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## Introduction

Since 1999, the Government of Canada's Canadian Biotechnology Secretariat and its partners have maintained a large-scale tracking program of public opinion research. During that time, It has commissioned ten public opinion surveys and more than seventy-five focus groups. In all, there are more than 17,000 data points available in what is North America's largest and most comprehensive investigation into attitudes about biotechnology and the public policy that surrounds it. The program is designed to produce two waves of research each year with a large tracking component and chapters of more intensive inquiry into specific issues like genetic privacy, GM food and stem cell research. Results have been remarkably consistent since the inception of the research program.

The eighth wave of research was completed in March 2003, and for the first time, carried out a cross-national study of attitudes towards biotechnology in Canada and the United States.

## Overall Attitudes

Canada provides a relatively benign and in many ways a quite positive environment for biotechnology development. In Canada, biotechnology continues to mature as an issue – almost everyone has now read or heard something about it and know some of the benefits and risks associated with it.

Canadian public opinion towards biotechnology – its processes, products and applications – has stabilized and displays a balanced, nuanced desire to gain the benefits of the technology while managing its risks appropriately. Canadians express about two to one support for the technology, with a small segment in the range of 7%, who are strongly opposed -- the lowest level of entrenched opposition since tracking began in 1999. Most Canadians believe it is a leading-edge technology that will be critical to the country's future economic success -- and most want the country to be a world leader in the technology so that they can gain its benefits – particularly in the areas of health and medicine.

Canadians exhibit a blend of high awareness of biotechnology mixed with low levels of engagement and knowledge. Most find the area too complex and technical to follow closely. However, the increase in awareness, coupled with extensive media coverage, has had an impact in the depth of knowledge among interested people and opinion leaders in the general population. Heightened awareness is driving the growth of more complex, nuanced and moderate views toward the technology.

There is a widely held sense, particularly among these interested Canadians, that biotechnology advances are inextricably linked to societal progress, that its development is bound to modernity and that its expansion in Canada and worldwide is inevitable. This is true even among those opposed to these technologies and presents itself as resigned acceptance and for the most part, hope that these advances will improve people's lives.

However, there continue to be areas of biotechnology, chiefly in the area of GM food, where there are strong reservations among significant pockets of the population about the potential risks involved. As well, there is clear trepidation about some of the more invasive processes like cloning and the potential use of animal genes in humans. Attitudes towards cloning have evolved and become somewhat more nuanced. Like other applications, some are supported by a majority – in medical research for example -- while others are widely opposed.

## Decision Making

To most Canadians, the acceptability and approval of biotechnology products and processes is largely a technical and scientific issue with relatively few significant moral or philosophical determinants. The vast majority believes that decisions approving biotechnology products and processes should be science-based and expert. And though Canadians expect ethical considerations to guide the development of these technologies, they are loath to allow the ethical standards of one person or group to determine whether a product should be allowed for all. Once deemed safe, Canadians believe the individual consumer and the marketplace should be the sole determiners of the decision to purchase and use biotechnology products. The preference of the vast majority is for individuals to make their own choices, based on their own ethical standards. The only situation where ethics trump other considerations, and where Canadians are prepared to accept a ban of an application on ethical grounds, is in the case of cloning human beings which in their view virtually everyone would agree upon, so they see no infringement of others' rights.

The focus on science rather than ethics is most obvious in Canadians' attitudes towards stem cell research. Few issues of public policy have gained public attention at such a rapid rate. The vast majority of Canadians support the research because of what they believe to be the very large potential health and medical benefits that will accrue from the research. Almost a third of Canadians believe stem cell research will lead to very important benefits to them personally. The one caveat that tends to be expressed is the possibility that stem cell research will enhance the possibility of human cloning. As a result, most people want the government involved in fostering and regulating the research – its involvement raises their comfort level that there will be consistent standards and regulatory enforcement.

## Biotechnology Applications

The vast majority of Canadians resist offering systemic views on biotechnology applications. Most people evaluate each application on its individual merits, employing a core analytical framework to assess applications on a case-by-case basis.

People come to views about applications using an implicit risk/benefit calculation, with their conclusion driven by an assessment of the marginal personal benefit conveyed by the application. In other words: “do the potential benefits of the application (compared to non-GM products already available) outweigh the potential risks to myself or my family?” In simple terms, the larger and more personal the anticipated benefit, the more acceptable the risk and the higher the level of support for a given application.

More than 40 current and prospective biotechnology applications in health, environment, and agriculture have been tested in the research. What has emerged is a clear hierarchy of support that finds health applications at the top of the hierarchy, environmental applications in the middle range, and agricultural and food applications with decidedly lower levels of support.

The case for biotechnology applications is most widely compelling to Canadians when it is built on science. The wide majority tends to be reluctant to accept arguments based on fear or emotion. Ultimately, if an application is deemed safe by the “best available” scientific research, and is monitored over time through diligent government surveillance and ongoing research, the test for acceptability has been met. Nevertheless there are some universal guiding principles that most Canadians apply:

- The proposed uses or outcomes have to be within a range of acceptability. Good science will not trump highly contentious applications that seem to fail the risk/benefit test.
- Biotechnology products have to meet higher scientific standards for safety than non-biotech products.
- Long-term research into potential impacts is important to the credibility of the regulatory system.

## Biotechnology Risk and Regulation

The most prevalent negative driver in the realm of biotechnology is concern about long-term risks and unknowable outcomes that these technologies may produce -- in particular, potential long-term risks to human health and the environment. The more intrusive the application, the higher the life form it involves and the larger the degree to which the application crosses boundaries separating plants, animals and humans, the larger the perceived risk. With the exception of human and animal cloning, where ethical issues are important drivers of opinion, risks drive negative perceptions about biotechnology.

While most Canadians express concern about potential risk, they are both resigned to its inevitability and confident that somewhere, someone is in charge of trying to mitigate that risk. In a world replete with threats and risks, the risks of biotechnology seem to many to be less urgent and commanding of immediate attention. The research shows that Canadians place the risks from biotechnology on a decidedly lower tier of concern than many other risks. In general, Canadians seem to have assumed a casually watchful and mostly neutral stance, relying on science to sort things out.

Most Canadians believe that products on store shelves have been tested and are safe. Even though they have virtually no detailed understanding or knowledge of the federal government's regulatory practices and imperatives, there is a general sense among Canadians that the systems are sound. Once Canadians are provided with information about the government's stewardship roles and systems, large majorities move towards supporting most applications. Most people want to know that government is trying to mitigate or reduce risks as society seeks to gain the benefits. They want biotechnology activity to proceed as long as government seems to be managing risk intelligently. There is, however, a preference that the government increase its emphasis on stewardship, with particular emphasis on studying the long-term impacts of these technologies.

The current government policy approach to biotechnology continues to be accepted by a wide majority of Canadians. There is continuing broad support for a two-track policy approach which includes a strong regulatory and scientific oversight system for long-term surveillance and research, in concert with measures designed to foster the development of the technology and the industry. Almost nine in ten agree that "the primary role of government in this field is to gain the benefits while managing the risks," suggesting that gaining the benefits is an acceptable and appropriate objective to strive for, as long as stewardship is diligently pursued. People don't see stewardship and promotion as a "zero-sum" game – both can and should be pursued, but primacy is assigned to the stewardship function because the technology is seen to have the potential to affect people's lives negatively.

Nevertheless, Canadians very much want government to ensure they reap the benefits of what they see as truly important scientific breakthroughs, particularly in health and medicine. They also want to ensure that Canada is at the forefront of scientific research internationally because of the economic benefits it can bring, and because it can help to address perceptions of a "brain drain" of bright young Canadians to other countries. For instance, most Canadians would like government to contribute to private sector venture capital funds earmarked for biotechnology research and development.

## Canada-U.S. Comparisons

Canadian public opinion towards biotechnology largely mirrors attitudes in the United States and is far closer on all dimensions to American opinion than to opinion in many other parts of the world. While American levels of support tend to be a bit stronger and attitudes somewhat less cautious overall, levels of entrenched opposition in both countries are similarly low.

Americans express higher levels of support for biotechnology – between 5-10% on most measures and applications. Conversely, Canadians display slightly higher levels of concern about the risks involved. The largest gaps in attitudes between the two populations fall in three areas:

- GM food – Americans are more comfortable than Canadians
- Perceived risks – More concern displayed among Canadians
- Confidence in regulatory authorities – Americans believe their government is more stringent

Underlying these differences appear to be two key drivers that are more prevalent in the U.S. than in Canada.

- An unwavering belief in science and technology as providers of improved quality of life and standard of living
- A stronger belief in the power of entrepreneurship and a belief that biotechnology represents a new wave of entrepreneurial achievement in the United States

Overall, however, it is important to note that these differences are relatively small and that the majority of people on both sides of the border are broadly supportive of the technology, particularly in those areas that promise to improve human health.

*This body of research is publicly available from the Canadian Biotechnology Secretariat of the Government of Canada. It can be accessed through its website at <http://biotech.gc.ca>.*