



Awareness and Attitudes towards GMOs

Summary of relevant research

The Brief

Network Communications was commissioned to undertake desk research to:

- Identify any relevant recent research undertaken on attitudes and awareness of GMOs
- Provide a brief written summary of the relevant research findings, to help ERMA New Zealand decide to what degree the general public survey it has commissioned should cover GMO issues in addition to non-GM new organisms.

Methodology and Approach

The desk research is a summary of surveys conducted in New Zealand on public opinions, attitude and awareness of GMO's. It also summarises relevant overseas research focusing on Australia, since the completion of Hamstra's *Survey of Survey's* which reviews and lists many of the major research initiatives internationally. It is intended as a guide to the information which exists and while every attempt has been made to make it as comprehensive and accurate as possible, it is important to remember that comments made are also somewhat subjective.

The research involved:

1. Internet search – using various search engines including, Google and Yahoo, NZSearch, Scirus and Alta Vista. Downloaded as appropriate – a summary of relevant sites are listed in the bibliography.
2. Searched any available online University library databases.
3. Contacted Market Research Society of New Zealand (MRSNZ) and library and emailed all members to ask if any relevant research had been completed.
4. Contacted Association of Market Research Organisation (AMRO) – as above.
5. Contacted major research agencies independently.
6. Reviewed material provided by ERMA New Zealand and called on knowledge of ERMA New Zealand communications staff and Network research staff of existing research on GM.
7. Bibliographic search through all relevant documents downloaded from websites and provided in existing collection of research.

Findings and conclusions

This survey of existing research identified 17 significant research studies from 1990 to 2002 into various aspects of public awareness of, and attitudes towards GM issues in New Zealand. We also undertook internet searches to gain an idea of the level and content of GM research overseas and have included a summary of some relevant Australian and international studies.

Looking at the New Zealand research overall, the following observations are relevant:

- Most of the research has been one-off. The exception is HortResearch's Transgenic Plants research started in 1998, while the Ministry for the Environment has recently (November 2001) completed what is described as a benchmark survey on public awareness and knowledge of GM.
- It is therefore difficult to accurately track changes in awareness or opinion over the 13 years covered.
- Where there have been broadly similar awareness or attitude questions in different surveys the results appear to be similar (e.g. in 1990 the DSIR Crop Research survey was reporting 50% were concerned about eating GM products and the 1998-1999 HortResearch study showed over 50% expressed negativity towards GE in food production).
- Research has generally not found significant correlation between different demographics and awareness of, or attitudes towards GM issues (exception: some surveys show men more accepting of GM in food).
- The studies identified include three international studies. The full international results have not been accessed, but where top-line results were included in published summaries there are significant differences in attitudes between New Zealand and other countries (e.g. New Zealanders less favourable towards biotechnology than Japanese or Europeans; less favourable to GE than Australians).
- Much of the research focuses GM or GE as it relates to food, reflecting the commercial or political interests of those commissioning the research or (in the case of syndicated studies) likely to buy the research results.

Some common themes emerge from the research:

- Respondents want to know more about GM, especially the risks involved.
- Respondents are aware of GM on the whole, although few claimed to be very informed. (compare 1990 DSIR crop Research results with 2000 Royal Commission survey and 2001 MfE survey).
- Respondents are generally more favourable towards / see advantages in GM in medicines and medical research than towards use of GM in food / agriculture and horticulture.
- There is nervousness of the 'unknown' aspect of GM.
- Attitudes towards GM do not vary greatly by demographics.

When undertaking this review, it was a common comment among researchers understanding of the New Zealand public's perception of biotechnology is inadequate, especially compared to the amount of research completed internationally. International studies are very numerous and Hamstra provides an excellent summary of major research on public perceptions, internationally.

Biotechnology Australia has also completed a number of surveys designed to initially benchmark public opinion and then track it over time, releasing its final report mid-last year. This research is very comprehensive, exploring issues both quantitatively and qualitatively through focus group research and regular national surveys.

Note that we also used academic search engines to try to identify any relevant New Zealand unpublished theses or academic research work. We have been unable to identify any such research, but cannot rule out the existence of such work.

Conclusions: While much of the research is one-off, collectively it provides a good deal of information on New Zealanders' awareness of, and attitudes to, GM. In particular the 2000 survey undertaken for the Royal Commission on Genetic Modification and the 2001 benchmark survey on public awareness and knowledge genetic modification undertaken for the Ministry for the Environment cover many of the questions that ERMA New Zealand would want to ask about GM. As a result, our recommendation is that ERMA New Zealand's public survey focus on non-GM new organism awareness and attitudes, and only include GM questions where ERMA New Zealand feels there are specific gaps in the existing research undertaken by others. ERMA New Zealand should also consider the possibility of greater co-operation with MfE over future research in this area to enable ERMA New Zealand's areas of interest to be better covered.

Summary of Research in New Zealand

<i>Title</i>	<i>Author/s</i>	<i>Date</i>	<i>Brief summary</i>
Consumer Response to a Variety of Gene Technologies including Genetic Modification (working title)	Gamble J. Small B. & Lau K. for HortResearch and NZ Institute of Social Research and Development	May 2002	<p><i>Objective:</i> Gain information regarding consumer and supplier response to a variety of gene technologies including genetic modification. Builds on 1998-2000 programme – Public Perceptions of Transgenic Plants and Plant Based Products</p> <p><i>Method:</i> Focus groups, in-depth interviews and national survey (repeated twice in 2001)</p> <p><i>Sample:</i> Focus groups – public, in-depth interviews – retailers and manufacturers, National telephone survey, nationally representative – n=404 (May 2001) and n=400 (October 2001).</p> <p><i>Major findings</i> (top-line results only):</p> <ul style="list-style-type: none"> • Consumers not averse to gene technology per se as long as it was made clear that it was not genetically modified. • Nearly two-thirds of respondents said an apple that had been genetically modified using genes from another apple was acceptable to some degree. • Meat from a cow that had eaten pesticide sprayed feed was equally acceptable as meat from a cow that had eaten GM feed. • Milk from a cow genetically modified with human genes to produce insulin for diabetics was acceptable to 60% of respondents.
Genetic Modification: Public Awareness & Knowledge Benchmark Survey	Harsant M. & Kalafatelis E for Ministry for the Environment	November 2001	<p><i>Objective:</i> To establish a benchmark survey to assist with the development of a public information campaign on genetic modification.</p> <p><i>Method:</i> Telephone interviews.</p> <p><i>Sample:</i> Nationally representative sample of n=603, 15 years and over (Maori over-sampled).</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • 53% claimed to be informed about GM and 43% admitted to being uninformed.

Title	Author/s	Date	Brief summary
			<ul style="list-style-type: none"> • 80% wanted to find out more about GM. • Demographic profile of those who want more information is similar to total sample i.e. total population. • Most people wanted to know about the risks associated with GM (26%), the level of use of GM in NZ (20%) and the use of GM in food or products for human consumption (19%). • 20% would like to know more about the benefits of GM and 14% how it is controlled. • 64% claimed there were controls, 13% claimed there were no controls and 23% didn't know. • Common misconceptions – 55% believed that GM was currently used in commercial crops. • 35% were not aware of the Royal Commission.
Current Awareness of Genetically Modified Food Issues	Dr Rob Lake, ESR for Ministry of Health	September 2001	<p><i>Objective:</i> One of a series intended to provide the Ministry of Health with an independent source of current information on issues related to genetically modified food. Covers scientific issues concerning safety, detection and nutritional quality of genetically modified foods. Only peripherally covers social effects – attitudes and awareness.</p> <p><i>Method:</i> N/A</p> <p><i>Sample:</i> N/A</p>
Public Opinion Survey	BRC Marketing and Social Research for Royal Commission on Genetic Modification	April 2001	<p><i>Objective:</i> To measure awareness, understanding, perceptions, beliefs and approval of GM.</p> <p><i>Method:</i> Telephone interviews.</p> <p><i>Sample:</i> Nationally representative n=1153, 15 years and over (Maori over-sampled).</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • Genetic modification is not a 'top-of-mind' issue. • Over one half of believe that genetic modification is of importance to New Zealand's future.

Title	Author/s	Date	Brief summary
			<ul style="list-style-type: none"> • Demographic differences don't discriminate. • High proportions believed that GM is currently being practised in NZ. • Few claimed to be very informed about GM. • Most claimed there were more advantages in using GM in medicines, medical research, pest control and plant research and more disadvantages in food, farm animals, research using animals and marginally in commercial crops. • Medical research and medicine and vaccines were the two most approved of in terms of GM.
Perceptions and Attitudes Towards Genetically Modified Foods – a New Zealand Survey	Maurer O. & Koslow S. for New Zealand Food Marketing Institutes, Waikato Management School	October 2000	<p><i>Objective:</i> To examine perceptions and attitudes of New Zealand consumers towards genetically modified food and how these factors impact on food purchasing decisions.</p> <p><i>Method:</i> Part of a face to face omnibus survey at food retail outlets and compared to a second survey of a sample of agricultural and food scientists.</p> <p><i>Sample:</i> Not included in abstract information.</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • Consumers more concerned about particular categories of food but no discernable pattern to suggest less concern for heavily processed food. • Attitudes (towards GM food) did not predict purchase. • Scientists more concerned about GM foods.
Public Views on The Biotechnology Question	Sally Mackay, Rosemary Nicolson and Sandy Brinsdon for Independent Biotechnology Advisory Council	2000	<p><i>Objective:</i> To identify major concerns of the public and give guidance for the future direction of IBAC.</p> <p><i>Method:</i> Data gained from public focus groups in four regions and responses received from <i>The Biotechnology Question</i> booklet.</p> <p><i>Sample:</i> 19,000 booklets distributed to public libraries, CABs, secondary schools and media also online submissions available. 254 submissions received nationwide.</p>

Title	Author/s	Date	Brief summary
	(IABC)		<p><i>Major findings:</i></p> <ul style="list-style-type: none"> • Focus group results revealed negative attitudes towards biotechnology, written responses were varied. • Many felt there was a role for specific applications for biotechnology, but that it was moving too fast. • Philosophical and ethical issues need to be addressed through wide public debate. • Respondents felt that focus should not be limited to short-term gains, but long-term consequences. • A major opportunity/benefit was medical applications and to a lesser extent agricultural and horticultural purposes. • A major concern was the treat to environment, biodiversity and biosecurity and the fear of corporate control. • Research seen to be driven by corporations. • Many felt that a major opportunity could be gained for New Zealand by not embracing biotechnology.
New Zealanders and the Environment	Gendall P. Department of Marketing, Massey University, International Social Survey Programme	2000	<p><i>Objective:</i> Part of an annual international survey carried out by 35 countries to establish and compare beliefs on environmental issues. Included a limited number of questions about GM</p> <p><i>Method:</i> Mail survey</p> <p><i>Sample:</i> Nationwide n=2000 with a response rate of 62%.</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • A majority of respondents would live with genetic modification for medical or environmental purposes but are more concerned about food and agriculture.
Evaluating the Behavioral impact of proposed Genetically	Macpherson T., Kearns Z & Sharland S. for the Department of	2000	<p><i>Objective:</i> To measure consumer responses to various labeling techniques for GM food.</p> <p><i>Method:</i> Choice modeling.</p> <p><i>Sample:</i> Information not available in abstract.</p>

<i>Title</i>	<i>Author/s</i>	<i>Date</i>	<i>Brief summary</i>
Modified Labeling Provisions	Marketing, Massey University		<p><i>Major findings:</i></p> <ul style="list-style-type: none"> While knowledge and understanding of biotechnology has increased, it does not appear to have had any affect on consumers' choice behaviour or sensitivity to genetic modification.
Consumer responses to GM food	NFO (formerly CM Research) syndicated study-+	1999	<p><i>Objective:</i> To explore consumer attitudes about food and concerns about GM.</p> <p><i>Method:</i> A qualitative study involving 25 in-depth interviews followed up by three focus groups.</p> <p><i>Major findings:</i> Not provided – this is a syndicated study available for \$1000. Report covers background attitude (e.g. judging food quality, food safety, food shopping patterns); Attitudes to GM food (beliefs, factors influencing perceptions); Communication issues (barriers to understanding, good brands bad brands, information strategies); Likely futures (GM food futures; NZ food futures).</p>
New Zealanders' Attitude towards Genetically Modified Food	Colmar Brunton syndicated research study	1999	<p><i>Objective:</i> Measure consumer awareness and understanding of GM foods and impacts of purchase decisions.</p> <p><i>Method:</i> Two stage research – focus groups and telephone survey</p> <p><i>Sample:</i> Focus groups - five different life stages and telephone survey n = 1000, 15 years and older, nationally representative. Ongoing annual tracking.</p> <p><i>This project is syndicated research – available to buy at a cost of \$2,000.</i></p>
Consumer Perceptions of Fruit Production Technologies	Richardson-Harman N., Phelps T., Mooney, P. & Ball R.	1998	<p><i>Objective:</i> To provide an assessment of New Zealand consumer perceptions of the risks and benefits of fruit production technologies.</p> <p><i>Method:</i> Information not available in abstract.</p> <p><i>Sample:</i> n=511</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> Respondents believed benefits of GE would outweigh risks but that neither the science community nor the respondents knew enough about the risks for the benefits to be clear.

<i>Title</i>	<i>Author/s</i>	<i>Date</i>	<i>Brief summary</i>
Public Perceptions of Transgenic Plants and Plant-Based Products	Joanna Gamble for HortResearch Foundation of Research, Science and Technology. CM Research – National Survey	1998 – 1999	<p><i>Objective:</i> To measure the public's awareness and understanding of biotechnology, particularly in relation to food.</p> <p><i>Method:</i> Three-part project using focus groups, conjoint analysis and a national survey as part of the EU project.</p> <p><i>Sample:</i> Used CM Research's (now NFO) telephone omnibus survey for the national survey, n=1000 (repeated 2001 and 2002 – as above).</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • New Zealanders are still making up their minds about GM food, both weighing up the potential risks and benefits and taking into account moral beliefs when deciding on acceptance i.e. attitudes are still fluid and unformed. • Over 50% of those nationally surveyed indicated negativity toward GE in food production – with a greater degree of acceptability among men. • Correlation between perceived and actual knowledge was poor – those who thought they knew a lot about technology were more likely to perceive risks. • Considerable 'nervousness of the unknown aspect of technology', in relation to health and the environment. • Cynicism aimed at big business and consequent lack of regulations and objective information available to consumers in NZ. • Perceived lack of choice – due to lack of labeling regulations. • Low understanding of biotechnology but the desire to know more.

<i>Title</i>	<i>Author/s</i>	<i>Date</i>	<i>Brief summary</i>
Attitudes to Biotechnology in Japan and New Zealand in 1997	Macer D. et al	1997	<p><i>Objective:</i> To better understand opinion about biotechnology in Japan and New Zealand and whether media stories influenced public attitudes.</p> <p><i>Method:</i> Telephone interviews using Eurobarometer 46.1 questionnaire as part of the international study on attitudes to biotechnology.</p> <p><i>Sample:</i> n=489 (NZ)</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • New Zealanders are relatively aware of the genetic engineering technology and less optimistic/favourable of biotechnology than in Europe and Japan. • New Zealanders tended to be more supportive of genetically engineered foods and crops than EU, but less supportive of medical applications. • No correlation of attitudes with any particular background variable such as sex, education, religion or awareness of GMOs.
Genetically Engineered Food – Opinion Poll	AGB McNair for Greenpeace, Soil and Health and Friends of the Earth	1997	<p><i>Objective:</i> Provide an indication of perceptions of eating GE food.</p> <p><i>Method:</i> Telephone opinion poll.</p> <p><i>Sample:</i> n=1000 nationally representative sample.</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • 43% worried a lot about eating GE food. • 17% were considerably worried about eating GE food. • 12% wouldn't worry at all about eating GE food.
Doing Good, Doing Harm: Public Perceptions & Issues in the Biological Control of Possums and Rabbits	Fitzgerald G. et al for the NZ Institute for Social Research & Development	1994	<p><i>Objective:</i> To examine the public perception of use of biotechnology in the control of possums. Repeated in 1996 and 1999.</p> <p><i>Method:</i> Focus groups and telephone survey.</p> <p><i>Sample:</i> Telephone n=1127 nationally representative, 11 focus groups with various representations.</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • Two-thirds approval for increasing the quantity and quality of food products through genetic engineering. • Relative to other risks genetic engineering rated low relative to other

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			risks by experts, but higher by the public because of fear of the unknown.
International Bioethics Survey	Macer D.	1993	<p><i>Objective:</i> To examine the acceptance of biotechnology in New Zealand.</p> <p><i>Method:</i> Mailed questionnaire</p> <p><i>Sample:</i> Three population samples chosen – public, university students and high school teachers. NZ public n=329, but very low response rate of 22%.</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • 41% thought GE was worthwhile (c.f. 62% in Australia). • Respondents supportive of science and technology in general and appeared to balance benefit and risk.
Public Attitudes to Genetic Engineering in New Zealand	Couchman P.K. & Fink-Jensen for DSIR Crop Research	1990	<p><i>Objective:</i> Examines the attitudes of New Zealanders to science and technology.</p> <p><i>Method:</i> Face to face interviews, mix of qualitative and quantitative.</p> <p><i>Sample:</i> n=2034 of the public and postal survey of farmers, scientists and biology teachers.</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • Nearly three quarters of the public had heard of GE, few felt they could adequately explain the concept. • GM of human cells the least acceptable and manipulation of plant cells the most acceptable. • Public concern centred around moral and ethical grounds and the possibility of environmental and human hazard resulting on the introduction of technology. • 50% concerned about eating GM products. • Three-quarters were aware GMOs could be used to produce food and medicines.

Summary of Relevant Australian and International Research

Title	Author/s	Date	Brief summary
Biotechnology Public Awareness Survey – Final Report	Millward Brown (formerly YCHW) for Biotechnology Australia	June 2001	<p><i>Objective:</i> Assist in the development of public information campaigns. Follows on from initial benchmarking surveys conducted by YCHW.</p> <p><i>Method:</i> Comprising two phases tracking research to replicate and build upon initial benchmarking study undertaken in 1999, focus groups and telephone survey with the Australian public.</p> <p><i>Sample:</i> telephone n=1001, nationally representative adults. Focus groups four initially and following public survey, nine following.</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • Biotechnology is a complex and intimidating scientific topic. • Biotechnology is out of control and beyond control because developments moved at such a fast pace. • Low awareness of regulators of gene technology. • Biotechnological issues tended to be related to a lack of understanding and negative attitude toward the issue in general. • Environmental issues rate higher than GM foods and cloning as science and technology concerns. • Most technological developments are seen as useful for society with the exception of human genes in animals and gene technology in food and drink. • The majority of the public describe all applications of gene technology as risky for society, but morally acceptable. • Awareness & attitudes toward the use of gene technology in medicine are mixed. • Half would eat GM food and 60% would eat GM foods to be healthier or use GM medicines.

Community Survey – GE/GM Issues	Myriad Consultancy for Biotechnology Australia	May 2001	<p><i>Objective:</i> To examine awareness, knowledge, products, use and media associated with GE and GM.</p> <p><i>Method:</i> Telephone survey.</p> <p><i>Sample:</i> n=407, adult Tasmanian residents.</p> <p><i>Major findings:</i></p> <ul style="list-style-type: none"> • 79% were aware of GE/GM, younger people more aware. • Half would like to know more. • One-third thought pharmaceutical products should be produced with GM/GE. • 65% were against GE/GM crops being grown in Tasmania. • Two-thirds thought GE/GM products should be sold if labeled. • 74% said they had noticed something in the media about GE/GM.
GE Foods and Community Opinion	CSIRO	1998	<p><i>Objective:</i> To examine peoples views and knowledge of biotechnology, particularly gene technology to produce food.</p> <p><i>Method:</i> Mailed questionnaire.</p> <p><i>Sample:</i> n=623 respondents.</p> <p><i>Major findings:</i> Not available in abstract.</p>
IFIC Consumer Attitudinal research: Most Americans can Articulate Expected Benefits of Food Biotechnology	Cogent Research for International Food Information Council (IFIC)	September 2001	Series of six consumer surveys on food biotechnology, n=1000 in US.
Public Opinion About Biotechnology : A Survey of Surveys	Hamstra I.A. for European Federation of Biotechnology	1999	Collation of public opinion surveys on biotechnology, giving aims, countries, sectors and groups surveyed as well as main conclusions.

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YCHW (1999) *Public Attitudes Towards Biotechnology*, Research Report for Biotechnology Australia.

Useful Websites

The following list represents sites that we found particularly useful when searching for information on the internet, many of them contain searchable databases, useful links and research reports readily available online:

www.biotechnology.gov.au

www.biotech-info.net –

www.agbioforum.org –

www.checkbiotech.org –

www.foodsafetynetwork.ca –

www.icgeb.trieste.it -

www.crop.cri.nz

www.genetech.csiro.au

www.ucsusa.org