

# Ethical, Cultural and Spiritual Objections to Genetically Modified Organisms: A Review of the New Zealand Process and Perspective

Jean S. Fleming

Department of Anatomy & Structural Biology, Otago School of Medical Sciences, P.O. Box 913, Dunedin, New Zealand

E-mail: [jean.fleming@stonebow.otago.ac.nz](mailto:jean.fleming@stonebow.otago.ac.nz)

**Summary** — The New Zealand Royal Commission on Genetic Modification was directed to investigate the strategic options available to address the use of genetically modified organisms and products. The Commission spent 14 months hearing submissions in public meetings and formal hearings. Over 10,000 written public submissions were received. Most were against any use of the technology in food, and many were angry at the lack of product labelling and therefore choice. Few were supportive, although there was little objection to the use of genetic technology or modified organisms in containment, especially for medical research. Many New Zealanders had strong spiritual objections to the creation of transgenic animals containing human DNA, which they described as “playing God” or “interfering with Nature”. Many expressed lack of trust in scientists and biotechnology companies. Despite these views, the Commission concluded that New Zealand should keep its options open and proceed carefully, minimising and managing risks. The Commission recommended that Government establish a Bioethics Council to act as a transparent advisory body and prepare guidelines on biotechnology, enabling public education and participation in decision-making.

**Key words:** attitudes, culture, ethics, genetically modified organisms (GMOs), religion, New Zealand.

## Introduction

The Warrant establishing the New Zealand Royal Commission on Genetic Modification directed it to investigate and report on the strategic options available to New Zealand, now and in the future, to address the use of genetically modified organisms and products. The Warrant specifically excluded discussion on cloning, mutagenesis, controlled pollination or hybridisation. The Commission spent a total of 14 months engaging with this complex topic, hearing submissions that covered the science, the implications for human health, the ethical, cultural and spiritual issues, *Treaty of Waitangi*<sup>1</sup> perspectives, and environmental, economic, legal and international issues. Through a process that included 15 public meetings, 12 hui (conferences attended by Maori), 13 weeks of formal hearings and over 10,000 written public submissions, we formed the opinions described in the Report (1). Given the size and complexity of the debate, I wish to focus on the ethical, cultural and spiritual objections to genetically modified organisms, in particular animals, raised by the public during the Commission’s hearings. Issues concerning the use of genetic modification in medicine, including gene

therapy, xenotransplantation and embryo modification and selection, are not discussed in this paper. Further information on the Commission’s process, as well as the full Report and Appendices, can be obtained by visiting [www.gmcommission.govt.nz](http://www.gmcommission.govt.nz).

## The Commission’s Report

The Report starts with a description of a shared framework of values. These values, we believe, were shared not only by Commissioners, but also by the majority of submitters. The seven core values that lie at the heart of the debate were named as:

- The uniqueness of Aotearoa/New Zealand
- The uniqueness of our cultural heritage
- Sustainability
- Being part of a global family
- The well-being of all
- Freedom of choice

<sup>1</sup>The Treaty of Waitangi is seen as the founding document of the nation of New Zealand. It was signed in 1840 by representatives of the British Crown (Queen Victoria) and many Maori chiefs.

### — Participation

The seven values were placed in three sets of criteria:

- cultural, spiritual and ethical issues;
- environmental and health issues; and
- economic and strategic issues.

These criteria were then used to assess the various applications of genetic modification, such as research in containment, crops, food and medicine. In each of these chapters, the existing and potential uses of the technology were described and the regulatory agencies assessed. Later chapters discussed issues that were interwoven throughout the debate, including intellectual property, the *Treaty of Waitangi* and liability. The Commission's major conclusions on the strategic options open to New Zealand were then discussed and further major recommendations made.

## The Major Findings

The overall conclusion reached by the Commission was that New Zealand should keep its options open with regard to genetic modification (1). There are many potential advantages on offer, but we should proceed carefully, minimising and managing risks. With regard to the use of genetically modified plants, the Commission recommended that the development of all forms of agriculture (conventional farming, organics and integrated pest management) should be facilitated. The different production systems should not be in opposition to each other, but rather should contribute in their own way to the overall benefit of New Zealand. Significantly, the Commission did not consider that New Zealand would benefit from the widespread release of "first generation" (largely herbicide- and insect-resistant) modified plant crops (1).

## Attitudes of the New Zealand Public

Throughout the process of the Commission, it was apparent that the centre of the debate about genetic modification was not so much the science as the ethical, cultural and spiritual dilemmas that arise for many people when faced with the technology. Political and social issues also arose often. I realised that genetic modification affected people at a very fundamental level. People were not so much telling us their views on genetic modification, but more their views on the future they wanted for their children and their children's children on our small, blue planet.

Over 10,000 written public submissions were sent to the Commission. Over 92% of these mainly one-page submissions were firmly against any genetic modification, and in particular, genetically modified food and the release of genetically modified food crops in the New Zealand environment. Further analysis indicated that nearly 50% of public submitters were concerned about the risk to the environment from the release of genetically modified organisms (mainly plants), 36% were concerned about public health safety risks, and 30% were concerned about food safety risks, including the lack of labelling of food as containing genetically modified ingredients. Only 2.8% of written public submissions talked about the religious implications, 0.6% mentioned animal rights and 0.1% mentioned human rights, whereas 16% were concerned about the ethical and spiritual implications of the technology (2). However, the written and oral public submissions and many of the submissions made at the formal hearings lacked substantive input on the ethics of genetically modified organism production, concentrating more on social, cultural and spiritual concerns.

In order to ensure that the opinions of the New Zealand public were canvassed fairly, in a representative way, the Commissioners decided to commission an independent public opinion survey, which involved telephone interviewing 1153 New Zealanders over the age of 15 years. When asked about the issues they saw as important to New Zealand's future, fewer than 3% mentioned genetic modification unprompted, but more than 93% of those surveyed were aware of the term. Once the topic had been raised, over half believed that genetic modification was of importance to the country's future. Many people were aware of New Zealand scientists' use of genetic technology (techniques using genetic modification) in research using animals (67%) and in medical research (72%). While 65% approved of using this technology in medical research, only 29% approved of genetic modification research using animals. Although 54% of New Zealanders surveyed approved of the use of genetic modification for pest control (rabbits, possums and mustelids), 70% disapproved of the use of genetic modification in farm animals (3).

## Anti-corporate Sentiment and Mistrust of Scientists

A large number of submitters to the Commission expressed concern about the independence of the scientists doing research on transgenic plants and animals. In New Zealand, there is currently a low public confidence in science and scientists, which may stem from memories of previous "scientific disasters", such as the use of DDT and thalidomide.

These perceptions of “scientists in it for the money” may have been exacerbated by the restructuring of governmental research laboratories at the end of the 1980s and the move to outcome-driven research. There is certainly more pressure on New Zealand’s scientists now to do research that might lead to new applications or products. Dr Morgan Williams, Parliamentary Commissioner for the Environment, told us: “There’s a widespread perception that the soul of science is, or has been bought, and . . . the objectivity, rightly or wrongly, that was bestowed upon science in previous decades, is not seeking to be as strong as it was” (4).

Submitters were also worried about the corporate control of research conducted in New Zealand, despite the high proportion of public funding for research and development in New Zealand. Dr Roger Wilkinson (Landcare Research) said:

*People don’t trust genetic engineering. . . . They also don’t trust genetic engineers. Some groups described how scientists have let us down too many times . . . [One] group observed the lack of trust in proponents. . . . Scientists were described in the [another] group as arrogant. . . . Biotechnology companies were described as being interested only in profits: . . . Someone . . . even suspected a conspiracy. Motives of scientists were regarded as important, along with the source of their research funds and who their employers were* (5).

Although we heard a great deal of opinion from both sides of the discussion, the Commission did not enter into the debate on whether genetically modified crops would feed the world, focusing our thoughts on the use of this technology in New Zealand. However, the story of Professor Ingo Potrykus and the development of “Golden Rice” epitomised the rift between the polarised ends of the debate. The proponents of genetic modification used the story to illustrate the potential of the technology, while the opponents used it to “prove” the involvement of scientists with multinational companies for their own gain (6).

## **Ethical Objections to Genetically Modified Organisms**

In addressing the issue of ethics, the Commission identified several underlying issues. The first concerned the difficulty of resolution of complex issues in the biotechnology area, at the level of the local ethics committee. The public showed little awareness of the system of animal and human ethics committees that operates currently in New Zealand, and there was an assumption that such committees were probably “in-house” and not truly independent anyway. The Commission considered there was a need for a trusted forum in which to debate the cultural and ethical issues.

Another issue raised was how to link cultural and spiritual values (such as the sacredness of nature) with specific decisions (such as whether to approve the development of a transgenic cow), so that the former informed the latter properly (7):

*No longer can biotechnology rely on a public acceptance of the Enlightenment model of progress driven by a scientific conquering of the power of nature. Increasingly this is replaced by the notion of being part of nature and needing to work in harmony and balance with it* (8).

Several of the presenters at the formal hearings spoke of their ecological world view, based on the assumption of the interconnectedness of all life, including humans. An ecological world view recognises that introducing a change into the biological system is likely to create effects on the whole system, many of which will not be predictable, given the complexity of biological systems (9). This approach was contrasted with another, currently more dominant view of science, that of reductionism, which was seen by these submitters as anthropocentric and advancing knowledge by breaking systems into smaller and smaller pieces: from cell to nucleus, to chromosome, to gene, to individual base pairs. Presenters with an ecological worldview thought that reductionism did not have the capacity to look at the system as a whole. Furthermore, they thought that reductionists assumed a view of nature as raw material for humans to use, for the benefit only of humans. From the ecological point of view, therefore, reductionists believed that life could be engineered (10).

The need for a more focused approach to ethical decision-making was noted by many witnesses, especially with regard to the incorporation of complex spiritual and cultural issues in that decision-making. Utilitarian approaches, where a decision is made giving due weight to the interests of all people equally, were seen to be too limited in the genetic modification debate. Several submitters pointed out that the utilitarian approach takes the human individual as the prime measure of value and pays insufficient attention to nature as a whole (11). Four key elements in ethical decision-making concerning genetic technology were identified:

- a clear statement of the values to be used as criteria;
- full information on the specific data relating to the case to be decided;
- a holistic approach that looks at both the data and the values in a connected manner; and
- appropriate participation by all stakeholders in the decision-making process and outcomes (12).

Although the Commission was satisfied that New Zealand's existing regulatory framework was appropriate, we did suggest some enhancements. Our emphasis was on wider public participation in the debate, with the formation of principles with which to guide our society's ability to deal with changing technologies. The recommendation to establish a national Bioethics Council was predicated on the conclusion that many of the major issues in the genetic modification debate were ethical or deeply embedded in the spiritual and cultural concerns of the community. The Commission considered that an independent forum for the open, informed discussion of new technologies was urgently needed. In order for New Zealand to maximise the opportunities that genetic technologies can offer and keep its options open, better communication of the scientific results to the community and a stronger debate on the ethical and cultural concerns were essential.

For that reason, we recommended that the New Zealand Government establish a national Bioethics Council to:

- act as an advisory body on ethical, social and cultural matters in the use of biotechnology in New Zealand;
- assess and provide guidelines on biotechnological issues involving significant social, ethical and cultural dimensions; and
- provide an open and transparent consultation process to enable public participation in the Council's activities (13).

### **Spiritual Objections to Genetic Modification**

For a large number of the opponents of genetic modification, the ability to play with genes and engineer life is equivalent to the ability of the scientist to "play God". A wide range of people, from scientists to religious leaders, expressed their unease at the mixing of genes between species. They described the ability to modify genes and create transgenic animals as "interfering with Nature" and referred to such practice as "unnatural". Unfortunately, no evidence was presented that defined the attitudes of these submitters to the hybridisation and mutagenesis techniques common in modern agriculture today. In some submissions from religious groups, the anti-reductionist argument was mixed in with the strong Christian view of God the Creator. Richard Davis, appearing for the Public Questions Committee (Methodist, Presbyterian, Churches of Christ and Quaker groups), said:

*Humans, cannot . . . in the Christian view, be reduced to their genes, in a genetic reductionism. Humans are not merely the interaction of their genes with the material environment. Christians assert that there is a God who is the giver and sustainer of life (14).*

The relationships between humans and creation and the sacredness of God's world were described in various ways, including "Life is a gift given in trust", and "Creation is our being not our enemy". These interpretations of the "wrong-feeling" of genetic modification came from the Jewish community, as well as from various Christian groups. They affirmed an interpretation of the Judaeo-Christian belief system as one of care for the Earth and its inhabitants, rather than of dominance, and asserted that "human beings [were] . . . the only life form that can . . . act in a stewardship role to the rest of the planet"(14).

If, indeed, humans are unique in their ability to act as planetary stewards, does this not imply that they are already acting like God? Gary Comstock, Professor of Philosophy and Religious Studies at Iowa State University, USA, discussed the inadequacy of people's "intrinsic concerns" over genetic modification, arguing that the objections couldn't be sustained (14). The irony of the argument that humans shouldn't play God, with regard to genetic modification, is that we do play God with every decision we make about the use of our environment. As Stanley Schmidt once stated, "Once you have the ability to 'play God', you cannot avoid exercising it — because even the decision not to use an ability is a decision with consequences" (15).

It was clear from the submissions from religious and environmental groups that their beliefs were genuine and deeply held. For example, conservation groups were strongly opposed to the use of any genetic modification to control animal pests in New Zealand, preferring the current use of more conservative trapping and poisoning methods. They considered the use of genetically modified parasites or viruses to reduce pests would do irreparable damage to New Zealand's "clean green environment", and might have "unpredictable consequences" (16).

### **Cultural Objections to Genetic Modification**

The Commission's terms of reference required it "to consult and engage with Maori in a manner that specifically provides for their needs", including any cultural and ethical concerns, in order to fulfil the Crown's responsibilities under the *Treaty of Waitangi*. After a scoping hui to assess requirements, a specific Maori consultation programme was developed, consisting of 28 regional workshops and ten regional hui throughout New Zealand, cul-

minating in a three-day national hui. An independent consultant was appointed to manage the programme (17).

Maori have their own “world view”, which is often inaccessible to, and therefore not understood by, non-Maori New Zealanders (18). Maori spiritual values we heard about frequently involved the concepts of “whakapapa” (genealogy or heredity), “mauri” (life principle or spirit) and kaitiakitanga or “obligated stewardship”. Maori can trace their whakapapa (genealogy) up through the ancestors to the Gods, and also sideways in kinship links to all living creatures, which are therefore regarded as kin. Because of the duty of kaitiakitanga, Maori believe they bear the spiritual costs associated with environmental degradation, since they are related to all living things. Sir John Turei (Tuhoe<sup>2</sup>) at the hui in Auckland put it this way:

*In times past this connectedness was an essential part of survival. A breach of tapu<sup>3</sup> . . . was an offence to the land, to the people (tangata), species of the sky (kirehe o te rangi) and of the land (me te whenua) and this offence led to misfortune (aitua) and sickness or death (mate). [These] were considered to be the consequence of any wrongdoing . . . (18).*

Careful consultation is required if common ground is to be found between Maori and non-Maori in decisions made on development and use of genetically modified organisms in the New Zealand environment. The Commission heard many complaints that Maori were not adequately consulted by scientists and decision-makers over such decisions. Bevan Tipene Matua (Ngai Tahu, Kahungunu), a lecturer at the University of Canterbury, said at the Christchurch hui, “They [the scientists] are unable and don’t want to create or enter into the Maori world or create relationships to ensure that our rights are protected, but also the taonga<sup>4</sup> themselves are protected” (19).

The most common objection to genetic modification raised by Maori concerned the movement of genes between species and in particular, the development of transgenic animals containing human genes. For some, transgenics brought up images of bestiality or cannibalism. The possibility that meat from such an animal could enter the food chain caused deep revulsion. Maori used the concept of mauri to explain why transgenics involving living creatures was morally wrong. Mauri is the life energy or the soul of all living things. Even inanimate objects like cliffs, stones and especially water, have their own mauri. Many submitters took the view that mixing this mauri by creating transgenic

animals was disrespectful. For instance, Angeline Ngahina Greensill (Tainui) said, “Everything possesses a mauri or life force and is to be respected. Because everything is inter-related and interconnected, any mutilation, modification or unnatural desecration of any part affects the whole”.

Despite these strong concerns, Maori made a clear distinction between using extracted human DNA sequences compared with using chemically similar or even identical sequences that were synthetic or derived from other mammals (19).

Maori concerns about genetic modification were relevant to the Commission’s debate, because New Zealand has an active research programme and considerable expertise in the production of transgenic agricultural animals, such as sheep and cows. One agricultural research laboratory involved in the development of transgenic cows is also situated on Maori land. The development of transgenic animals for the production of human proteins in milk (so-called bioreactor animals) is currently a highly capital-intensive and high-risk undertaking. The Commission did not envisage a New Zealand landscape with large, unconstrained herds of pharmaceutical-producing goats, sheep and cattle in the near or medium future. However, we considered bioreactor animals might form a small, high-value niche market in our mixed, diversified economy, at least in the short to medium term (20). There was little information available on the economic viability of animal bioreactors, mainly because this technology is still so new. Given the capacity of the New Zealand dairy cow to produce high milk volumes and the possibility of high yields of the transgenic protein in the milk, very small numbers of transgenic animals may be required to saturate the international market for proteins required for rare diseases. It would be much easier to contain animals and prevent transgenic animal products appearing in the food chain if small numbers of animals were involved, and sterile purification of the gene product from the milk might be simplified.

While products from transgenic animals hold out immense hope to the carriers of genes for rare genetic diseases, a process of genuine consultation with Maori in the development of such animals is clearly required in New Zealand.

## Finding a Pathway Through a Polarised Argument

*I know no safer depository of the ultimate powers of the society but the people themselves, and if we think them not enlightened enough to exercise that control*

<sup>2</sup>The names in parentheses indicate tribal affiliations.

<sup>3</sup>Tapu — the inviolable, right way.

<sup>4</sup>Taonga — assets or valuable belongings.

*with a wholesome discretion, the remedy is not to take it from them, but to inform their discretion.*  
Thomas Jefferson (21)

The debate over the use of genetic modified organisms and products in New Zealand did not disappear with the Commission's Report. In fact, it became the most talked about political issue of the 2002 election campaign. The views of the proponents and the opponents drifted further apart, rather than coming together to form some consensus opinion on the technology. In the year since the release of the Commission's Report, New Zealanders have had access to a great deal of information on the pros and cons of biotechnology, but there has been no noticeable change in the beliefs and attitudes of those who oppose it. The government of New Zealand has moved to establish the Bioethics Council, as recommended by the Commission. It will be chaired by Maori Anglican Bishop and past Governor General Sir Paul Reeves, and membership will be gender and culture balanced. Members of the Bioethics Council will require wisdom, patience and tolerance and must earn the respect and trust of the New Zealand public if they are to be successful in their objective of providing an open and transparent consultation process.

Another step in resolving the issue concerns reviving public trust in the integrity of the regulatory authorities, the companies who make the products of genetic modification and the scientists who do the research. I believe the biotechnology companies need to be more open about their research, to regularly disseminate their results on gene flow to the scientific media, to discuss the environmental effects of genetically modified crops with the public, and to involve the community more in decision-making. Scientists need to speak publicly about their work more often, and the processes of research funding and management need to be made more transparent. As an academic teacher of future scientists, I believe strongly that we must emphasise the acquisition of communication skills and ethical decision-making in our biological science courses, at both school and university levels.

The science has reached the stage where the big decisions are not really scientific, but ethical, cultural and spiritual. We must go beyond asking, "what can we do?" and start to ask ourselves, "what should we do", whether we are considering where to invest our money or when our children are deciding their future careers. So how can the experience of a small country like New Zealand help others find the pathway to acceptable use of this technology? The following are a few suggestions:

— listen to all stakeholder viewpoints, and constantly ask who benefits and who doesn't;

- gather as much information as you can about the science relating to the case to be decided;
- obtain independent opinion from public surveys of non-stakeholders;
- allow and encourage participation of indigenous/minority groups in bioethical decision-making, as well as in the discussion;
- develop a clear statement of the values that will be important in the decision-making;
- take a holistic approach that connects the values to the scientific facts;
- maximise the transparency of the decision-making process, and document all outcomes of meetings;
- work with the farmers and the people who prepare food, as well as with the food companies and the scientists;
- encourage scientists to speak about their work publicly;
- develop the skills of the next generation in science communication and ethical decision-making;
- assume that most people are looking for a better life, a cleaner environment and a growing economy.

Above all, those involved in determining the use of biotechnology in the future should be prepared to listen to and respect the views of all, remembering the words of Immanuel Kant.

*We do not see things as they are, but as we are.*

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