



Office of Consumer Affairs

CONSUMER QUARTERLY

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Bridging the biotechnology information gap

B iotechnology raises two types of consumer concerns. Consumers want to be assured that the products that result from applying biotechnology will be healthy, safe and nutritious. And, they want to know about biotechnology's longer term implications for the environment and society's socio-ethical values. However, the complexity of biotechnology puts it well beyond the understanding of most consumers.

Addressing consumers' concerns is a considerable challenge, but it may not be insurmountable. Consumers already make decisions about a wide variety of products and services involving complex technologies. So, despite the fact that only specialists really understand all the science behind, and the issues related to, today's cars, televisions and portable phones, for example, consumers still feel comfortable making purchasing decisions about them. This is because consumers have information about certain factors (such as cost, convenience and quality) that they can judge. Consumers also, in general, trust the manufacturers of these products, the providers of this information and the gov-

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ernment's ability to regulate these products and technologies.

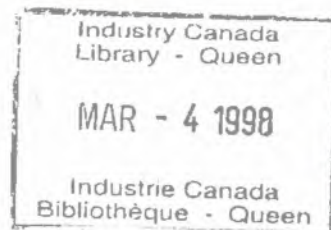
Can the same thing be said about the products of biotechnology?

In 1996, the Office of Consumer Affairs (OCA) conducted consultations with other federal government agencies, industry associations and consumer groups with responsibilities for and interests in biotechnology. The purpose of these consultations was to secure views on how to build on the surveys and other research already completed to better understand

the consumer perspective with respect to this important technology.

Following these consultations, OCA solicited a number of research papers on the consumer and marketplace issues raised by biotechnology. This research program culminated in a September 1997 symposium, hosted by OCA and attended by about 150 representatives from government, industry, consumer and environmental groups, to review the research findings and discuss the next steps.

The July 1996 edition of *Consumer Quarterly* provided a brief introduction to the consumer issues surrounding biotechnology. (You will find a copy of this issue on the OCA Web site, *Consumer Connection*, on *Strategis*.) This second edition on biotechnology highlights some of the main themes and key findings in the research papers that OCA sponsored, reviews the key points of discussion from the symposium, and underlines the information, roles and responsibilities, and other challenges posed by biotechnology for industry, government and the consumer.



The role of producers and marketers through advertising

Producers typically convey information to consumers through marketing and advertising efforts. The effectiveness of producer-provided information is highlighted in a study by Alan Mathios. Mathios shows how producers in the U.S. were effective in providing information on the links between diet and disease to promote healthier food products. Producers were able to educate the public by using a variety of media to target specific markets and seemingly alter consumer behaviour towards their diet. Government advertising, on the other hand, which was not product-specific and tended to appear in the print media, did not reach all segments of the public.

Firms also know the importance of developing a good reputation with consumers. When product characteristics are too complicated to convey through advertising, or if these characteristics cannot be determined when the product is purchased, firms can use advertising as a "performance bond."

Andrew Kleit shows how pharmaceutical firms invest heavily in their brand names, promoting recognition and demonstrating to consumers a willingness to stand behind their products. "If firms renege on their implicit promise of quality, consumers punish them by refusing to buy their products." As a result, clear and strong links between information on products and company names create a positive impression that can allay consumer misgivings about product safety and quality.

It is argued that advertising can also create product differentiations that provide no real benefit to consumers. Seen from this perspective, advertising reduces product competition and introduces barriers to the entry of new products and companies. These potential disadvantages speak to the need for traditional consumer protection — the monitoring of truth in producers' representations of their products. This points out the importance of laws against misleading advertising and product misrepresentations, which are addressed in Canada under the *Competition Act* and many other federal and provincial statutes.

The OCA Research Papers

- *A Synopsis of Survey and Focus Group Research*, Heather Sheehy, Economist, Office of Consumer Affairs (now at Health Canada)
- *The Industrial Economics of Biotechnology*, Christopher Green, Department of Economics, McGill University
- *Biotechnological Innovation and Industrial Performance*, Claude Crampes, Université des sciences sociale de Toulouse, and Abraham Hollander, Department of Economics, Université de Montréal
- *International Comparisons of Biotechnology Policies*, Zhiqi Chen, Department of Economics, Carleton University, and Alison McDermott, Economist, Office of Consumer Affairs
- *Theoretical Perspectives on Consumer Controversy and the Funding of Biotechnology R&D*, Jeffrey MacIntosh and Douglas Cummings, Faculty of Law, University of Toronto
- *An Information-based Approach to Labelling Biotechnology*, Gillian Hadfield and David Thomson, Faculty of Law, University of Toronto
- *The Dissemination of Science-based Information to Consumers*, Alan Mathios, Department of Policy Analysis and Management, Cornell University
- *Biotechnology and the Media*, Stephen Strauss, *The Globe and Mail*
- *Using Advertising to Generate Information and Signals for Product Quality*, Andrew Kleit, Department of Economics, Louisiana State University
- *The Economics of Application Risk*, Jennifer Wohl, Department of Agricultural Economics, University of British Columbia
- *The Federal Biotechnology Regulatory System: A Commentary on an Institutional Work in Progress*, Bruce Doern, Department of Public Policy, Carleton University, and Heather Sheehy, Economist, Office of Consumer Affairs (now at Health Canada)
- *The Commercialization of Human Genetics: A Discussion of Issues*, Timothy Caulfield, Faculty of Law, University of Calgary
- *The Market for Credible Information*, Edna Einsiedel, Communication Studies, University of Calgary
- *Comparative Study of Mechanisms Developed for the Ethical and Social Issues of Biotechnology*, Thérèse Leroux, Marie Hirtle and Louis-Nicholas Fortin, Faculty of Law, Université de Montréal
- *Biotechnology: Background on Regional Issues*, Christina Weise, Analyst, Industry Canada
- *Case Study Analysis of a Marketplace Application of Biotechnology*, Creative Research International (consultants)
- *Rapporteur's Remarks: Symposium on Biotechnology and the Consumer*, Bryne Purchase, School of Policy Studies, Queen's University
- *About Biotechnology: The Communications Experience in Canada*, The Canadian Institute of Biotechnology
- *Integration Document: Biotechnology, the Consumer, and the Canadian Marketplace*, Office of Consumer Affairs

OCA will soon publish executive summaries of each paper on its Web site (<http://strategis.ic.gc.ca/oca>). The full papers will be published in a research volume later in 1998. In the meantime, copies of individuals papers are available to our readers on request (see page 6).

The information challenges of biotechnology

Biotechnology applications are part of a class of goods that have characteristics not directly evident to consumers before, during or after purchase. (For example, a consumer may not be able to tell the difference between a genetically altered vegetable and a regular vegetable.) As a result, consumers look for some means of identifying biotechnology products in the marketplace. In addition, biotechnology, particularly the newer forms of genetic engineering, is relatively unfamiliar and complex. Combined, these characteristics create an information gap between the biotechnology industry and the non-specialized consumer, who in turn becomes dependent on specialists, government agencies and other stakeholders to learn more about this technology.

This information gap creates two kinds of problems for market participants. First, it opens up the possibility that consumers could be misinformed or misled. Second, because the technology is

complex, it is difficult, time-consuming and expensive for consumers to acquire new information about it.

These information problems apply not only to the market interactions between consumers and producers, but also to specialists in the field. The research emphasizes that the complexity of the factors considered in safety evaluations, for example, and the lack of understanding regarding certain aspects of biotechnology — even on the part of scientific experts — add a degree of uncertainty to the information provided to the consumer.

According to Gillian Hadfield, consumers cope with this uncertainty by assuming that government regulation and producer self-interest (based on a desire to maintain company reputation and avoid product liability suits) together ensure that food and other products are safe. Consumers routinely employ this assumption, together with simple rules of thumb (e.g. buying time-proven products and those with well-known brand names), to solve information problems.

Product labelling

The diversity of modern consumers and the relative levels of trust they have in new technology are both important factors to be considered in future discussions on labelling and other information policies and programs.

In her paper, Gillian Hadfield argues that consumers who see alert symbols on products may be encouraged to learn more about biotechnology, and producers can then effectively meet that demand for information.

Speakers at the symposium stressed, however, that there is more to labelling than just alerting consumers to a product of biotechnology. Policy makers must address many factors when developing labelling policies: the costs of government enforcement and industry compliance; the types of biotechnology applications future policies will have to address; the merits of voluntary labelling; and Canada's trade interests and obligations. It was noted in particular that Canada will have to harmonize its labelling policies with those of its major trading partners.

A first step may be to better inform non-governmental organizations and concerned consumers about the contents of and rationale for current labelling policies, which stress information on known product outcomes regarding health, safety, nutrition and the environment rather than on the technologies employed in making the product.

It is expected that these and other consumer information issues will continue to be addressed by the Canadian Food Inspection Agency and Health Canada in their public consultation prior to the next meeting of Codex Alimentarius, to be held in Ottawa in May. Codex is a joint initiative of the United Nations' Food and Agriculture Organization and the World Health Organization.

The role of the media

Proponents and critics of biotechnology either praise or criticize the media's role — often depending on the content or impact of an article or news item. Steven Strauss, a science and technology reporter for *The Globe and Mail*, describes some of the challenges the print media face in addressing a subject such as biotechnology.

He states that the media are always rushing toward a deadline, which can compromise a story's accuracy and clarity. Also, as news tends to focus on conflict, progress, disaster, novelty or human interest, news about process and slow change, of the kind that clearly takes place in biotechnology, does not get reported until a major event happens.

Reporters face an additional dramatic imperative. The push for stories of dramatic appeal may tend to create an anti-biotechnology bias, as potential risks are highlighted more than the benefits, or may cause the stories to underemphasize the practical information that the public can actually use to better understand biotechnology.

The media may experience pressures from interest groups, particularly in small markets in which a few large firms dominate advertising. In all markets pressures exist to design the information so that it makes a good story. Finally, reporters, like consumers, also depend to a great extent on specialists, so their reporting may ultimately reflect the particular bias of their sources. According to Strauss, a predilection among science writers to consult experts can in itself create biases, so that journalists may tend to "become defenders and champions of what they legitimately should only report upon."

The role of government in minimizing risks

Research paper authors addressed the role of government in minimizing the risks posed by biotechnology. The federal framework for regulating biotechnology in Canada is based on six principles:

- maintaining Canada's high standards for the protection of human health and the environment
- building on existing legislation and institutions, clarifying jurisdictional responsibilities and avoiding duplication
- developing guidelines, standards, codes of practice and monitoring capabilities for pre-release assessment of the risks associated with release to the environment
- developing a sound scientific database, upon which risk assessments and evaluations of products can be made
- promoting development and enforcement of Canadian regulations in an open and consultative manner, in harmony with national priorities and international approaches
- fostering a favourable climate for development, accelerating innovation and adoption of sustainable Canadian biotechnology products and process.

In addition to meeting these six principles, all pertinent federal legislation must comply with the notification, environmental and human health assessment standards outlined in the *Canadian Environmental Protection Act*.

Bruce Doern and Heather Sheehy characterize Canada's biotechnology regulatory system as an institutional work in progress because it is relatively new, emerging and shared among several departments (Health Canada, Environment Canada and the Department of Fisheries and Oceans). The authors suggest that this arrangement presents some particular challenges:

- building understanding and providing transparency, particularly among smaller businesses and consumers who often do not have the time and money to learn about complex regulatory structures
- communicating decisions and outcomes to the general public
- building political understanding and support.

Doern and Sheehy also examined the core functions of the regulatory framework — making regulations, handling cases, ensuring compliance and enforcing regulations. In the researchers' estimation, the basic statutory foundations and the regulation-making process associated with biotechnology leads to reasonably good consultation among federal departments. However, more work may be needed to improve communications, consultations and understanding with groups outside government, particularly smaller businesses and industry associations, consumer groups and other non-governmental organizations.

How consumers assess risks and benefits

The research also emphasizes that consumer acceptance of biotechnology applications is related to individual assessments of risks and benefits.

These assessments may include an evaluation of the science behind a product, but, according to Jennifer Wohl and Edna Einsiedel, consumers consider additional factors when judging the risks of new high technology products:

- how much *dread* is associated with a negative outcome should one occur (cancer is dreaded more than emphysema, for example)
- whether the risk is taken *voluntarily* (voluntary risks are more acceptable than non-voluntary risks to most consumers)
- how much *control* the consumer has over the incidence of the risk
- how much is known about the *magnitude* of the risk
- how the *benefits and risks are shared* between producers and consumers
- whether this distribution is seen as *fair* by the typical consumer.

In the past, public reactions to products generally took place in the post-marketing phase of development. Increasingly, however, the products of innovative technologies are undergoing scrutiny by publics in earlier stages of the technological development cycle. This appears to be the case with biotechnology. The coalescing of the impacts of various social changes and movements over the last several decades, including consumerism, environmentalism, health activism and the visibility of public interest campaigns relating to a variety of technologies... have pushed forward the time lines for consideration of market reactions to technological products.

— Edna Einsiedel

Addressing socio-ethical issues

Consumers are also looking long and hard at the socio-ethical aspects of biotechnology, such as whether a specific application runs counter to an individual's ethical or religious values. The discussions at OCA's biotechnology symposium reiterated the importance of these concerns. In addition, a number of participants stressed that governments should do more to consult the public on socio-ethical issues related to biotechnology.

Why is public participation and input so important? According to Thérèse Leroux and her colleagues, it is because consumer involvement increases consumer awareness. Also, the experience of other countries suggests that having the public participate in the policy-making process for biotechnology legitimizes policy outcomes: if consumers believe they are being consulted in a meaningful way, they will have fewer concerns and be more likely to

accept biotechnology. This is particularly true when public participation is actively sought and concerns are listened to and incorporated into policy development and corporate strategy.

How the public is consulted is also important, and Canada can learn from the efforts and experiences of other countries. Leroux examines several consultation approaches other countries have used to involve citizens and groups in the discussion of the social and ethical issues raised by biotechnology (see table). The study findings underline that it is necessary, when selecting a public consultation mechanism, to take into account not only the country's social, economic, political and technological realities, but also the specific characteristics of the target public and the accessibility of the mechanism under consideration.

Strengths and Weakness of Mechanisms to Consult the Public

Approach	Representativeness of the public	Quality of information	Feasibility	Advantages	Disadvantages
Opinion poll	◆◆◆◆	◆	◆◆◆◆	<ul style="list-style-type: none"> • Accessible • Wide range of respondents 	<ul style="list-style-type: none"> • Static picture of public opinion • Limited, one-way information
Focus groups	◆	◆◆	◆◆	<ul style="list-style-type: none"> • Process conducive to discussion and exchange of information 	<ul style="list-style-type: none"> • Limited representativeness • Factors of time and place
Sequential consultation	◆◆◆	◆◆◆	◆◆	<ul style="list-style-type: none"> • Good circulation of information • Verification of positions in different stages of policy development 	<ul style="list-style-type: none"> • Greater participation by interest groups • Management of information gathered is more complex
Consensus conference	◆◆	◆◆	◆◆	<ul style="list-style-type: none"> • Active participation by interested persons • Consensus on a given subject 	<ul style="list-style-type: none"> • Limited number of participants in a single event • Logistics
Distribution of discussion paper and request for comments	◆◆◆	◆◆	◆◆◆	<ul style="list-style-type: none"> • Simple methodology • Detailed oral or written comments 	<ul style="list-style-type: none"> • Participation of an informed public • Fragmentary, incomplete information
The Internet	?	?	◆	<ul style="list-style-type: none"> • Technology offering a variety of tools • Investment according to organization's resources 	<ul style="list-style-type: none"> • Limited accessibility for public at large • Participants' lack of control of identity
Legend:	◆ poor	◆◆ good	◆◆◆ very good	◆◆◆◆ excellent	? unknown

Adapted from *Comparative Study of Mechanisms Developed for the Ethical and Social Issues of Biotechnology*, Thérèse Leroux, et al.

Is it worth the effort to get biotechnology information?

Gillian Hadfield examined consumer behaviour in relation to the information challenge posed by biotechnology. She found that consumers regard information about new technologies very much in the same way they view other "products" in the marketplace. They focus on the potential benefit that the information could provide — that is, consumers assess the value of information and compare it with the cost of acquiring the information and the time and effort required to use the information to increase learning and

understanding. Consumers base the value of the information on the increased benefit they realize from making different and better purchasing choices due to the new information.

Whether a consumer will actually seek out and acquire the information is determined by the cost relative to the perceived or expected value. As such, consumers will acquire high-cost information only when they perceive it will yield a significant benefit. The scientific nature and complexity of biotechnology makes it expensive for consumers to acquire and absorb new information.

Symposium participants discussed government and industry efforts to reduce the cost of the information and increase its

accessibility. It was noted that government financial assistance has brought down the costs of acquiring information, but that consumers still remain uninformed about biotechnology. This might suggest that consumers do not perceive information about biotechnology to be particularly valuable, and that additional efforts to reduce information costs or increase its accessibility may not be particularly productive. This is because these efforts may not directly address the low value consumers currently place on this information. This situation, however, could improve in the future as new biotechnology products that respond more directly to the particular needs and preferences of consumers come on the market.

For further information

► about the biotechnology research program or to request copies of the research papers, contact Julia von Hahn, Analyst.

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► about the *Consumer Quarterly*, contact Bernard A. Keating, Senior Economist.

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<http://strategis.ic.gc.ca/oca>

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Moving the agenda forward

While their views differed on labelling and other policies, symposium participants agreed that it is time to move the Canadian biotechnology agenda forward.

They noted, in fact, that now is not the time to do more research and generate more information about biotechnology. Rather, it is time to move forward and capitalize on the mechanisms, information and institutions now in place to provide consumers with the information they need, in a form they can use, to make their own choices about biotechnology and its many applications.

In particular, symposium participants see the need for action in several areas:

- encouraging multi-stakeholder consultations, involvement and partnerships, including voluntary codes of practice
- broadening the debate by bringing new issues and voices to the table
- discussing in public fora, finalizing and publicizing key policies of interest to concerned consumers
- preparing the information already available in plain language for broader distribution to consumers
- sorting out the responsibilities of government, industry and public interest groups in providing consumer information and promoting the consumer interest.

Grappling with these issues is the major challenge and objective of the renewal of the Canadian Biotechnology Strategy now taking place. A special interdepartmental task force that reports to seven federal deputy ministers leads this effort.

The Office of Consumer Affairs is contributing to this work, in part through its involvement in three working groups. When the public consultations begin in the spring of 1998, many consumer groups and other non-governmental organizations will have their opportunity to provide input in a public forum.