

4D: SAFETY AND LABELLING OF GM FOODS

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Eating is an inherently dangerous activity

We unwittingly ingest uncountable micro-organisms every time we eat, plus a range of chemicals which, at some concentrations, can be toxic or even lethal. Yet, we eat to survive. We eat to obtain the nutrients necessary to maintain healthy bodies and carry out our functions as human beings.

We have learned over millennia which plants to avoid as food, and which parts of plants to avoid. Our food culture tells us how to store and prepare our food. This culture is reinforced by national food regulation systems that set standards for food that can be legally sold. As a society, we rely on the food regulator not only to set standards for existing food products, but also for new foods entering the marketplace.

Foods that are not part of our traditional diet are known as novel foods. In Australia and New Zealand, the Australia New Zealand Food Authority (ANZFA) is the food regulator. One of its roles is to make sure that these novel foods are safe to consume. It does this by requiring a pre-market safety assessment of novel foods before any approval for sale is given by a Food Standards Council of ministers.

Genetically modified (GM) foods must be subjected to this safety assessment process. These GM foods come from crops and other food sources that have been modified by a technique called gene technology – a technique that allows food producers to alter more precisely certain characteristics of a food crop by introducing genes from another source. An example of this is a corn plant with a gene that makes it resistant to insect attack.

But how safe are GM foods? Do they pose a long-term danger to human health? Are there any benefits to consumers in choosing GM foods over conventionally produced foods or organic foods? If GM foods are the great advance in food production claimed by the life science companies, why are so many people protesting against the technology?

GM foods – a major food issue

Surveys conducted by the Commonwealth agency Biotechnology Australia have found that, given a choice, more than half of respondents would rather not eat GM foods and more than 90% want GM ingredients to be labelled on food packages.

Doubt about the safety of GM foods is certainly a factor in these attitudes, but not necessarily a primary factor. Other considerations, such as environmental and ethical concerns, fear of multinational companies gaining control of the food supply and the lack of discernible benefits to consumers, appear to loom large in people's thinking.

Much of the direction for public attitudes against GM foods has come from Europe, where public distrust and suspicion of food regulation has reached unwarranted proportions.

In the United Kingdom, for example, major supermarket chains have taken the decision on whether or not to eat GM out of consumers' hands by declaring themselves GM free and refusing to stock GM foods.

Nevertheless, countries such as the United States, Canada and China are developing their GM food industries steadily. The recent New Zealand Royal Commission on Genetic Modification has given the green light to continued research and application of gene technology in that country.

The issue, therefore, appears to be one of managing the new technology. In Australia, the risk management of GM foods falls into two parts: ensuring the safety of GM foods for consumption and providing consumers with the information necessary to choose which foods to eat. These risk management strategies are discussed below.

It is important to remember in this discussion that ANZFA is neither a proponent nor an opponent of GM foods. The prime concern of the food regulator is to maintain the safety of the food supply. The rate of uptake of GM foods will depend on their acceptance by consumers.

Consumers appear to see few benefits in buying GM foods. Until the new wave of GM foods appear which provide foods of better taste, nutritional value or health benefit, GM food uptake will probably remain slow.

The safety of GM foods

Because there is no history of safe use of GM foods, they cannot legally enter the food supply until their safety has been assessed. Food manufacturers must provide ANZFA with a package of scientific information according to a schedule set down by ANZFA to enable the assessment to be made.

The scientific data – including raw results from experiments – are examined by ANZFA's toxicologists, microbiologists, nutritionists and food technologists. The results are assessed according to principles adopted by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) of the United Nations.

The main features of the assessment involve a study of the toxicity, allergenicity and nutritional value of the GM food compared with its conventionally produced counterpart, as well as an examination of the stability of the genetic modification over several generations.

The results provided by the companies must have been obtained in independently certified laboratories. If ANZFA finds gaps in the information, it requests the companies to take steps to fill those gaps. The data provided are augmented by the latest knowledge gleaned from the world's scientific literature.

The result of this process is that we know more about the genetic make-up of GM foods than any other food. No other food or category of foods in history has been subjected to so much close scrutiny.

ANZFA will only recommend the approval of a GM food if it is found to be as safe as its conventional counterpart, with all the nutritional benefits. To date, ANZFA has received 22 applications for GM foods (two subsequently withdrawn), covering soybeans, corn, canola, potato, sugar beet and cotton. It has completed and released full safety assessments on 16 of these commodities for public comment. Twelve have already been approved for sale in Australia and New Zealand by the Ministerial Council.

All but one of these GM foods relate to the introduction of genetic traits designed to improve production characteristics, such as pest and disease resistance or tolerance to herbicides. The other application relates to changes in the oleic acid content of a soybean which improves the cooking characteristics of the oil and may also provide potential health benefits to consumers.

Some of the packaged foods in supermarkets contain approved GM ingredients derived from one of the six GM crops listed above. They appear as ingredients in many foods ranging from mayonnaise to breakfast cereal, confectionery to savoury snacks – many have been in the marketplace in Australia for around five years.

These foods have been in the food supply of other countries (for example, the United States and Canada) for much longer. In that time, there has been no case reported worldwide of a GM food causing an adverse effect on human health [OECD Conference on the Scientific and Health Aspects of Genetically Modified Foods, January 2000].

Cotton is the only GM food commodity being commercially grown in Australia (its oil is consumed), although approval for canola is expected soon. No fresh GM vegetables, fruit, meat or fish have been approved for sale in Australia.

Labelling for consumer choice

From December 7th 2001, subject to certain exemptions, most GM packaged food products on sale in Australia and New Zealand – either as a whole food or as an ingredient additive or processing aid in a processed food – must have their GM status identified on the packaging label if introduced genetic material or GM protein is present in the final food.

This means that even if the slightest trace of the introduced genetic material or protein can be found in a corn chip or a jar of mayonnaise, it must appear on the label, usually in the ingredients list.

So, a typical ingredients list for white bread containing a GM ingredient could be:

Ingredients: wheat flour, water added, yeast, salt, soya flour (genetically modified), vegetable oil, sugar, emulsifiers (471, 472E), preservative (282), enzyme amylase,

Wherever a GM ingredient, additive or processing aid is present in the final food, the food must be labelled. Some GM additives or processing aids may be used in the manufacturing process, but are not present in the final food and these do not need to be labelled. Some GM ingredients, such as sugars and oils, may have been refined to such a degree that no genetic material or protein is left in the final food. Again, no special labelling is required.

Another exemption to the labelling requirements in processed foods are flavours, which are allowed to be present up to a level of one part in a thousand in the final food. Foods prepared from GM ingredients, additives and processing aids, but sold unlabelled at the point of sale – for example, restaurants, hotels and takeaways – are also exempt from labelling requirements.

The Ministerial Council agreed to these new regulations for the sale of GM food, not on safety grounds, but to provide consumers with information on the GM content of a food. These labelling requirements are among the most stringent in the world.

By empowering consumers in this way, we can make informed choices about the food we buy. Increasingly, we are being offered food produced by a range of methods and technologies – for example, organic, conventional, genetically modified. GM labels on packaged food will allow us to make that choice at the time of purchase.

The future for GM foods

As has already been stated, the first wave of genetically modified crops has provided benefits almost exclusively to the primary producer. The next wave promises foods with new and beneficial characteristics for consumers, such as improved nutrition or enhanced flavour.

The knowledge gained by the life science companies in proving the safety of their GM food products may also be put to work more directly to produce foods which help people with particular food intolerances or as a means of improving the general health of the population.

An example of the former is the removal of allergens from foods such as peanuts, while the latter can be illustrated by the research currently being undertaken on developing bananas, using gene technology, which can carry vaccines.

The immediate future of GM foods will be determined by public attitudes towards the new technology and by the transparency exhibited by national food regulators and the food industry as it rolls out its new products. ANZFA operates one of the most, if not the most, transparent approval processes in the world for GM foods.

ANZFA also acknowledges that many people have concerns about the long-term – that is, generational – effects of GM foods on human health. It is therefore monitoring very carefully work being undertaken in the United Kingdom to track the purchase of GM foods with the health patterns of the buyer and his/her family.

Discussion notes

- Some consumers will still appreciate knowing if food contains GM oil, such as Round-up ready soy or canola, irrespective of whether any of its DNA remains. This concern is because, presumably, these oils will have comparatively high levels of the herbicide Roundup.
- The reason that oils such as canola oil do not require special labelling if they come from a GM source is that they are chemically indistinguishable from oil derived from their non-GM counterpart. In deciding on a labelling regime for GM foods, the health ministers agreed that outcome rather than process should be identified on labels. Chemical residues in foods are strictly governed by the Food Standards Code, whether the food has GM ingredients or not. Permitted levels of Roundup, for example are either equal to international standards (Codex) or set at lower levels
- Some consumers may wish to modify their food purchases because of ecosystem concerns. While there are apparent advantages to implanting insect resistance or nitrogen fixing, we need to be sceptical about building up herbicide resistance if this entails greater use of herbicides, or if the economic benefits of cotton growing by irrigation lead to a spread of salinity. There are also doubts about the adverse impact of monocultures on biodiversity.

- Clearly, some people will wish to avoid GM foods for a number of reasons. This is a valid response to environmental, religious, ethical and other concerns. The job of the food regulator – by being open and transparent – is to eliminate as far as possible safety concerns from the equation.
- The concern of the Australia and New Zealand Food Authority is with the safety of GM foods. It will not recommend that the Food Standards Council approve a GM food for sale in this country until it is satisfied that it is as safe as its conventionally produced counterpart. If manufacturers wish to sell GM foods and consumers wish to buy them, ANZFA's job is to ensure that GM foods are as safe as possible. Within the bounds of present scientific knowledge, approved GM foods pose no additional threat to human health than that posed by their conventional counterparts.
- Despite these assurances, there is a need to take a holistic approach to food policies, which should give equal weight and investment to non-GM alternatives such as organic farming and preservation of biodiversity. They should ensure long-term aims for sustainable environmental health as well as for human health and wellbeing.

Further reading

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