Doubtful dialogues: Public understanding of genetic modification in New Zealand

Alison Henderson & C. Kay Weaver

Department of Management Communication

University of Waikato

This paper draws on theories of discourse to examine how a small sample of the New Zealand public made sense of the controversial science of genetic modification during the 2000/2001 period of the New Zealand Royal Commission on Genetic Modification. Research data was collected from five focus groups involving a total of 29 participants from different occupational backgrounds in the Bay of Plenty area. The analysis considers how participants construct a sense of their knowledge about genetic modification, as well as examining how they discursively understand the science. The paper identifies that many of the research participants felt alienated from the debate about genetic modification and felt that they had no power to contribute to that debate. While research participants wanted to know 'the facts' about genetic modification, they expressed considerable awareness of how 'facts' are relative and socially constructed. A distrust of sensationalist and media representations of genetic modification and the partisan agendas of scientists and business was also evident. These findings are of concern given the New Zealand government's decision that there has now been sufficient public consideration of genetic modification to support the release of genetically modified organisms into the nation's environment.

Key words:

Discourse, genetic engineering, genetic modification, Royal Commission, public knowledge, public understanding.

Introduction

Since 1998 when it was revealed that genetically modified products were being sold in New Zealand supermarkets, genetic modification has become a topic of considerable political and public debate in this country. This relatively new science—which has equally been a topic of significant public and political controversy in the US, Europe, Australia and in other national contexts in recent years—has attracted both criticism and praise, from a diverse range of perspectives in New Zealand.

From a scientific perspective, genetic modification has been promoted as offering the potential to create disease- and pesticide-resistant food crops; it is seen as enabling improved agricultural outputs, and advancing the development of new medicines (see, for example, Berridge, 2000, Conner, 2000, Elliot, 2000). Some scientists, as well as environmental groups, have challenged claims about the benefits of genetic modification and instead assert that the science is fraught with unknown risk factors in terms of long term impacts on the environment (see, for example, Ho, 1998). New Zealand environmentalists have been especially likely to stress such concerns arguing that because of the country's relative geographical isolation and unique biodiversity, genetic modification presents the potential for significant ecological damage (Allen, 2000).

Cultural and religious groups in New Zealand have variously argued about the ethics of genetic modification technologies (Brown, 2000, Tipene-Matua, 2000). Others—particularly business and political groups—have argued about its possible economic benefits. Some commentators have argued that New Zealand's neo-liberal, free market economic agenda has led to a climate of business practice and political belief that the country should exploit genetic modification for commercial advantage (Weaver & Motion, 2002). Indeed, economic forecasting has asserted that major benefits could be derived from maintaining an innovative and competitive edge in international markets through the commercial application of genetic modification in primary industries such as agriculture, horticulture, forestry, and fisheries (Foresight Project, 1999).

It was in the context of genetic modification becoming a matter of concern in New Zealand—a concern that, at least in part, contributed to the Green Party winning seven seats in the 1999 general election and a role within the Labour Alliance coalition—that a Royal Commission in Genetic Modification was established in 2000.

The Commission's remit was to report on the strategic options available to enable New Zealand to address genetic modification, genetically modified organisms and products, and any desirable changes needed to address their legislation, regulation, policy, or institutional arrangements (Royal Commission on Genetic Modification, 2000). Evidence for the Commission's consideration was collected from public meetings, written submissions from the public, and oral and written submissions from 'interested persons' (i.e. groups that could identify themselves as having particular vested interests in the issue).

What particularly interests us here is an implicit assumption that the New Zealand public was sufficiently informed about genetic modification to be in a position to contribute to the data collected by the Royal Commission. This assumption is especially troubling in the context of Nicola Legat's (1999) assertion that New Zealanders have not had "sufficient access to quality, propaganda- and agenda-free information about genetic engineering to develop an informed and considered opinion on a topic which is, after all, about so much more than what's on the shelves at the supermarket down the road" (p. 50).

This paper challenges the assumption that the New Zealand public was in a position to make a considered contribution to the Royal Commission , through a qualitative analysis of focus group interviews conducted with adult members of the public living in the Bay of Plenty region during the time of Commission. Drawing on theories of public understanding, discourse and public knowledge, the paper examines how well-informed the research participants felt about genetic modification, how they discursively made sense of it, and to what extent they felt able and willing to engage in its debate.

Public understanding, discourse and knowledge

Our research draws on a social constructionist perspective which theorises public understanding of genetic modification as constructed by discourses. Foucault (1980) theorises discourses as ways of constructing knowledge that are socially and historically specific. Representing different values, beliefs, and interests, discourses "systematically form the objects of which they speak" (Foucault, 1972, p. 49) in the sense of defining and delimiting how these objects are understood and talked about, and by whom (Foucault, 1980). Some discourses will be compatible and mutually

reinforcing, while others are in opposition and struggle against each other to assert their particular knowledges and gain hegemonic ascendancy (Fairclough, 1989, Laclau & Mouffe, 1985). When a particular discursive position achieves dominance, it comes to assert a certain set of concepts or practices as the natural and legitimate way of thinking and acting in the world (Fairclough, 1989; Foucault, 1980).

Discourses about genetic modification predominately revolve around three central conceptual concerns: progress, risk and ethics. As Beck has stated, "talk of 'progress' presumes the subject whom all this is ultimately supposed to benefit" (1992, p. 207). Positivist scientific perspectives most frequently promote genetic modification as scientific progress that contributes to new knowledge and the public good by facilitating previously unavailable outcomes such as improved agricultural and medical products (see, for example, Davis, 1991). The free-market economic point of view uses a discourse of progress to construct genetic modification as potentially contributing to new intellectual property and product development, which in turn results in increased consumer choice (Gates, 2000).

Free-market discourses are contested by those opposed to the corporate commercialization of genetic modification. Oppositional perspectives claim that corporates investing in genetic modification are participating in the commodification of nature and exploitation of developing nations through free trade, the imposition of monopoly agriculture, and the patenting of seeds and knowledge (Ho, 1998; Shiva, 1997). Shiva (1997, p. 67), for example, argues that the Western values and interests inherent in patenting and monoculture cropping devalue many forms of local and indigenous knowledge and cultural systems. Shiva (1997) also argues that the common rights of peoples, including the right to work in traditional ways on their own lands, have been usurped by the private rights of multinationals seeking profit.

Environmentalists are also very often critical of the view that genetic modification should be understood in terms of progress. From their perspective the science has been presented as a threat to biodiversity and as an experiment (Allen, 2000; Rifkin, 1999) that involves "the exploitation of biological materials and processes for human needs" (Aldridge, 1996, p. 183). Environmentalists have also criticised the scientific assessment of risk in relation to genetic modification. It is important, however, to acknowledge that scientists' conceptions of risk are very different to those held by environmentalists and the lay public. From the positivist scientific perspective "there is an objective, measurable, verifiable level of risk

associated with any given hazard that can be determined with precision" (Priest, 1995, p. 40-41). Risk assessment involves, then, mathematically "estimating as precisely as possible the probability of harm" (Priest, 1995, p. 39), and risk-benefit analysis involves assessing the probable benefits of a course of action in relation to the probable harm that it may cause to, for example, health, the environment and/or the economy. As Beck (1992) points out, the rational scientific, technical and economic conceptions of risk do implicitly include consideration of the ethics of actions, but the values brought to ethical judgements are those of 'expert' rational modernism and capital. In contrast, subjectivist positions argue for the need to consider non-expert knowledge, value judgements and cultural responses to the ethical analysis of risk (Priest, 1995).

Ecological perspectives (which focus on the interrelationships of living organisms) primarily foreground ethical concerns about the effects that this science could have on the whole range of species on the planet, as do many critics of genetic modification. Ecological perspectives argue that science is not neutral and that the development of 'new knowledge' is not necessarily progressive and could, indeed, have significant regressive impacts on the well being of species, environments and habitats (Ho, 1998; Rifkin, 1999). Yet it is not only ecologists and environmentalists who call for the need to consider the ethical application of genetic modification and to reflect on how the public good is subjectively defined and determined. Many groups, including those with religious affiliations, doctors, academics and scientists have questioned the morality of genetic modification. They argue that the suffering that genetic modification causes to animal and human research subjects, and the dangers that its poses to the environment are greater than its potential benefits, and/or that it is equivalent to 'playing god' with life forms (Anderson, 2000; Brown, 2000; Mcgregor, 2000). New Zealand Maori have also raised ethical objections against genetic modification on the grounds of its cultural "impacts on whakapapa, mauri, kaitiakitanga, and rangatiratanga" (Tipene-Matua, 2000, p. 100).

How the New Zealand public discursively understands genetic modification is affected by the information available to them about the science and how that information is presented. Knowledge and understanding is therefore susceptible to the influences of (inevitable) subjective discursive partisan representation as well the imperatives of the channels of communication - which in the case of New Zealand's national news media are highly commercial.

Research into the media reporting of genetic modification has found that journalists struggle to convey the complexity of the science and debates about its associated risks (Glasner, 2000, Priest, 1995). As with other science issues, the reporting of genetic modification also discursively privileges 'expert knowledge' over lay knowledge (Cottle, 2000, Glasner, 2000) and emphasises benefits and economic concerns over environmental issues (Priest, 1995). There is also evidence of political and commercial interest groups in New Zealand and abroad using public relations tactics to manage public understandings of genetic modification (Bruno, 1998; Weaver & Motion, 2002; Motion & Weaver, in press).

This is not to suggest that the public are 'dupes' of media and public relations communication of genetic modification. Media research has demonstrated that publics are often more widely informed than they acknowledge and construct opinions based on the articulation of existing values, logical argument, direct experience, and critical awareness of media form (Corner, Richardson & Fenton, 1990; Philo, 1998). The ability to develop a considered understanding of, and opinion on an issue like genetic modification does, however, require access to a range of perspectives on the issue that can then be evaluated, judged, and accepted or rejected to varying degrees. And as Priest (1995) has argued, given that most audiences are likely to have "little direct experience with science and little exposure to science publications" what they think and understand about genetic modification "is likely to come from the media as well as general culture" (p. 51). The nature of public understanding about science that the media and culture generate is not fixed, but constantly negotiated and evolving through discourse (Herbst, 1993). Consequently we acknowledge that our own research into public understandings of genetic modification is very much a reflection of how that issue was perceived at a particular moment in time and location within New Zealand.

The research method

In line with our discursive approach to investigating public understandings of genetic modification, a qualitative research methodology was used to collect data that could then be discursively analysed. Focus group interviews were chosen as a method because they encourage research participants to express themselves in their own language as opposed to using language framed by structured interview questions developed by the researcher (Morrison, 1998). They also allowed us "to acknowledge the extent to which public opinion is an active formation, shaped in and through social

interaction" (Brunt & Jordin, 1987, p. 144). Since the research participants were concerned when first contacted that they had nothing to say on the topic of genetic modification, the focus group method was of additional value in that it "encouraged a more sustained and elaborated response" (Brunt & Jordin, 1987, p. 144) and provided participants with an opportunity to articulate and develop their ideas in conversation (Kitzinger & Farquhar, 1999).

When constructing the focus groups we decided to work with groups that already had some social existence (Brunt & Jordin, 1987), and, given our interest in a possible range of discourses, chose to investigate if there was any correlation between occupational background and discursive understanding and opinions on genetic modification. Five focus groups were therefore interviewed: one comprising workers from the environmental sector; one comprising business professionals; one comprising health professionals, one comprising people working in science roles; and one comprising those working as caregivers. A total of 29 participants were interviewed: 10 males and 19 females; and group members varied in age between 25 years and 55 years. Although we originally intended to interview an equal number of men and women, including health professionals and caregivers in the groupings resulted in a gender bias due to the greater proportion of women working in these two occupations in the organisations that we recruited from. A somewhat significant limitation of the research is that all but one of the respondents identified as Pakeha/New Zealand European, meaning that we are unable to comment on how differences in ethnic and/or cultural background might have impacted on the responses. All the focus group interviews took place in Tauranga, lasted between one and two hours, and were facilitated by the first author. The interviews were audio-taped and later transcribed.

A thematic analysis (Owen 1984, 1985) was used to identify dominant themes in the focus group discussions. Using Foss's (1989) cluster analysis we searched for ideas that were recurrent, or repetitive, terms of high intensity, or that clustered around particular subjects in the texts. Critical discourse analysis was adapted to further examine these substantive texts, and investigate the discourse practices influencing participants' understanding (Fairclough, 1992).

In presenting the findings of the research we firstly discuss the major discursive themes that emerged in relation to the knowledge that participants presented about genetic modification. Secondly, we focus on how participants construct their

understanding of the science, and thirdly, we explore the terms where the research participants accessed information on genetic modification and the extent to which they felt able to participate in the debate about the science.

Degrees of knowledge about genetic modification

When first contacted about participating in the research many of the interviewees claimed to know little about genetic modification. In all of the focus groups comments such as 'I'm not very well-learned on genetic engineering' [Business Respondent] and 'I don't really know a lot about it' [Science Respondent] were common. Such statements can be understood in terms of what Michael (1996) defines as "discourses of ignorance" which "not only constitute a means of understanding and explaining one's lack of knowledge, they also signify and reflect the perceived social relations between science and lay person, between self and expert" (p. 112). However, the focus group interviewees did not attempt to delineate themselves from science, or 'other' scientists. Indeed, in all of the groups, interviewees presented themselves as 'responsible members of the public' potentially interested in knowing more about genetic modification. For example:

> It makes you realise how little we know [about genetic modification], but it makes you realise you want to know a bit more. [Health Respondent]

> Even us, who are involved in science and science education . . . don't understand anywhere near enough. [Environment Respondent]

Health participants were less likely than other respondents to draw on discourses of ignorance and instead demonstrated a range of specialist medical knowledge around genetics. They were also more likely than the other focus group members to want to engage with and understand how the science actually worked from an 'expert' point of view:

> I'd like to know how they actually do it. I mean because just naturally those little codons – there's three have got to actually match up with another three and they say that only one goes to another, recognises another and pairs up with it. [Health Respondent]

Although very few of the focus group participants constructed themselves as knowledgeable about genetic modification, all of them perceived there to be risks associated with the science. Their discursive constructions of the risk of genetic

modification all fell into what Priest (1995) defines as subjective assessments of risk where the knowledge being developed by the science was questioned as well as its values and the ability to control its impacts. Risks of genetic engineering were never referred to as acceptable, manageable, or negligible in the focus groups. Neither did participants indicate that risks were outweighed by the benefits, rather they literally feared that risks cannot be confidently assessed. For example, questions were asked by interviewees such as "What's going to be created out of genetic engineering? It's the main worry isn't it?" [Business Respondent] and "I still think that it's the control … how easily could it just get out of hand?" [Health Respondent]

In all of the focus groups, at one point or another, environmentalist discourses were drawn on in the discussion of the risks of genetic modification. Fears of contamination of the environment were widely expressed, along with concerns about whether it was really possible to have both genetically modified and non-modified crops co-existing in New Zealand, and whether genetic research environments were really that secure. Yet while the participants brought knowledge about the possible environmental risks of genetic modification to the discussion, this environmental knowledge was very often framed by a discursive perception of the 'sanctity of the natural'. For example:

> It's also an issue for the environment as well because you [do not] know what the effect is of altering nature … what's going to happen to the soil? [Caregiver Respondent, emphasis added]

> You have to feel that the laws of nature apply or else you decline a species. [Science Respondent, emphasis added]

Such comments are implicitly underpinned by what Priest describes as a "reverence for ecological integrity [that] has become a modern religious tenet" (2001, p.79). Certainly, the fact that none of the research participants challenged the validity or basis of this ecological discourse attests to the degree of its normalisation.

Discursive understandings of genetic modification

While environmental discourses were prominent in the focus group participants' concerns about the risks that genetic modification posed, discourses of progress were extremely powerful in guiding all of the participants' understanding and belief in the medical value of the science. For example:

> You can start to solve and treat all the human cancers … blood disorders and stuff through genetic [modification]. [Environment Respondent]

> They'll be able to wipe out a whole lot of diseases through genetic engineering. [Science Respondent]

> They're isolating a gene that can do away with Huntington's . They've isolated a gene that causes retinitis … Now that's all good positive stuff. [Health Respondent]

There was less consensus, however, around the issue of whether genetic modification could be defined as progress in the context of providing benefits to developing nations. Six of the health group and four of the science group considered that it might help food supply in such nations, making statements such as:

> I think that it's exciting that they can make hardier crops for less developed countries. [Health Respondent]

> Genetically engineered rice … carries tremendous properties that would be good for the Third World. [Health Respondent]

> Genetic engineering has the potential to feed the world and to make it healthier. [Science Respondent]

These statements illustrate that the discursive promotion of genetic modification as having philanthropic utilitarian potential has gained a considerable traction among the science and health respondents. Indicative of a strong relationship between occupational interests and perceptions of the likely benefits of the application of genetic science, the environment group were, in contrast to the health and science groups, extremely critical of claims that genetic modification would be used to benefit developing nations. One environment participant was particularly vehement in his rejection of this notion, stating "It's not about saving a million kids a year in Ethiopia – it's just pure bull."

The science group also discussed genetic modification in terms of economic benefits, seeing it as bringing opportunities for New Zealand to compete in the world markets, as the following quotation illustrates:

> The fertiliser issue is very dear to the heart because what we're saying is that you want to increase the intensity of the production on the existing land … so

> there's an opportunity to modify the plants to have potentially quite a significant economic benefit in New Zealand. [Science Respondent]

Across the focus groups, participants expressed the view that genetic modification could bring economic benefits by improving crops, prolonging the shelf-life of perishable goods, creating bigger, or brighter fruit, getting rid of pests, and growing crops faster or more intensively. This discursive privileging of economic outcomes through the commodification of science is consistent with the dominance of free-market neo-liberal economic discourses in New Zealand over seas the last three decades (Cheney, 1998, Kelsey 1997).

However, while an economic discourse of progress was a prominent theme in the focus groups, some participants were concerned about the vested interests behind the promotion of this construction of the benefits of genetic modification. In this context environmental participants identified scientists as promoting 'benefits' of genetic modification because their research needed funding, and businesses as wanting to capitalise on the potential to profit from the science. For example:

> …it's all about the implications for funding … It's all big company propaganda … One of the big issues is company driven product-making versus the good of society and who really gets to say in these days and age when governments have almost little control. [Environmental Respondent]

This comment also demonstrates a critical scepticism among the research participants about how and why certain discursive understandings of genetic modification were dominating the debate in New Zealand. Sixteen of the focus group participants exhibited concerns about who was controlling this debate, who was making the decisions about the future of genetic modification in New Zealand, and how the science would be regulated. The following statements are indicative of these concerns:

> One of the big issues is company driven profit-making versus the good of society, and who really gets to say in this day and age when governments have almost little control really. [Environmental Respondent]
>
> Who's going to keep track of what they do? [Business Respondent]
>
> The hidden agenda and influence of the political [agenda] … at a very high level, that is my concern. [Business Respondent]

Because they were concerned that partisan agendas and interests were driving the genetic modification debate, participants sought strong neutral leadership that they could trust to make decisions in the public interest:

> So we need some consultants to make a decision. [Science Respondent]

> [I would like] a new ombudsman. [Health Respondent]

> I'd like some sort of neutral organisation … I don't even know if it can be a government agency. [Environmental participant]

These concerns about who could be trusted to make decisions that are in the public interest around the use of genetic modification were closely linked to perceptions of the difficulty of making decisions on the ethics of the science.

As in previous studies of public understanding of science (Priest 1995), the research participants brought subjective discursive understandings of ethics, rather than the positivist, rationalist risk assessment perspectives used by scientists. For example, the participants' discussions of ethics foregrounded questions of whether actions were honourable, responsible, or morally justifiable:

> That's the ethical issue isn't it? How far do you tinker and what is good medicine and what is acceptable and what isn't? [Science Respondent]

> Typically debate seems to end up on whether it's OK to put such-and-such a gene into a cow that produces safe milk. [Environmental Respondent]

Particularly prominent in the focus group discussions of the ethics of genetic modification was the belief that rather than being used for public good, the science would be exploited for private self interest, or even nationalistic reasons. In a number of groups these views were informed by an awareness of Hitler's treatment of Jews and his 'master race' eugenics project. Indeed, one health respondent expressed considerable reservations about cloning because she associated it with Nazi practices:

> I have fears probably in terms of people using it with their own benefits to make or try and engineer babies … The example that … springs to my mind is the whole holocaust … and the … German superiority thing in terms of what would have happened if this technology had been around then. [Health Respondent]

Concerns that genetic modification might be exploited for reasons for purely individual self-interest and self-indulgence were also informed by narratives of

popular culture, and even perceptions that star personalities might be ego-centric and rich enough to use the science for mere self serving ends:

> It's like the Boys from Brazil that came out about 20years ago, how Joseph Mankelin cloned Hitlers. I mean, it was far fetched, but … [Environmental Respondent]

> What I'm worried about is that … where Michael Jackson can clone himself 50 times or something, because he'd have the money to do it, that people that could really benefit might not. [Caregiver Respondent]

Apparent across the range of ethical concerns raised by genetic modification for the respondents was a sense that an egocentric ethic – which is 'grounded in self and is historically associated with the rise of laissez faire capitalism and a mechanistic view of the world' (Gamble & Fisher, 2002, p.10) could well prevail in the application of the science.

Access to information and participation in the genetic modification debate

As has been found in many recent studies of media audiences (Corner et al., 1990) the focus group participants demonstrated a critical awareness of the media and interest groups' discursive construction of social issues. The feelings of many of the interviewees can be summed up by one of the business group's comments that "I've just always been sceptical of anything I've read [in the media]." Many of the participants blamed the commercialisation of the media, and television in particular, for what they defined as 'sensationalist reporting' of genetic modification which was lacking in facts and depth of coverage.

While all of the group participants expressed criticism of the mainstream media's representation of genetic modification, a particular concern among the health group focused on transparency of information. One health participant stated that "There's a lot of stuff that we would never hear about on the news … that would be going on." In relation to Michael's (1996) analysis of discourses of ignorance, this comment identifies ignorance as intentionally constructed by gate-keepers who seek to prevent an informed and responsible citizenry from debating the place of genetic modification in New Zealand.

Comments from all groups indicated that participants wanted to have access to more factual information about genetic engineering, with six participants (two

caregivers, three health professionals and a science worker) preferring television documentaries and four participants (one business, one health and two science participants) recommending the Internet as a reliable source of information. Seven participants (three caregivers, one science, two business and one health) commented that genetic modification was not often a topic of general conversation, so information was rarely shared through informal social networks.

The focus group participants' belief that they did not have sufficient information about genetic modification contributed to a widespread feeling of powerlessness in terms of its debate. Both the lay public and governments were seen as powerless, with technology industries and business groups driving the decision-making. For example, one environment group participant commented, "Governments have almost little control really", and a health respondent said that "People at the top are going to really make no difference if somebody wants to go ahead and do it". On an individual level, one caregiver respondent stated "I don't think that I can do anything about it – it's bigger than me, you know, it'll just happen regardless". Fox (1992) describes this feeling of powerlessness, in relation to dominant ideologies valuing technology, as technocracy: a form of ideological imperialism.

Yet the research participants' feelings of powerlessness can also be understood in the context of the New Zealand's political history over the last thirty years. Kelsey (1997) has argued that, during this period, politicians and economists have "[w]ith the conviction of religious zealots, … claimed that they knew best and that people would appreciate the benefits of change only after it had been made" (p. 349). This context also helps to explain the comments made by an environment respondent who suggested that the establishment of a Royal Commission on Genetic Modification allowed the ordinary public to breathe a sigh of relief in the knowledge that others would be making the decision about the place of this science in New Zealand:

> The lay person doesn't want to understand it. The importance of understanding a Commission or even a Select Committee review is that the lay person can actually step back from it now and say 'wheew' somebody else that [is] representing me will make the decision and I have trust in them.

This participant also commented:

> Who do you think's making the submissions to the Royal Commission on GE and to the select committee on organics? I'm certainly not spending a million dollars preparing my case to put to them are you?

We would argue that the research respondents' perceptions of their political powerlessness impacted on their view of their role in the debate about genetic modification. Combined with their discursive construction and identification of themselves as ignorant about this science – a construction grounded in the exclusion of the public from "political influence other than in their roles as self-seeking investors and consumers" (Jesson, 1999, 221) in recent years – the respondents were able to disregard themselves as potential agents in the genetic modification debate.

There was some belief expressed among the research participants, however, that public pressure can force multi-nationals to modify their policies on issues such as genetic modification. Both business and science participants made a comparison with public protest action taken by New Zealanders over nuclear issues and racism in sport. One business participant stated: "We could stand out as a green country and organic number one in the world ... it becomes a very serious issue because you start to wonder – memories of nuclear plants and protests and the radicals that stood up ... against Springbok tours and everything else that's gone on in the past." It was perhaps in the context of such memories of public protest action having forced the State to respond to the power of public feeling that the participants spoke generally positively of activist groups – though no specific advocacy groups campaigning on the genetic modification issue were named.

Concluding remarks

Genetic modification is a complex science that has become a major issue of social and political concern. In New Zealand the government has, through the Royal Commission on Genetic Modification, supposedly consulted with the public about the place of this science in the nation's future. With the lifting of the moratorium on commercial field trials of genetically modified products in October 2003, New Zealand now faces the impending prospect of the release of genetically modified organisms into the environment.

While these decisions have been made, our findings – which we must stress are based on a very small sample of almost exclusively Pakeha/European New Zealanders – suggest that people may well have not felt able to participate in decisions about the

role of genetic modification in New Zealand. Our research participants felt ill informed about the science, alienated from its debate, and relatively powerless in the face of the commercial profit imperatives which they regarded as driving decision making about genetic modification. The research participants were not necessarily opposed to the science per se - they saw it as offering medical breakthroughs and as having merits in improving food production. However, environmental discourses that drew on broad conceptions of risk and ethics played a significant role in their questioning the value of genetic modification.

As Hindmarsh, Lawrence and Norton (1998) suggest, publics have a democratic right to participate in the genetic modification debate to protect public interests, to avoid abuses of power, and to decide how public money is spent. If the public is to enter into this debate, a wider appreciation of the barriers to public knowledge and democratic participation is crucial.

Certainly, the government has very recently indicated awareness the need for greater public discussion of science. Since 2001 the Ministry of Research Science and Technology has placed an emphasis on investing in projects designed to promote dialogue between scientists and the New Zealand public. This is an important step on the way to identifying ways of encouraging more inclusive decision making about science in New Zealand. Unfortunately it has come too late for a thorough public involvement in the assessment, debate and judgment of the whether genetically modified organisms should be released into the nation's environment.

References

Aldridge, S. (1996). The thread of life: The story of genes and genetic engineering. Cambridge, UK: Cambridge University Press.

Allen, T. (2000) The environmental costs of genetic engineering. In R. Prebble (Ed.), Designer Genes: The New Zealand guide to the issues, facts and theories about genetic engineering (pp. 61-68). Wellington, NZ: Dark Horse.

Anderson, B. (2000). The biotechnology juggernaut. In R. Prebble (Ed.), Designer Genes: The New Zealand guide to the issues, facts and theories about genetic engineering (pp. 129-139). Wellington, NZ: Dark Horse.

Beck, U. (1992). Risk society: Towards a new modernity. London: Sage.

Berridge, M. (2000). Genetic engineering for human health. In R. Prebble (Ed.), Designer Genes: The New Zealand guide to the issues, facts and theories about genetic engineering (pp. 85-96). Wellington, NZ: Dark Horse.

Brown, T. J. (2000) Spiritual and ethical considerations. In R. Prebble (Ed.), Designer Genes: The New Zealand guide to the issues, facts and theories about genetic engineering (pp. 111-117). Wellington, NZ: Dark Horse.

Bruno, K. (1998, September-October). Monsanto's failing PR strategy. The Ecologist, 28(5), 287-293.

Brunt, R., & Jordin, M. (1987). The politics of 'bias': How television audiences view current affairs. In J. Hawthorn (Ed.), Propaganda, persuasion and polemic (pp. 141-156). London: Edward Arnold.

Cheney, G. (1998). 'It's the economy, stupid!' A rhetorical-communicative perspective on today's market. Australian Journal of Communication, 25(3), 25-43.

Conner, T. (2000). Crops, food, environment and ethics. In R. Prebble (Ed.), Designer Genes: The New Zealand guide to the issues, facts and theories about genetic engineering (pp. 141-151). Wellington, NZ: Dark Horse.

Corner, J., Richardson, K., & Fenton, N. (1990). Nuclear reactions: A study in public issue television. London: John Libbey.

Cottle, S. (2000). TV news, lay voices and the visualisation of environmental risks. In S. Allen, B. Adam, & C. Carter (Eds.), Environmental risks and the media (pp. 29-44). London: Routledge.

Davis, B. D. (Ed.). (1991). The genetic revolution: Scientific prospects and public perceptions. Baltimore: John Hopkins Press.

Elliot, R. B. (2000) Genetic manipulation to produce insulin. In R. Prebble (Ed.), Designer Genes: The New Zealand guide to the issues, facts and theories about genetic engineering (pp. 37-40). Wellington, NZ: Dark Horse.

Fairclough, N. (1989). Language and Power. London and New York: Longman.

Fairclough, N. (1992). Discourse and social change. Cambridge, UK: Polity Press.

Foresight Project, The. (1999). Retrieved January 8, 2001 from the World Wide Web: http://www.morst.govt.nz/publications/info.folders/global/genetics.html

Foss, S.K. (1989). Rhetorical criticism: Exploration & practice. Prospect Heights, IL: Waveland Press.

Foucault M. (1972). The archaeology of knowledge. London: Tavistock Publications.

Foucault M. (1980). Power-knowledge: Selected interviews and other writings, 1972-1977. Brighton: Harvester Press.

Fox, M. W. (1992). Superpigs and wondercorn: The brave new world of biotechnology and where it all may lead. New York: Lyons & Burford.

Gamble, J. & Fisher, M. (2002) An exploration of the worldviews and beliefs involved in determining attitudes regarding genetic engineering. HortResearch internal report N. 20002/303. Palmerston North: HortResearch.

Gates, B. (2000, June 26). Will Frankenfood feed the world? Time, 102-103.

Glasner, P. (2000). Reporting risks, problematising public participation and the Human Genome Project. In S. Allen, B. Adam, & C. Carter (Eds.), Environmental risks and the media (pp. 130-141). London: Routledge.

Herbst, S. (1993). The meaning of public opinion: Citizens' constructions of political reality. Media, Culture & Society, 15, 437-454.

Hindmarsh, R., Lawrence, G., & Norton, J. (1998). Bio-Utopia: The way forward? In R. Hindmarsh, G. Lawrence & J. Norton (Eds.), Altered genes: Reconstructing nature – The debate (pp. 3-23). St. Leonards, NSW, Australia: Allen & Unwin.

Ho, M. (1998). Genetic engineering: Dream or nightmare? Turning the tide on the brave new world of bad science and big business. Dublin, UK: Gateway.

Jesson, B. (1999). Only their purpose is mad: The money men take over NZ. Palmerston North: Dunmore Press.

Kelsey, J. (1997). The New Zealand experiment: A world model for structural adjustment. Auckland, NZ: Auckland University Press.

Kitzinger, J. & Farquhar, C. (1999). The analytical potential of 'sensitive moments' in focus group discussions. In R. S. Barbour & J. Kitzinger (Eds.), Developing focus group research: Politics, theory and practice (pp. 156-172). London: Sage.

Laclau, E., & Mouffe, C. (1985). Hegemony and socialist strategy. London: Verso.

Legat, N. (1999, August). GM food: Should we worry? North & South, 39-50.

Mcgregor, N. (2000) Footprints of genetic engineering in agriculture. In R. Prebble (Ed.), Designer Genes: The New Zealand guide to the issues, facts and theories about genetic engineering (pp. 179-185). Wellington, NZ: Dark Horse.

Michael, M. (1996). Ignoring science:Discourses of ignorance in the public understanding of science. In A. Irwin & B. Wynne (Eds.), Misunderstanding science? The public reconstruction of science and technology. (pp.107-125). Cambridge, UK: Cambridge University Press.

Morrison, D. E. (1998). The search for a method: Focus groups and the development of mass communication research. Luton, UK: University of Luton Press.

Motion, J., & Weaver. C. K. (in press, 2004). A discourse perspective for critical public relations research: Life Sciences Network and the battle for truth. Journal of Public Relations Research.

Owen, W. (1984). Interpretive themes in relational communication. Quarterly Journal of Speech, 70, 274-287.

Owen, W. (1985). Thematic metaphors in relational communication: A conceptual framework. The Western Journal of Communication, 49, 1-13.

Philo, G. (1998). Conclusions on media audiences and message reception. In G. Philo (Ed.), Message received: Glasgow Media Group research 1993-1998 (pp. 282-288). Edinburgh, UK: Longman.

Priest, S. (1995). Information equity, public understanding of science, and the biotechnology debate. Journal of Communication 45(1), 39-55.

Priest, S. H. (2001). A grain of truth: The media, the public, and biotechnology. New York: Rowan and Littlefield Publishers, Inc.

Rifkin, J. (1999). The biotech century: Harnessing the gene and remaking the world. New York: Jeremy P. Tarcher/Putnam.

Royal Commission on Genetic Modification. (2000). Introduction. New Zealand Government. Retrieved September 23, 2000 from the World Wide Web: http://www.gmcommission.govt.nz/intro/warrant_eng.html

Shiva, V. (1997). Biopiracy: the plunder of nature and knowledge. Boston, MA: South End Press.

Tipene-Matua, B. (2000). A Maori response to the biogenetic age. In R. Prebble (Ed.), Designer Genes: The New Zealand guide to the issues, facts and theories about genetic engineering (pp. 97-109). Wellington, NZ: Dark Horse.

Weaver, C. K., & Motion, J. (2002). Sabotage, and subterfuge: public relations, democracy and genetic engineering in New Zealand. Media, Culture & Society, 24, 325-343.

Contact details: Alison Henderson & C. Kay Weaver, Department of Management Communication, University of Waikato,Private Bag 3105
Hamilton.Phone: 07 838 4466 ext. 6307,Fax: 07 838 4358.
alison@waikato.ac.nz
ckweaver@waikato.ac.nz

Copyright of Communication Journal of New Zealand is the property of Communication Journal of New Zealand and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.