POLLARA AND EARNSCLIFFE

PUBLIC OPINION RESEARCH INTO BIOTECHNOLOGY ISSUES

SECOND WAVE

Presented to the Biotechnology Assistant Deputy Minister Coordinating Committee (BACC), Government of Canada

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Prepared for the Biotechnology Assistant Deputy Minister Coordinating Committee, Government of Canada, by Pollara Research and Earnscliffe Research and Communications.

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A. INTRODUCTION

Pollara Research and Earnscliffe Research and Communications are pleased to present this report on a public opinion research program conducted in late January and early February 2000 for the Biotechnology Assistant Deputy Minister Coordinating Committee, Government of Canada. The research was comprised of two separate instruments: a telephone survey and a set of focus groups. This report presents the findings of both.

The research was designed to establish whether there had been significant changes in public opinion towards biotechnology since the previous research phase in the fall of 1999.

Using some elements from the benchmark survey questionnaire from the fall of 1999, Earnscliffe designed and conducted a national telephone survey of 1000 people between January 31 and February 4, 2000. That was followed up with focus groups in the third week of February, using much of the focus group agenda from the fall as well.

The research probed four areas of investigation in order to track current opinion on biotechnology and compare the results with the fall survey. The areas included:

- overall awareness and familiarity;
- perceived risks, benefits and drawbacks;
- assessments of government performance in biotechnology, preferred roles for government and future priorities; and
- the acceptability of various products and processes.

The final results report on the views of a random sample of 1000 Canadians and carry a margin of error for the national sample of +/- 3.0%, nineteen times out of twenty. Margins of error for sub-samples range up to +/- 3.9% for smaller regional samples. Precise margins of error can be provided for the variety of aggregated sub-samples.

Three nights of focus groups (six groups in all) were conducted in Montreal, Toronto and Vancouver between February 9, and February 10, 2000. The research followed a consistent agenda for discussion and was designed to probe in more detail opinion underlying the results of the telephone survey. Each night of the focus group wave comprised a group of approximately ten participants drawn from the general population and a group of similar size of *Involved Canadians*, our proprietary population segmentation of Canadians who are significantly more interested and involved in public policy issues.

This report is divided into two main sections: results of the survey, followed by a summary of the learnings from the focus groups.

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B. EXECUTIVE SUMMARY

Overall the survey indicates that awareness of biotechnology is growing, though that is having no real impact on self-reported familiarity and interest. As a result, the depth of knowledge of the field remains relatively low. Nevertheless, growing awareness is translating into increased levels of concern on all fronts, particularly health. It also appears to be fuelling somewhat more interest in the ideas of more regulation and more research into the impacts of biotech applications. Federal government performance ratings are consistent with these growing concerns, eroding somewhat on all indicators. However, the generalized presumption among Canadians that their food is safe appears to be relatively insulated from these trends.

The message from this updated survey is a bit mixed. On the one hand, these results do not signal a major absolute shift in opinion despite months of intense media coverage and debate. Most Canadians remain disengaged and disinterested and there has been no galvanizing or catalytic event to change that.

On the other hand, the public opinion numbers continue to move in a consistent direction, towards higher overall concern. Though the movement is *comparatively* small, it is quite marked given the relatively short space of time between surveys. Significantly as well, the movement is larger among *Involved Canadians*, that 30% segment of the population that Earnscliffe has identified as more activist in its behaviour and more influential than other cohorts. If the current pace and direction of change continues, the result over time might be an undermining of confidence in the biotechnology sector and in the federal government's ability to address the issues that biotech raises.

The highlights of the findings include:

Awareness of biotechnology-related issues has risen substantially. There has been a 15% increase in the number of Canadians who say they have heard something about biotech in the past three months, now 53%.

Familiarity and interest in biotech have not grown significantly. The number of those who say they are very or somewhat familiar with biotechnology has grown by three percentage points since October, though only 6% are very familiar now. Interest levels – quite low -- are unchanged since October.

There has been a downward trend in the assessment of benefits vs. drawbacks, especially in health and food.

Since October, 13% fewer people believe that there are major or modest benefits to health from biotechnology. The number is almost precisely the same (12%) when it comes to benefits in the quality of food, while those perceiving drawbacks in those areas have gone up 8% and 9%, respectively.

Assessments of federal government performance are down slightly in all areas. While there is no change in *excellent* and *good* overall performance ratings, they still hover under 20%. However, *poor* overall performance ratings have risen from 26% to 29%, with *health* performance down five percentage points (22% say good or excellent) and *ensuring interests of Canadians taken into account* down 4% (14% say good or excellent).

The desired priority list for government remains largely unchanged from October. Health, environment, the ethical use of biotech and informing Canadians are the main issues, while economic benefits are waning as a priority.

Health remains the most effective benefits case for communications messaging. The same percentage as last time see it as the strongest argument (36%). Biotechnology's potential to help solve world hunger is the second strongest argument (29%), increasing by 4% since October.

Long-term risk is by far the most effective negative argument. In fact, 5% more see it as the strongest negative argument (now 44%).

Experts and science remain the preferred decision-making drivers. There was no change in how most people wanted decisions made: they continue to believe that experts should be more influential than members of the public and they want science to trump ethics when the two come into conflict.

- 59% would rather rely on experts over the public
- Two-thirds would rather rely on science over ethics

The demand for regulation and caution is growing. For instance, 7% more *disagree* with the proposition that "government should encourage biotech although there may be unknown risks" (37% now disagree.) Other results in this area include:

- A 4% increase in agreement with the idea of "government regulating biotech more than other sectors" (73% now agree)
- A 4% increase in agreement with the idea of "conducting further research into long-term health and environmental impacts before allowing any further use of biotech" (87% now agree)
- A 5% increase in agreement with the idea of "slowing use of biotechnology until more is known" (72% now agree)
- 10% more *disagree* with the idea that "enough is known about safety of products made through biotechnology to allow them to be used" (54% now disagree)

The presumption of the safety of food remains insulated from growing concerns overall. Though within the margin of error, there has been a 2% increase in the assumption that food on store shelves is safe (now 71%), with a similar increase of 4% in the assumption that food has been tested for safety by government (now 77%.) At the very least, given the margin of error, there has been no substantial deterioration in this assessment despite the intensified debate about GM foods.

The focus groups were consistent with the telephone survey. Participants were somewhat more aware of biotechnology and its applications than they had been in the fall but were no more engaged, interested or knowledgeable. Consistent with previous focus group findings, few are prepared to fully endorse or fully oppose biotechnology writ large. Instead, most Canadians make distinctions between biotech applications that are acceptable and not acceptable. Health and medical applications are consistently met with positive sentiment. GM food applications continue to be met with resistance by most, although this resistance has yet to catalyze determined behaviour to oppose the production of these foods or to avoid eating them. The safety of food continues to be an issue most people separate from their concerns about GM food, as most Canadians believe the food they purchase is safe and is tested for safety. In addition, these results indicate that few have any sense of what the federal government is doing in this field and confidence is eroding about the federal government's ability to address key issues (particularly in terms of health and environmental risks) that biotech raises.

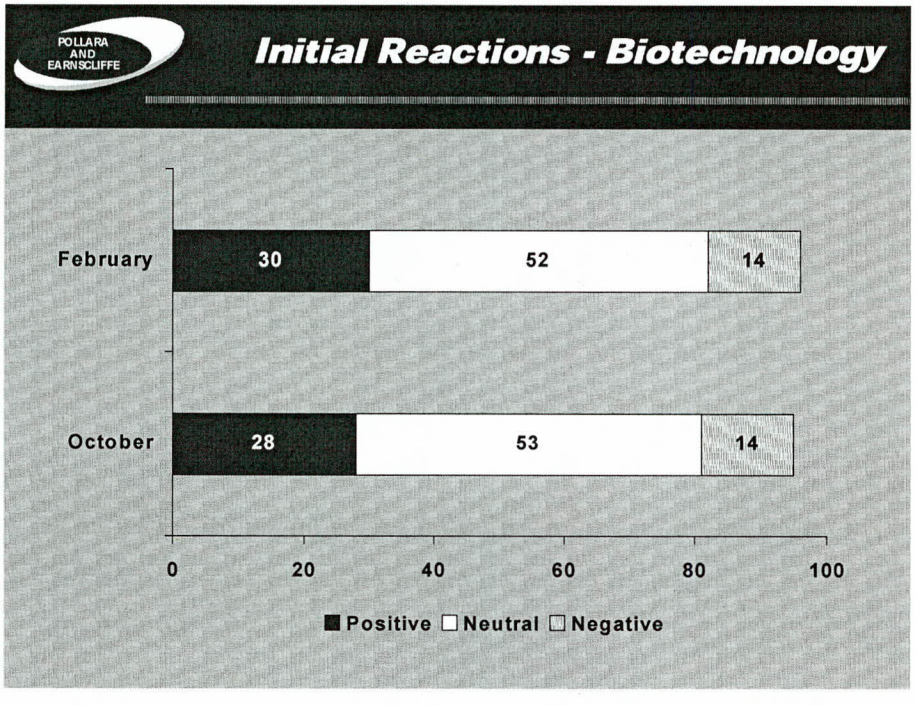
A final word about the demand for information about biotechnology. Though the survey did not ask the full battery of questions posed in October, it did probe respondents' views about the role of government in providing information. An overwhelming number of people wanted government to provide them with information and then let them decide for themselves whether to use biotechnology products. In focus groups, most people advocated an "informed choice" approach to GM foods, leading them to support some form of labelling. Many said they would accept a voluntary process but indicated they would expect a mandatory solution if the voluntary process did not produce results.

C. THE SURVEY – DETAILED FINDINGS

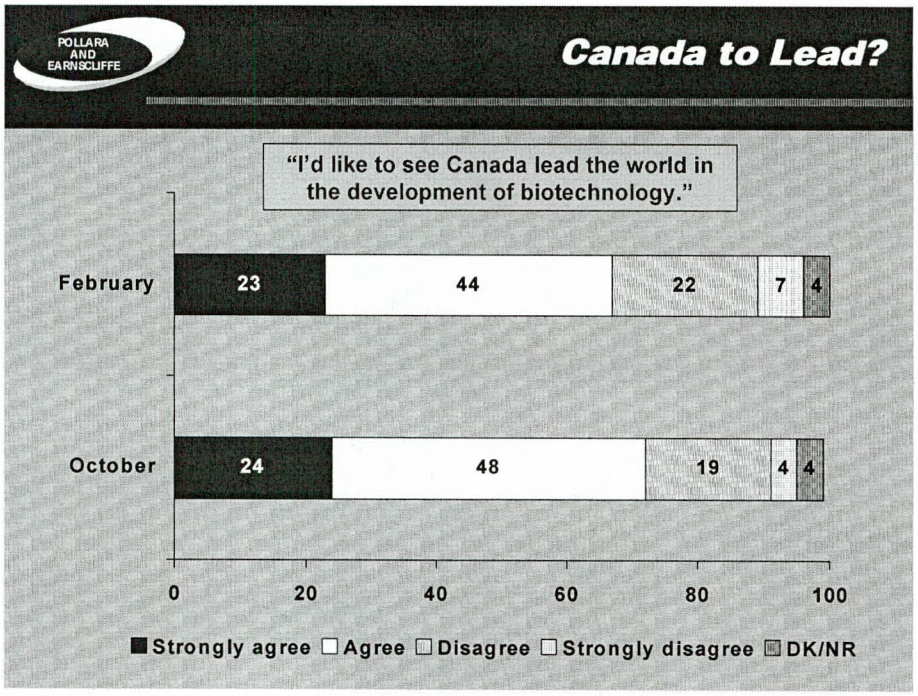
Awareness, Familiarity and Interest Levels

Once again, the survey tested top-of-mind reactions to biotechnology in the way it had in the fall survey – asking three consecutive questions about *biology, technology* and *biotechnology*. Again, there are far more positive associations with *technology*, an even split between positive reaction and neutrality towards *biology* and a decidedly neutral tilt towards *biotechnology*. However, despite the differences the words create, entrenched negative opinion towards biotechnology is still quite low and has not changed at all between surveys.

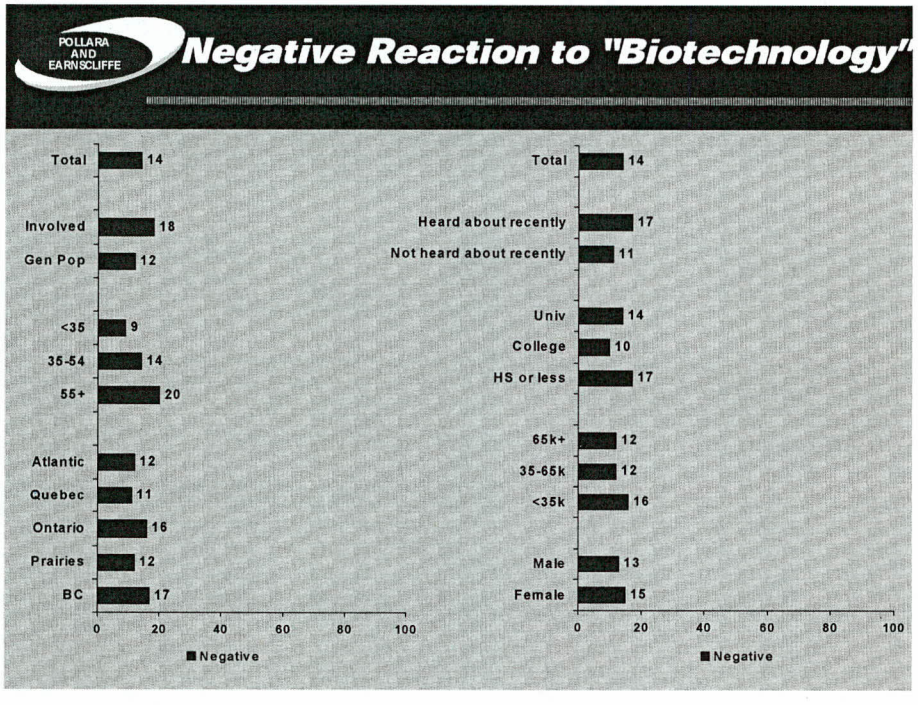
Focus groups revealed that public opinion towards high technology continues to evolve in Canada, as more and more people invest their hope for the future success of the Canadian economy in high technology. Correspondingly, the concept has become much less threatening, no longer automatically conveying job loss and plant closures. There is a bit of a positive "halo" that the word *technology* casts over any phrase or description that uses it.



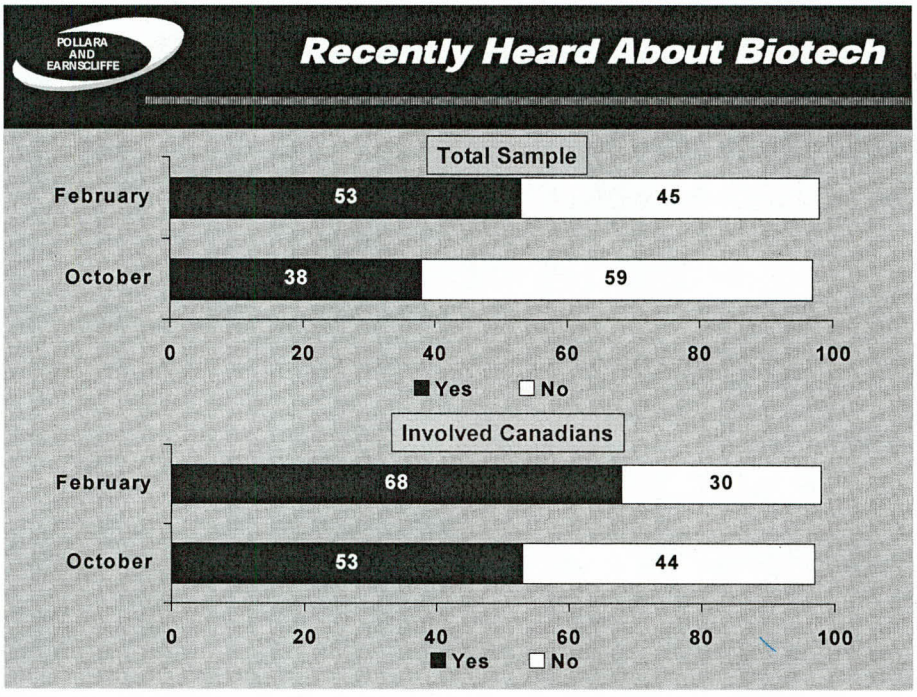
As further evidence of the positive halo generated for most people, a strong majority of Canadians still want Canada to lead the world in the development of biotechnology. That number has dropped somewhat from October but is still quite significant.



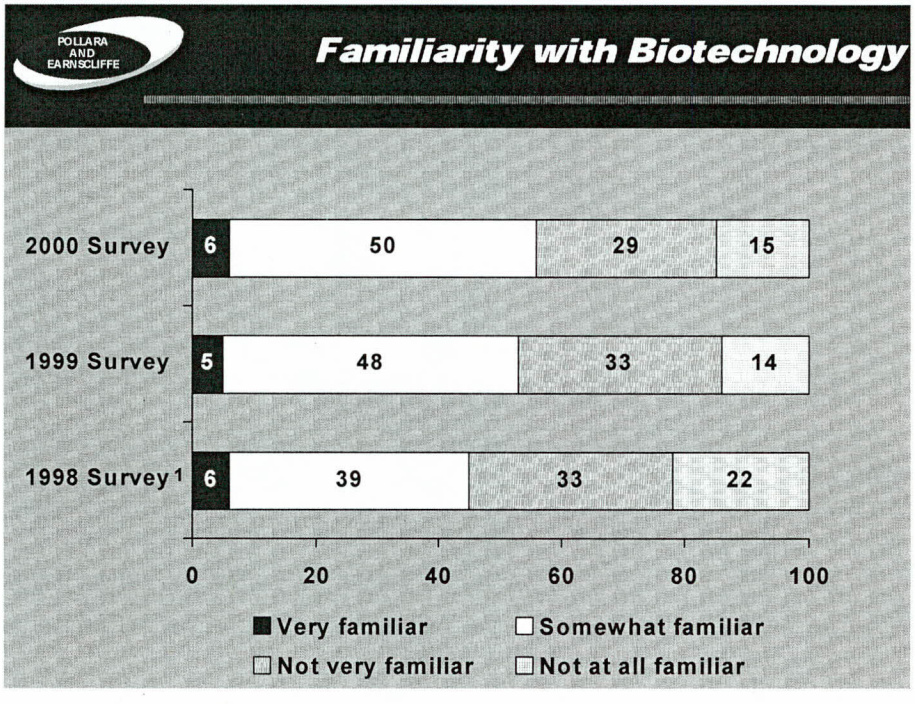
In examining those who expressed negative reactions to biotechnology, there are easily discernible clusters of people who are more concerned than the average. They include *Involved Canadians*, older people, and those who report having heard some of the recent debate about biotechnology. The following graph shows the various demographic subgroups and the percentage of Canadians within each subgroup who report a negative reaction to biotechnology.



Awareness of biotechnology-related issues has risen dramatically between surveys. There can be little doubt that the substantially increased volume of media coverage over the past few months has brought the issue to more significant levels of public awareness and recognition. There is a remarkable 15% increase in the number of people who say they have heard about stories or issues involving biotechnology over the past three months. That brings to a majority the number of people saying that, and a significantly higher proportion of *Involved Canadians*.

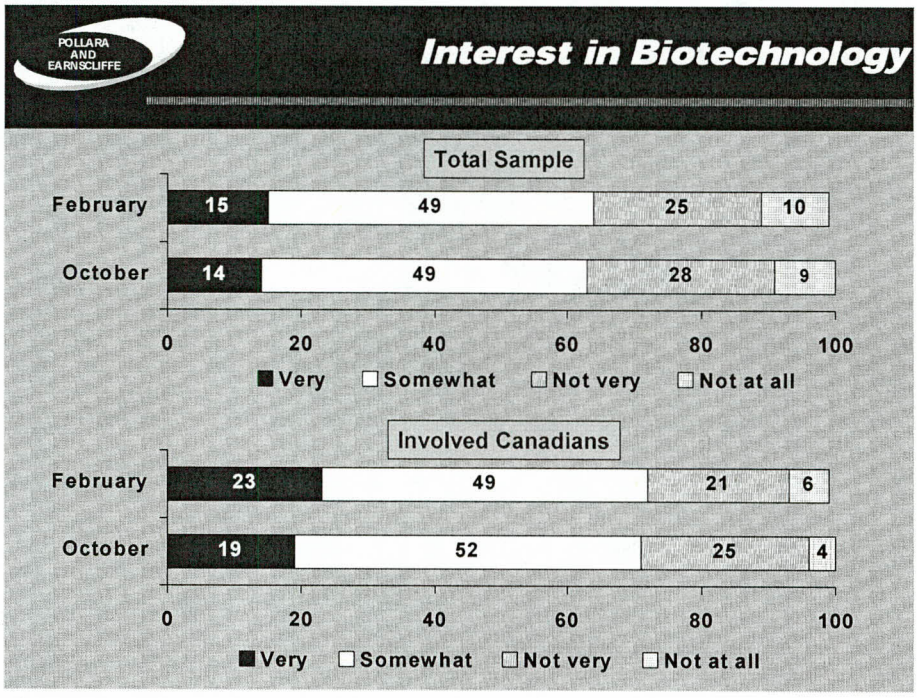


Nevertheless, heightened awareness has not translated into much deeper familiarity or expressed interest. Those levels – quite low in October – have barely shifted in February. The reasons for that, at least according to focus group participants, involve a mix of factors. Some find the issues quite complex and esoteric, a debate about a branch of science that they find hard to follow. Others find it hard to directly link benefits, or risks, to what they know of the actual practice of genetic modification. And many believe the issue has become politicized, somewhat inappropriately, and have lost interest in the rhetoric and conflict. As a result, only an extremely consistent 5-6% of the population is willing to claim that they are very familiar with biotechnology.

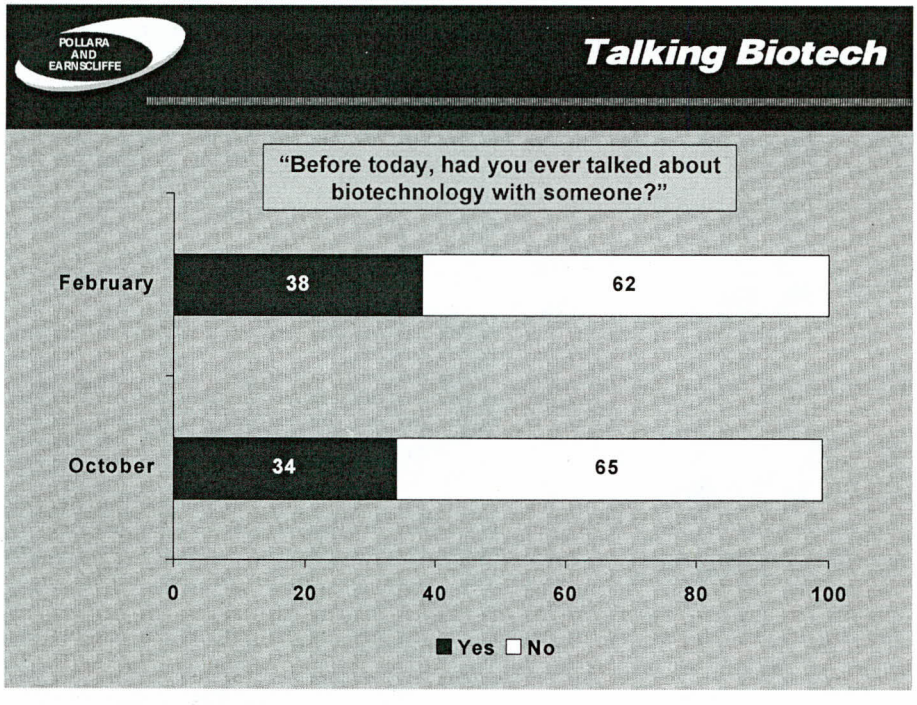


[1]Environics Research Group, *Renewal of the Canadian Biotechnology Strategy: Public Opinion* Research (1998). The Executive Summary of this report is available at: **http://strategis.ic.gc.ca/cbs**.

The proportion of the general population expressing a high level of interest in biotechnology is comparatively low as well and hasn't increased despite the months of intense media coverage. Where it has moved somewhat more significantly is among *Involved Canadians*, where interest was somewhat higher to start with. Almost one quarter of these people now say they are very interested in the subject.



As further evidence of the apparent lack of interest in biotechnology, three of five Canadians say they have never talked about biotechnology with anyone. That number has changed only slightly from the fall.

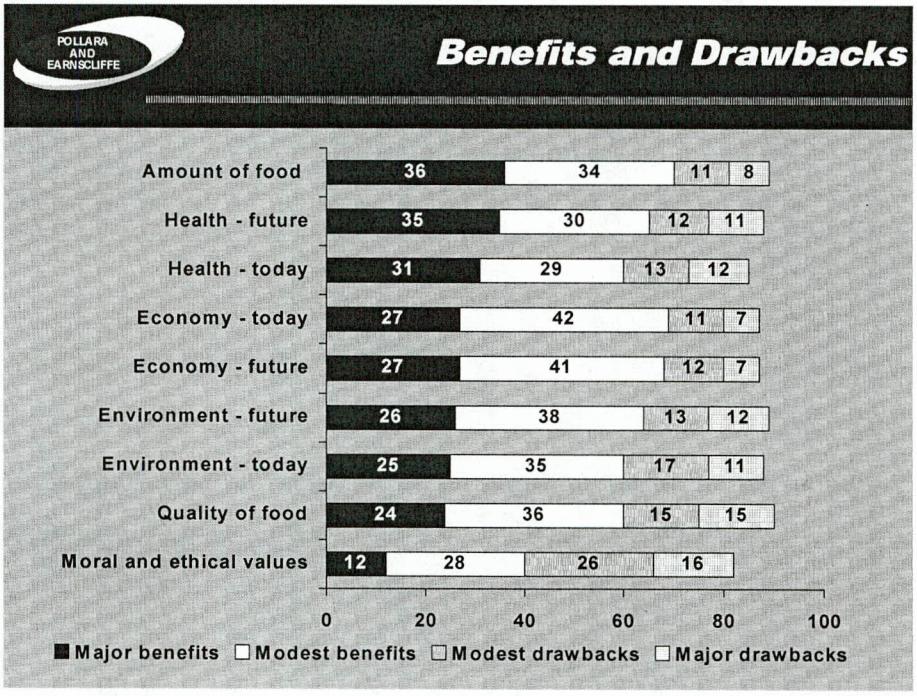


Assessments of Benefits and Drawbacks

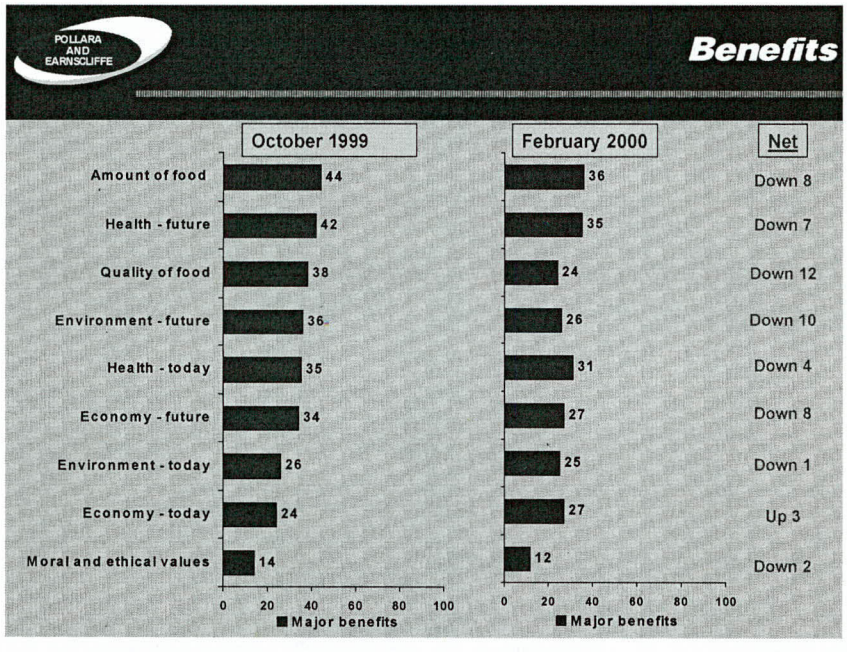
On the whole, most people continue to see substantially more benefits than drawbacks to biotechnology, though the gap has narrowed since October, quite substantially in several key areas like health and food quality. In many ways, this overall positive assessment expresses the biotechnology conundrum quite well. As a general proposition, biotechnology is greeted neutrally to positively, with an underlying assessment that it promises more benefits than drawbacks. However, once the question becomes much more specific – e.g., the assessment of actual applications of the technology – attitudes begin to polarize as people begin to assess each on a case-by-case basis. Focus group discussions show clearly that

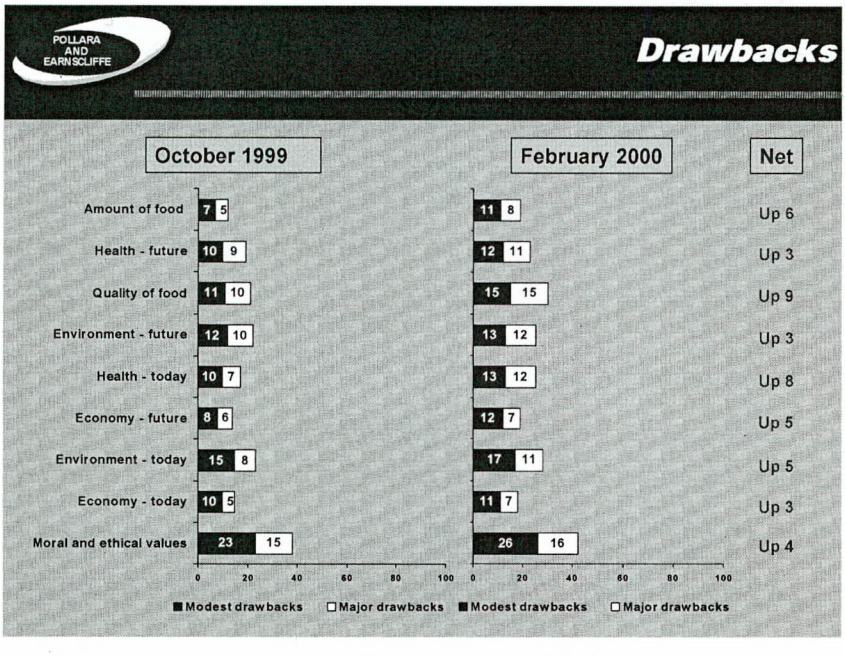
most people want to use a case-by-case frame for their own decision making, because they want to apply a risk-to-benefit equation to test the potential marginal personal benefit for themselves of each application.

The following graph shows the assessed benefits and drawbacks along nine variables. The availability of food and health care applications seem to many to promise the largest benefits. The potential moral and ethical conundrums pose the largest drawbacks.



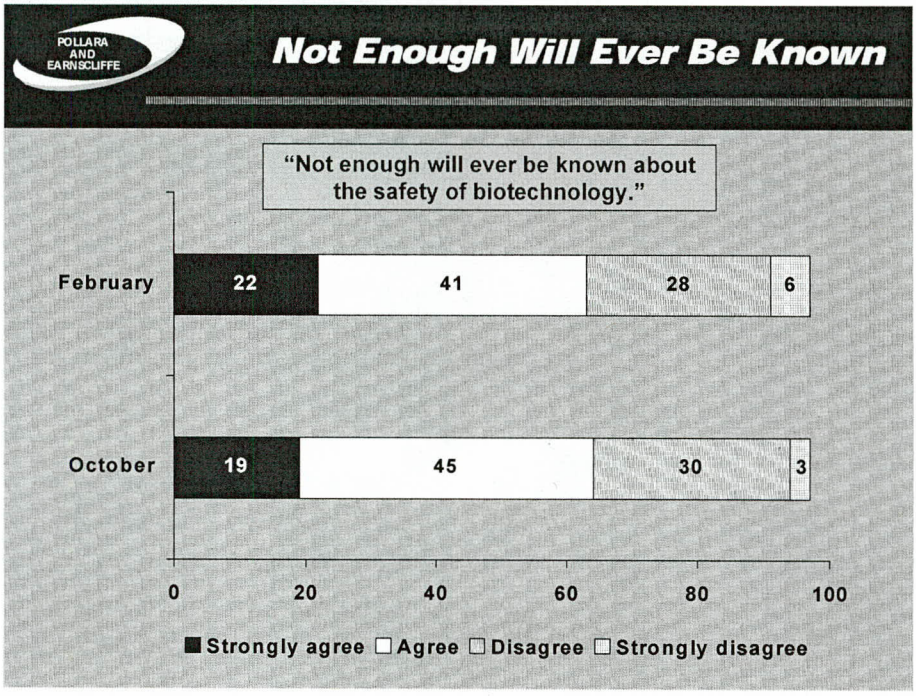
The following graphs show the degree of change in perceptions since the fall. The erosion in the number of Canadians saying they expect major benefits has been quite significant. Similarly, the increase in those seeing major or modest drawbacks has been quite consistent.





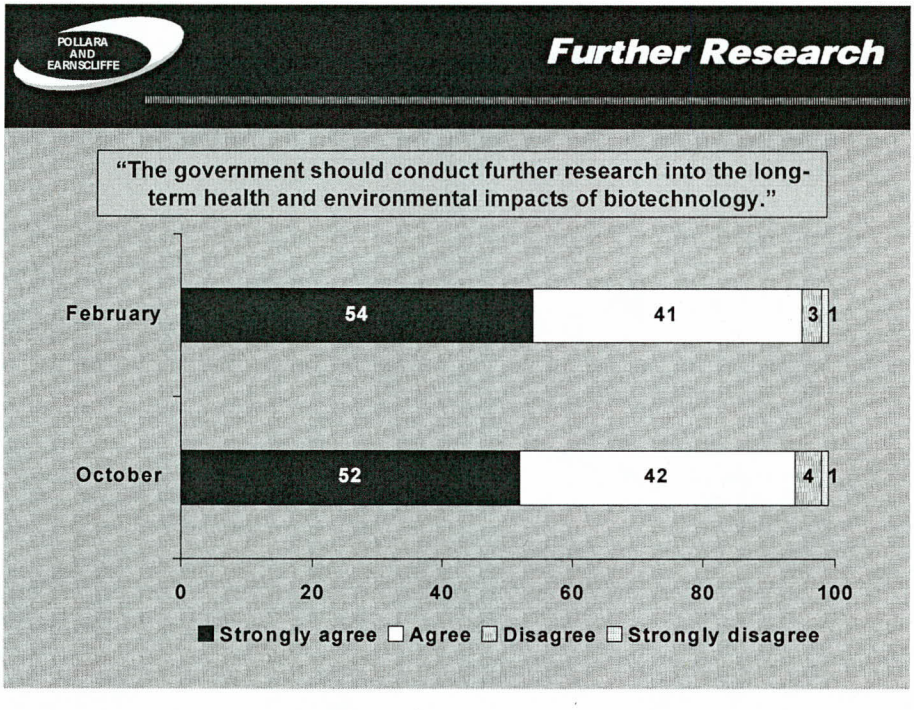
The Question of Risk

As indicated just above, the question of risk is central to attitudes about biotechnology and its applications. Most people understand that many things in life carry risk and they tend to believe that you can't move forward without taking some risk. Biotechnology is no exception to that and Canadians generally do not impose a zero-risk frame on the technology. Nevertheless, they believe there are risks particular to biotechnology and, as a result, they tend to employ a personal sense of the risk/benefit ratio to decide whether, on balance, a particular application is worth proceeding with in spite of the risk involved. The larger the perceived benefit – for example, health benefits are highly prized – the larger the willingness to take risk. There is a clear logic chain. Most people believe that not enough will ever be known about the safety of biotechnology. It seems to follow then that almost two-thirds of Canadians agree that "we have to accept some risk to achieve health benefits from biotechnology research." However, in what is a commonsense approach, most Canadians very much want further research into the risks of biotechnology so that they can understand the long-term implications.

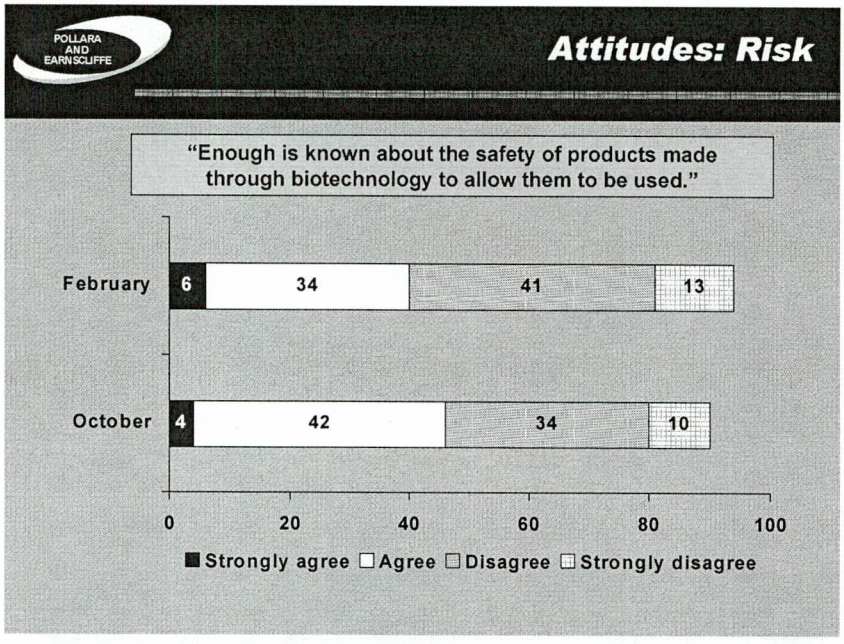


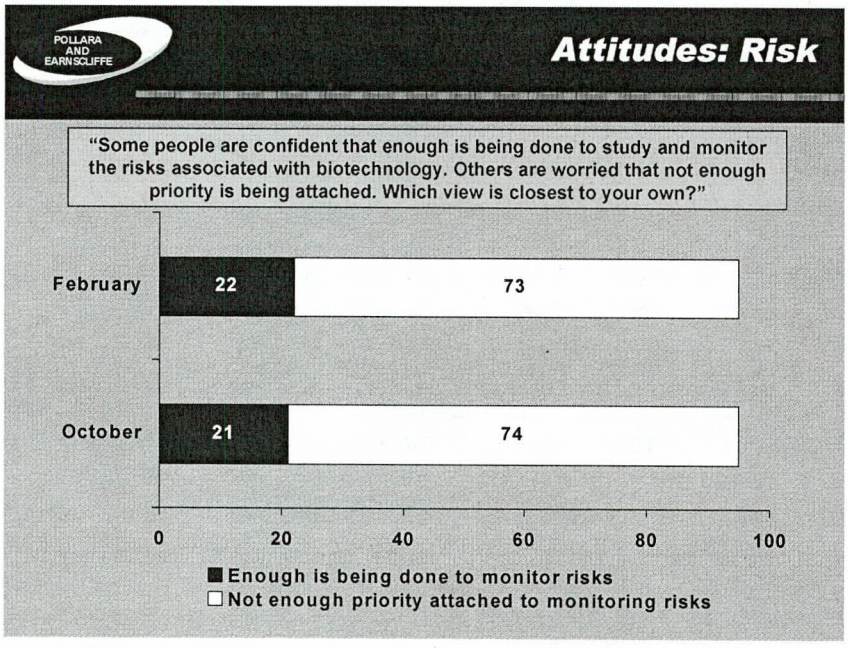
Attitudes: Risk

Further Research

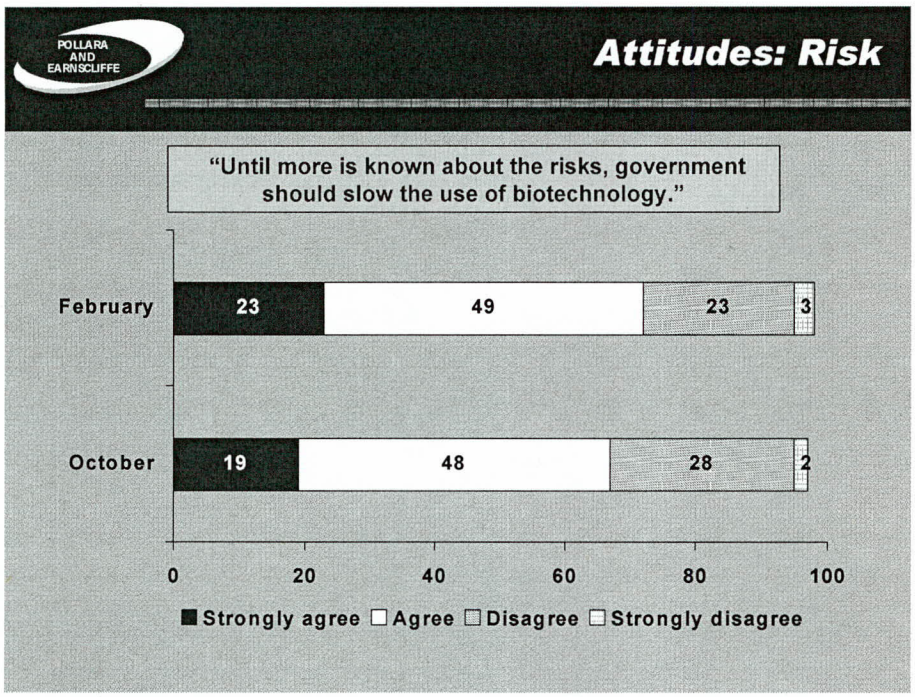


There clearly is some mixed emotion about all this. Though in the previous response Canadians were willing to accept some risk, they increasingly are not sure that enough is known about the safety of products made through biotechnology to allow them to be used. Again, the generic question generates one kind of response, the specific trade-off question, another.





Ultimately, when people are given a bit of middle ground – i.e., that government should *slow* the use of biotechnology until more is known about the risks – they agree in increasingly larger numbers.



The Role of Government

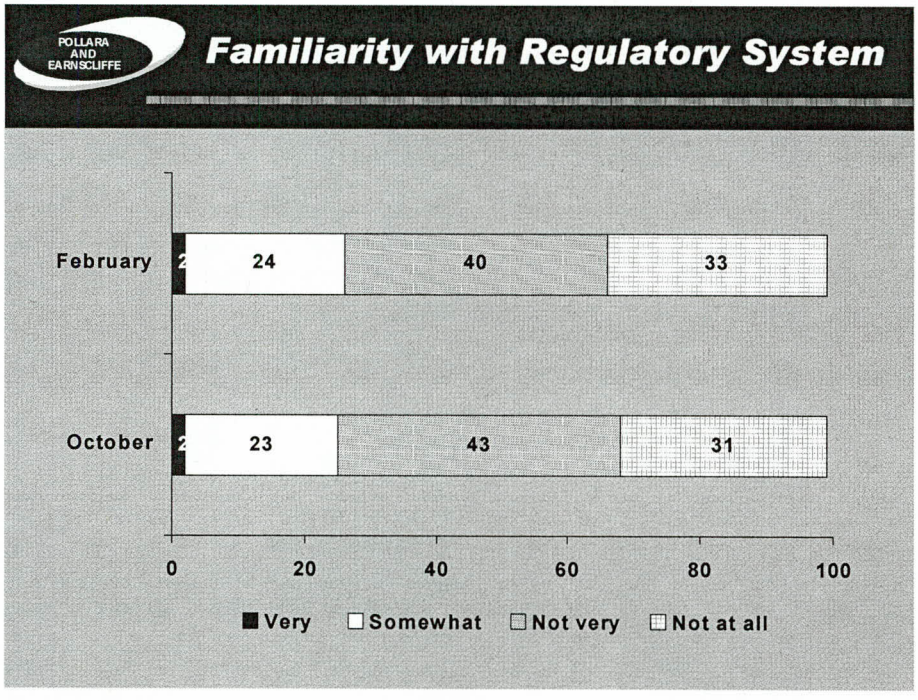
Over the past few months, performance ratings of the federal government in relation to biotechnology have eroded slightly, both on its overall performance as well as its work on specific issues. The number of Canadians who say the government is doing a poor job has grown by three percentage points among the general population, and higher among *Involved Canadians*.

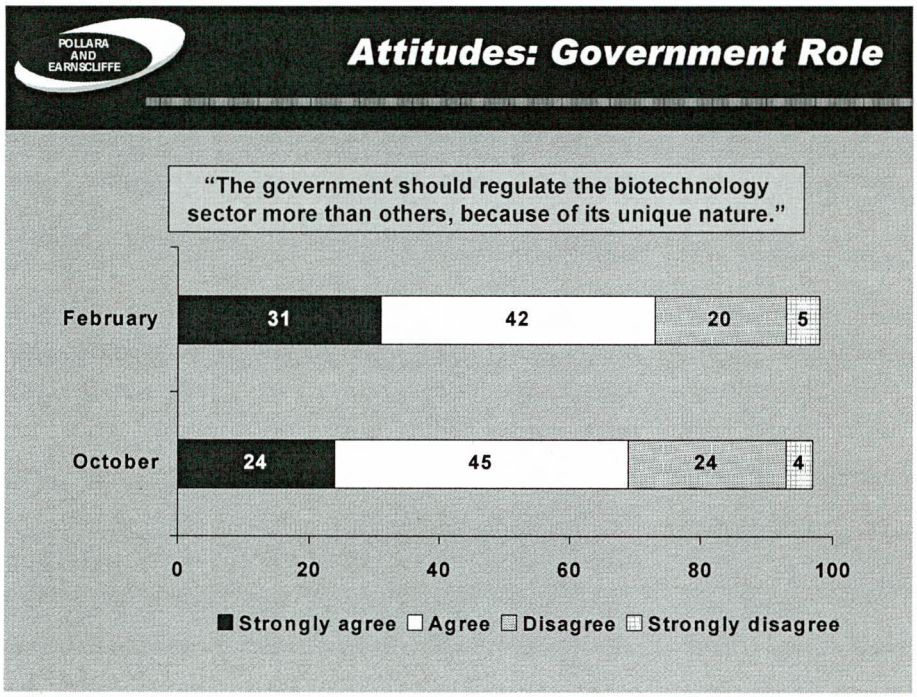
It is fair to say that the ratings probably reflect more the rise in concern about biotechnology than a precise knowledge of what government does in the area. In fact, focus groups show that people have trouble identifying the various government roles. For instance, Canadians know very little about current regulations or the workings of the regulatory system. Few describe themselves as familiar with the system and most seem willing to assume the best, that someone's in charge and doing the proper job. When it comes to food, the overwhelming majority believes that food on grocery shelves is safe and that it has been tested for safety.

But the apparent low levels of knowledge and modest levels of concern are only a part of the picture. Most people would support a greater level of regulation on a going-forward basis because they believe the risks are real.

Ultimately, they want government to carry out two roles quite vigorously. They want it to facilitate the technology in order to gain the benefits they think important but they also want aggressive regulation and intensive research so that the risks can be managed and minimized.

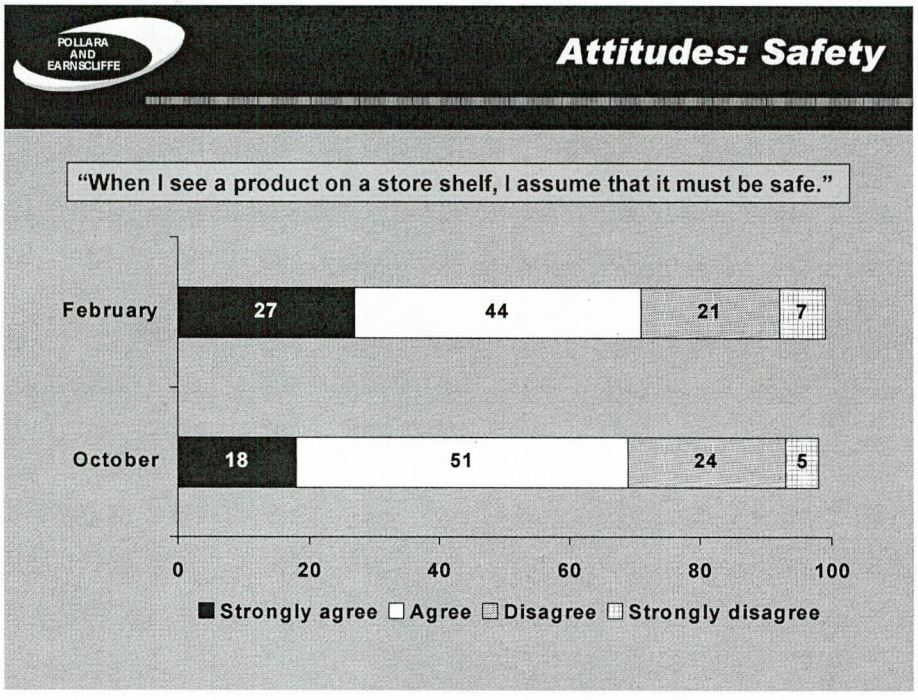
Clearly, the demand for aggressive regulation is based almost entirely on the perceived long-term risk, and not on any criticism of the current regulatory system. In fact, virtually no Canadian, including *Involved Canadians*, is willing to say that they are very familiar with the regulatory system.

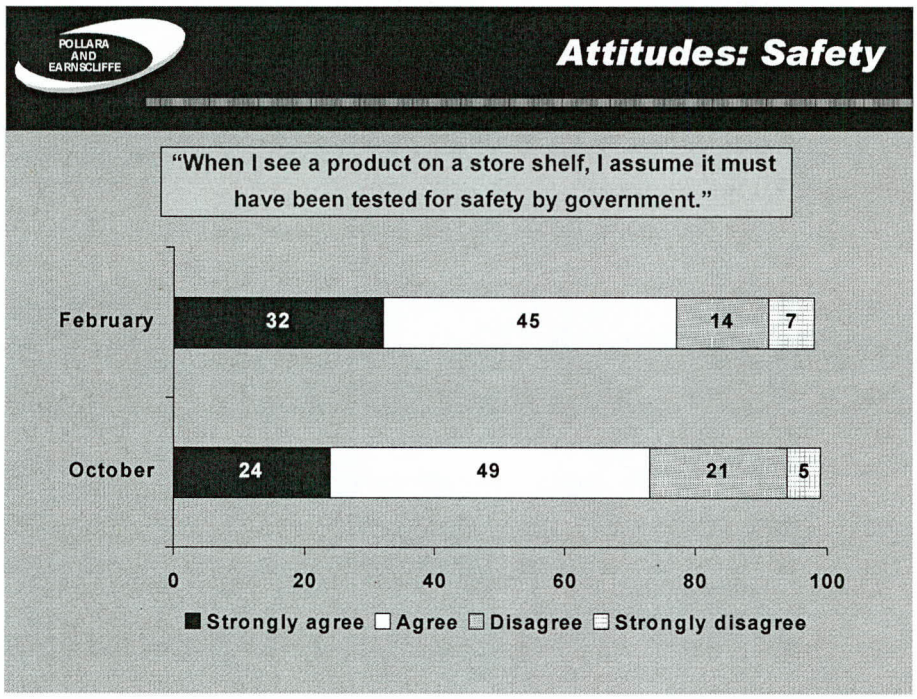




By a margin of about three to two, Canadians reject the proposition that too much regulation will render the sector less successful.

Though concern is rising about some aspects of biotechnology and fuelling demand for increased regulation, perhaps counter-intuitively it is not apprehension about food safety that is driving that increase. In fact, the current debate seems to have convinced more Canadians about the safety of their food. In February, more people felt strongly that their food was safe and had been tested for safety by government.

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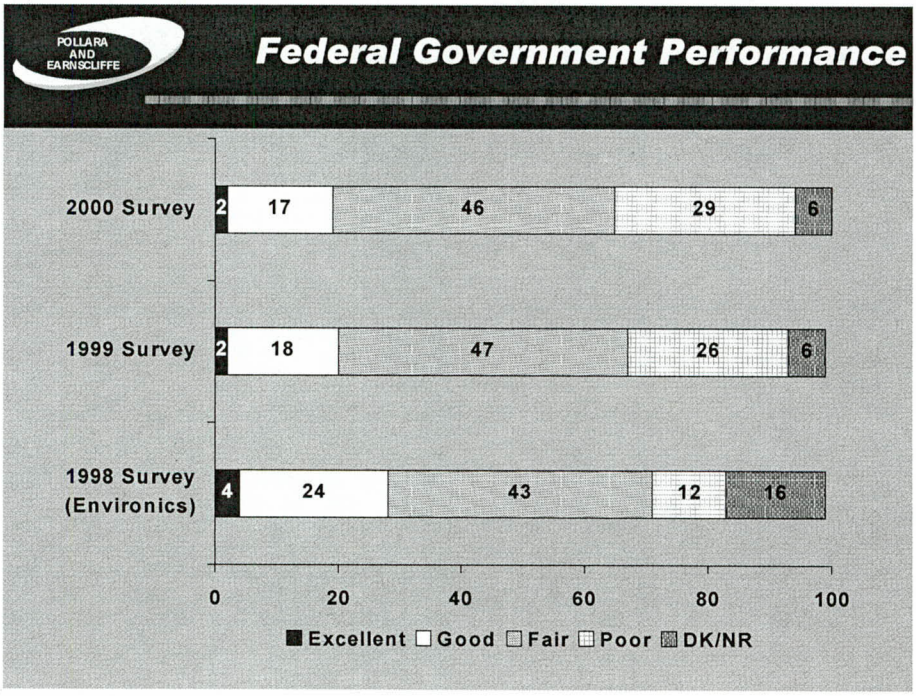
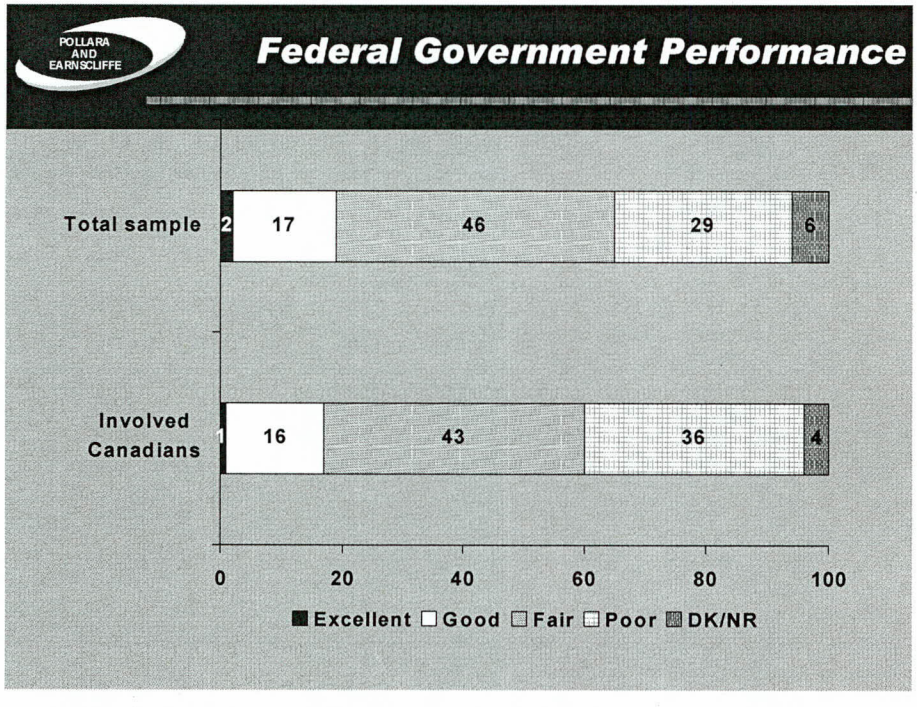
Attitudes: Safety
"When I see a product on a store shelf, I assume it must have been tested for safety by government."
February
32
45
14
7
October
24
49
21
5
0
20
40
60
80
100
Strongly agree
Agree
Disagree
Strongly disagree

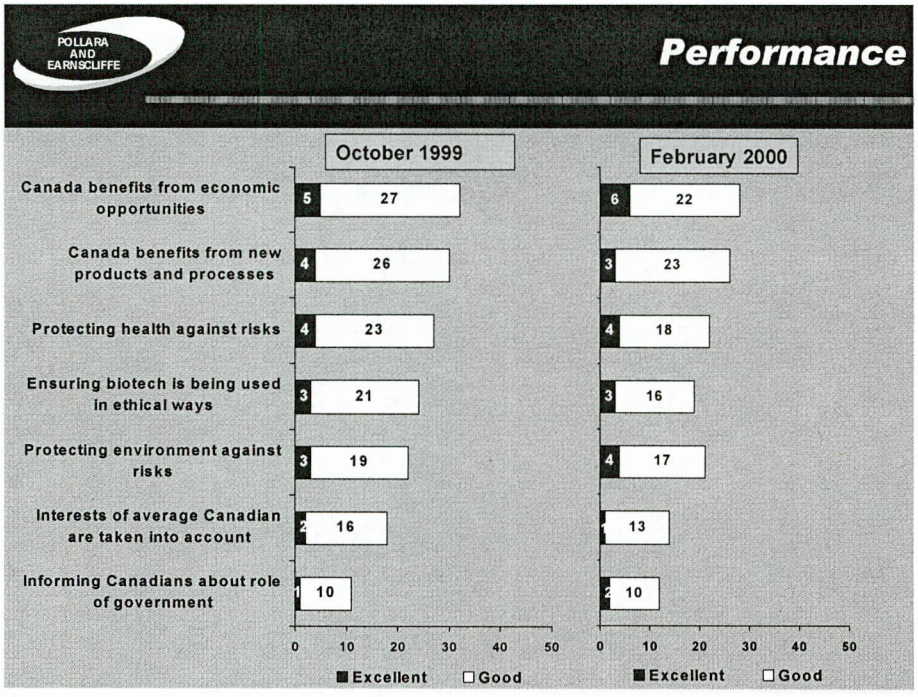
Comparing data from the three years' worth of Canadian Biotechnology Strategy polling shows a steady increase in the number of people dissatisfied with government performance on biotechnology. However, the much larger number of people who are still willing to say government has done a fair job or better is further evidence that there is an overall comfort level with biotechnology.



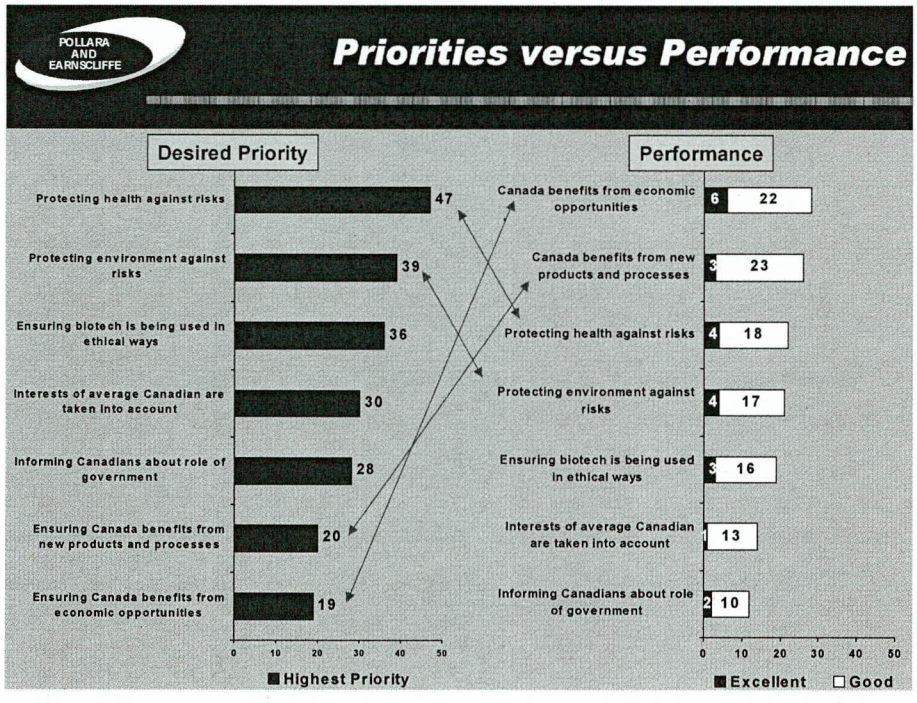
However, *Involved Canadians* – the people who show much higher levels of knowledge and familiarity with biotechnology – also show higher levels of dissatisfaction with government performance.



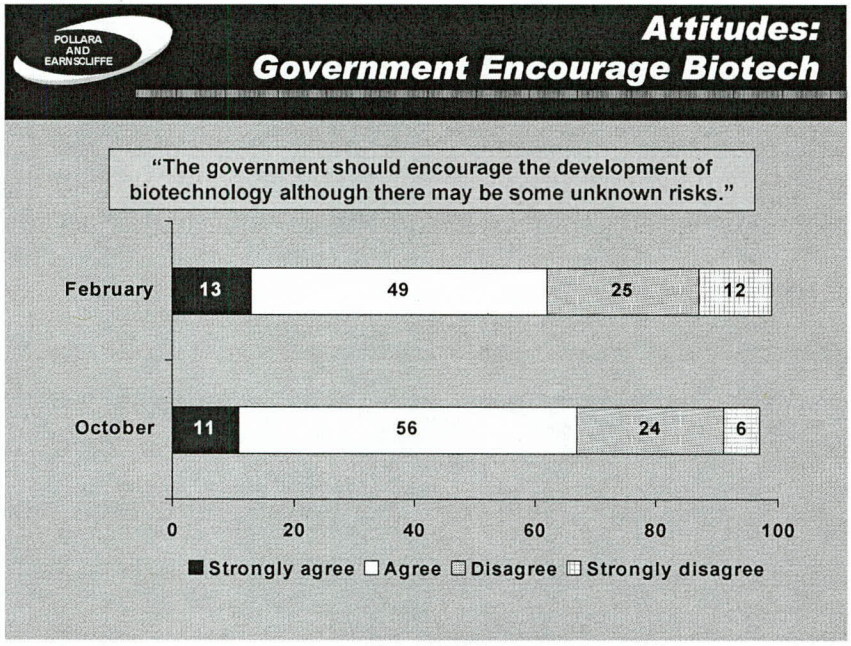
The declines in positive rating for government performance are reflected consistently throughout the list of specific biotechnology issues. Comparing the data from the fall and winter shows a fairly uniform decline in the number of people volunteering that the government has done a good or excellent job.

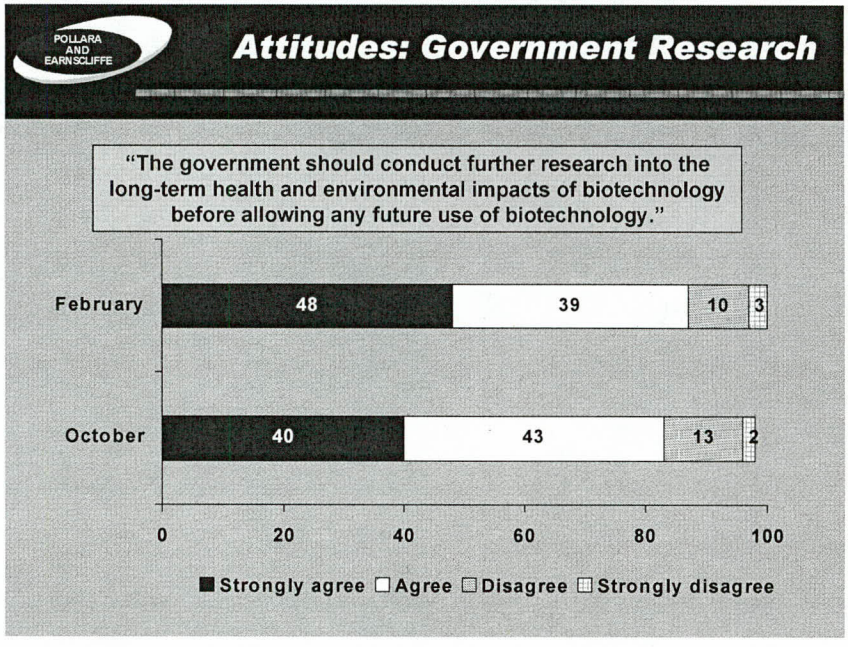


And, as in October 1999, there is a mismatch between what people express as their desired priorities for government and how they perceive the government's performance on those priorities. In the following graph, it is clear that government gets its highest marks for its performance on the two priorities Canadians rank least in importance. Conversely, it receives only middling ratings for the two highest priorities of Canadians – protecting health and environment against risks.



The ambivalence and inner tension felt by Canadians are well illustrated by their apparently contradictory responses to two separate questions in the survey. Majorities believe both that government should encourage the development of biotechnology despite unknown risks and that government should not allow the future use of biotechnology until it conducts further research into long-term health and environmental impacts.

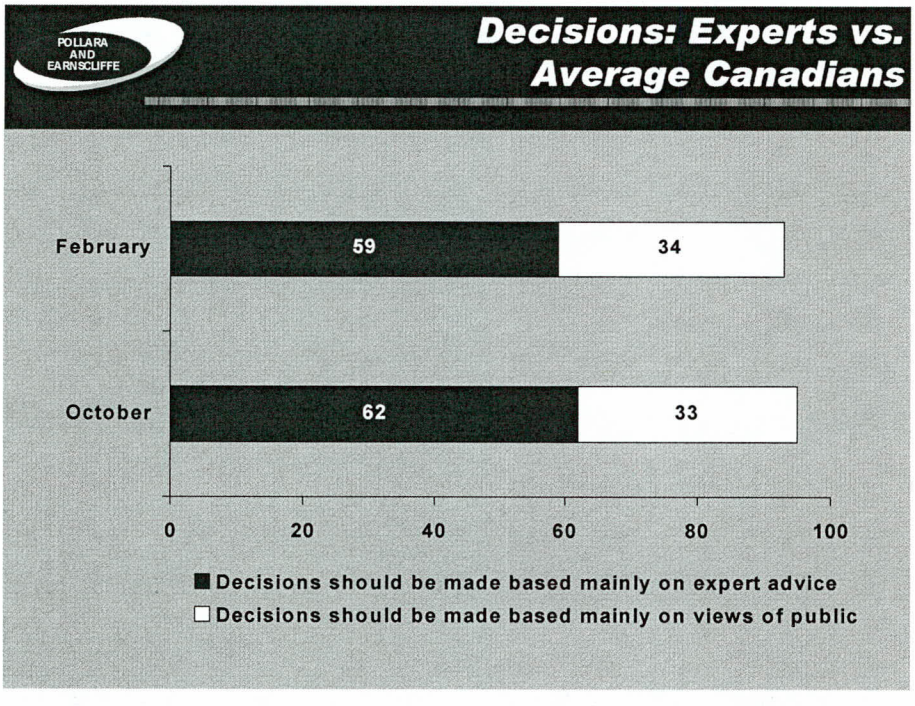




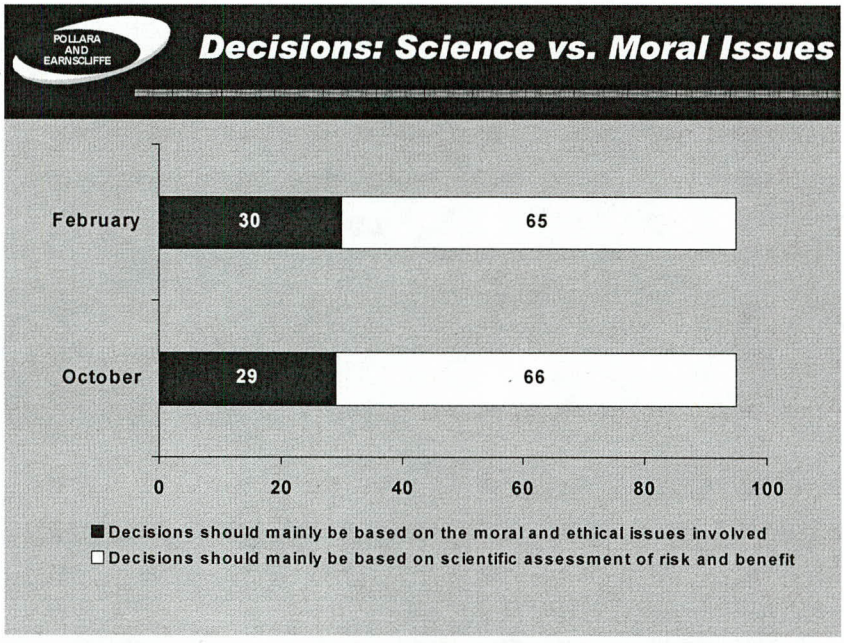
Focus group discussions show that ambivalence quite clearly, and the way people resolve it is to demand of government the dual-track roles of facilitating the benefits while understanding and minimizing the risks.

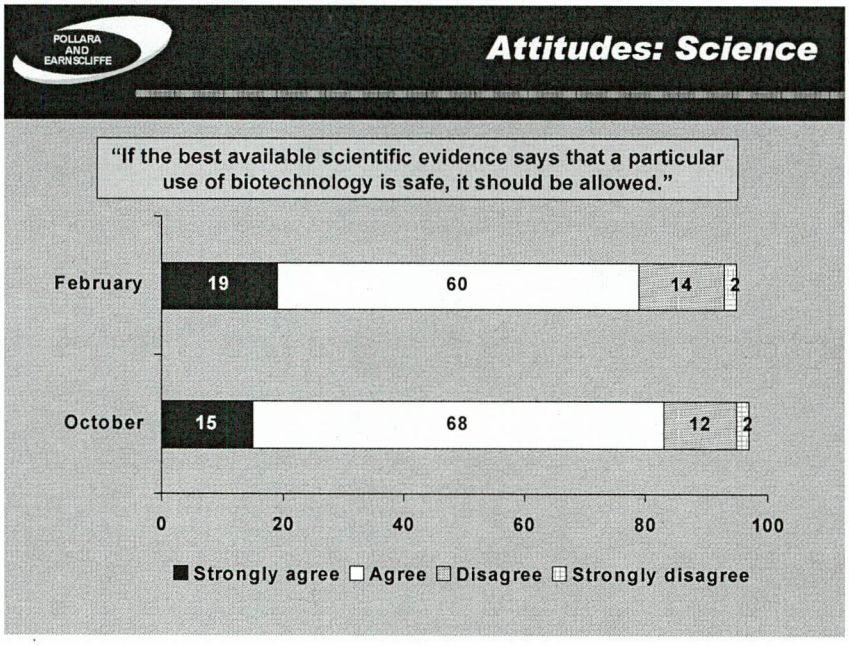
Decision Making in Biotechnology

There has been little change over the past few months in Canadians' attitudes towards decision making in allowing biotechnology products. They continue to believe strongly that experts should make those decisions and that they should use scientific evidence of safety as their guide. Though the public wants to be informed about those decisions and to have access to studies about risk, it does not want to lead in decision making.

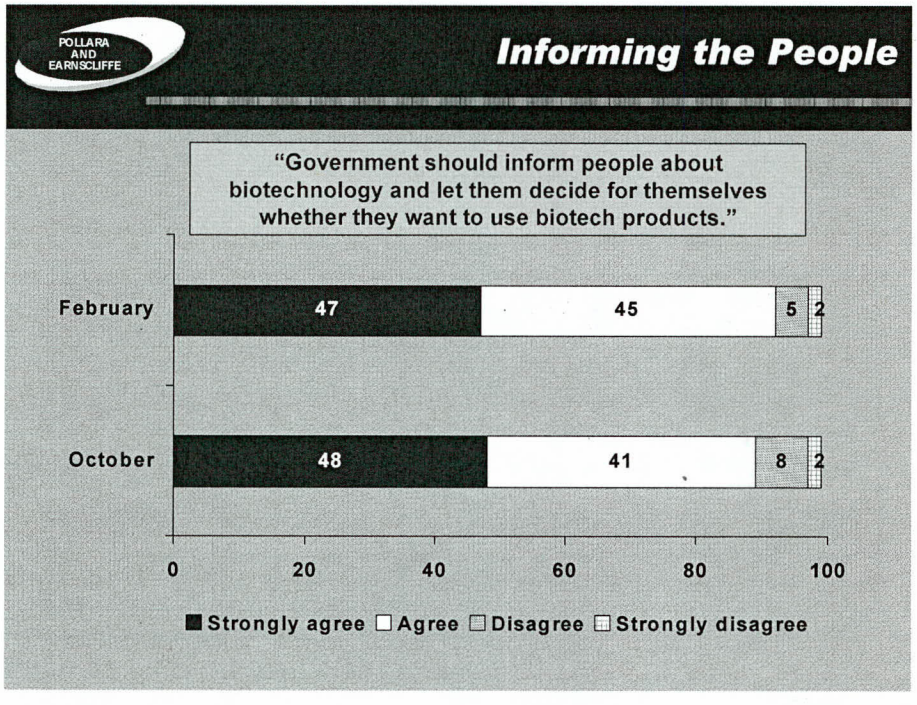


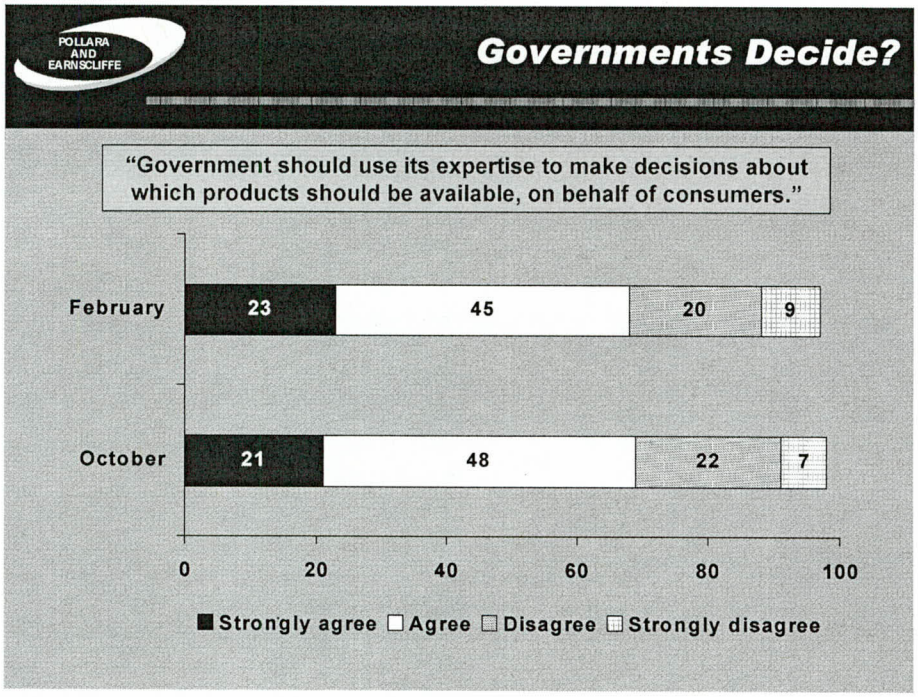
Most people believe that science should be the guide to decision making. They see ethical issues as important but as a secondary driver. In fact, if the "best available evidence" says a product is safe, most people see that as a reasonable standard for approval; that is true even if the standard is "*most* available evidence."





There are mixed views about whether government should simply make the decisions on behalf of consumers or provide information to consumers so they can decide by themselves. In part, the mixed results are a function of a normal and strong desire by people to decide things for themselves, leavened by an acknowledgement that decision making in this area is complex and is better left to experts.



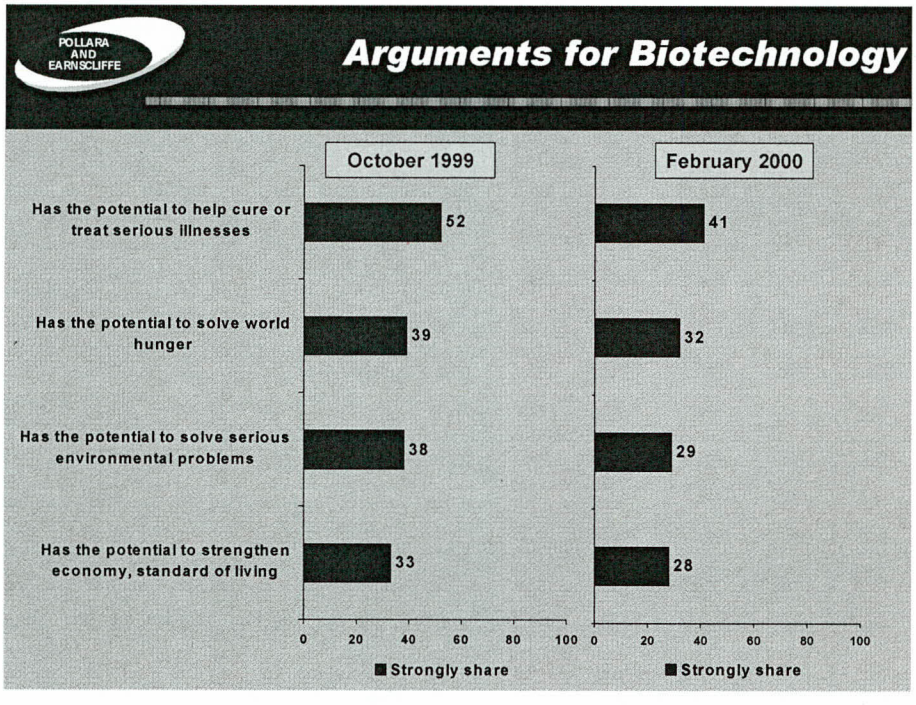


Argumentation

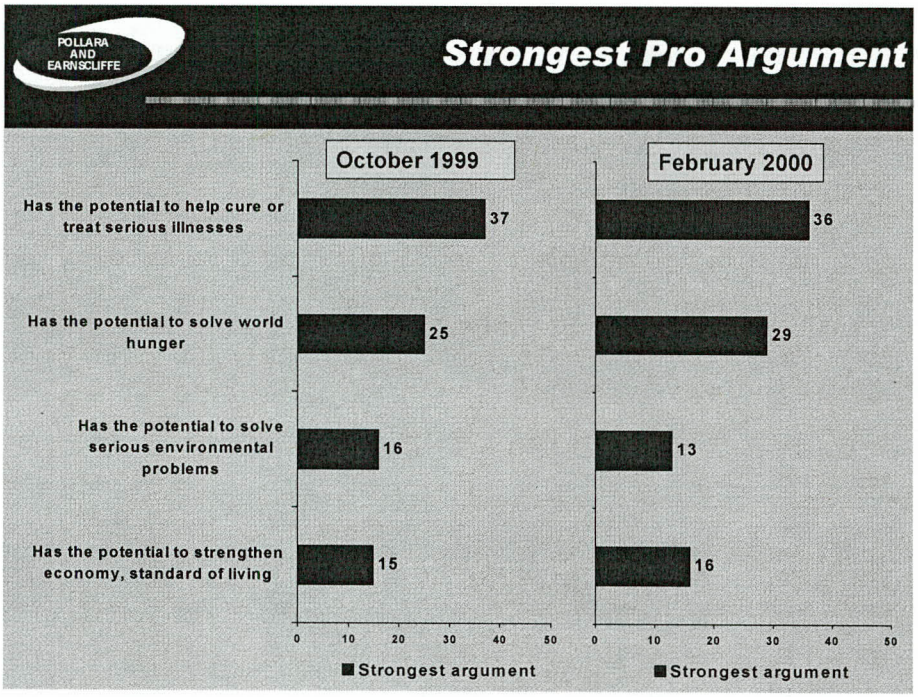
This survey, as did the last, tested a variety of arguments dealing with biotechnology, pro and con. This exercise helps to clarify underlying drivers of opinion and suggests ways to frame communications messaging. On the whole, the results were quite consistent directionally, though there was a decline in the number of people who found some of the pro arguments very persuasive.

The more important learnings centre around the fact that while most people hold several positive views of biotech, many of them share several negative views as well. It is reasonable to infer that most people harbour a level of internal tension about biotechnology. There is support for development of the technology to gain its benefits mixed with varying degrees of apprehension about its risks. This is clearly evident in the arguments they find most persuasive – pro and con. The most favourable argument is one that promises cures or treatments for illnesses – the most valued potential benefit of biotechnology. The most negative argument is the one that indicates that biotechnology may create long-term risks to health and the environment.

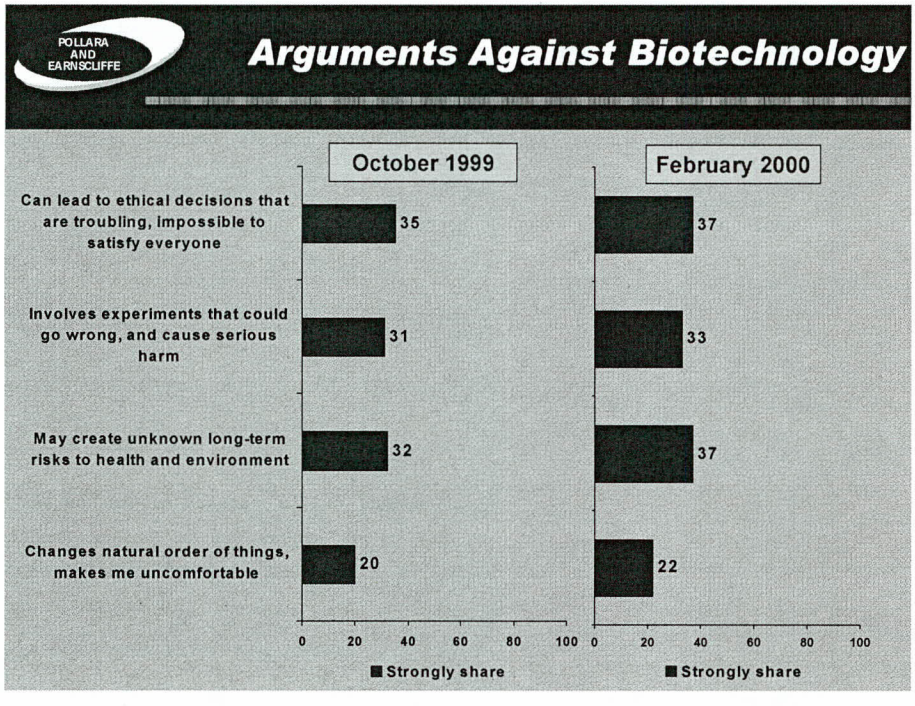
There has been a decline in the number of people who *strongly* share the view expressed by arguments in favour of biotechnology. In each of the four arguments, there has been significant slippage, about half of it going to a slightly less assertively positive view, half of it going to a negative view. To fully understand the context, however, it is important to indicate that fewer than one in five take negative views on *any* argument.



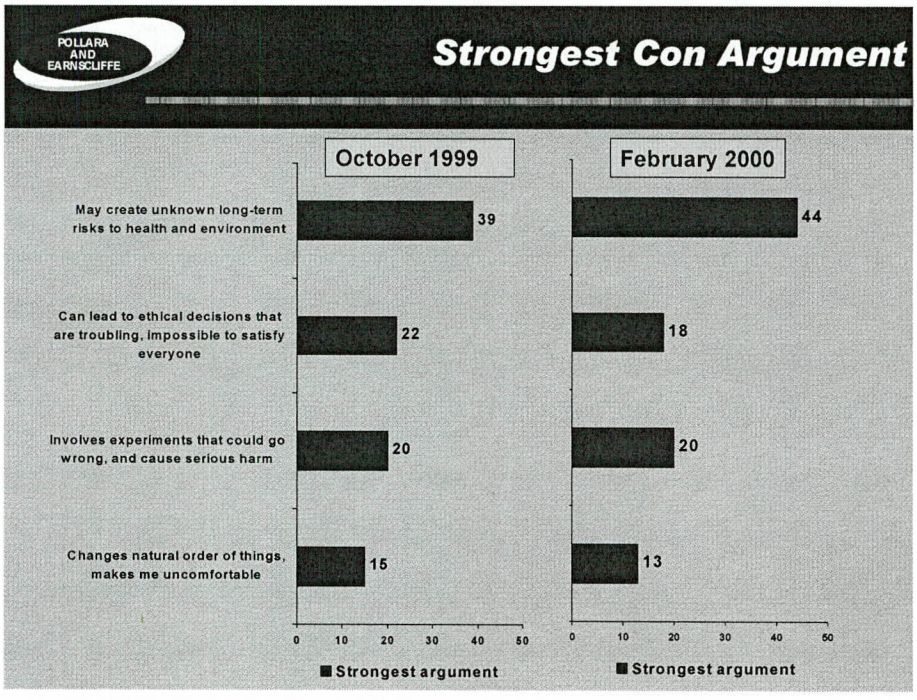
While a majority of people see merit in each of the four arguments, there is no doubt which ones most people find most persuasive. When asked to select the strongest argument, they immediately support the two they believe produce the most important benefits.



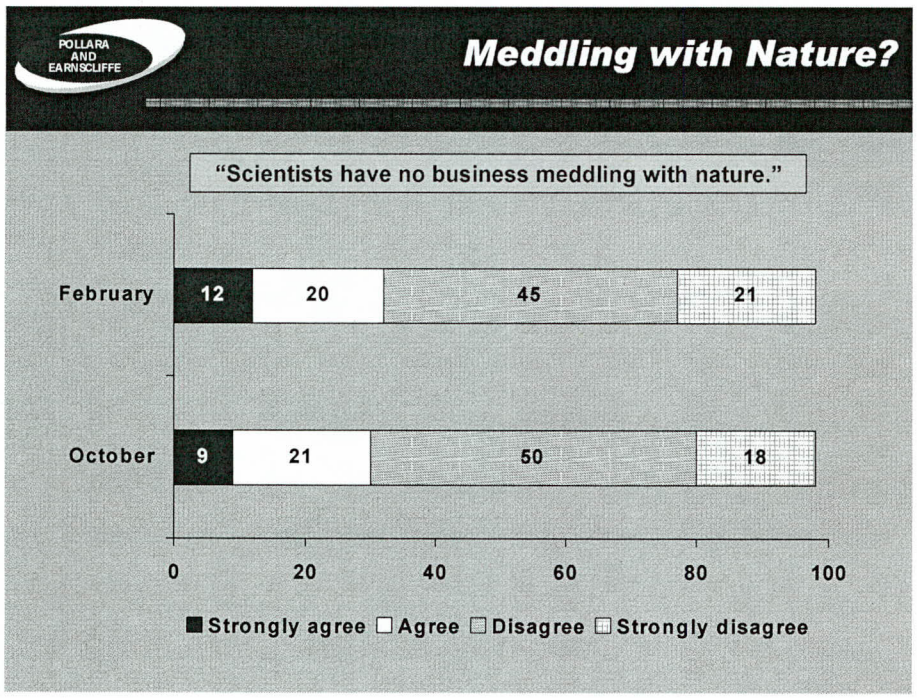
As evidence of the internal tension on biotechnology, most people find it possible to agree as well with the arguments posited against biotechnology. That is true of three of the arguments, as shown in the graph below. There is determined resistance to the argument that there should be discomfort with changing what God or nature created.



However, when asked what the strongest argument against biotechnology might be, there was little doubt. As shown in the graph below, people went to the direct argument about risk by a margin of better than two to one over the next argument, which posed another version of the risk scenario.



The weakness of the philosophical argument is further underscored when people are asked directly whether they agree with the proposition that "Scientists have no business meddling with nature." Overwhelmingly, they disagree.

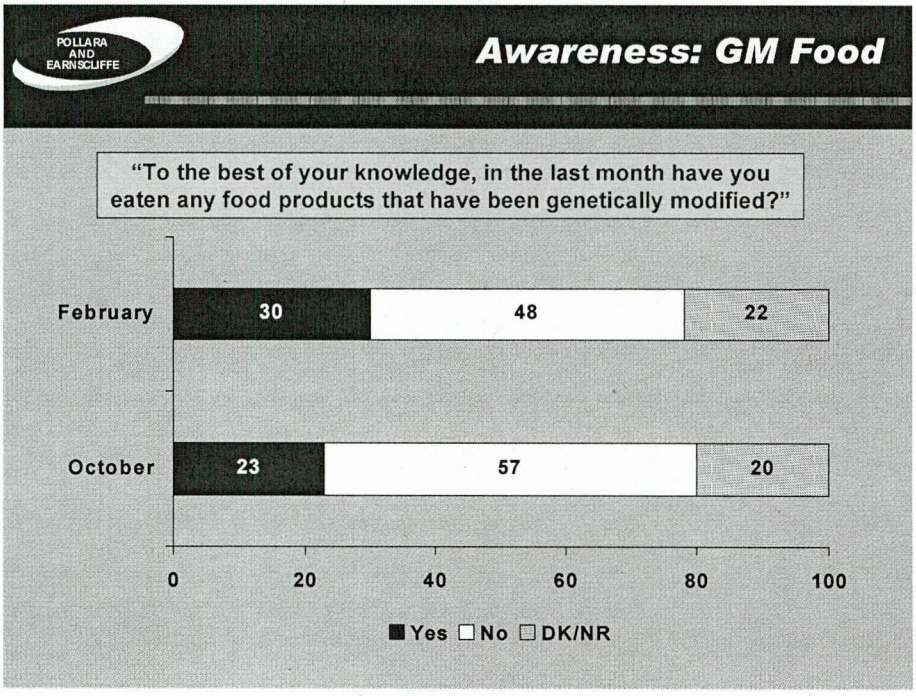


GM Food

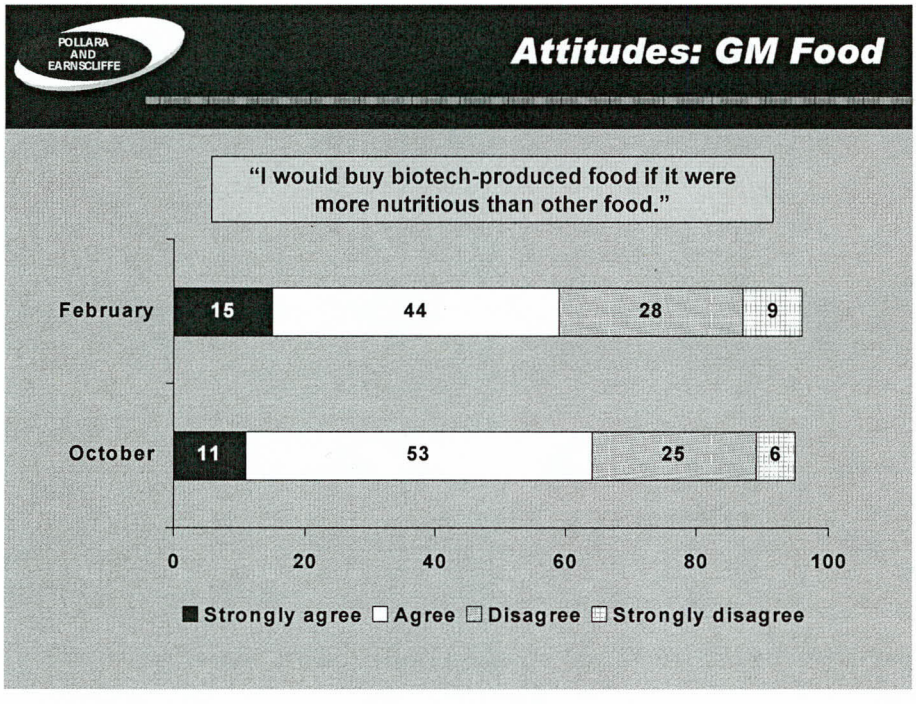
Finally, the survey re-tested some of the questions asked in the fall of 1999 about genetically modified (GM) foods. Given the current public environment and the complexity of this issue, it is important to understand that these few questions just begin to test the full dimensions of public attitudes towards GM foods. A comprehensive examination of the issue area was beyond the scope of the mandate of the previous survey (which was to establish baseline data along a broad front of biotech issues) and the update in February (which was to test whether the fall data were still reliable).

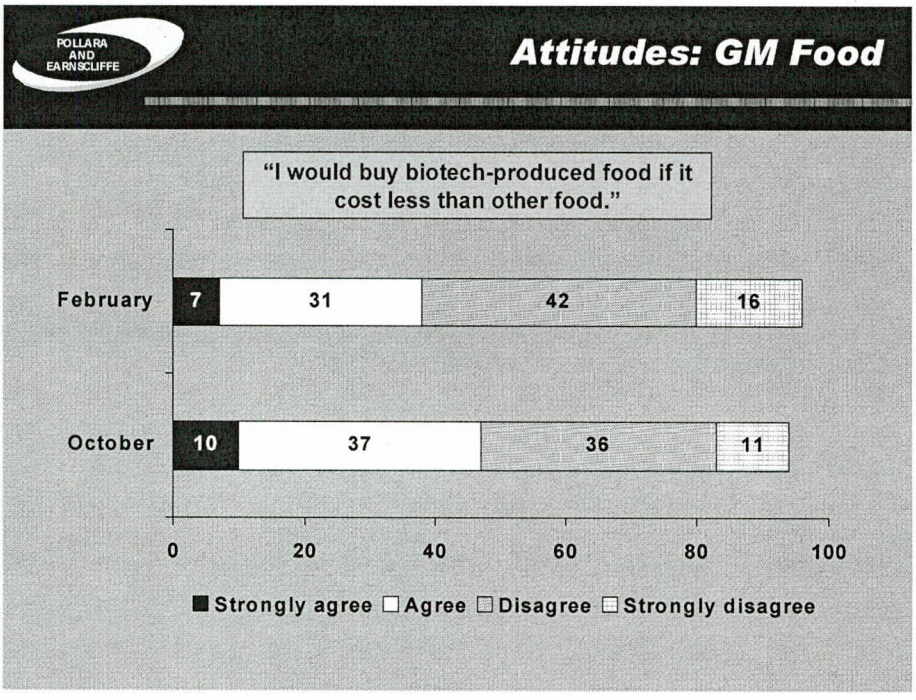
The focus groups delved much more deeply into GM foods and those results are outlined in the section below.

As indicated earlier in this report, most Canadians believe the food they eat is safe and has been tested. That finding indicates that the current debate about GM food has not affected the view of most people about the safety of the food they eat. However, focus groups indicate that Canadians continue to be surprised at the degree to which GM ingredients are present in their food. Awareness is growing slowly but only 30% of Canadians believe they have consumed GM food in the last month, a statistic that probably belies the reality that anywhere from 60 to 75 percent of all processed foods contain ingredients or come from plants that have been genetically modified.



There are findings in the survey that suggest that the resistance to biotech-produced food is less entrenched and more strategic than might otherwise have been assumed. Though resistance has grown since October, a majority of Canadians (59%) say they would buy biotech-produced food if it were more nutritious than other food. Only a small minority (9%) strongly disagrees. However, as is consistent with the findings elsewhere, as the benefit seems less important, the resistance increases. A majority say they will not buy these foods if the identified advantage is restricted to lower price.




POLLARA AND EARNSCLIFFE
Attitudes: GM Food
"I would buy biotech-produced food if it cost less than other food."
February
7
31
42
16
October
10
37
36
11
0
20
40
60
80
100
Strongly agree
Agree
Disagree
Strongly disagree

D. THE FOCUS GROUPS – MAIN FINDINGS

Top-of-mind awareness about biotechnology has grown since last fall, but familiarity and interest remain relatively low. Consistent with the quantitative survey results, there has been a notable rise in the number of Canadians that have noticed the subject of biotechnology over the past three months. However, this rise has not translated into engagement. The February focus groups signal no notable change in the level of interest or concern that Canadians had about biotechnology in the groups conducted last October.

While people have heard more in recent months, they are as likely to have heard positive news as negative news. Most focus group participants associate biotechnology with leading-edge health and medical technology. A sizeable minority of participants initially associate biotechnology with the controversy surrounding GM food.

Most people are initially neutral to positive about biotechnology, with a small minority showing relatively entrenched negative opinion. These initial sentiments are usually linked to their primary association. A positive view tends to be tied to awareness of health or medical applications, whereas a negative view tends to be tied to awareness of GM food. After initial discussion, however, it becomes evident that most people carry both positive and negative views toward biotechnology. Many who have not directly confronted the subject previously are torn by the issues involved.

Focus group participants expressed mixed views about biotechnology product applications. Consistent with the fall focus group findings, people clearly differentiate between medical or health research applications and other applications. They feel positively towards and strongly support biotechnology applications that can help cure people or prevent diseases, but show little support for what they consider more 'frivolous' uses such as making vegetables more attractive. Applications that promise environmental benefits (e.g. forestry, toxic cleanups) were generally mixed. In several groups, respondents questioned the impact of these applications on biodiversity, and this had a negative impact on overall support for the application.

Participants understood that all biotechnology applications (like most other things) carry risk, and were prepared to accept those risks in cases where the potential benefit outweighed the risks. If the application was thought to produce a substantial health or medical benefit, participants were prepared to accept a higher level of risk.

Participants' acceptance of biotechnology applications was most often based on a risk/benefit analysis, evaluated on a case-by-case basis. This analysis employed a system of measurement that was heavily influenced (positively or negatively) by certain common factors. Respondents tended to be more supportive of applications and products that seem to have the potential to positively affect them personally, and provide a significant health or environmental benefit. Conversely, if the potential benefits were viewed as accruing to a subset of society only, this substantially reduced their value. If the biotechnology application were to entail the manipulation of the genetic structure of higher order organisms, or if the application entailed the insertion of genes across plant/animal/human boundaries, the risk was viewed as being much higher.

With a few exceptions, the majority of participants believe that science should be the primary guide to decision making about biotechnology applications. They do not see biotechnology as an overarching moral or ethical dilemma though they acknowledge it has some of those dimensions. Health and environmental risks are the key drivers. Ultimately, if an application is deemed safe by the "best available" scientific research, most say that their concerns would be reduced. This is not to say that the "best available" scientific evidence would make all biotech products acceptable; rather that science is the most effective means to abate perceived drawbacks. **Individuals who tend not to be driven by science tend to be small in number, but also tend to be among the most hardened in their opposition to biotechnology.**

The GM food debate has not penetrated very deeply as yet in most of the centres, although Vancouver is an exception. Where it has registered (Vancouver), it is evolving into a significant debate about safety and science. In the other centres, it is viewed largely as a complicated and somewhat ideological conflict led by interest groups.

Most people believe the food on grocery shelves must be safe and has been tested by government. However, there is widespread confusion about the nature of the testing system. Most believe the testing of food involves spot inspection, largely of meat and fresh produce. Few have thought through the testing or inspection of processed foods.

There is virtually no understanding or awareness of the actual regulatory system for approval of foods. Indeed, in the context of discussing GM food, participants tended to probe for more information about the food-testing system in Canada and, on the whole, became more concerned as the subject was discussed. Their expectations are that GM food has undergone more rigorous testing than organic food in order for it to have been allowed on store shelves.

Most people advocated an "informed choice" approach to GM foods, and that leads to some form of labelling. Many accept voluntary labelling as a reasonable step but will expect a mandatory system if a voluntary one does not produce results. Involved Canadians are more likely to want a mandatory labelling system. However, some, mostly those who are less engaged, are not sure that level of compulsion is necessary and they are unsure precisely what a label would say or how it would advance their consumer needs.

Most had no idea what government's role is in the area of biotechnology, and once raised, a number of participants became uneasy about what government was doing (or not doing) in this field. As such, **the majority felt that the federal government had not performed well on biotechnology-related issues, because they had not heard anything about what government had done or the components of the regulatory system.** Similar to food inspection, most assumed that some type of regulatory framework was in place. However, many expressed concern that government cutbacks had eroded the effectiveness of the regulatory system.

There was broad support for a two-track government policy approach, including a strong regulatory and scientific oversight system in addition to fostering the development of the industry. Participants had no problem with government playing dual roles, as long as the regulatory system could be insulated from economic pressures.

The first priority for the federal government is a comprehensive regulatory testing system before biotech products get to market, along with long-term study of potential health and environmental impacts. Economic support to industry was deemed important, but much less important than health and safety regulations and research.

Messaging or arguments that focus on health or environmental benefits tended to be much stronger than those that promise to expand the food supply or convey economic benefits to individual producers or the economy as a whole. Indeed, arguments about "solving world hunger" were initially met with tepid support but quickly moved to uncertainty once discussion about the subject took place and questions were raised about whether there is already enough food to feed the world. It should be noted that, as presented, the statements left many participants, especially Involved Canadians, wanting for more specifics.

On the negative side, it is the argumentation about long-term, unknown or unknowable risk that is most effective. There is little support for arguments that changing things God or nature created should mean ending biotechnology efforts. While some people express discomfort with changing the natural order of things, they have become resigned to it on a broad front of activity and believe it part of modern science.

On the whole, negative messaging is stronger than positive messaging. Even in the absence of detail about what the risks are or might be, the negative messages about long-term risks are disconcerting to most. Any communications effort will have to respond directly to those fears.

There is virtually no way to create positive messaging around GM food. There is only the prospect of trying to convince people they are safe or at least benign. Largely, participants don't understand why there are GM ingredients in food, and the linkage to agricultural crops is only hazily understood. It is reasonable to infer that people would prefer, all things being equal, not to have to confront the issue. Functional foods might provide an acceptable rationale over time but as of now there remain questions about what the marginal benefit of these products would be.[2]

[2] A functional food is similar in appearance to, or may be, a conventional food; is consumed as part of a usual diet; and is demonstrated to have physiological benefits and/or reduce the risk of chronic disease beyond basic nutritional functions.

Consistent with results last fall, there is a widespread distrust of a variety of institutions and potential spokespeople on all sides of the debate. There are few voices people would believe to be completely trustworthy in providing information about biotechnology.

- On a government level, there was widespread mistrust of politicians and senior civil servants. In addition, there was concern about the basic competence of government officials to fully understand and manage risk. **The only people in government that were deemed to be relatively trustworthy were officials involved in research and/or regulatory processes.**

- Business was widely perceived to be in a conflict and would be expected to extol products out of self-interest.

- Scientists in general were regarded with some suspicion because most believed they were too heavily influenced by potential funders of research. Curiously perhaps, participants tended to differentiate between scientists and university academics, whom they felt were the most independent in the scientific community.

- Interest groups continue to be a source of deep suspicion among Canadians. They tend to be regarded as uni-dimensional and, in some cases, radical. People tended to believe that interest groups always represented one side of a debate and were not to be trusted to provide dispassionate or even credible views.

The most trustworthy spokespeople were those identified as having independent status and no obvious benefit to gain. That was the basis of appeal for university academics. Others that fall into that category are doctors and hospital researchers.

Most people were willing to accept the word of expert panels or advisory boards as long as they were clearly at arm's length from government and industry, and had representation from "all sides" of the issue. Participants felt that independent advisory boards (like the Canadian Biotechnology Advisory Committee) carry credibility as information sources on biotech.

On many questions, there were substantial differences between participants from the general population and those from the Involved Canadians groups. Though initial attitudes were roughly similar, the Involved had a higher awareness and knowledge base. Starker differences emerged during discussion as participants were exposed to more detail.

The Involved participants tended to become more concerned and to differentiate clearly between acceptable and less acceptable applications. As is consistent with survey results, concern increased as higher life forms were involved and as boundaries were crossed between plants, animals and humans. Their desire for further information sharpened. They also tended to display increased scepticism about the ability of governments and scientists to fully understand and manage the potential risks. Interestingly, heightened concern did not alter their initial assessments of the technology; rather it seemed to make them determined to be more watchful. On the whole, they were attracted to the potential benefits (largely the ones involving health and medicine) and accepted the current risk/benefit equation but were insistent on more research into and understanding of the long-term health impacts.

The general population participants tended to have more difficulty understanding applications and differentiating among them. They tended to be more accepting after detailed discussion and tended to extrapolate their basic position forward without differentiation. However, in many cases, that basic position was one of uncertainty. Many members of the general public find the idea of these sorts of applications unsettling, and that leaves them torn about whether they are acceptable or not. In general, they tended to fall back on a basic assumption that experts in government and scientists would know more than they do and would tend to operate in the public interest. Their level of interest, moderate at best, did not seem to increase substantially. For instance, they, unlike the Involved, displayed little interest in being consulted about biotechnology issues or in participating in events like town halls.

E. CONCLUSIONS

While awareness has grown, the public continues to be disengaged on biotechnology, and in the absence of a catalyzing event are unlikely to become engaged. Current voices of opposition to biotechnology and GM foods have thus far not been sufficiently credible and/or widely enough heard to engage the public.

It seems clear that heightened awareness leads some people, particularly those who are more active and involved, to become more uncertain about biotechnology. After discussion of specific applications, concern rises and determination to seek more information seems to get firmer. In the absence of available information (research studies, etc.) that satisfies these concerns, uncertainty can lead to opposition among this segment of the population.

For others, particularly members of the general public who display little initial awareness and interest, further information on biotechnology is difficult to cope with, and they can become confused by the issues. This segment of the population tends to believe the issue is quite complicated, an argument between competing factions and, as a result, a debate they are not sure is worth following closely. These people are more likely to rely on experts (including advisory bodies to government) to represent them.

There are some applications that are clearly a step too far for a majority of participants. Applications that provide potential health or environmental benefits, and are of benefit to all, are most likely to be acceptable. Applications which are deemed to be cosmetic or are not seen as fulfilling a societal need tend to be met with resistance. As the issues begin to involve higher and higher life forms or more and more crossing of plant, animal and human boundaries, many begin to dig in and their opposition becomes quite determined. They can only be swayed by the clearest of potential medical benefits.

As awareness grows, people tend to reject a comprehensive view of biotechnology. Rather, they seek to segment applications (or categories of applications) and evaluate the marginal benefits of each on a case-by-case basis. This case-by-case evaluation approach leads to the rejection of broadly stated messages about biotechnology. **It also reflects the fact people tend to possess a discrete conception of the acceptability of individual applications, and as such, views toward one application tend not to influence views toward another.**

Participants understand and accept that risk management is a fact of life, though they still tend to be risk averse. Some are resigned to the fact that their food supply may contain GM ingredients, although a majority questions whether the benefits of these foods outweigh their potential risks. They are uncomfortable about much of this but presume that someone's in charge and that somewhere the appropriate decisions are being made. It will be difficult to shake this general posture because they aren't sure whom to trust in any debate about these issues and do not see tangible potential benefits. **By and large, most people see biotechnology as a technical scientific issue to be resolved on those grounds.**

It was clear in the focus groups that the way ahead for government includes a visible two-track process – most want to reap the significant benefits of biotechnology but only within a rigorous framework of strong regulatory oversight and determined, directed research to settle the long-term health and safety issues. While participants were content with government playing multiple roles, they did not want one-sided information. They reject any notion of an advocacy effort by government. They want government to present information about biotech in as neutral a form as possible, including both risks and benefits. Government credibility rests on its ability to be seen as a player that can realize the benefits of biotech but is prepared to reject any applications that threaten the health or safety of Canadians.

People are divided when asked whether government should slow the use of biotechnology until more is known about the risks, or whether we have to accept some risk. Mostly, they feel they don't have enough information to make that decision. They tend towards the latter, however. They suggest going forward with health-related applications and slowing down with cloning and food.

GM food is generally viewed as the least beneficial aspect of biotechnology, and is therefore the most likely launching point for opposition.

F. APPENDIX

1. Moderator's Guide
2. Questionnaire

POLLARA AND EARNSCLIFFE

Moderator's Guide

Probing on general level impressions

- When you hear the word **biotechnology**, what are the first thoughts which come to mind right away? Please write them down on a piece of paper.

- Overall, do you have a positive reaction or a negative reaction to the term **biotechnology**? Please tell us what you wrote down, and where you developed these impressions.

- Over the past couple of months, would you say you have heard more, less, or no more or less than in previous months? Do you think that this will subside or that you will be hearing more and more in the future? Thinking about what you have been hearing lately, is it more and more positive, or more and more negative about the impact and potential impact of biotechnology?

- Have your views changed over the past year or two on this subject, and why?

- Biotechnology has applications in a number of fields. Please write down examples of biotechnology-related products or applications that you have heard about.

Definition: Biotechnology applies science and engineering to living things like plants and animals to create new products and processes. It includes numerous applications, everything from cross-breeding plants to genetic testing to screen for inherited diseases.

- Are you interested in this subject? Why does it interest you? Those of you who feel that it is not interesting, can you talk about why it is not all that interesting to you?

- From what you know about biotechnology, in general, do the potential benefits outweigh the potential risks, or vice versa?

Biotechnology as industry

- Compared to other countries, does Canada have a substantial biotechnology industry? Why or why not? Should we be trying to be leaders, followers, or in the middle of the pack? Why?

- Compared to other Canadian industries, would you say that biotechnology is very important, moderately important, or not very important to the **future** of the Canadian economy? Why do you say that?

POLLARA AND EARNSCLIFFE

COMMUNICATIONS TESTING

10 What have you heard about aspects of biotechnology, and from what source? Do you hear more about this from government, from the industry, or from interest groups? Is what you hear more negative than positive or more positive than negative?

11 When it comes to learning about the potential benefits of biotechnology, who are you more likely to trust to have the most reliable information? Probe biotech industry, federal government, provincial government, ENGOs, university researchers. In addition, do you trust them to give it to you in an honest and clear fashion?

12 How about when it comes to the potential drawbacks associated with biotechnology?

I'm going to read a series of arguments that people make when they advocate biotechnology. Thinking about each of the following arguments, which resonate with you? Probe: Which stakeholders of those listed above would you be most anxious to hear from, and most likely to trust? (In each case, a specific probe will be made of the role of the federal government, if it is not explicitly raised by the participants.)

- Biotechnology has the potential to help solve world hunger.
- Biotechnology has the potential to help solve serious environmental problems.
- Biotechnology has the potential to help cure or treat serious illnesses.
- Biotechnology has the potential to strengthen our economy and improve our standard of living.
- Biotechnology is one of the modern technologies that will drive the future economy of the world.

I'm going to read a series of arguments that people make when they outline the drawbacks of biotechnology. Thinking about each of the following arguments, which resonate with you?

18 ▪ Biotechnology involves changing things that God or nature created, and that makes me uncomfortable.

19 ▪ Biotechnology may be creating unknown, long-term risks to health or the environment.

20 ▪ Biotechnology involves experiments which could go wrong and cause serious harm.

21 ▪ Biotechnology can lead to ethical decisions which are troubling and impossible to resolve to everyone's satisfaction.

22 With respect to the preceding issues, imagine that you wanted to get information about them. Where would you like to get it, in what form, and from what stakeholders? What would be the most effective way of getting it to you?

How likely would you be to consume information from the federal government if it were delivered in the following ways:

- At a special biotechnology web site, which was advertised and promoted.
- Via e-mail to all those who indicated they wanted regular updates.
- Through newspaper and magazine advertisements or inserts.
- Through a documentary video which was available to everyone who wanted a copy for a dollar or two.
- Through a publication or a brochure which you could send away for.
- Through an extended five-minute televised segment, bought as advertising.

How much and in what ways should the government attempt to involve people like you in decisions about biotechnology policy?

Would you be interested in participating in a consultative process like a town-hall meeting on biotechnology?

Would you be interested in attending a two-day conference to explore biotechnology issues in detail with a group of other Canadians?

BIOTECHNOLOGY APPLICATIONS

People seem to be more comfortable with some applications of biotechnology than with others. For each of the following, ***please tell me if you feel positively or negatively toward them***. In each case, tell me if you feel that there are no or few risks, or if you think that the benefits outweigh whatever risks there may be.

- Implanting plant genes in other plants (like corn that has a gene from another plant inserted into it to resist certain kinds of insects) to help improve the quality and quantity of food.
- Using genes from one organism to change another organism in order to help clean up environmental problems.
- Changing the genetic makeup of trees to make them resistant to diseases and insect attack.
- Creating a potato that insects will not eat or destroy.
- Modifying genes in a human embryo to eliminate an inherited disease.
- Creating genetically modified fish that will be healthier and more disease resistant.

- Breeding genetically engineered livestock animals to have less fat.
- Implanting animal genes in plants to help improve the nutritional value or appearance of food products.
- Breeding genetically engineered animals for use in medical research.

Let's try to clear up what elements are more likely to create acceptance or rejection. I would also like to know whether your views on the applications should be interpreted as hard directions to government, or impressions which you would like taken into account. Are there any exceptions to that?

RISK MEASUREMENT AND MANAGEMENT

As mentioned earlier, the field of biotechnology raises issues of risk and benefit to society. I'm going to ask a few questions that attempt to get at how you feel about what the risks and benefits are, and how you think decision makers should approach decisions regarding biotechnology.

- From what you know now about biotechnology, do the potential benefits outweigh the potential risks, or vice versa?
- Some people are confident that enough is being done to study and monitor the risks associated with biotechnology. Others are worried that not enough priority is being attached to this. Which of these points of view is closest to your own? Why?
- Some people say until more is known about the risks, governments should slow the use of biotechnology. Others say we have to accept some risk to achieve health benefits from biotechnology research. What do you think is the best approach? Please explain your point of view?
- If most scientific evidence says that a particular use of biotechnology is safe and should be allowed, should that be the approach we use? OR should we use a precautionary principle, where we ban a product if there is any potential of future risk (knowing that no one can rule out the risk of virtually anything). Why?
- Should scientists be the primary decision-makers about biotechnology, or should it be ordinary Canadians, or some combination of the two?

POLLARA AND EARNSCLIFFE

GM FOODS

- From what you know, is all the food that gets to the grocery store tested for safety? How, when, by whom?
- If you had to guess, what percentage of the processed food we eat on a daily basis do you think is genetically modified or comes from plants that have been genetically modified?
- The amount is anywhere between 60% and 75%. What impact does that have on your views of genetically modified foods?
- Do you feel that the authorities are doing enough to ensure your safety when it comes to GM foods? What would reassure you?
- Is having GM food a good thing, a bad thing, or not much of an issue to you at all?
- What do you need to know about the GM aspects of food that you buy at a grocery store? How would you feel about the following approach? (test likely scenarios)
  - Government communications campaign
  - Information at the grocery store
  - Voluntary labelling
  - Mandatory labelling

FINAL QUESTIONS

I'd like to go back for a minute to the beginning of this discussion.

Could you consider how your view evolved over this discussion. Would you say that the information during the discussion influenced your view, and if so did the discussion tend to increase or decrease your concern about this issue? Did it inspire you to follow this subject more closely, or not?

Do you think that your views on biotechnology could change, and if so, what would make them change? Are there some people or organizations who would be more likely to cause a change in your opinions?

IF TIME PERMITS Most new inventions are protected by what are called patents. Patents ensure that inventors are rewarded by making sure that their inventions cannot be copied for a period of time. However, it also means that until the patent expires, the inventor controls the availability and price of the invention.

Some people feel that the idea of patent protection is necessary in the field of biotechnology, because we need to encourage inventions in this area for all the benefits which they can bring. Others are uncomfortable with the idea of patents in the field of biotechnology, because there is something wrong with the idea of patenting a life form such as an animal or a plant. Which of these two points of view is closer to your own? Let's discuss your views.

EARNSCLIFFE RESEARCH & COMMUNICATIONS

Questionnaire

PERCENT **PERCENT**

1. When you hear the word **biology**, do you have a positive reaction, a neutral reaction, or a negative reaction?

	October 1999	February 2000
Positive	43	44
Neutral	50	47
Negative	4	6
DK/NR	3	2

1b. When you hear the word **technology**, do you have a positive reaction, a neutral reaction, or a negative reaction?

	October 1999	February 2000
Positive	58	65
Neutral	33	28
Negative	5	5
DK/NR	4	2

2. When you hear the word **biotechnology**, do you have a positive reaction, a neutral reaction, or a negative reaction?

	October 1999	February 2000
Positive	28	30
Neutral	53	52
Negative	14	14
DK/NR	5	4

3. Over the last three months, have you heard anything about stories or issues involving biotechnology?

	October 1999	February 2000
Yes	38	53
No	59	45
DK/NR	3	2

4. Before today, had you ever talked about biotechnology with someone?

	October 1999	February 2000
Yes	34	38
No	65	62
DK/NR	1	0

Biotechnology applies science to living things such as plants and animals in order to develop new products and processes.

5. Would you say you are very familiar, somewhat familiar, not very familiar, or not at all familiar with biotechnology?

	October 1999	February 2000
Very familiar	5	6
Somewhat familiar	48	50
Not very familiar	33	29
Not at all familiar	14	15
DK/NR	0	0

6. Is biotechnology a subject you are very interested in, fairly interested in, not too interested in, or not at all interested in?

	October 1999	February 2000
Very interested in	14	15
Fairly interested in	49	49
Not too interested in	28	25
Not at all interested in	9	10
DK/NR	1	1

In your opinion, does biotechnology bring major benefits, modest benefits, modest drawbacks, or major drawbacks in each of the following areas. How about: (ROTATE)

7. The health of Canadians today

	October 1999	February 2000
Major benefits	35	31
Modest benefits	38	29
Modest drawbacks	10	13
Major drawbacks	7	12
DK/NR	9	14

8. The health of Canadians over the longer term

	October 1999	February 2000
Major benefits	42	35
Modest benefits	29	30
Modest drawbacks	10	12
Major drawbacks	9	11
DK/NR	10	12

9. Canada's economy today

	October 1999	February 2000
Major benefits	24	27
Modest benefits	49	42
Modest drawbacks	10	11
Major drawbacks	5	7
DK/NR	13	13

10. Canada's economy over the long term

	October 1999	February 2000
Major benefits	34	27
Modest benefits	40	41
Modest drawbacks	8	12
Major drawbacks	6	7
DK/NR	13	13

11. The amount of food we produce

	October 1999	February 2000
Major benefits	44	36
Modest benefits	35	34
Modest drawbacks	7	11
Major drawbacks	5	8
DK/NR	9	11

12. The quality of food we produce

	October 1999	February 2000
Major benefits	38	24
Modest benefits	34	36
Modest drawbacks	11	15
Major drawbacks	10	15
DK/NR	8	10

13. Canada's environment today

	October 1999	February 2000
Major benefits	26	25
Modest benefits	39	35
Modest drawbacks	15	17
Major drawbacks	8	11
DK/NR	12	12

14. Canada's environment over the long term

	October 1999	February 2000
Major benefits	36	26
Modest benefits	31	38
Modest drawbacks	12	13
Major drawbacks	10	12
DK/NR	11	12

15. Moral and ethical values

	October 1999	February 2000
Major benefits	14	12
Modest benefits	32	28
Modest drawbacks	23	26
Major drawbacks	15	16
DK/NR	16	18

END OF ROTATION

(6)

In each of the following areas, would you say that the federal government is doing an excellent, good, fair or a poor job. How about (ROTATE)

16. Ensuring that the interests of the average Canadian are taken into account as policies are developed for the use of biotechnology.

	October 1999	February 2000
Excellent	2	1
Good	16	13
Fair	39	38
Poor	35	38
DK/NR	8	8

17. Ensuring that Canada benefits from the economic opportunities which biotechnology offers.

	October 1999	February 2000
Excellent	5	6
Good	27	22
Fair	41	42
Poor	16	19
DK/NR	11	11

18. Ensuring that the health of Canadians is protected against risks associated with biotechnology.

	October 1999	February 2000
Excellent	4	4
Good	23	18
Fair	38	38
Poor	27	32
DK/NR	7	8

19. Ensuring that the environment in Canada is protected against risks associated with biotechnology.

	October 1999	February 2000
Excellent	3	4
Good	19	17
Fair	41	40
Poor	29	31
DK/NR	8	9

20. Ensuring that Canada benefits from the new products and processes which biotechnology offers.

	October 1999	February 2000
Excellent	4	3
Good	26	23
Fair	43	44
Poor	17	19
DK/NR	10	10

21. Ensuring that Canadians are informed about the role of government in biotechnology.

	October 1999	February 2000
Excellent	1	2
Good	10	10
Fair	34	32
Poor	49	52
DK/NR	6	5

22. Ensuring that biotechnology is being used in ethical ways.

	October 1999	February 2000
Excellent	3	3
Good	21	16
Fair	41	40
Poor	23	27
DK/NR	11	13

23. Overall, do you think the federal government is doing an excellent, good, fair or a poor job of handling its responsibilities in the area of biotechnology?

	October 1999	February 2000
Excellent	2	2
Good	18	17
Fair	47	46
Poor	26	29
DK/NR	6	6

How much priority do you feel the federal government should attach to each of the following roles...the highest priority, high priority, moderate priority or low priority? (ROTATE)

24. Ensuring that the interests of the average Canadian are taken into account as policies are developed for the use of biotechnology.

	October 1999	February 2000
Highest priority	28	30
High priority	42	45
Moderate priority	23	17
Low priority	4	5
DK/NR	2	3

25. Ensuring that Canada benefits from the economic opportunities which biotechnology offers.

	October 1999	February 2000
Highest priority	23	19
High priority	44	44
Moderate priority	26	29
Low priority	5	6
DK/NR	2	3

26. Ensuring that the health of Canadians is protected against risks associated with biotechnology.

	October 1999	February 2000
Highest priority	47	47
High priority	38	37
Moderate priority	12	10
Low priority	3	3
DK/NR	1	2

27. Ensuring that the environment in Canada is protected against risks associated with biotechnology.

	October 1999	February 2000
Highest priority	42	39
High priority	40	43
Moderate priority	14	13
Low priority	3	4
DK/NR	2	2

28. Ensuring that Canada benefits from the new products and processes which biotechnology offers.

	October 1999	February 2000
Highest priority	22	20
High priority	47	43
Moderate priority	24	29
Low priority	5	5
DK/NR	2	3

29. Ensuring that Canadians are informed about the role of government in biotechnology.

	October 1999	February 2000
Highest priority	25	28
High priority	44	45
Moderate priority	23	20
Low priority	6	6
DK/NR	2	1

30. Ensuring that biotechnology is being used in ethical ways.

	October 1999	February 2000
Highest priority	39	36
High priority	39	41
Moderate priority	17	16
Low priority	3	4
DK/NR	2	2

END OF ROTATION

31. Would you say you are very familiar, somewhat familiar, not very familiar, or not at all familiar with ways in which biotechnology is regulated in Canada?

	October 1999	February 2000
Very familiar	2	2
Somewhat familiar	23	24
Not very familiar	43	40
Not at all familiar	31	33
DK/NR	1	1

I would like to read you some statements which various people have made who are comfortable with the development of biotechnology. In each case, please tell me if you strongly share this view, share it somewhat, or don't share this view. The first one is: (ROTATE)

32. Biotechnology has the potential to help solve world hunger.

	October 1999	February 2000
Strongly share view	39	32
Share it somewhat	42	47
Don't share this view	16	18
DK/NR	3	3

33. Biotechnology has the potential to help solve serious environmental problems.

	October 1999	February 2000
Strongly share view	38	29
Share it somewhat	45	49
Don't share this view	14	17
DK/NR	3	5

34. Biotechnology has the potential to help cure or treat serious illnesses.

	October 1999	February 2000
Strongly share view	52	41
Share it somewhat	37	43
Don't share this view	7	11
DK/NR	4	5

35. Biotechnology has the potential to strengthen our economy and improve our standard of living.

	October 1999	February 2000
Strongly share view	33	28
Share it somewhat	53	53
Don't share this view	12	15
DK/NR	3	3

END OF ROTATION

36. Which of the statements above is the *strongest* argument in favour of the development of biotechnology?

	October 1999	February 2000
Potential to help solve world hunger	25	29
Potential to solve serious environmental problems	16	13
Potential to help cure serious illness	37	36
Potential to strengthen our economy	15	16
DK/NR	6	6

Now, I would like to read you some statements which various people have made who are uncomfortable with the development of biotechnology. In each case, please tell me if you strongly share this view, share it somewhat, or don't share this view. The first one is (ROTATE)

37. Biotechnology involves changing things which God or nature created, and that makes me uncomfortable.

	October 1999	February 2000
Strongly share view	20	22
Share it somewhat	31	35
Don't share this view	47	42
DK/NR	2	1

38. Biotechnology may be creating unknown, long-term risks to health or the environment.

	October 1999	February 2000
Strongly share view	32	37
Share it somewhat	47	45
Don't share this view	18	14
DK/NR	3	3

39. Biotechnology involves experiments which could go wrong and cause serious harm.

	October 1999	February 2000
Strongly share view	31	33
Share it somewhat	46	44
Don't share this view	21	21
DK/NR	2	2

40. Biotechnology can lead to ethical decisions which are troubling and impossible to resolve to everyone's satisfaction.

	October 1999	February 2000
Strongly share view	35	37
Share it somewhat	45	43
Don't share this view	18	17
DK/NR	2	2

END OF ROTATION

41. In your opinion, which of these is the *strongest* argument *against* the development of biotechnology?

	October 1999	February 2000
Changing things God/nature created	15	13
Create unknown long-term risks to health and environment	39	44
Experiment going wrong, causing serious harm	20	20
Lead to ethical decisions	22	18
DK/NR	4	5

42. **Which of the following views is closest to your own? (ROTATE)**

	October 1999	February 2000
Decisions about biotechnology should be based mainly on the views and advice of experts about the risks and benefits.	62	59
Decisions about biotechnology should be based primarily on the average Canadian's views of risks and benefits	33	34
DK/NR	5	7

43. **And which of these two views is closest to your own? (ROTATE)**

	October 1999	February 2000
Decisions about biotechnology should be based mainly on the moral and ethical issues involved	29	30
Decisions about biotechnology should be based mainly on the scientific evidence of risk and benefit	66	65
DK/NR	5	5

Please tell me whether you strongly agree, agree, disagree or strongly disagree with each of the following statements which have to do with the role of government. (ROTATE)

44. Government should try not to regulate the biotechnology sector too much; otherwise, it will be less successful.

	October 1999	February 2000
Strongly agree	9	9
Agree	31	31
Disagree	35	39
Strongly disagree	21	19
DK/NR	3	2

45. Government should regulate the biotechnology sector more than other sectors, because of its unique nature.

	October 1999	February 2000
Strongly agree	24	31
Agree	45	42
Disagree	24	20
Strongly disagree	4	5
DK/NR	2	2

46. Government should inform people about biotechnology, and let them decide for themselves whether they want to use biotech products.

	October 1999	February 2000
Strongly agree	48	47
Agree	41	45
Disagree	8	5
Strongly disagree	2	2
DK/NR	1	1

47. Government should use its expertise to make decisions about which products should be available, on behalf of consumers.

	October 1999	February 2000
Strongly agree	21	23
Agree	48	45
Disagree	22	20
Strongly disagree	7	9
DK/NR	2	3

48. Government should encourage the development of biotechnology although there may be some unknown risks.

	October 1999	February 2000
Strongly agree	11	13
Agree	56	49
Disagree	24	25
Strongly disagree	6	12
DK/NR	2	2

END OF ROTATION

Please tell me whether you strongly agree, agree, disagree or strongly disagree with each of the following statements about biotechnology. (ROTATE)

49. I'd like to see Canada lead the world in the development of biotechnology.

	October 1999	February 2000
Strongly agree	24	23
Agree	48	44
Disagree	19	22
Strongly disagree	4	7
DK/NR	4	4

50. Scientists have no business meddling with nature

	October 1999	February 2000
Strongly agree	9	12
Agree	21	20
Disagree	50	45
Strongly disagree	18	21
DK/NR	2	3

51. The government should conduct further research into the long-term health and environmental impacts of biotechnology.

	October 1999	February 2000
Strongly agree	52	54
Agree	42	41
Disagree	4	3
Strongly disagree	1	1
DK/NR	1	1

52. The government should conduct further research into the long-term health and environmental impacts of biotechnology before allowing any further use of biotechnology.

	October 1999	February 2000
Strongly agree	40	48
Agree	43	39
Disagree	13	10
Strongly disagree	2	3
DK/NR	3	1

53. When I see a product on a store shelf, I assume that it must be safe.

	October 1999	February 2000
Strongly agree	18	27
Agree	51	44
Disagree	24	21
Strongly disagree	5	7
DK/NR	1	1

54. When I see a product on a store shelf, I assume that it must have been tested for safety by the government.

	October 1999	February 2000
Strongly agree	24	32
Agree	49	45
Disagree	21	14
Strongly disagree	5	7
DK/NR	1	1

55. I would buy biotech-produced food if it were more nutritious than other food.

	October 1999	February 2000
Strongly agree	11	15
Agree	53	44
Disagree	25	28
Strongly disagree	6	9
DK/NR	5	4

56. I would buy biotech-produced food if it cost less than other food.

	October 1999	February 2000
Strongly agree	10	7
Agree	37	31
Disagree	36	42
Strongly disagree	11	16
DK/NR	6	4

57. Enough is known about the safety of products made through biotechnology to allow them to be used.

	October 1999	February 2000
Strongly agree	4	6
Agree	42	34
Disagree	34	41
Strongly disagree	10	13
DK/NR	9	6

58. Not enough will ever be known about the safety of biotechnology.

	October 1999	February 2000
Strongly agree	19	22
Agree	45	41
Disagree	30	28
Strongly disagree	3	6
DK/NR	4	3

59. Until more is known about the risks, government should slow the use of biotechnology.

	October 1999	February 2000
Strongly agree	19	23
Agree	48	49
Disagree	28	23
Strongly disagree	2	3
DK/NR	3	2

60. We have to accept some risk to achieve health benefits from biotechnology research.

	October 1999	February 2000
Strongly agree	10	13
Agree	55	49
Disagree	26	26
Strongly disagree	7	10
DK/NR	1	1

61. If most scientific evidence says that a particular use of biotechnology is safe, it should be allowed.

	October 1999	February 2000
Strongly agree	12	17
Agree	68	63
Disagree	15	13
Strongly disagree	3	4
DK/NR	2	3

62. If the best available scientific evidence says that a particular use of biotechnology is safe, it should be allowed.

	October 1999	February 2000
Strongly agree	15	19
Agree	68	60
Disagree	12	14
Strongly disagree	2	2
DK/NR	3	5

END OF ROTATION

63. Some people are confident that enough is being done to study and monitor the risks associated with biotechnology. Others are worried that not enough priority is being attached to this. Which of these points of view is closest to your own?

	October 1999	February 2000
Enough being done to study/monitor risks	21	22
Not enough priority attached to it	74	73
DK/NR	5	5

64. To the best of your knowledge, in the last month have you eaten any food products which have been genetically modified?

	October 1999	February 2000
Yes	23	30
No	57	48
DK/NR	20	22