FOOD STANDARDS
Australia New Zealand
Te Mana Kounga Kai – Ahitereiria me Aotearoa

5 July 2010
[15-10]

APPLICATION A1029
FOOD DERIVED FROM DROUGHT-TOLERANT CORN LINE MON87460
APPROVAL REPORT

Executive Summary

Purpose

Food Standards Australia New Zealand (FSANZ) received an Application from Monsanto Australia Limited (Monsanto) on 10 June 2009. The Applicant requested an amendment to Standard 1.5.2 – Food produced using Gene Technology, in the *Australia New Zealand Food Standards Code* (the Code), to permit the sale and use of food derived from a new genetically modified (GM) variety of corn, drought-tolerant corn line MON87460 (referred to as MON87460 corn).

This Application was assessed under the Major Procedure.

Safety Assessment

MON87460 corn has been genetically modified to tolerate cultivation under water-limited conditions. The trait is conferred by expression of a single bacterial gene encoding cold shock protein B. The corn line also contains a commonly used marker gene encoding antibiotic resistance.

FSANZ has completed a comprehensive safety assessment of food derived from MON87460 corn. This assessment included consideration of (i) the genetic modification to the plant; (ii) the potential toxicity and allergenicity of the novel proteins; and (iii) the composition of MON87460 corn compared with that of conventional corn varieties.

No public health and safety issues were identified as a result of the safety assessment. On the basis of the available evidence, including detailed studies provided by the Applicant, food derived from drought-tolerant MON87460 corn is considered as safe and wholesome as food derived from other commercial corn varieties.

Labelling

Labelling addresses the objective set out in paragraph 18(1)(b) of the *Food Standards Australia New Zealand Act 1991* (FSANZ Act); that is, the provision of adequate information relating to food to enable consumers to make informed choices. The general labelling requirements will provide consumers with information about the GM status of foods.

In accordance with general labelling provisions, if approved, food derived from MON87460 corn will be required to be labelled as genetically modified if novel DNA and/or novel protein are present in the final food. Studies conducted by the Applicant show that novel proteins are present in the grain.

Impact of regulatory options

Following satisfactory completion of the safety assessment, two regulatory options were considered: (1) reject the Application; or (2) approve food derived from MON87460 corn.

Following analysis of the potential costs and benefits of each option on affected parties (consumers, the food industry and government), option 2, approval of food derived from MON87460 corn, is the preferred option. Under option 2, the potential benefits to all sectors outweigh the costs associated with the approval.

Assessing the Application

In assessing the Application and the subsequent development of a food regulatory measure, FSANZ has had regard to the following matters as prescribed in section 29 of the *Food Standards Australia New Zealand Act 1991* (FSANZ Act):

- whether costs that would arise from an amendment to the Code approving food derived from MON87460 corn do not outweigh the direct and indirect benefits to the community, Government and industry that would arise from the development or variation of the food regulatory measure
- there are no other measures that would be more cost-effective than a variation to Standard 1.5.2 that could achieve the same end
- any relevant New Zealand standards
- any other relevant matters.

Decision

To approve the variation to Standard 1.5.2 – Food produced using Gene Technology, to include food derived from drought-tolerant corn line MON87460 in the Table to clause 2.

Reasons for Preferred Approach

The development of a variation to the Code to give approval to the sale and use of food derived from MON87460 corn in Australia and New Zealand is proposed on the basis of the available scientific evidence, for the following reasons:

- the safety assessment did not identify any public health and safety issues associated with the genetic modification used to produce MON87460 corn
- food derived from MON87460 corn is equivalent to food from the conventional counterpart and other commercially available corn varieties in terms of its safety for human consumption and nutritional adequacy
- labelling of certain foods derived from MON87460 corn will be required if novel DNA and/or protein is present in the final food

- a regulation impact assessment process has been undertaken that fulfils the requirement in Australia and New Zealand for an assessment of compliance costs. The assessment concluded that the preferred option is Option 2, an amendment to the Code

- there are no relevant New Zealand standards

- there are no other measures that would be more cost-effective than a variation to Standard 1.5.2 that could achieve the same end.

Consultation

As this Application was assessed as a Major Procedure, there were two rounds of public comment. Consultation on the 1st Assessment was conducted over a period of eight weeks; twenty-five submissions were received. Consultation on the 2nd Assessment was conducted over a period of five weeks; thirty-five submissions were received. A summary of these is provided in this Report at Attachment 2.

FSANZ has taken all submitters' comments into consideration in completing the assessment of this Application, and has addressed issues, particularly those relevant to the safety of food derived from MON87460 corn. Additional information was incorporated into the Safety Assessment where necessary. Responses to the 2nd Assessment Report were used to complete this Approval Report.

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SUPPORTING DOCUMENTS

The following material, which was used in the preparation of this Approval Report, is available on the FSANZ website at
http://www.foodstandards.gov.au/standardsdevelopment/applications/applicationa1029food4367.cfm

SD1: Safety Assessment Report (Updated)

INTRODUCTION

On 10 June 2009, Monsanto Australia Limited (Monsanto) submitted an Application seeking approval for food derived from drought-tolerant corn line MON87460 (referred to as MON87460 corn) under Standard 1.5.2 – Food produced using Gene Technology, in the *Australia New Zealand Food Standards Code* (the Code).

MON87460 corn has been genetically modified (GM) to tolerate cultivation under water-limited conditions. Although MON87460 corn is still susceptible to drought conditions, the level of yield loss is less than conventional corn. The drought tolerance trait is conferred by expression of a single gene, *cspB*, from *Bacillus subtilis*, which encodes cold shock protein B (CSPB). Cold shock proteins are widely found in bacteria and facilitate adaption to suboptimal temperatures by essentially preserving protein synthesis. Similar proteins are also found in plants and enable them to tolerate various abiotic stresses.

The GM corn line also contains a commonly used antibiotic resistance marker gene (ARMG), *nptII* (neomycin phosphotransferase type II) from the ubiquitous gut bacterium, *Escherichia coli* that confers resistance to the antibiotics, neomycin and kanamycin. The ARMG enabled the identification and selection of GM plant tissue during the initial stage of development of the GM corn line in the laboratory.

FSANZ has completed a scientific evaluation of food derived from MON87460 corn according to FSANZ guidelines[1] to assess its safety for human consumption. The 1st Assessment Report prepared in relation this Application was released in December 2009 for an eight week public consultation period. Issues raised in submissions were considered and addressed in the 2nd Assessment Report, which was released in April 2010 for a five week public consultation period. Comments received during this second consultation period have been considered in completion of this Approval Report. All submissions relating to the 2nd Assessment Report have been summarised in **Attachment 2** to this Report.

1. The Issue / Problem

The Applicant has developed MON87460 corn that is genetically modified to reduce yield loss under water-limited conditions. Pre-market approval is necessary before this product may enter the Australian and New Zealand food supply. An amendment to the Code granting approval to food derived from MON87460 corn must be approved by the FSANZ Board, and subsequently notified to the Australia and New Zealand Food Regulation Ministerial Council (Ministerial Council). An amendment to the Code may only be gazetted once the Ministerial Council process has been finalised.

MON87460 corn is intended for cultivation in North America. Before release onto commercial agricultural markets, the Applicant is seeking regulatory approval for MON87460 corn in key trading markets for corn, including Australia and New Zealand. This is necessary because once it is cultivated on a commercial-scale, corn products imported into Australia and New Zealand could contain ingredients derived from MON87460 corn as a result of comingling practices at harvest or later processing stages. The Applicant has therefore sought the necessary amendments to Standard 1.5.2 to include food derived from MON87460 corn prior to any decision to commercialise this line. The Application has been assessed under the Major Procedure.

[1] FSANZ (2007). Safety Assessment of Genetically Modified Foods – Guidance Document. http://www.foodstandards.gov.au/_srcfiles/GM%20FINAL%20Sept%2007L%20_2_.pdf

2. Current Standard

2.1 Background

Approval of GM foods under Standard 1.5.2 is contingent upon completion of a comprehensive pre-market safety assessment. Foods that have been assessed under the Standard, if approved, are listed in the Table to clause 2 of the Standard.

2.2 Overseas approvals

MON87460 corn is intended for commercialisation in the United States and Canada. The Applicant has stated that regulatory submissions have been made to the United States Food and Drug Administration (FDA) and the United States Department of Agriculture-Animal and Plant Health Inspection Service. The outcome of these approvals is pending. An application for authorisation of GM maize MON87460 for food and feed uses, import and processing is also currently being assessed by the European Commission.

The Applicant has advised that further submissions for import approvals in key international markets will also be made.

3. Objectives

In developing or varying a food standard, FSANZ is required by its legislation to meet three primary objectives, which are set out in section 18 of the FSANZ Act. These are:

- the protection of public health and safety; and
- the provision of adequate information relating to food to enable consumers to make informed choices; and
- the prevention of misleading or deceptive conduct.

In developing and varying standards, FSANZ must also have regard to:

- the need for standards to be based on risk analysis using the best available scientific evidence;
- the promotion of consistency between domestic and international food standards;
- the desirability of an efficient and internationally competitive food industry;
- the promotion of fair trading in food; and
- any written policy guidelines formulated by the Ministerial Council.

4. Assessment questions

In completing the assessment of this application, three questions have been addressed.

1. Based on information provided by the Applicant on the nature of the genetic modification, the molecular characterisation, the characterisation of the novel proteins, the compositional analysis and consideration of any nutritional issues, is food derived from MON87460 corn comparable to food derived from conventional cultivars of corn in terms of its safety for human consumption?

2. Is other information available, including from the scientific literature, general technical information, independent scientists, other regulatory agencies and international bodies, and the general community, that should be taken into account in this assessment?

3. Are there any other considerations that would influence the outcome of this assessment?

RISK ASSESSMENT

Food derived from drought-tolerant MON87460 corn has been evaluated according to the safety assessment guidelines prepared by FSANZ. The completed safety assessment is available as **Supporting Document 1** to the 2nd Assessment Report. The summary and conclusions from the safety assessment are presented below.

In addition to information supplied by the Applicant, other available resource material including published scientific literature and general technical information were used in this assessment.

5. Risk Assessment Summary

5.1 Safety Assessment Process

In conducting a safety assessment of food derived from MON87460 corn, a number of criteria have been addressed including: a characterisation of the transferred *cspB* gene, its origin, function and stability in the corn genome; the changes at the level of DNA, protein and in the whole food; detailed compositional analyses; evaluation of intended and unintended changes; and the potential for the newly expressed proteins to be either allergenic or toxic in humans.

The safety assessment applied to food from MON87460 corn addresses only food safety and nutritional issues. It does not address any risks related to the release into the environment of GM plants used in food production, the safety of animal feed or animals fed with feed derived from GM plants, or the safety of food derived from the non-GM (conventional) plant.

5.2 Outcomes of the Safety Assessment

MON87460 corn contains two novel genes, *cspB* and *nptII*. Detailed molecular analyses indicated that one copy of each gene has been inserted at a single site in the corn genome. The *cspB* gene is stably inherited from one generation to the next.

Two novel proteins are expressed in MON87460 corn, namely CSPB and NPTII. While CSPB has not previously been assessed by FSANZ, it is likely that humans have already been exposed to it via contact with the source organism. In addition, humans are also likely to have been exposed to other bacterial cold shock proteins and their plant homologues. CSPB is nearly identical to that present in the source organism except for a single amino acid substitution at position 2 (from leucine to valine) necessary for cloning purposes.

CSPB is present in MON87460 corn grain at a mean concentration of 0.041 and 0.33 µg/g fresh weight under well-watered and water-limited conditions, respectively. The plant protein conforms in size and amino acid sequence to that expected, is immunoreactive to antibodies to CSPB, is not glycosylated, and exhibits the expected functional activity.

FSANZ has assessed NPTII on several previous occasions and an extensive database exists regarding its safety. The level of NPTII in corn grain was below the limit of quantitation (LOQ).

Bioinformatic studies with CSPB and NPTII confirmed the absence of any biologically significant amino acid sequence similarity to known protein toxins or allergens. Digestibility studies demonstrated that CSPB would be rapidly degraded following ingestion, similar to other dietary proteins. An acute oral toxicity study confirmed the absence of toxicity for CSPB. Taken together, the evidence indicates that neither protein is toxic nor likely to be allergenic in humans.

Compositional analyses of drought-tolerant MON87460 corn, which was cultivated under well-watered and water limited conditions, established its equivalence to conventional corn cultivated under the same conditions.

For all analysed components in forage and grain from MON87460 corn, there were no compositional differences of biological significance compared to conventional (non-GM) corn. The detailed compositional analysis was considered acceptable to establish the nutritional adequacy of food derived from MON87460 corn. The introduction of MON87460 corn into the food supply would therefore be expected to have little nutritional impact.

5.3 Conclusions

No potential public health and safety issues have been identified in the assessment of drought-tolerant MON87460 corn. On the basis of the data provided in the present Application, and other available information, food derived from MON87460 corn is considered as safe and wholesome as food derived from conventional corn varieties.

RISK MANAGEMENT

6. Issues raised

6.1 Risk Management Strategy

In accordance with the general labelling provisions of Standard 1.5.2, food derived from drought-tolerant MON87460 corn, if approved, will be required to be labelled as genetically modified if novel DNA and/or novel protein are present in the final food. Studies conducted by the Applicant show that novel proteins are present in the grain. Highly refined products, such as corn oil, are exempt from this general labelling requirement where novel protein and/or novel DNA are removed during the refining process (refer to subclause 4(1)(c) of Standard 1.5.2).

As food derived from drought-tolerant MON8760 corn is equivalent to food from the conventional counterpart in terms of its composition and safety, FSANZ concludes that no additional labelling will be required in relation to the matters specified in clause 7 of Standard 1.5.2. The general labelling requirements will provide consumers with adequate information about the GM status of foods.

7. Options

There are no non-regulatory options for this Application. The two regulatory options available for this Application are:

7.1 Option 1 – Reject the Application

Maintain the *status quo* by rejecting the Application.

7.2 Option 2 – Develop a food regulatory measure

Proceed to development of a food regulatory measure to amend Standard 1.5.2 to permit the sale and use of food derived from drought-tolerant corn line MON87460, with or without specified conditions in the Table to clause 2 of the Standard.

8. Impact Analysis

In the course of developing food regulatory measures suitable for adoption in Australia and New Zealand, FSANZ is required to consider the impact of all options on all sectors of the community, including consumers, the food industry and governments in both countries. The regulatory impact assessment identifies and evaluates, though is not limited to, the costs and benefits of the regulation, and its health, economic and social impacts.

8.1 Affected Parties

The affected parties may include the following:

- Consumers of corn-containing food products, particularly those concerned about the use of biotechnology to generate new crop varieties.

- Industry sectors:

    - food importers and distributors of wholesale ingredients
    - processors and manufacturers of corn-containing food products
    - food retailers.

- Government:

    - enforcement agencies
    - national Governments, in terms of trade and World Trade Organization (WTO) obligations.

MON87460 corn has been developed primarily for agricultural production overseas and at this stage the Applicant has no plans for cultivation of this variety in either Australia or New Zealand.

The cultivation of MON87460 corn in Australia or New Zealand could have an impact on the environment, which would need to be independently assessed by the Office of the Gene Technology Regulator (OGTR) in Australia, and by various New Zealand government agencies including the Environmental Risk Management Authority (ERMA) and the Ministry of Agriculture and Forestry (MAF) before commercial release in either country could be permitted.

8.2 Benefit Cost Analysis

8.2.1 Option 1 – reject the Application

Consumers: Possible restriction in the availability of imported corn products to those products that do not contain MON87460 corn.

No impact on consumers wishing to avoid GM foods, as food from MON87460 corn is not currently permitted in the food supply.

Government: Potential impact if considered inconsistent with WTO obligations but impact would be in terms of trade policy rather than in government revenue.

Industry: Possible restriction on imports of corn food products once MON87460 corn is commercialised overseas.

Potential longer-term impact - any successful WTO challenge has the potential to impact adversely on food industry.

8.2.2 Option 2 – develop a food regulatory measure

Consumers: Broader availability of imported corn products as there would be no restriction on imported foods containing MON87460 corn.

Potentially, no increase in the prices of imported foods manufactured using comingled corn products.

Appropriate labelling would allow consumers wishing to avoid GM corn to do so.

Government: Benefit that if MON87460 corn was detected in corn imports, approval would ensure compliance of those products with the Code. This would ensure no potential for trade disruption on regulatory grounds.

Approval of MON87460 corn would ensure no conflict with WTO responsibilities.

This option could impact on monitoring resources, as certain foods derived from MON87460 corn will be required to be labelled as genetically modified.

Industry: Importers of processed foods containing corn derivatives would benefit as foods derived from MON87460 corn would be compliant with the Code, allowing broader market access and increased choice in raw materials.

Retailers may be able to offer a broader range of corn products or imported foods manufactured using corn derivatives.

Possible cost to food industry as some food ingredients derived from MON87460 corn would be required to be labelled as genetically modified.

8.3 Comparison of Options

As food from drought-tolerant MON87460 corn has been found to be as safe as food from conventional varieties of corn, Option 1 is likely to be inconsistent with Australia's and New Zealand's WTO obligations. Option 1 would also offer little benefit to consumers, as approval of MON87460 corn by other countries could limit the availability of imported corn products in the Australian and New Zealand markets. In addition, Option 1 would result in the requirement for segregation of any products containing MON87460 corn from those containing approved corn varieties, which would be likely to increase the costs of imported corn foods.

Based on the conclusions of the safety assessments, the potential benefits of Option 2 outweigh the potential costs. A variation to Standard 1.5.2 giving approval to drought-tolerant MON87460 corn is therefore the preferred option.

COMMUNICATION AND CONSULTATION STRATEGY

9. Communication

FSANZ applied a basic communication strategy to this Application that involved advertising the availability of assessment reports for public comment in the national press and placing the reports on the FSANZ website. As normally applies to all GM food assessments, this Approval Report will be available to the public on the FSANZ website and distributed to major stakeholders.

The Applicant and individuals and organisations that made submissions on this Application were notified at each stage of the assessment. This Approval Report and the decision of the FSANZ Board to approve the variation to Standard 1.5.2 would be notified to the Ministerial Council. If the approval of food derived from MON87460 corn is not subject to review, the Applicant and stakeholders, including the public, would be notified of the gazettal of the variation to the Code in the national press and on the website.

10. Consultation

10.1 Public consultation

As this Application was assessed under the Major Procedure, there were two rounds of public consultation. During both rounds of consultation, comments were specifically sought on the scientific aspects of this Application, in particular, information relevant to the safety assessment of food derived from drought-tolerant MON87460 corn.

Public submissions were invited on the 1st Assessment Report between 16 December 2009 and 10 February 2010. Twenty-five submissions were received on the 1st Assessment Report and these were summarised in Attachment 2 to the 2nd Assessment Report. Issues raised in submissions were considered and addressed in the 2nd Assessment Report, which was released for public comment between 7 April and 12 May 2010. Comments received during this second consultation period have been considered in completion of this Approval Report. All submissions relating to the 2nd Assessment Report have been summarised in **Attachment 2** to this Report. FSANZ has taken the submitters' comments relevant to food safety into account in preparing the Approval Report for this Application.

10.1.1 General issues

Some stakeholders have asked that FSANZ not approve any GM foods on philosophical grounds. It should be noted that FSANZ has a statutory obligation to consider all applications seeking to amend the Code on their individual merits, subject to the application meeting detailed criteria concerning format and inclusion of information. An open and transparent process of assessment is then used to develop or amend food standards as may be appropriate in Australia and New Zealand. In particular, public consultation periods are considered integral to this process, and comments received from submitters contribute to the overall effectiveness of the risk assessment.

General issues raised during public consultation on the 2nd Assessment Report for MON87460 corn included the following:

- labelling of GM foods
- costs to consumers wanting to avoid GM foods
- safety of GM foods, including long-term health effects
- FSANZ's assessment process for GM foods
- traceability and testing of GM foods
- post-market monitoring of adverse health effects

Issues relating to GM food labelling and the safety assessment of GM food, including post-market monitoring, were addressed in the responses provided in the 2nd Assessment Report and will not be re-iterated in this Approval report. Further, these issues have been addressed by FSANZ in previous applications and in addition, specific information is available on the FSANZ website (Table 1).

Table 1: Information regarding GM food on the FSANZ website

Issue	Web link
Safety assessment of GM food	http://www.foodstandards.gov.au/_srcfiles/GM%20Foods_text_pp_final.pdf http://www.foodstandards.gov.au/consumerinformation/gmfoods/frequentlyaskedquestionsongeneticallymodifiedfoods/
Lack of independent data to inform the risk assessment	http://www.foodstandards.gov.au/consumerinformation/gmfoods/ http://www.foodstandards.gov.au/consumerinformation/gmfoods/frequentlyaskedquestionsongeneticallymodifiedfoods/part2safetyassessmen4658.cfm
The need for long-term animal feeding studies	http://www.foodstandards.gov.au/consumerinformation/gmfoods/ http://www.foodstandards.gov.au/consumerinformation/gmfoods/frequentlyaskedquestionsongeneticallymodifiedfoods/part2safetyassessmen4658.cfm http://www.foodstandards.gov.au/foodmatters/gmfoods/roleofanimalfeedings3717.cfm http://www.foodstandards.gov.au/_srcfiles/GM%20FINAL%20Sept%2007L%20_2_.pdf

Issue	Web link
Post-market monitoring	http://www.foodstandards.gov.au/consumerinformation/gmfoods/frequentlyaskedquestionsongeneticallymodifiedfoods/part2safetyassessmen4658.cfm
Labelling	http://www.foodstandards.gov.au/_srcfiles/GM%20Foods_text_pp_final.pdf http://www.foodstandards.gov.au/consumerinformation/gmfoods/frequentlyaskedquestionsongeneticallymodifiedfoods/part3labellingofgmfo4659.cfm

Some submitters incorrectly stated that FSANZ's assessment of GM foods is based on the United States Food and Drug Administration's (US FDA's) Generally-Recognised-As-Safe notification scheme for substances deliberately added to food. Whereas FSANZ does note regulatory approvals from other countries, including the scientific information and basis for the approval, FSANZ does not adopt regulatory approvals from any country and does not use the US's GRAS system as the basis to regulate GM foods in Australia.

One submitter cited a statistical re-interpretation of animal toxicity data conducted by *de Vendomois et al*[2] on three approved GM corn lines (unrelated to MON87460 corn) as evidence that GM corn is unsafe. FSANZ has previously provided a critique to this novel statistical approach[3] and concluded that by using conventional toxicological and statistical methods of data analysis there is no evidence for adverse effects in laboratory rats fed a diet containing these three approved GM corn lines.

Several submitters raised safety and environmental issues associated with the use of glyphosate. Given that MON87460 corn does not contain the glyphosate tolerance trait, this issue is not considered relevant to the current Application.

Several submitters requested that approval be delayed until the results of the food labelling review are finalised or that approval is granted in the US to grow MON87460 corn. With regard to both requests, FSANZ has a statutory obligation to consider all valid applications seeking to amend the Code. Further, there is a statutory timeframe associated with this consideration and FSANZ cannot delay a consideration process on the grounds that information may become available at a future point. While overseas applications or existing approvals are noted, and FSANZ and other regulators have established networks for sharing information on the same application, FSANZ's consideration of food derived from GM crops and indeed approval of any food, food additive, or processing aid is conducted independently of the outcome of regulatory processes in other countries. In the case of food derived from MON87460 corn, FSANZ considers that sufficient evidence has been provided to allow completion of a safety assessment.

10.1.2 Specific issues

The Centre for Integrated Research in Biosafety (CIRB) from the University of Canterbury submitted a second detailed response to this Application. CIRB believes that FSANZ did not adequately respond to its questions submitted during public consultation on the 1st Assessment Report. While FSANZ disagrees with this perception, a reconsideration of the main issues raised by the submitter follows.

[2] *de Vendomois et al* (2009) A comparison of the Effects of Three GM Corn Varieties on Mammalian Health, *Int. J. Biol. Sci*. 5(7): 706-726

[3] http://www.foodstandards.gov.au/scienceandeducation/factsheets/factsheets2009/fsanzresponsetoseral4647.cfm

10.1.2.1 General FSANZ comments on the submission from CIRB

When conducting its safety assessments on food derived from GM crops, FSANZ uses a weight-of-evidence approach and does not rely on any one piece of information as the basis for its conclusions. FSANZ notes that most of the questions posed by CIRB do not directly relate to an assessment of the potential risk. It is unclear how the additional data suggested by CIRB would improve the safety assessment process.

10.1.2.2 Identity of the control used in the molecular characterisation experiments

FSANZ incorporated supplementary information into the Safety Assessment Report on the identity of the control corn line used in the compositional analysis study following questions from two submitters (including CIRB) during the first round of public consultation. CIRB has subsequently requested further information on the controls used during the development of MON87460 corn. CIRB expressed concern that different controls may have been used in the molecular characterisation and compositional analysis studies, and argue this would invalidate the safety assessment.

In the development of a GM crop, a step-wise process is followed from the initial laboratory transformation event and molecular characterisation, through to the crossing into a commercial cultivar suitable for large-scale production of the commodity to go into the food supply. The crossing of the original transformed line, containing the desired trait, into other commercial lines more suitable for agricultural production, is standard agricultural practice. During development, various analyses are undertaken on plant material generated at each step. Molecular characterisation experiments occur at an early stage of development and therefore it is appropriate to include negative controls linked to that early stage. The compositional analysis occurs much later (years) and therefore it is appropriate to include additional comparators with a genetic background more closely related to the GM line used in those analyses.

FSANZ can confirm that the negative control used in the molecular characterisation experiments to establish non-specific hybridisation to the southern blots was the conventional isogenic line, LH59 x LH244. This differs from the control line used in the protein expression and compositional analysis studies, DM1718 (LH59 x 01DKD2), used as a comparator to ascertain biologically-significant compositional differences with MON87460 corn. FSANZ agrees with CIRB that a 'proper comparator should be used for all studies' but disagrees that the same comparator should be used throughout all phases of development for the reasons described above. The use of different negative controls at different phases of development does not invalidate the safety assessment.

10.1.2.3 Digestibility of CSPB:nucleic acid complexes

CIRB stated that FSANZ's assessment of the digestibility of CSPB:nucleic acid complexes 'is based entirely on the assumption that CSPB:nucleic acid complexes will be completely degraded *in vivo* because of other protease activities'. They claim the Applicant has deviated from the 'FAO/WHO guidelines' without justification.

The FAO/WHO convened an expert consultation in 2001 to provide recommendations to Codex on the evaluation of allergenicity of GM foods. These recommendations do not have any status as FAO/WHO guidelines. The report of the expert consultation included discussion in relation to pepsin resistance studies however prescriptive guidance was not subsequently incorporated into the *Codex Guideline for the Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants*.

No international guidelines exist in relation to the *in vitro* digestion of complexes of proteins with other molecules that they may be bound to (either specifically or non-specifically), whether it be DNA, protein, carbohydrate, lipid, etc.

The possible presence of CSPB:nucleic acid complexes in food derived from MON87460 corn and their stability to digestion (and processing) was an issue identified by FSANZ following a comprehensive review of the scientific literature on the biochemistry of CSPB and other cold-shock domain (CSD)-containing proteins. This included a review of the *in vitro* study by Schindler et al (1999) showing that binding of CSPB to synthetic DNA delayed its digestion by trypsin. FSANZ does not consider this to be a safety concern for the following reasons:

- CSPB is not hazardous (i.e. it is not toxic or allergenic) and therefore does not pose a risk to human health.
- The source organism of the *cspB* gene, *B. subtilis*, has a safe history of use as a dietary probiotic, animal feed additive, in aquaculture and in the production of traditional foods.
- CSPB is susceptible to *in vitro* digestion by pepsin and pancreatin.
- The DNA binding domain of CSPB (the CSD) is highly conserved across multiple species including humans, animals, plants and bacteria. The CSD of CSPB has not been modified and therefore its interaction with nucleic acids would be no different to what would occur naturally.
- The interaction between CSPB and nucleic acid is reversible and therefore it would be susceptible to dissociation in the digestive tract.
- The *in vitro* study of Schindler et al (1999) does not replicate the physiological conditions of human digestion and therefore is not a useful surrogate for how CSPB may behave in the digestive tract.

10.1.2.4 Recombination events at loxP sites

In the response to this issue in the 2nd Assessment Report, FSANZ stated that as the gene for *Cre* recombinase was not introduced into MON87460 corn, there is no potential for site specific recombination events at the loxP sites in MON87460 corn. CIRB propose that the presence of loxP sites 'increases the potential for unintended genomic instability' but provide no reference or data to support this view. Further, they speculate that future interbreeding with *Cre* lines may generate a MON87460-containing *Cre*. While this is theoretically possible, the outcome (excision of the *nptII* gene) would not lead to an adverse outcome because the *nptII* gene is ubiquitous in the environment and has previously been assessed by FSANZ and other regulators as posing no safety issues when present in GM crops.

10.1.2.5 Toxicity or allergenicity of CSPB aggregates

CIRB speculated that elevated temperatures and denaturing conditions commonly used in food processing may cause the formation of misfolded proteins that could potentially form hazardous protein aggregates. Given the number and variety of dietary proteins humans are naturally exposed to, no argument or information was provided by CIRB to suggest why CSPB would behave uniquely in this regard or how, mechanistically, this would happen. Indeed the ubiquitous occurrence of CSPB and other cold shock proteins in the diet would argue against this hypothesis.

There is no evidence in the scientific literature suggesting that protein aggregation *per se* poses any dietary risk. Humans have been cooking conventional corn for a very long time and the likelihood that the presence of trace quantities of CSPB protein (mg/kg corn) would pose a risk seems unlikely.

The association between *in situ* aggregation of misfolded proteins and diseases like Alzheimer's and Huntington's is known. However, this association is not relevant to a dietary exposure scenario. On this basis, there are no grounds to request additional information.

10.1.2.6 Expression of novel open reading frames (ORF) encoding theoretical peptide 5_2

In Section 3.4.3 of the Safety Assessment Report, FSANZ concluded that there was no biologically-significant structural or immunological similarity between this theoretical protein and known toxins, allergens or other biologically-active proteins. Further, as the ORF is located between two stop codons, its expression is improbable. CIRB has requested further data to rule out the possibility that this peptide is transcribed or translated because statistically significant amino acid similarities were identified between this theoretical protein and some proteins in a database of known toxins.

FSANZ addressed this issue in the Safety Assessment Report and concluded that the statistically significant similarities between theoretical peptide 5_2 and known protein toxins were not biologically significant based on amino acid (proline) composition bias. FSANZ does not consider that there would be any justification for asking for further studies.

10.1.2.7 Digestibility studies on recombinant CSPB

Resistance to digestion is not the sole determinate of whether a dietary protein may be an allergen. There are other important immunological factors such as molecular size. It is worth noting that CSPB is a particularly small protein, comprising 67 amino acids (~7 kDa), which is outside the molecular weight range (10-40 kDa) of known food allergens[4,5].

CIRB considered that the *in vitro* digestibility study conducted on recombinant CSPB was inadequate because: (1) inappropriately high concentrations of pepsin and pancreatin were used and that the experimental design was not validated; (2) the use of a sequential digestion protocol [using simulated gastric fluid (SGF) followed by simulated intestinal fluid (SIF)] is not part of a validated international protocol; (3) no negative controls were used. On this basis, it was argued that it is not possible to determine whether recombinant CSPB is more resistant to digestion than known food allergens.

(1) Ratio of pepsin/pancreatin to CSPB and protocol validation

Other than reference to the FAO/WHO protocol on allergenicity evaluation, no rationale was provided by CIRB for why the experimental protocol used by the Applicant would not allow an accurate estimation of the *in vitro* digestibility of CSPB. The purpose of this type of *in vitro* analysis is to ascertain whether a protein can be digested under simulated conditions; the protein either has the susceptible peptide bonds available for hydrolysis by pepsin or pancreatin, or not. Varying the ratio of protease to protein will affect the rate of hydrolysis to a point but will not cause a protein to degrade that does not have susceptible peptide bonds. CSPB is clearly degraded by pepsin and pancreatin, and has the potential to be degraded by other proteases present in the digestive tract.

[4] Metcalfe, D.D., Astwood, J.D., Townsend, R., Sampson, H.A., Taylor, S.L., Fuchs, R.L. (1996). Assessment of the allergenic potential of foods derived from genetically engineered crop plants. Critical Reviews in Food Science and Nutrition **36**(S): S165-S186.

[5] FAO (2001). Evaluation of allergenicity of genetically modified foods. Report of a joint FAO/WHO expert consultation on allergenicity of foods derived from biotechnology. Rome, Italy.

Using the amino acid sequence of CSPB from *B. Subtilis*[6], and the PeptideCutter tool in the ExPASy Proteomics site[7], FSANZ has determined that CSPB has potentially at least 15 pepsin cleavage sites. Further, it has potential cleavage sites for a number of other digestive tract proteases including endopeptidases (14 sites), chymotrypsin (12 sites) and trypsin (6 sites).

The Applicant's *in vitro* digestibility protocol is based on an internationally validated assay[8], which used a ratio of 10U of pepsin activity/µg CSPB. Further, the ratio of pancreatin to CSPB is within the range of published protocols that have assessed the *in vitro* digestibility of food proteins[9,10,11]. The protocol used by the Applicant is therefore consistent with the Codex guideline.

(2) Sequential digestion in simulated gastric fluid (SGF) and simulated intestinal fluid (SIF)

Sequential *in vitro* digestion is considered appropriate as this reflects the normal digestive process in humans. Under this scenario, CSPB was completely degraded. This finding adds to the weight-of-evidence that MON87460-derived CSPB is unlikely to be allergenic when ingested in food.

(3) Absence of negative controls

FSANZ does not consider that the absence of negative controls in any way affects the interpretation of the *in vitro* digestibility data on CSPB. CSPB was degraded in SGF and SIF, both individually and sequentially, as analysed by sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) and western blotting analysis.

10.1.2.8 Characterisation of MON87460-derived CSPB

CIRB did not accept that the low level of CSPB in MON87460 corn grain was adequate justification for using *E. coli*-derived CSPB as a surrogate. This is an established approach in situations where it is difficult to extract the large amount of novel protein required for an acute toxicity study in rodents from a GM plant. Therefore the equivalent protein produced in a bacterial system is often used. However, for this practise to be valid, equivalence between the plant-produced and bacterially-produced proteins needs to be established. In the case of MON8760 corn, CSPB was produced in a recombinant *E. coli* expression system and compared to the plant-produced CSPB using a variety of techniques. SDS-PAGE, western blotting, N-terminal sequencing; matrix assisted laser desorption ionisation time of flight (MALDI-TOF) mass spectrometry, glycosylation analysis and a CSPB activity assay were performed. The weight-of-evidence from these separate analyses indicated that the two proteins can be considered equivalent and therefore it is appropriate to use *E. coli*-derived CSPB as a surrogate for plant-derived CSPB in the acute toxicity and *in vitro* digestibility studies.

[6] http://www.uniprot.org/uniprot/P32081
[7] http://expasy.org/tools/peptidecutter/
[8] Thomas et al (2004) A multi-laboratory evaluation of a common in vitro pepsin digestion assay protocol used in assessing the safety of novel proteins. Reg. Tox. Pharmacol. **39**: 87-98.
[9] Yagami et al (2000) Digestibility of allergens extracted from natural rubber latex and vegetable foods. J. Allergy Clin. Immunol. **106**(4):752-762.
[10] Takagi et al (2003) Comparative study of the *in vitro* digestibility of food proteins and effect of preheating on digestion. Biol. Pharm. Bull. **26**:969-973.
[11] Fu et al (2002) Digestibility of food allergens and non-allergenic proteins in simulated intestinal fluid: a comparative study. J. Agric. Food Chem. **26**:969-973.

Equivalence criteria

CIRB requested scientific evidence for the criteria used by the Applicant to establish equivalence between MON87460- and *E. coli*-derived CSPB. The criteria used by the Applicant were that: the molecular weight should be within ±10% (the analytical difference was actually 3%); the immunoreactivity should be within ±35% (the analytical difference was actually 33.4%); the functional activity should be within ±25% (the analytical difference was actually 12.8%); and the protein should not be glycosylated (there was no evidence that the protein was glycosylated). These criteria were arbitrary in nature but were appropriately established by taking into consideration the intrinsic variability of each method. In addition, other methods were used to establish equivalence (N-terminal sequencing and MALDI-TOF), which have a 0% difference requirement.

FSANZ considers that any acceptance (or rejection) criteria are arbitrary and only serve as a guide to assist in the interpretation of comparative analyses. Whether a result meets or does not meet a specific criterion does not negate the need to exercise scientific judgement and interpret a finding in the context of the existing body of evidence.

The Applicant has advised that the acceptance criteria used for each assay were based on their own experience with each assay and public literature addressing method variability. In the case of SDS-PAGE, molecular weight precision is reported to be approximately 2-7% for proteins ranging in size from 14.4 to 166 kDa[12]. The CSPB protein, with a molecular weight of ~7 kDa, would be expected to have a higher probability of error because measurement error increases with the extremes of gel resolution. The acceptance criterion for assay accuracy determined during functional assay validation was 20%; this value was increased to 25% to account for any contaminants that may interfere with the assay. The acceptance criterion for immunoequivalence was determined based on experience with this assay and the many steps (gel electrophoresis, electrotransfer to a membrane and development of bound antibody) involved in producing this data.

Glycosylation analysis

CIRB was critical of the glycoprotein analysis undertaken on MON87460-derived CSPB and stated that the stain for carbohydrate was not sufficiently sensitive to detect glycoproteins present at less than ~10% of the total protein loaded. It was recommended that the gels be re-run but loaded with an order of magnitude more CSPB protein. To support their argument, CIRB produced a digitally enhanced image of the blot, which revealed two faint diffuse bands with molecular weights of approximately 6 and 8 kDa; both bands had equal staining intensity. The suggestion that these bands highlight the possible glycosylation of *in planta* produced CSPB is not supported by the corresponding protein-stained blot, where only a single, tight, 7 kDa band is visible. Furthermore, detection using a CSPB-specific polyclonal antibody revealed only a single band as well. On this basis, the faint diffuse bands revealed only after digital enhancement are not considered to be related to CSPB.

There are other data and information that does not support the contention that MON87460-derived CSPB is glycosylated. The Applicant has advised that the CSPB protein sequence contains only one potential N-glycosylation site (NVT starting at position 61 of the observed protein in MON 87460), but lacks the signal peptide required to transport it to the endoplasmic reticulum (where proteins are glycosylated). Therefore, CSPB has no intrinsic potential to be glycosylated.

[12] Goetz et al (2004) Comparison of selected analytical techniques for protein sizing, quantitation and molecular weight determination. Journal of Biochemical and Biophysical Methods **60**: 281-293.

Further, based on intact molecular mass as determined by MALDI-TOF mass spectrometry and identical migration on SDS-PAGE compared to *E. coli*-derived CSPB, there is no evidence to suggest any post-translational modification of CSPB isolated from MON 87460 corn. Collectively, these data support the conclusion that CSPB is not post-translationally modified in MON 87460 corn.

Purification method

CIRB was critical of the use of a monoclonal antibody to affinity purify CSPB and suggested that this approach could enrich for a single isoform of CSPB, thereby missing a potentially hazardous isoform. The use of monoclonal antibodies in this regard is a well-established, protein purification technique; it is highly specific and overcomes the practical limitations of using polyclonal antibodies, such as the difficulty of eluting tightly-bound protein due to binding to more than one antibody molecule. The Applicant advised that a monoclonal antibody was chosen as part of the purification protocol to maximise yield because the expression of CSPB in corn grain was so low (see Section 4.3.2 of the Safety Assessment Report).

It is difficult to see how an isoform could be potentially hazardous because *in vitro* digestion assays indicates that CSPB protein is readily degraded to constituent amino acids by proteases normally found in the gastrointestinal tract.

Other forms of post-translational modifications

CIRB stated that the Applicant's methodology should be capable of detecting all post-translational modifications. There are many different types of post-translational modification, and many of these can now be predicted from the DNA sequence of the protein, without the need to resort to empirical studies. Given the weight-of-evidence discussed above, which indicates that CSPB is unlikely to be post-translationally modified, combined with the absence of information on how other forms of post-translational modification can alter the hazard of dietary proteins, there is no justification for such a request.

10.1.2.9 Immunoreactivity equivalence criteria for MON87460-derived NPTII

CIRB requested clarification as to whether the criteria used to establish the equivalence of MON87460-derived NPTII to *E. coli*-derived NPTII was the same as that used to establish the equivalence of *E. coli*-derived and MON87460-derived CSPB.

As discussed in the Safety Assessment Report, there is an extensive database on the safety and characterisation of NPTII given its history of use in the production of GM crops. To make use of this database, the Applicant sought to establish the equivalence of NPTII derived from MON87460 corn (leaves) to that from the source organism (i.e. *E. coli*). Because NPTII has previously been assessed for safety (while CSPB has not), a more limited comparison was undertaken. Comparison by SDS-PAGE and Western blotting indicated only a 1% variation in molecular weight between MON87460-derived NPTII and *E. coli*-derived NPTII. This is well within the arbitrary acceptance criteria of $\pm$10% used for both CSPB and NPTII.

10.1.2.10 WTO considerations

CIRB and other submitters asked why rejecting the Application would be inconsistent with WTO obligations. In terms of food regulation, Australia's and New Zealand's responsibilities as members of the WTO are outlined in Section 10.2 below.

Under the Agreement on Sanitary and Phytosanitary Measures (SPS), any prohibition on a food product must be supported by a robust risk assessment. This discourages member countries from adopting or introducing domestic regulatory measures that are merely trade-protective.

In the case of MON87460 corn, the conclusions of the risk assessment do not support a prohibition on this food. On the contrary, the body of evidence supports the safety of this corn and therefore, in the context of the SPS Agreement, Australia and New Zealand have no grounds for prohibiting MON87460 from entering the food supply.

10.1.2.11 Cost benefit analysis

CIRB recommended that FSANZ update its cost benefit analyses for GM foods to be more research-based. FSANZ notes this recommendation but considers that the qualitative analysis undertaken for this Application is adequate.

10.2 World Trade Organization

As members of the WTO, Australia and New Zealand are obligated to notify WTO member nations where proposed mandatory regulatory measures are inconsistent with any existing or imminent international standards and the proposed measure may have a significant effect on trade.

The inclusion of food derived from MON87460 corn in the Code would have a trade enabling effect as it would permit any foods containing this variety of corn to be imported into Australia and New Zealand and sold, where currently they would be prohibited. For this reason, there was no need to notify this Application under the Sanitary or Phytosanitary Measures (SPS) Agreement.

CONCLUSION

11. Conclusion and Preferred Approach

Preferred Approach

To approve the variation to Standard 1.5.2 – Food produced using Gene Technology, to include food derived from drought-tolerant corn line MON87460 in the Table to clause 2.

11.1 Reasons for Preferred Approach

Proceeding to the development of an amendment to the Code to give approval to the sale and use of food derived from MON87460 corn in Australia and New Zealand is proposed on the basis of the available scientific evidence, for the following reasons:

- the safety assessment did not identify any public health and safety issues associated with the genetic modification used to produce drought-tolerant MON87460 corn
- food derived from MON87460 corn is equivalent to food from the conventional counterpart and other commercially available corn varieties in terms of its safety for human consumption and nutritional adequacy
- labelling of certain foods derived from drought-tolerant MON87460 corn will be required where novel DNA and/or protein is present in the final food

- a regulation impact assessment process has been undertaken that fulfils the requirement in Australia and New Zealand for an assessment of compliance costs. The assessment concluded that the preferred option is Option 2, the development of a food regulatory measure

- there are no other measures that would be more cost-effective than a variation to Standard 1.5.2 that could achieve the same end.

12. Implementation and Review

The FSANZ Board's decision will be notified to the Ministerial Council. Following notification, the proposed variation to the Code is expected to come into effect on gazettal, subject to any request from the Ministerial Council for a review of FSANZ's decision.

ATTACHMENTS

1. Draft variation to the *Australia New Zealand Food Standards Code*
2. Summary of submissions on the 2nd Assessment Report

Attachment 1

Draft variation to the *Australia New Zealand Food Standards Code*

Section 87(8) of the FSANZ Act provides that standards or variations to standards are legislative instruments, but are not subject to disallowance or sunsetting

To commence: on gazettal

[1] ***Standard 1.5.2*** *of the Australia New Zealand Food Standards Code is varied by inserting in* Column 1 *of the* Table to clause 2 –

Food derived from drought-tolerant corn line MON87460	

Attachment 2

Summary of Public Submissions on 2nd Assessment Report

Submitter	Comments
New Zealand Food Safety Authority	• Supports approval of the Application on the grounds that FSANZ has adequately addressed issues raised on the 1st Assessment Report.
Queensland Health (Whole of QLD Govt response)	• Consideration of the approval of the Application should be deferred until the outcomes of the Food Labelling Review and the study by Dr Judy Carman are known. • Concern was also expressed that approval to grow MON87460 corn in the US has not yet been granted.
Food Technology Association of Australia	• Opposes approval of the Application on the basis that approval to grow MON87460 corn has not been granted in the US.
Consumers for GM Free WA (Michelle Denise)	• Opposes approval of the Application in the basis of the following: - results of the food labelling review have not been finalised - the methods of testing GM foods is inadequate - a study by Dr GE Seralini has shown that GM corn is unsafe - it is unethical.
Hsieh Lim (Private)	• Opposes approval of the Application until research on GM foods is conducted over a period of at least 30 years.
Anna Clements (Private)	• Expresses concern over the presence of foreign GM materials in food and the desire to avoid eating GM food. • Considers that current labelling of GM foods does not allow consumers to make informed choices.
Paul White (Private)	• Opposes approval of the Application.
Barbara Morgan Nicole Page (Private)	• Opposes approval of the Application. • Opposes any GM food in Australia on the basis of the following concerns: - cross contamination with non-GM foods - they are unsafe and the long-term health effects are unknown - current GM food labelling is inadequate.
Nathan Kennerley (Private)	• Opposes approval of the Application on the basis of the following: - there is no post-market monitoring for adverse health effects from GM foods - inadequate labelling and traceability of GM foods - the Applicant is unethical - the safety assessment process used by FSANZ is based on the US FDA GRAS system, which is scientifically inadequate
Celia Martin (Private)	• Opposes the trialling and development of all GM foods on the basis of the following: - evidence of harm to the soil and humans - NZ consumers do not want GM food - all GM foods are unsafe.
Scott Baker (Private)	• Opposes approval of the Application on the basis of an inadequate process of assessment that exposes the public to unacceptable risk.
Dorothy Coe (Private)	• Opposes the approval of all GM foods Australia on the basis of the following: - possible cross contamination with non-GM foods - safety concerns.

Submitter	Comments
Josephine Agiel-Knudsen Kay Bannatyne Andrew Bell Lisa Benson Edward Burrows Jon Carapiet Jonathan Eisen Karen Forno Lynley Jenness Charlotte Huckson Patricia McKinnon Joe McLaughlin Jennifer Michelsen Christine Phippen Rod Sandle Katherine Smith Jeremy Watt (Private)	• Opposes approval of the Application on the basis of the following: - current GM food labelling provisions are inadequate - unreasonable costs on consumers seeking to avoid GM foods - the data on which the safety assessments are based is inadequate - GM food should not be GRAS - traceability and safety testing of GM foods is inadequate - there are other measures that would be more cost-effective.
Shirley Collins (Private)	• Opposes the approval of all GM applications on the basis of the following: - the food labelling review is complete - all food derived from GM ingredients must be labelled - insufficient safety testing on the long-term health and environmental effects of GM foods - inadequate surveillance and traceability of GM foods.
Johanna Metz (Private)	• Opposes approval of the Application on the basis of the following: - the effects on livestock and animals have not been considered. - costs to NZ's international trade opportunities. - costs to NZ farmers
Dr Cliff Mason (Private)	• Opposes approval of the Application on the basis of the following: - unreasonable costs to consumers wishing to avoid GM foods - concerns over the regulatory approval process in the US for GM food and its relationship to Australian approvals. - lack of traceability of GM foods - threat of WTO is not adequate justification (for approval).
Centre for Integrated Research in Biosafety (University of Canterbury, NZ)	• Opposes approval of the Application on the basis that FSANZ has not adequately addressed issues it raised during consultation on the 1st Assessment Report. • Further information/data should be provided on the following: - the comparator used in the molecular characterisation experiments. - digestibility of CSPB:nucleic acid complexes - recombination events at *loxP* sites - toxicity or allergenicity of CSPB aggregates - expression of ORF encoding theoretical peptide 5_2 - digestibility studies on recombinant CSPB - characterisation of MON87460-derived CSPB - immunoreactivity equivalence threshold of MON87460-derived NPTII - Cost benefit analysis.

Submitter	Comments
Gene Ethics	• Opposes the approval of this Application on the basis of the following: - the safety of any GM foods has not been proven conclusively and it is therefore premature to approve them. - Australia should apply the Precautionary Principle to regulating GM products. Australia should ratify the Cartagena Protocol. - GM peas developed by CSIRO were evidence of harm to experimental animals. - there is no international consensus on appropriate regime of techniques for safety assessments. - current labelling does not allow consumers to avoid this GM corn. - FSANZ safety assessment process is inadequate to detect possible unintended effects. There is no requirement for more detailed profiling studies which might show up differences. - evidence exists to show that proteins can behave differently in transgenic organisms, therefore the science is still under development. - FSANZ does not require animal feeding studies using the whole food or post-market monitoring, both of which would help to examine whether the current guidelines are working. - FSANZ itself acknowledges that the comparative approach does not constitute a safety assessment, and Gene Ethics concurs. - Governments and different sectors of society do not agree on whether to approve GM foods. With a lack of international or domestic consensus on GM foods, approval is premature, particularly as MON 87460 is not yet approved in the U.S. - Multinational companies are producing GM products that are not wanted. Patents are putting global food supplies under the control of only a few multinational companies. - Co-existence and segregation of GM crops are a complex and costly regulatory burden. - Supports the submission prepared by the University of Canterbury that questions the risk of a challenge in the WTO if this corn is not approved. - Other varieties of drought tolerant corn are available that are not patented and are free for public use. - FSANZ cost/benefit analysis appears biased in favour of GM. Other production techniques are not given a fair hearing.