 1998), we have asked American consumers whether they supported or opposed agricultural biotechnology. The results have been identical — just over 70 percent expressed support. This support is highest among men and people with more formal education.

Most people will buy new varieties of fruits and vegetables that have better flavor or are protected from insect damage with reduced use of pesticides. American surveys between 1995 and 1997 have shown that most consumers recognize the benefits of biotechnology and are willing to buy food developed through biotechnology. Results of surveys conducted in 1995 show clear differences among countries in consumers' willingness to buy produce developed through biotechnology. Over half of the consumers in all but three countries reported a willingness to buy a new variety of produce (such as a potato or tomato) that had been modified by biotechnology to be protected from insect damage. Only German and Austrian consumers were clearly opposed to plant biotechnology. Results for a similar question about "better tasting or fresher" produce show a similar pattern, but acceptance is somewhat lower.

It is important to put perceived risks of biotechnology into an appropriate context (compared to other potential food safety concerns). The FMI surveys in the U.S. and Europe asked consumers to rate the relative severity of a range of potential food safety risks. American consumers expressed the most concern about microbial contamination and pesticides and moderate concern over several other risks. Fewer than one-in-five saw biotechnology as a serious food safety risk (the lowest of any issue discussed). The pattern is similar in Europe, where genetic engineering was perceived to be the eighth in the list (perceived as just slightly more risky than artificial colors).

Different applications of biotechnology vary considerably in terms of their acceptance. Consumers see considerable value in human genetic testing and the development of new medicines to combat disease. They are also quite supportive of the use of biotechnology to develop new types of insect-resistant crop plants. However, consumers are less likely to accept the use of biotechnology with animals (even to enhance human health). This presents challenges to use of biotechnology for the development and commercialization of new livestock applications.

### **Educational Needs And Opportunities**

The extent to which people are aware of an issue reflects the general level of importance or relevance. Respondents have been asked to rate their own understanding and awareness of biotechnology in the various surveys. The results from the U.S. show virtually no change in consumer awareness of biotechnology between 1992 and 1996. Only about one-third of U.S. consumers had heard or read a lot or something about biotechnology. Awareness in the U.S. rose significantly in 1997 with the media attention to the cloning of a sheep.

Awareness in other countries varies considerably. In 1995, awareness was very high in Germany, Austria, Denmark, and Japan. It was also quite high in Canada, the Netherlands, and three other Scandinavian countries. The other nine European countries reported relatively lower levels of awareness, with the lowest levels coming from the southern European countries. During the last few years, awareness appears to have risen in Europe. This has been fueled by increased media coverage. There is evidence that increased levels of awareness are not direct reflections of increased levels of knowledge about biotechnology from a scientific perspective.

Survey results show that providing factual information increases consumer acceptance (at least in the U.S. and Japan). Sources of information vary in terms of their credibility. People in these countries have the most trust in independent health and scientific experts. In particular, we find that acceptance increases significantly when American consumers learn that groups such as the American Medical Association, the Food and Drug Administration (FDA), and other independent scientific experts have determined that the foods from biotechnology are safe. However, Europe is a different story. The European public expresses the most trust in consumer and environmental groups. Trust in government and industry is much lower than in the U.S.

People do tend to express interest in learning more about biotechnology. They want to know why it is used, as well as its safety, benefits, and other issues. People will ask the same basic questions about biotech-produced food as they ask about foods available now. At the top of the list will be “How does it taste and how much does it cost?” Then people will want to know about nutrition, safety, and cooking techniques. How the products (or its ingredients) were developed will be irrelevant for the vast majority of American consumers. The European consumer reaction appears to be somewhat different, with more concern over the environmental, political, and social impacts of agricultural biotechnology.

### **Labeling Issues**

The most challenging issue facing the food industry involves labeling. To avoid confusion, the FDA has determined that a food product should be labeled as a product of biotechnology *only* if it has been changed in some significant way. This policy ensures product availability, while providing consumers with relevant information about food safety or compositional changes. A national survey of American consumers conducted in 1997 found that over three-quarters of consumers supported the FDA labeling policy (Hoban & Katic, 1998).

People claim to pay a lot of attention to food labels, especially for nutrition information. In the case of biotechnology, it might make sense to label fresh produce developed through biotechnology if there is a clear difference (such as longer shelf life or reduced pesticides.) However, the labeling of processed foods presents a number of logistical challenges and costs for everyone involved. For example, American consumers report little need to label a bottle of ketchup that includes biotech-tomatoes 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).

It is important to realize that labeling is not education. In the U.S., the FDA has determined that information on food labels should be simple, meaningful, and consistent. Labels on foods that have not been changed in any way through the use of biotechnology would likely be perceived as alarming and irrelevant. Consumers want and deserve meaningful choice (that is, among products that are truly

different). Most do not want to be confronted by unnecessary duplication of product offerings.

## **Conclusions And Implications**

Results of this and other research indicates that biotechnology will not become an issue for most American, Canadian, or Japanese consumers. American consumers (as well as many others around the world) are optimistic about biotechnology. They will accept the products if they see a benefit to themselves or society; and if the price is right! Their response to foods developed with biotechnology is the same as for other foods. Taste, nutrition, price, safety, and convenience are the major issues. Biotechnology will remain an issue in some parts of Europe, at least over the short-term. However, the opposition there should fade with time, as more products arrive on the market that are clearly beneficial to consumers.

Further analysis of the survey results shows that consumer acceptance of biotechnology is driven by a number of inter-related factors. First, there needs to be a demonstrable benefit from the application, as well as an acceptable (that is, low) level of risk. It is also very important that the applications are viewed as morally acceptable to society. People need confidence in third party experts.

Given the low levels of public understanding, more education will be important as more new products become available. The public needs to recognize that the products of biotechnology have benefits. They should come to believe that the applications of biotechnology are morally acceptable and safe. The ethics of feeding the world, while protecting the environment could also influence some consumers' attitudes. It will also be important to ensure that government regulations are in place to minimize any risks.

Additional analysis of the latest international surveys will be helpful. This would help to systematically evaluate the factors that influence public attitudes, as well as the causes and nature of differences among the countries. Additional research on this topic will also be important. In particular it would be very helpful to have a systematic comparison between public attitudes and those of key leaders from government, industry, and other areas.

Several reasons can be suggested for the differences observed between various countries. Media coverage and activist opposition has been most pronounced in those countries where survey respondents were more negative. In general, controversies have been more visible in Germany, Austria, Sweden, and Denmark than in other countries. The benefits of biotechnology have not generally been recognized, while the potential risks have been emphasized. There also are a number of fundamental cultural differences (especially between some of the European countries and North America). These and other issues need more careful attention.

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