

Biotechnology

Addressing Today's **CORE ISSUES** For Better Food & Industry Growth

BY THOMAS JEFFERSON HOBAN, PH.D.

■ OVER THE PAST SEVERAL YEARS, THE FOOD INDUSTRY HAS CONFRONTED A WIDE RANGE OF COMPLEX AND CONTENTIOUS ISSUES ASSOCIATED WITH BIOTECHNOLOGY.

Clearly, CPG companies need to be responsive to consumer demands and needs. But to realize biotechnology's potential for driving food industry growth via new, more nutritious, better tasting, higher-value products, it is vital to distinguish true consumer wants from self-serving campaigns being waged by activists with their own vested interest in spawning fear. In truth, much of today's biotech controversy is being deliberately generated by certain groups within the organic foods industry, who stand to benefit financially from consumer uncertainty about mainstream food; and by Greenpeace, which finds food companies convenient, concrete targets for its attacks against a number of more abstract "demons" -- capitalism, agribusiness, globalization, advanced science, change in general.

IS IT TIME FOR THE FOOD INDUSTRY TO GET TOUGH?

Editor's Note: The data and analysis on public perceptions of biotechnology in the article below represent the best view available in late October, 2000. Public perceptions of any issue, especially one as volatile and controversial as modern food biotechnology, may change over time, depending on factors including new scientific data, shifts in the political climate and the issue's portrayal in the news media.

Biotechnology: Assessing Today's CORE ISSUES

■ Protest groups claim, of course, to speak for consumers. But analysis shows they are, for the most part, speaking only for themselves. In truth, they are usually promoting transparently self-serving myths about what consumers feel and think.

■ HAVING TRACKED THE BIOTECHNOLOGY ISSUES AND CONDUCTED RESEARCH ON PUBLIC PERCEPTIONS FOR OVER A DECADE, I believe there are certain key challenges that the food industry must address in the near future. These issues include consumer acceptance of biotechnology, organic foods, product labeling and communication opportunities.

While many parts of the world are feeling the impact of biotechnology, and while many food companies are now international or global and are thus affected by biotechnology issues around the world, it is important, I believe, for the food industry to focus right now on the US. Why? Because our own backyard is becoming the key arena for the biotechnology controversy. As gatekeepers to the marketplace, US food industry decision-makers will play a vital role in determining the future of biotechnology.

Consumer Acceptance Myths...

Today, especially in the wake of the StarLink corn-related product recalls, most food companies are anxious about the reaction of consumers to the headlines and to the issues associated with food biotechnology. And clearly, companies do need to be sensitive to consumer concerns, responsive to consumer demands, and prepared to meet their changing needs.

But when it comes to biotechnology in particular, it is vital to distinguish true consumer interests from campaigns being waged by activist groups opposing biotechnology to further their own interests.

In truth, research shows that much of the information and disinformation fueling the biotech controversy is generated by protest groups such as Greenpeace, groups who obviously see food companies as a convenient target for their attacks against a num-

ber of imagined "demons," including capitalism, globalization, and change in general.

Protest groups claim, of course, to speak for consumers. But analysis shows that they are, for the most part, speaking only for themselves. Often, they are promoting transparently self-serving myths about what consumers know and think about these important developments.

These activist groups try to shape public opinion for their own benefit, rather than reflect true consumer interests. They are trying to convey the impression that the public is rejecting foods with ingredients produced through biotechnology.

But their public support is limited to a small group of elite consumers who have the time or money to spend on "organic" foods -- and, of course, organic food suppliers with a vested interest in instilling fear of the mainstream food supply. Indeed, today's anti-biotechnology campaign is a key marketing strategy for the organics industry.

ONE MYTH PROMULGATED BY THE PROTEST GROUPS IS THAT THE MORE PEOPLE LEARN ABOUT BIOTECHNOLOGY, THE LESS ACCEPTING OF IT THEY WILL BE. In fact, research shows just the opposite. Studies clearly demonstrate that people who have the greatest levels of knowledge and awareness of the subject are also the most positive about biotechnology. In fact, the majority of US consumers are unconcerned, even optimistic, about the application of modern biotechnology to agriculture and health care. Food biotechnology has *not* become an issue for most consumers, despite the protesters' theatrical ploys and questionable science.

Another myth is that the current agricultural biotechnology products do not provide any benefits for consumers.

Consumers Speak Out on Biotechnology ...

YET THE FACT IS, ABOUT TWO-THIRDS OF US CONSUMERS CONSISTENTLY SAY THEY APPRECIATE AND WILL ACCEPT THE USE OF BIOTECHNOLOGY to reduce the amount of chemical pesticides that farmers use.

And why not? This application of biotechnology represents a clear and present food safety and environmental benefit for people and the ecosystem.

SO DOES THE USE OF BIOTECHNOLOGY TO REDUCE WIDESPREAD FOOD SHORTAGES. This fact, too, is not lost on American consumers, who are concerned about world hunger and who, on the whole, support the vital role of biotechnology in helping poorer countries feed themselves.

In addition, consumers are truly enthusiastic about the potential health benefits of biotechnology, both in medicine and nutrition. They expect to benefit personally from biotechnology in the future.

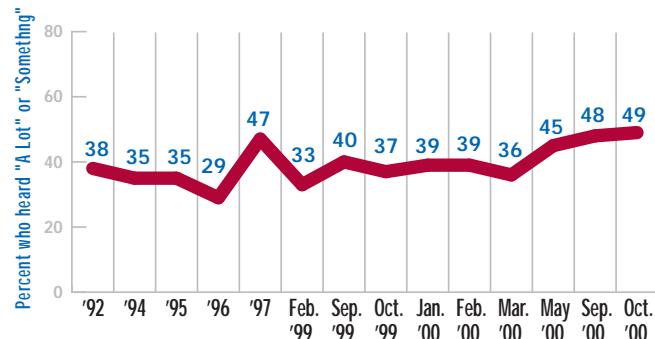
Another myth is that the American public does not trust US government agencies and the scientists who are responsible for testing and regulating biotechnology.

Again, nothing could be further from the truth. Studies consistently show that US citizens have the most trust in third-party scientific experts (including the National Academy of Sciences, which has come out twice recently in support of biotechnology).

The American public also looks with confidence to the FDA, USDA and EPA to protect public health and the environment.

The irony is that the biotechnology protest groups are the ones with the lowest credibility among the US public -- and their present desperation tactics are hardly helping their cause; their recent terrorist attacks on research facilities are further alienating the vast majority of Americans.

Awareness of Biotechnology in the U.S.



American Consumers' Acceptance of Biotechnology

Percent agreement that application should be encouraged

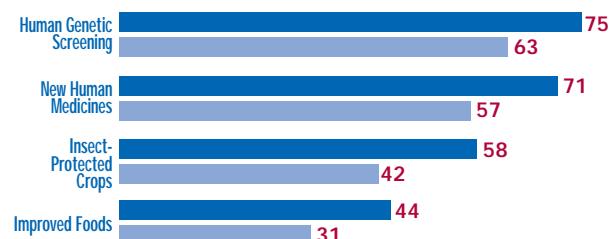
■ Priest, 2000 ■ Hoban and Miller, 1998



European Consumers' Acceptance of Biotechnology

Percent who felt each application should be encouraged

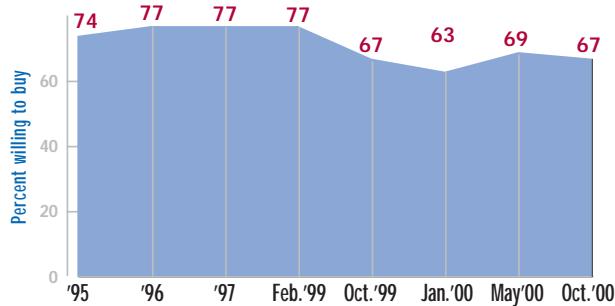
■ 1999 ■ 1996



Eurobarometer

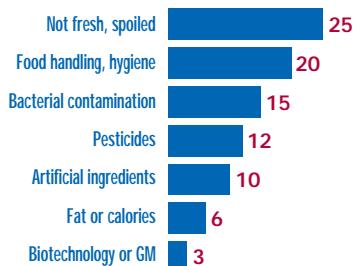
Consumers Speak Out on Biotechnology ...

U.S. Consumers Will Buy Biotech Produce



"What, if anything, are you **most** concerned about when it comes to food safety?"

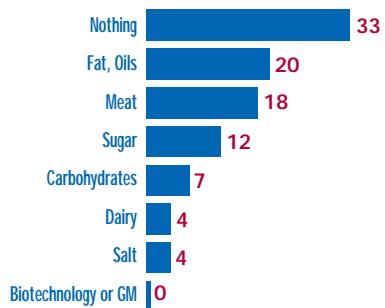
Percent response to open-ended question



Source: GMA, Oct. 2000

"Over the past few months, what if anything, have you been **avoiding** or eating less of?"

Percent response to open-ended question



Source: GMA, Oct. 2000

A related myth is that the food industry is rejecting biotechnology. Not so. We recently interviewed over 200 food industry leaders, learning that they truly support and welcome the developments brought by biotechnology.

More, they have no trust in the protest groups who are threatening them with boycotts (that never materialize). Indeed, a good question is why any company should accede or capitulate in any way to the demands of a group of "consumers" who are in no way part of its target market -- i.e., they do not eat at fast food chains, drink sugared sodas, or buy salty snack foods.

Even companies that have publicly given in to activist pressure, hoping to reduce some of the heat, really have no intention -- or even the capability -- of eliminating all biotechnology ingredients from their food products.

Yet, the protest groups continue using the Internet to encourage their supporters to flood targeted companies' phone lines, fax machines and e-mails with boycott threats.

Little Real Consumer Concern

But by now, the food companies, GMA and other food industry associations realize that these e-mails, phone calls and faxes are not indicative of a spontaneous movement of real consumers.

Indeed, food manufacturers have received very few calls about biotechnology from real consumers. Accordingly, food company executives -- especially those in marketing and public relations -- need to listen instead to the scientific community, government regulators and their own industry associations, who represent the interests of a majority of American consumers, and stand behind the safety and benefits of biotechnology.

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A MAJOR FRUSTRATION FOR THE BIOTECHNOLOGY ACTIVISTS is that they have been unable to arouse the same level of concern in regard to the issue that Europe has seen.

The reason, of course, is a very different cultural context. As a people, Americans have always been forward-looking and optimistic. As a people, we welcome the advances of science and technology, advances that have greatly improved our health and the quality of our lives, and have virtually doubled our average lifespan during the 20th Century.

In addition, most thinking people have an historical perspective on society's adoption of new technologies. The fact is, no innovation is ever immediately and universally accepted by everyone. Similar controversies have taken place over pasteurization, microwave ovens, and cellular telephones.

Most people realize that if we had to ensure that all previous technologies -- electrical power, the automobile, airplanes, pharmaceuticals, processed foods -- were completely risk-free, we would be still be living in the Dark Ages. Every new development carries some degree of risk. Sensible people understand this and agree that, as a society, our goal should not be to reduce the risk to zero -- for that would require foregoing the opportunity entirely -- but to minimize the risks and maximize the benefits.

Protest groups refuse to recognize this reality. They are out of touch with the public and out of step with the times because they started their anti-progress campaign in Europe, where the culture is more attuned to the past. People in the EU also have very different views on agriculture, as well as different cultural values related to food. Biotechnology protest groups fail to per-

ceive these differences -- probably, of course, because they do not wish to acknowledge them.

Organics' Transparent Self-Interest

Meanwhile, wrapping themselves in a cloak of virtue, certain organic foods industry groups are playing on whatever consumer uncertainty exists about biotechnology to build their own business. Organic food has become a profitable and growing market niche, due in part to the promotional strategies of the organic industry. One approach has been to question the safety and wholesomeness of conventional food production methods, while stressing the presumed superiority of organic methods.

TO CERTAIN ORGANIC FOODS INDUSTRY PLAYERS, CONTROVERSY OVER BIOTECHNOLOGY REPRESENTS A HUGE, LUCRATIVE OPPORTUNITY to spawn fear of modern biotechnology as another way to draw customers to its own products. Evidence shows that the groups attacking biotechnology receive a good deal of money and other support from the growing organic foods industry.

Indeed, as a result of an earlier grass-roots campaign, USDA regulations now prohibit the presence in organic food of any genetic ingredients introduced through agricultural biotechnology.

This standard will be very confusing to consumers and, in fact, it will be impossible to uphold due to small levels of natural cross-pollination. This is just one of the inconsistencies in the current organic campaign against biotechnology.

It is certainly in the interest of consumers to scrutinize and publicize the hidden, self-interested motives and the arguments of organic food industry groups. To the degree they succeed, the real losers in this battle will be consumers, farmers, and the natural

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These players are now spreading fear of modern biotechnology as another way to draw customers to their own products.

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■ *The irony is, if not for their hidden motives and self-serving financial interest, organic foods marketers should actually welcome modern food biotechnology. After all, will it not advance many of the goals that they purport to be trying to achieve?*

environment. Again, the main beneficiaries will be those parts of the food industry that generate and cater to consumer misperceptions about modern agriculture.

In the UK, the organic foods industry was recently charged with making unsubstantiated claims.

Meanwhile, in the US the organics industry is asking consumers to accept its claims (and buy its pricey products) on faith -- while demanding that biotechnology proponents make their claims based on science.

The food industry and consumers deserve to understand the real similarities and differences between organic food production and the use of modern biotechnology. It is instructive to compare organic food production with modern biotechnology along a number of dimensions:

FIRST, IT IS WORTH KEEPING IN MIND THAT ALL FOOD SOLD ANYWHERE HAS BEEN GENETICALLY MODIFIED. Organic fruits and vegetables, as well as food ingredients like soybeans, have been transformed from their "natural" state through artificial mutation and traditional breeding techniques. These processes are slow and imprecise. Modern biotechnology allows for much more predictable and controlled improvements than were possible in the past.

Another point of confusion is the implied assumption that we know more about the safety and nutrition of organic food than we do about modern biotechnology.

The fact is, products of modern biotechnology undergo much more rigorous testing and government oversight than do organic products. The organics industry does not want to have to prove itself -- it wants to follow the model of the herbal supplement manufacturer, whose product claims do not have to be substantiated by science. Indeed,

the safety and efficacy of many herbal products are so untested that their labels indicate that the FDA does not endorse the manufacturers' claims.

On the other hand, the National Academy of Sciences, the US Food and Drug Administration, the House Subcommittee on Science and others have recently reaffirmed the safety of biotechnology.

Confusion also exists in regard to contentions that organic food production does not involve the use of pesticides. In fact, organic growers are allowed to use a variety of pesticides -- but these are considered "acceptable" because they are considered "natural."

The most confusing example involves the compound known as Bacillus thuringiensis, or "Bt." Organic farmers have been free to spray dead bacteria containing Bt directly on fruits and vegetables for decades. It has been proven safe for wildlife and for humans.

Now, by means of modern biotechnology, it is no longer necessary to spray crops with Bt pesticide -- today, scientists can insert the Bt gene directly into the crop plant, where it protects against insects in the plant's roots, stalk or leaves.

Which is to say, the self-same protesters who are confidently using and consuming Bt and other natural pesticides on their organic crops are now trying to scare consumers about the risks of biotech Bt to butterflies.

The irony is, if not for their hidden motives and self-serving financial interest, the organic foods industry should actually welcome biotechnology. After all, will it not accomplish many of the goals that its players purport to be trying to achieve?

■ Biotechnology is an environmentally friendly approach to sustainable production, especially for developing countries that can't afford the luxury of high crop losses.

■ Biotechnology crops reduce the use of energy as well as pesticides, land, labor and other farm inputs. In 1998, farmers planting biotechnology-derived crops reduced their use of agricultural chemicals by more than two million pounds.

■ Herbicide-resistant biotech plants also help reduce soil erosion by facilitating soil conservation. The purported environmental benefits of organic farming have not been as systematically evaluated.

The Labeling Issue...

One of the most challenging issues involves labeling of foods developed through modern biotechnology.

The anti-biotechnology groups and organic industry recognize mandatory labeling as a key strategy for scaring consumers away from the use of biotechnology. They invoke the consumer's "right to know" that there are genetically modified ingredients in their food, even if the food itself is completely unchanged. They attempt to portray this as a simple solution that will not cost much for food organizations to implement.

The facts, again, are very different. Mandatory labeling would create enormous logistical problems for the entire food value chain, and add significantly to costs.

MORE, WHERE DOES IT END? Consider the labeling situation that is developing in the EU, where protest groups have managed to pressure the government into adopting a largely unworkable labeling policy. By mandating a one-percent threshold, the EU has imposed a standard that will be nearly

impossible to meet. Some food manufacturers have gone so far as to reformulate their food products to remove all ingredients derived from soybeans and corn. That, clearly, is not an optimal solution.

The case of "Roundup Ready" soybeans is also instructive. The EU food industry and public officials are planning to source "non-biotechnology" soybeans from Brazil because they are not officially approved there.

MEANWHILE, IT IS COMMON KNOWLEDGE THAT QUITE A FEW BRAZILIAN FARMERS ARE GROWING BIOTECH SOYBEANS that are readily available from Argentina on the black market. Even in the US, the seeds farmers buy are only guaranteed to be "95 percent pure". The net result will be that all processed foods in the EU will likely have enough "GM ingredients" to require a label. Consumers will end up with more anxiety and even higher costs (the average EU household pays about 22 percent of its income for food, compared to about 11 percent in the US).

So, what *do* consumers truly want and need from food labels? It's a difficult question to answer, because labeling questions on surveys tend to be simplistic and ambiguous. From my own research and other surveys, it is clear that how a question is asked directly affects how consumers respond.

Two examples from our experience in the US are instructive. On one hand, opinion polls indicate that a majority of consumers agree, in theory, that foods developed through biotechnology should be labeled.

At the same time, almost as many want to know the country of origin for the food. And an even greater percentage feel labels should explain which pesticides were used.

Clearly, then, it will be hard to set priori-

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ties for limited label space when everything is very important to everybody.

How to explain these results, when it ought to be obvious to everyone that labels can realistically be only so large, and contain only so much information?

OFTEN, AGAIN, IT'S THE WAY THE QUESTION IS POSED. People are sometimes asked to answer questions spontaneously over the phone, with little or no time to think about the topic. Therefore, such findings alone do not provide a sufficient basis for important policy and marketing decisions.

A more valid approach starts by describing the current FDA labeling policy (i.e., not to label foods developed through biotechnology that are basically identical to traditional foods). The questions explain that FDA *will* require a label to indicate if the food has been changed in a significant way.

When questions are posed in this way, we consistently find that two-thirds to three-quarters of US consumers support the current FDA policy.

It is more valid to use focus groups that engage consumers in a thoughtful discussion. This is a more realistic approach, because it can provide a meaningful context to elicit consumer views.

First, we have learned that consumers really expect a label only if the food has been changed in some significant way. For example, we explored with focus group participants the case of a widely used cheese ingredient, chymosin, developed through biotechnology. In this case, most consumers felt there was no need for special labels, since the end-product cheese is no different in taste, nutrition, or safety. In fact, this cheese is now labeled only as containing an enzyme.

Even the organic industry has chosen not to push for labeling in this case. This is due in part to the fact that such cheese is preferred by vegetarians, as the enzymes are not of animal origin. (One wonders where they think the cheese comes from.)

Second, we found that consumers see less need for labels on processed foods than they do on fresh fruits or vegetables. Using tomatoes as an example, we found that few consumers have any idea that food processors blend together different tomato varieties to get the desired taste or consistency for ketchup or frozen pizza.

In fact, most consumers don't particularly care about the ways in which ingredients in processed foods are developed. Thus, it answers no particular consumer need to require detailed labels on all processed foods.

No Label Large Enough

In any case, there is no way that enough information to answer all consumer questions can ever be summarized on a package. Labeling is not the same as education. Some consumers want to learn more, and we all have the right to more information. However, without a major commitment to education, any voluntary labeling initiative could likely confuse and alarm consumers.

As for mandatory labeling, all this would really accomplish would be to raise costs. After all, again, with what information does such a requirement end? Meeting every arcane or quixotic consumer request for product information would ultimately require attaching little -- or not-so-little -- booklets to every product (as is presently done with prescription drugs).

Third, we found that consumers do *not* want to pay higher food costs for testing and to keep commodities segregated. In

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fact, one common reaction is to expect food companies to simply put on a new label and absorb the additional costs. Care must be taken with any labeling initiative, because costs will ultimately be passed on to consumers -- while imposing headaches on all parts of the food value chain from farm to table.

Finally, research has clearly shown that the vast majority of consumers use labels -- if they read them at all -- mainly to evaluate fat, sugar, and salt content for health reasons. Many express frustration with conflicting information, and seem overwhelmed by the variety of food already available.

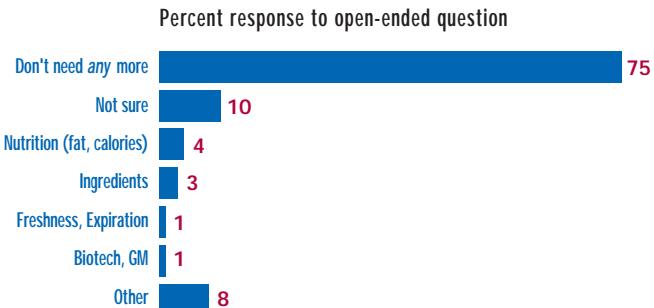
More, the fact is most consumers say their scarcest resource is time. Complex labeling related to biotechnology would significantly increase the time and mental energy consumers would have to spend shopping.

NONETHLESS, IT SHOULD BE RECOGNIZED THAT SOME PEOPLE DO HAVE QUESTIONS, AND DO WANT ANSWERS. One effective way to provide them would be a system of voluntary labeling for foods *not* produced through biotechnology.

If the demand for biotech-free products is real, a viable market will emerge. In this case, meaningful choice can be provided to concerned consumers *without* imposing costs on or denying benefits to the majority of consumers who support or have no objection to biotechnology. Based on input from its three public hearings last year, this is the approach the FDA is now taking on this particular issue.

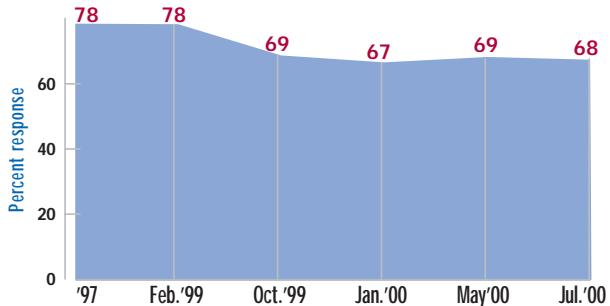
These findings are consistent with food industry best practices; through Efficient Consumer Response and other initiatives, the food industry now realizes that the last thing most shoppers truly need is more information and greater selection of "me, too" items.

"Can you think of any information not currently included on food labels that you would like to see?"



Source: GMA, Oct. 2000

U.S. Consumers Trust the FDA Labeling Policy



RESEARCH HAS SHOWN CLEARLY that the vast majority of consumers use labels -- if they read them at all -- mainly to evaluate fat, sugar, and salt content for health reasons.

More, the fact is most consumers say their scarcest resource is time. Complex labeling related to biotechnology would significantly increase the time and mental energy consumers would have to spend shopping.

Nonetheless, it should be recognized that some people do have questions, and do want answers. One effective way to provide them would be a system of voluntary labeling for foods not produced through biotechnology.

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■ *Biotechnology promises both to reduce famine where it exists, and make our own food even healthier... Thus, at all times we need to keep the public's and society's real interests foremost in mind.*

The food industry needs to stand up forcefully and continuously for the benefits and safety of biotechnology.

It's time to stand up to the protest industry.

Continue the Dialogue...

MANY OF TODAY'S BIOTECHNOLOGY ISSUES HAVE ARISEN BECAUSE CONSUMERS HAVE NOT RECEIVED ENOUGH BALANCED INFORMATION.

This problem is exacerbated by the fact that, as research shows, most consumers have limited understanding of how food is produced. Nor do they really have much interest. Most consumers are very comfortable with the current food system. The biotechnology controversy is raising questions that have never occurred to them.

So, while there is need for a coordinated, two-way communication program, the question is what such a program should include.

FIRST, WHAT DO CONSUMERS WANT TO KNOW? Research shows they are very interested in learning about the benefits and uses of biotechnology. Once they understand why it is being used (i.e., the benefits), most will recognize the reasons for its use as valid.

Next, they want assurance that biotech-derived products are safe for human consumption and the environment.

Finally, they are genuinely curious about future developments in modern biotechnology. One effective way we have found to explain this is to draw comparisons between modern agricultural biotechnology and traditional plant breeding.

WHO SHOULD PROVIDE THIS INFORMATION? Effective communication campaigns will require an ongoing partnership among government, industry, universities, consumer groups and others. American consumers have consistently reported the greatest trust in information from university scientists and third-party scientific organizations. In partnership with the industry and others, the nation's land grant universities and cooperative extension programs are ideally positioned to help educate consumers

and American opinion leaders.

WHICH CONSUMERS ARE MOST RECEPTIVE TO COMMUNICATION? Not all consumer segments will need to receive the same level of information about biotechnology. Research has shown that opinion-leader consumers will generally want the most information, and will actively seek it out.

At the same time, among the most important audiences is the primary shopper (often the woman in the home). The challenge: These consumers tend to be relatively uninterested in learning about food production.

Accordingly, it will pay to listen to the various segments through surveys, focus groups and other techniques before implementing communication efforts.

FINALLY, HOW SHOULD WE PROVIDE CONSUMERS WITH THE INFORMATION they want about biotechnology? Toll-free numbers and Internet sites hosted by third parties such as the ALLIANCE FOR BETTER FOODS are excellent mechanisms for education. The food industry, government agencies or university groups could maintain an information clearinghouse that describes products of biotechnology that have been approved, including the foods in which new ingredients are found.

GOING FORWARD, ONE OF THE MOST IMPORTANT NEEDS IS TO ENSURE GREATER COMMUNICATION AMONG ALL PARTS OF THE FOOD VALUE CHAIN -- from research labs to consumers' tables. The food industry associations, particularly GMA, have done a good job over the years -- and a great job recently, since the biotechnology controversy arose -- in promoting such collaboration and information sharing. With the arrival of additional new products, it will also be important to focus more on business-to-business communication. Crops with enhanced nutritional profiles or improved processing characteristics will require close

coordination through vertical integration, contracting, or other business relationships.

BioTechnology: Inevitably Successful

ULTIMATELY, CONSUMERS WILL ACCEPT THE PRODUCTS OF MODERN BIOTECHNOLOGY. The benefits will simply be too important for society to turn its back on them.

This is particularly true of the developing world. We in the developed world are spoiled, in that we generally take our abundant, safe, and inexpensive food supply for granted. Biotechnology promises both to reduce famine where it exists, and to make our own food even healthier and our children's lives better.

Thus, at all times we need to keep the public's real interests and societal needs foremost in our minds. The food industry needs to speak up forcefully and continuously for the benefits and safety of modern genetic modification. *It is time to stand up to the biotechnology protest industry.*

Going forward, the outlook for North America is quite positive. New educational efforts such as those by the Council for Biotechnology Information will be effective with key opinion leaders and consumers. Protest groups have very low credibility; ultimately, they will run out of gimmicks. Overall, biotechnology should not become a serious issue for most American consumers.

The bottom line for consumers is that third-party experts say it is safe. In fact, the criteria for most consumers' food selection will remain taste, value, nutrition, and convenience -- not seed genetics.

For Europe, the outlook is complicated and unpredictable. Complex requirements for labeling and identity preservation will further drive up food prices. Consumers may ultimately call for some reason in the market -- especially if the "GM foods" can

be priced lower. Eventually, more biotech-derived products that have tangible consumer benefits will arrive on the market. Educational efforts will make headway with European leaders and consumers. Internal economic concerns such as high levels of unemployment should outweigh perceived risks. The EU will be increasingly isolated on this issue if it continues its protectionist policies.

BUT IT IS THE EMERGING MARKETS OF THE DEVELOPING WORLD THAT MAY WELL HOLD THE KEY to global acceptance of biotechnology. Health and nutritional benefits will become increasingly evident -- and compelling in countries where food is not guaranteed for all consumers. Opportunities will be available for poorer countries to feed themselves and even find new market niches.

In fact, some countries, particularly China and India, are actively pursuing biotechnology development. Developing-world leaders and scientists want to speak for themselves. They are growing tired of the arrogance of activist groups who presume to represent their best interests.

Many observers have referred to the new century as the "Age of Biology." In fact, we have a wide range of tough issues on the horizon with human genetics and the biomedical uses of biotechnology.

We must be ready to understand and evaluate a host of scientific developments from the human genome project.

Looking back in a decade, we will all wonder why anyone made such a big deal out of adding single genes to crop plants. ■

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