EVIDENCE TAKEN BEFORE

STANDING COMMITTEE ON STATE DEVELOPMENT

INQUIRY INTO GENETICALLY MODIFIED FOOD

At Queanbeyan on Monday, 26 June 2000

The Committee met at 9.15 a.m.

PRESENT

The Hon. A. B. Kelly (Chair)
The Hon. I. Cohen
The Hon. J. R. Johnson
The Hon. I. M. Macdonald

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ANDREA MATTHEWS, Legal Policy Consultant, Interim Office of the Gene Technology Regulator, 26 Carrington Street, Deakin, Australian Capital Territory,

ELIZABETH CAIN, Assistant Secretary, Interim Office of the Gene Technology Regulator, Commonwealth Department of Health and Aged Care, Edmund Barton Building, Barton, Australian Capital Territory, and

TERRY SLATER, National Manager, Therapeutic Goods Administration, Symonston, Australian Capital Territory, before the Committee:

CHAIR: Technically, we cannot swear you in, so I will just caution you that you are not covered by the Parliamentary Evidence Act. I just do not know whether the other two members of the Committee are about to walk in the door or are an hour away. We propose to go through the process that we would have gone through had they been here except for swearing you in. I have some formal questions, which I will ask. When that process is complete we will give you a copy of the transcript and ask you to send a covering letter to say that that is your submission. That then is incorporated and will have parliamentary privilege as though it was evidence and you had been properly sworn in. We will proceed in that way until we can formally swear you in and from there on it will be normal evidence.

Ms Matthews, what is your occupation?

Ms MATTHEWS: Legal Policy Consultant for Matthews Pegg Consulting, contracted to the Interim Office of the Gene Technology Regulator [IOGTR] for Therapeutic Goods Administration.

CHAIR: In what capacity are you appearing before the Committee?

Ms MATTHEWS: As a contractor to the Interim Office of the Gene Technology Regulator.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Ms MATTHEWS: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Ms MATTHEWS: I am.

CHAIR: Ms Cain, in what capacity do you appear before the Committee?

Ms CAIN: As head of the Interim Office of the Gene Technology Regulator.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Ms CAIN: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Ms CAIN: I am.

CHAIR: Mr Slater, in what capacity do you appear before the Committee?

Mr SLATER: The Interim Office of the Gene Technology Regulator, as part of the Therapeutic Goods Administration.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr SLATER: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr SLATER: Yes

CHAIR: If any of you should at any stage during your evidence consider that it is in the public interest that certain evidence or documents you may wish to present should be heard or seen only by members of the Committee, then the Committee would be willing to accede to your request and resolve into confidential session, but I have to warn you that the Parliament has the ability and the right to override any decision we might make and make it public. In the past I do not think we have ever done it, but the Parliament has the right. Would either or all or any of you like to make a short presentation first and then we will ask some questions?

Mr SLATER: Thanks very much for the opportunity to appear before the Committee. The Gene Technology Bill was introduced into the Federal Parliament last week. That bill sets in place a regulatory framework for regulation of genetically modified organisms [GMOs]. It forms part of a number of regulatory arrangements that the Commonwealth has.

There is regulation for medicines, which is the responsibility of the Therapeutic Goods Administration; there is regulation of food, which is the responsibility of the Australia New Zealand Food Authority [ANZFA]; there is regulation over chemicals, which is looked after by the National Occupational Safety Authority, which has the National Industrial Chemicals Notification Scheme; the Australian Quarantine Inspection Service [AQIS] looks after imported food and other products coming into Australia, and the National Registration Authority for Agricultural and Veterinary Chemicals [NRA] looks after ag and vet

chemicals, which has also controlled the use of some genetically modified organisms.

The Gene Technology Regulator, as set out in the bill that was introduced last week, will regulate to ensure that those aspects of gene technology regulation that are not covered by existing regulators will now be covered by a legal framework. That legal framework has been the subject of discussion with all States and Territories and negotiation, and the legal framework that has gone into the Federal Parliament represents agreement with all States and Territories with the exception of Tasmania in the area of an opt-out clause for the application of the law. I think that is probably sufficient to sort of get us started.

CHAIR: So that legislation has not been --

Mr SLATER: It has not been debated yet. The second reading speech was made with the introduction of the bill last week.

CHAIR: Was that not intended to be through by 1 July, or not necessarily?

Mr SLATER: The office was named or nominally given a start-up date of 3 January 2001 by the Federal Government. That still may well be achieved.

CHAIR: Would either of you like to make some comments as well?

Ms CAIN: If the Committee would like, we might elaborate on some of the issues that Terry has referenced and then be guided by you as to the areas that you would like us to address further.

As Terry mentioned, the Interim Office of the Gene Technology Regulator basically has two key functions. One is to oversee a system of voluntary administrative controls on genetically modified organisms pending the establishment of the new national regulatory system, and the other one is to work with State and Territory officials as well as a vast range of non-government stakeholders to develop the new national regulatory system.

The independent regulator that will be created through the legislation that Terry referenced will derive his or her powers from a combination of Commonwealth legislation as well as State and Territory legislation. This is not a Commonwealth regulator that is being developed here; it is a State and Territory, Commonwealth, national regulatory framework, which is why the consultations that Terry referenced with the States and Territories has been really important.

So what we have is the draft Gene Technology Bill, which has been introduced into the Commonwealth Parliament, the Federal Parliament, and we have provided you with an information package through the Secretary to the Committee. In the information package there are copies of the suite of bills that were introduced last week, that being the main bill, the Gene Technology Bill

2000; the Gene Technology (Consequential Amendments) Bill, which creates the interface with the existing regulators that Terry mentioned; and the Gene Technology (Licence Charges) Bill, which creates the capacity for cost recovery.

We have provided you also with the explanatory material tabled in Parliament last week in respect of those three bills, and we have also provided you with some question and answer material, which may be useful to the Committee.

At some stage in the future each State and Territory government will consider gene technology legislation, and it is hoped that each State and Territory will introduce its complementary part of the national system to create full national coverage. In the meantime, the voluntary arrangements continue to apply.

The voluntary arrangements revolve around risk assessment undertaken by the Genetic Manipulation Advisory Committee [GMAC], which looks into biosafety matters in relation to genetically modified organisms and provides advice to proponents or applicants on how those biosafety risks to human health and the environment can be managed effectively. It is a voluntary system. The recommendations are made to the proponents.

I think the proponents make good efforts to comply with the voluntary system, but it is important that the voluntary system be replaced with a regulatory underpinning, to bring it in line with the arrangements for the existing five regulatory systems that Terry mentioned.

CHAIR: I am going through deja vu with dairy regulation. What happens if the States do not pass complementary legislation?

Ms CAIN: The way the Commonwealth legislation is written, from the day that the Commonwealth legislation is passed there will be broad coverage using the Commonwealth's constitutional heads of powers. Because it truly is a co-operative legislative system, the intention is that when a State - for example, New South Wales - passes its own legislation, where that legislation is consistent with the Commonwealth legislation, the Commonwealth can wind back its coverage and provide some capacity for New South Wales to legislate in particular areas.

Ms MATTHEWS: The wind-back as it is proposed at the moment applies in respect of higher education institutions and State agencies. So the Commonwealth legislation would regulate corporations, interstate trade and commerce, quarantine and all of the standard kinds of power that Commonwealth legislation relies on. The State legislation would regulate everything, and when those two are in line together the Commonwealth legislation would wind back to enable greater application of the State law, and together they would cover 100 per cent of the field in relation to all dealings by all people with GMOs.

CHAIR: So the New South Wales Department of Agriculture perhaps will have a big hand in the operation of this work when it gets under way.

Ms MATTHEWS: That is right. In New South Wales as we have been developing the legislation, the Premier's Department and Cabinet have been taking the lead with strong involvement through an interdepartmental committee of their health, agriculture, industry and environmental agencies.

CHAIR: Have you finished your comments?

Ms CAIN: Yes.

CHAIR: Who do you actually work for?

Ms MATTHEWS: Matthews Pegg Consulting.

CHAIR: Who do they work for?

Ms MATTHEWS: That is a company.

CHAIR: Yes. But are they consultants to the State Government?

Ms MATTHEWS: No, we are consultants to the Commonwealth Government, to the Therapeutic Goods Administration.

CHAIR: I thought you might be a consultant to the State Government.

Ms CAIN: We went through a tendering process and Matthews Pegg Consulting were the successful tenderers to provide the Commonwealth with legal policy advice.

The Hon. J. R. JOHNSON: Do I take it that when the Commonwealth introduces the legislation and has had consultation with the States it is then submitted to the various States with the usual injunction from the Minister, "This is complementary legislation, and we have got to pass it"? It is a bit like the treaties we were signing with the United Nations that were imposed on us. The various caucuses of the political parties are presented with a document and told, "This is it."

Mr SLATER: I do not think that is correct.

The Hon. J. R. JOHNSON: My word it is correct.

Mr SLATER: I do not think that is correct in this instance, a State or Territory may choose not to do anything and the Commonwealth's constitutional reach will leave some gaps covered by the law. Those gaps might go to individuals, but if the activities are companies or they are trading across State boundaries, then

they are automatically covered by the legislation that would be passed by the Federal Parliament.

As Ms Cain said, there has been much consultation with the States and Territories over a period of some almost 12 months in the current round, but all together, probably historically some seven or eight years in this area where there has been the development of various legislative models.

So that, plus community consultation, has given us a situation where all States and Territories have agreed to the model and agreed that it is preferable to have a national approach rather than just a Commonwealth approach which gives full constitutional coverage in Australia.

Ms CAIN: I also recognise that we often use the term "we have developed the bill in consultation with States and Territories" but what that has meant in actual fact is we have worked through, we defined our aim which was to provide comprehensive national regulatory framework for genetically modified organisms and then the States, Territories and Commonwealth worked through the bill in incredibly fine detail and the States were very open and constructive in bringing their issues to the table and defining what they needed in terms of this national regulatory framework.

Terry is quite right when he says there is a very high degree of - it is not like a national regulatory framework that has been imposed on the States and Territories. It was developed in a collaborative way.

The Hon. J. R. JOHNSON: By the bureaucrats?

Ms CAIN: By the bureaucrats, the officials, but with a lot of input from non-government stakeholders. We have had two rounds of national consultations so far on the development of this national framework, the second of which was conducted in the early part of this year and it involved public forums, open discussion, a lot of input.

We received just over 160 written submissions through the second round of national consultations. There was an earlier round, and the broad input that we have had into the regulatory system from the research and development sector, from the environmental groups, the consumer sector, and from private individuals who wanted to contribute and from industry has been really terrific. It has been a very open sort of process in developing the legislation.

The Hon. J. R. JOHNSON: Does it extend to pharmaceuticals?

Mr SLATER: The Therapeutic Goods Administration already controls a legal framework over all medicines, which includes pharmaceuticals. This legislation ensures that in those areas where a clinical trial is taking place where the Therapeutic Goods Administration has not approved the medicine but where that

involves a live, genetically modified organism, the Office of the Gene Technology Regulator will need to assess the public health and environmental aspects of such a trial to ensure --

The Hon. J. R. JOHNSON: Can I interpose there. You state assess.

Mr SLATER: Assess the risks of public health and safety.

The Hon. J. R. JOHNSON: Do they rely on research in Australia or do they draw on and accept the conclusions of overseas regulatory bodies that have, in parenthesis, tested certain commodities?

Mr SLATER: Certainly for the assessment of a medicine, the Therapeutic Goods Administration draws on any information that the applicant wishes to make available, and that includes trials conducted overseas but it does not require the trials --

The Hon. J. R. JOHNSON: But is there other information available from some of these organisations overseas that are not made available?

Mr SLATER: I was coming to that. It does not require trials to have been conducted in Australia for its data. It also has access to the evidence from overseas regulators where that is considered to be comparable if that material can be made available to Australia.

In some cases it is not available, so we draw on whatever information is available to make an assessment of the quality, safety and efficacy of those products.

Ms MATTHEWS: We should distinguish between therapeutic goods and, for example, agricultural uses of gene technology where if someone applied, for example, to release a genetically modified organism into the environment in Australia, they must provide comprehensive application information and that might include results of field trials from overseas.

But that certainly would not be adequate. They would have had to have done field trials in Australia to establish the absence of risk or minimal risk in relation to unique flora and fauna in Australia. It would not be adequate to rely on international data.

The Hon. J. R. JOHNSON: How are they given permission to undertake these trials in Australia?

Ms MATTHEWS: The Gene Technology Regulator regulates the full life cycle of the genetically modified organism, so if you have a live and viable organism, for example, a seed, the research and development of that seed will be regulated by the Gene Technology Regulator.

The initial trialling of that seed in a small area would be regulated by the Gene Technology Regulator all the way through until there is likely to be a general release of that genetically modified organism.

The Hon. J. R. JOHNSON: You say they are given a small area. The area cannot be controlled as has been proved in recent times in South Australia.

Ms MATTHEWS: And that is exactly --

The Hon. J. R. JOHNSON: So there are tremendous risks there.

Ms CAIN: If I may, as Andrea said, right from the point where there is an initial concept for research, this regulatory system is quite unlike a lot of regulatory systems in that it actually does regulate the research and development phase of a genetically modified organism. That does not happen in most areas.

If you look at radiation or something like that, research and development is not regulated, but this one, right from the concept development phase through to the full, general commercial release of a genetically modified organism, Andrea's point is that, under the proposal for the gene technology in the gene technology bill, the applicant would have to keep on coming back to the regulator with subsequent applications for approval which the regulator would need to assess against the risks associated with the genetically modified organism and the proposed dealings with that genetically modified organism.

To go back to your original question, the regulator would need to be satisfied of the risks to the Australian environment and the risks to the Australian community and draw information from overseas experience, but would require information from the Australian experience as well, and so you are developing over a period of time a cumulative picture of the risks associated with a genetically modified organism as it moves from its research and development phase through to potentially full commercial --

Ms MATTHEWS: If at each stage the risks are not able to be managed as assessed by the Gene Technology Regulator with input and consultation from non-government and government stakeholders, then the application would be refused in relation to an application for a field trial involving a genetically modified organism, where any risk may be able to be managed through containment provisions or monitoring contingency planning, all those kind s of thing.

So the regulator will have the capacity to apply significant conditions if that is what is necessary to manage risk or deny the application altogether if that risk cannot be managed.

The Hon. J. R. JOHNSON: If the prohibition is ignored, what are the penalties?

Ms MATTHEWS: The penalties are up to $1.1 million for a corporation per offence.

The Hon. J. R. JOHNSON: And each offence stands alone on a daily basis?

Ms MATTHEWS: Separate offences are outlined in the legislation. There are standard offences and strict liability offences where the prosecution would not have to establish any mental element, so there would not be any necessity to establish knowledge or recklessness. The offence could be established purely by virtue of the breach occurring.

Obviously lower penalties apply in relation to that because of the absence of the need to establish a mental element, and at the top level there are aggravated offences where the action of the licence holder or proponent did, or may be likely to, cause damage to the environment or public health and safety, and those penalties are a lot higher.

The Hon. J. R. JOHNSON: Or to a neighbour's crop or a neighbour's business, are there compensable provisions?

Ms MATTHEWS: The legislation does not establish a compensation fund per se. It establishes criminal offences for breaches of the legislation and breaches of conditions of licence.

The Hon. J. R. JOHNSON: Criminal offences, therefore, attract gaol terms?

Ms MATTHEWS: Most of them attract penalties rather than imprisonment, but there are some offences that attract imprisonment, consistent with the Crimes Act, and current Commonwealth policy in relation to the levying of penalties.

Ms CAIN: But the bill, the way it is prepared at the moment, has explicit references in the legislation to the regulator being able to set conditions to limit contamination or gene flow from a transgenic crop to a neighbouring crop, and so if those conditions were established by the regulator and if they were breached, if they were not adhered to under the legislation, then the penalties that Andrea was talking about could be imposed.

CHAIR: How do you go ahead and charge somebody for transgressing that and how do you guard against vexatious claims?

Ms MATTHEWS: The legislation essentially sets up a scheme administered by the Gene Technology Regulator where the Gene Technology Regulator would appoint inspectors under the legislation, and inspectors may be Commonwealth officers or they may be States and Territory officers.

CHAIR: And the Environment Protection Authority?

Mr MATTHEWS: That is right. Those inspectors have a range of powers under the legislation, including examining potential breaches of the legislation, gathering evidentiary material, search features, the standard kind of Australian Federal Police provisions. So they would collect the evidence along with the Gene Technology Regulator and then the Director of Public Prosecutions would determine whether to take a prosecution, similarly under the State legislation.

Ms CAIN: It has been important to write into the legislation those powers of the inspectors that are equivalent to those of the Australian Federal Police so the regulator is not reliant on another agency to conduct those inspections. The agency will then have the capacity to build up the expertise and support a prosecution for the Director of Public Prosecutions, which is a model that we understand is more assured of a conclusion.

The Hon. J. R. JOHNSON: What happens when certain products or processes are banned in other countries, a transnational accedes to the law in that country but continues to use those methods or products in other countries?

Ms CAIN: The laws of the country in which the activity is occurring are the laws that will apply to the activities. Australia has no jurisdiction to --

The Hon. J. R. JOHNSON: Watch that.

Ms MATTHEWS: One of the things that is explicitly provided in the legislation, and this is one of the very good things to come out of the consultations that people felt strongly about, is an express provision that before granting a licence the Gene Technology Regulator has to look at the suitability of the applicant, and the things that he has to look at include any relevant convictions under Commonwealth law, State law or the law of a foreign country in relation to a similar subject matter, or any refusals of applications.

The Hon. J. R. JOHNSON: Or withdrawn by the company itself?

Ms MATTHEWS: That is right, including their capacity to manage any conditions.

The Hon. J. R. JOHNSON: But only in certain countries?

Ms MATTHEWS: No, any country.

The Hon. J. R. JOHNSON: If a transnational withdraws a product in country A yet continues on to sell that process or product in other countries, what consideration is given to it withdrawing it in a country?

Ms MATTHEWS: Looking at the suitability of the applicant, one of the things that the Gene Technology Regulator could take into account is what the reasons for and impact were, of that withdrawal. The whole point of the provision is to enable the regulator to look at anything that is necessary to determine whether the multinational, the company, or the university is competent to hold a licence to undertake gene technology.

If some of the information available is that it has been withdrawn under unusual circumstances or it does not look like the crop was able to be managed or the gene technology was able to be managed in another country, that would certainly be taken into account in this case, but it would be a case-by-case consideration, obviously.

CHAIR: You talked about the complementary laws in the various States. I know you have had discussions with the bureaucrats in each State, and perhaps it is nice and easy to think we are going to have this common law right across Australia, but we are finding with DNA and dairy and a host of other things that there is a provision that, firstly, you have to get the caucuses of each Parliament to agree to it, and it might be altered there.

Perhaps it might be okay in Queensland, where there is no upper House, but in New South Wales, and neither the Government nor the Opposition controls that, you have got to get the support of various Independents, so you might end up with the situation where there are gaps in the legislation in some States or you might end up with a situation where the legislation is stronger in some States than in others. Is that going to be a problem?

Mr SLATER: I think we need to start from the premise that this bill has been introduced to the Federal Parliament and, of course, it has to go through those processes. The Senate --

CHAIR: It might come out differently there.

Mr SLATER: -- has a good look at this bill, and there are processes there which could amend the proposal that is on the table.

The Hon. J. R. JOHNSON: Which Minister has carriage of it?

Mr SLATER: The Minister for Health.

CHAIR: Michael Wooldridge.

Mr SLATER: It is also important to note that individual governments at executive level have given their approval for their officials to indicate support for the bill as it stands and for the drafting of State legislation. The State legislation is being drafted, I think, by Victoria on behalf of the other jurisdictions.

Ms MATTHEWS: Except in New South Wales. There are two types of laws that the States have been developing in connection with the Commonwealth law. Some States are indicating an early preference to just apply the Commonwealth law with a very short 10-page bill that essentially applies the Commonwealth law in, for example, New South Wales.

Other States are more inclined towards introducing a substantive piece of legislation that essentially mirrors the Commonwealth legislation and applies in their particular jurisdiction. Victoria has been taking the lead in developing that model State legislation, working with Parliamentary Counsel throughout Australia to ensure that the drafting is consistent with the parliamentary legislative principles of each of the States and Territories. That model State legislation is being developed alongside the Commonwealth legislation and, similarly, the application law.

The Hon. J. R. JOHNSON: Is there provision in the bill for the Minister to be the final arbitrator?

Ms CAIN: No.

The Hon. J. R. JOHNSON: On anything?

Ms CAIN: No. The bill creates an independent statutory office holder, who would be appointed by the Governor-General with the support of the majority of States, Territories and the Commonwealth, and that independent statutory office holder will be the decision maker on individual applications.

The policy parameters within which the independent statutory office holder would operate will be set by a joint Commonwealth, State, Territory ministerial council, and it will be by majority vote of Ministers for the policy.

Ms MATTHEWS: But the final decision on all individual applications to undertake work with gene technology or genetically modified organisms rests with the independent regulator.

The Hon. J. R. JOHNSON: Is that in relation to pharmaceuticals also?

Mr SLATER: No. In the area of pharmaceuticals, that is a decision for the Therapeutic Goods Administration under their own Commonwealth law, the Therapeutic Goods Act 1989.

CHAIR: Who funds all the inspectors?

Ms CAIN: The current Federal Government policy in relation to the regulatory system is that it will be 100 per cent cost recovered. The interim office has recently let an independent consultancy to work with States, Territories, the Commonwealth and non-government stakeholders to work out what that would mean in reality, you know, to cost the regulatory system and each of its

components, including the State contribution to the regulatory system, because that is an important cost factor that has got to be built into the system.

CHAIR: So, you are saying 100 per cent cost recovery for the Federal Government?

Ms CAIN: No, 100 per cent cost recovery for the entire regulatory system. What we then have to do is take that information and plot it against the expected throughput of the regulatory agency and work out whether 100 per cent cost recovery in the short term is a viable proposition and take that information back to the Federal Government with various models of cost recovery for it to consider. We would expect that to happen round about September this year.

So what we have done with the suite of bills that has been introduced into Parliament is created the capacity for cost recovery but we need to provide further information later in the year so that the Government can set the final parameters for that.

The Hon. J. R. JOHNSON: What provision is there in the bill or proposed regulations for a process that has gone wrong, for the disposal of something that has gone wrong?

Ms CAIN: The bill as it is currently written provides absolute capacity for the regulator to require any remedial action necessary to be taken.

Ms MATTHEWS: Obviously the regulator can impose conditions to try to reduce the capacity for that occurring, but should something occur or should something happen that has gone wrong, one of the strongest provisions in the legislation, which is quite unique, is the capacity for the regulator to direct remediation.

If, for example, a genetically modified virus has been accidentally released into the environment, the Gene Technology Regulator could (a) direct the licence holder to fix it up and cover all costs in relation to fixing it up; (b) the Gene Technology Regulator could utilise his or her staff to fix it up, re-contain the virus, test the surrounding areas to ensure that the virus has not travelled any further and that kind of thing; or (c) use any other people who are suitably qualified to enable them to undertake the remediation or clean-up, so they might utilise Australian Quarantine Inspection Service staff or other people. The costs of all of those things are directly recoverable back against the licence holder.

The Hon. J. R. JOHNSON: If the licence holder has gone broke in the process, is there an imposition, for the sake of another word, or a requirement on the principal provider to take out substantial insurance, including insurance for it going broke?

Ms MATTHEWS: The legislation does not explicitly provide that in every case there must be insurance, a bond or otherwise because obviously we are talking about a very large range of things here going down to very low risk research right through to general release, but certainly the Gene Technology Regulator would have the capacity if it was necessary in an individual circumstance to require insurance or a bond or something of that nature. If the risk was sufficiently great that it was a likely outcome that there was going to be an unintended release, obviously that is going to be an argument for refusing to allow the work to proceed at all.

Ms CAIN: It would be one of the things that would predispose the regulator not to grant the application in the first place, because one of the things that the regulator is there to do is to assess the risks and whether those risks can be appropriately managed. If the regulator believed that the risks were so great, either because of the risk of the GMO itself or the risk of release of the GMO, that that would warrant a substantial up-front levy to be paid to the regulator, which the regulator has got the capacity to do, then the regulator would have to think very seriously whether he or she would approve the release in the first place.

The Hon. J. R. JOHNSON: But we have had the situation with Lloyds of London, and one would think they would know a lot about risk. But what happened to Lloyds?

Ms CAIN: The other thing which is I think relevant to your question is the issue of the regulator having control of all of the funds of the regulator through a reserve fund, so if there were, for example, 100 per cent cost recovery, if the regulator wanted to use some of the reserve funds to meet the costs of a clean-up or remedial action, that is a third option that is open to the regulator.

So what you have is the capacity for the regulator to require any remedial action that the regulator deems necessary and for the company to foot the bill. In addition, the regulator can require up-front levies, bonds, insurance arrangements prior to the approval of any action. The third thing that is relevant is that the regulator has control over the regulator's own funds and can use them as the regulator sees fit.

The Hon. J. R. JOHNSON: One last question from me. Are there guidelines on the types of buildings that shall be used in which these processes would take place? One would hate to think that they were subject to earthquake. Having in mind the Newcastle earthquake and various other earthquakes around the place, one would hope that the buildings would be earthquake-proof.

Ms MATTHEWS: In addition to requiring any proponents or anyone who wants to undertake gene technology to have a licence, the legislation requires that if people want to undertake work within a facility that facility must be certified by the Gene Technology Regulator to a certain containment level, and the containment levels are physical containment levels 2, 3 and 4. If, for example, you

are undertaking a research activity of some level of risk within your facility, you might be required to be certified to physical containment level 4.

The guidelines issued in relation to that physical containment would describe procedures in the case of emergencies, for example, earthquake proofing the structure of the building, the necessary structures, to ensure that any work being undertaken within that laboratory is appropriately contained. Laboratory procedures for occupational health and safety and all those types of things would be set out in guidelines and the facility would not be certified by the regulator unless it met those guidelines. The facility would also be regularly inspected by the regulator to ensure the continued compliance with the guidelines in the terms of certification.

CHAIR: So you would need a lot of staff.

Ms CAIN: The way the arrangement is intended to work is that there will be centrally located core staff who will undertake risk assessments and support the statutory committees and perform many of the general day-to-day functions it is responsible for, but then what we have been working with State and Territory officials to achieve is an arrangement whereby there can be a memorandum of understanding between the regulator and State officials or the regulator and, for example, AQIS, the Australian Quarantine Inspection Service, officials, to undertake the on-the-ground monitoring on behalf of the regulator.

You mentioned earlier Environment Protection Authority (EPA) people; there are also agricultural inspectors who go out. They know the on-the-ground farming systems very well; they have their established networks. It would seem sensible to have the capacity to tap into those networks on a fee-for-service basis so there is appropriate recompense for the effort, rather than create a separate work force of gene technology regulatory inspectors running around the place, but I must stress that that arrangement would not be something that the regulator could automatically impose on any jurisdiction; it would have to be an arrangement that suited the State or Territory entering into the arrangements.

Ms MATTHEWS: The regulator may delegate functions and powers to State offices, but obviously it is always with the agreement of the State or Territory.

CHAIR: Do you have a list of plants and seeds that have been approved for release in Australia for trial purposes?

Ms CAIN: We can provide you with a GMO approved list for field trial purposes. For general release, the three are two carnations, one with a long vase life and one which was a different colour carnation and Bt [Bacillus thuringiensis] cotton, the cotton that expresses the pesticide. We can give you a comprehensive list.

CHAIR: Things like tomatoes and so forth, they are on trial?

Ms CAIN: If there are tomatoes that are genetically modified, and, I am sorry, we do not have our GMAC [Genetic Manipulation Advisory Council] secretariat --

The Hon. J. R. JOHNSON: God would not do to us what they have done to tomatoes.

Ms CAIN: Would the Committee be at all interested - we have mentioned a number of times the interface between the new regulator and the five existing regulators. Shall we walk you through that interface in a little more detail?

CHAIR: Yes, and you will provide that list of trials?

Ms CAIN: Yes, we will.

The Hon. J. R. JOHNSON: In answer to the Chairman, you suggested that you can provide us with that information. Can you tell us also where those trials are taking place?

Ms CAIN: I can tell you to the specificity of a local government area, yes.

The Hon. J. R. JOHNSON: Local government will be interested in that, too, because we found recently when we quizzed them that local government found out to their amazement that it was happening in their areas.

Ms CAIN: I have heard that said and it does surprise me because the arrangement that Genetic Manipulation Advisory Committee and its secretariat has in place is that each time a proposal or application to conduct a field trial is received, notification is provided to State and Territory governments and also to all local governments in an area where the field trial is proposed to occur.

A period of 30 days is allowed for comments to come back from either the State or Territory Government or from the local government.

The Hon. J. R. JOHNSON: Is it in plain English or is it in jargon?

Ms CAIN: I think it is fairly plain English because I have not got a science background and I get it. It does not say things like a transgenic crop of a hybrid species.

The Hon. J. R. JOHNSON: Am I right in saying that, that local government areas did not know that it was taking place in their areas?

CHAIRMAN: We were given evidence that they were supposed to have got approval but I think it is reverse approval the way you have described it.

Ms CAIN: The arrangements that are in place require that all local governments be notified and be given a 30-day period to comment and raise concerns, environmental or human health concerns.

The Hon. J. R. JOHNSON: If, after 30 days, they do not respond, is that taken as acquiescence by the group that sent them the letter in the first place?

Ms CAIN: No. As I mentioned earlier, the Genetic Manipulation Advisory Committee is tasked with assessing the bio-safety risks to the environment and human health of any proposal to do with a genetically modified organism.

Advising local governments, State governments and putting information on the website and things like that, that is the opportunity for people to say to GMAC, "They are the risks that we want you to have a look at", and GMAC is supposed to have a look at those risks and factor the concerns into their risk assessment, then make recommendations.

This is a voluntary system of compliance at the moment, which is why we need the legislative system to be in place. GMAC, through its secretariat, is then supposed to notify local government, State Government and interested parties of the outcome of their deliberations.

Ms MATTHEWS: Taking into account the advice provided by all stakeholders including local council. So there will be two notifications for every local council.

The Hon. J. R. JOHNSON: What one has to have in mind is that you may have a person on a council who is known to the regulator as the person in charge of this sort of approval or notification, but there is such a thing as long service leave and annual leave.

When you get people away for six weeks or 13 weeks on their long service leave in one hit, there has to be some, in my view, back-up system that it goes not to a specific person alone but to the chief executive officer of the organisation as well.

Ms CAIN: Yes. I think you do raise an important point and it is an issue we have raised with States and Territories recently through our Commonwealth and State consultative group and that is not only how do you make sure that the information that you are providing on individual trials is being received and considered by the appropriate person within the local government, but also one of the functions written into the draft legislation is a function for the regulator to provide information about the regulatory system, and one of the groups that we think it is really important for the regulator to actively engage is the local government area.

We have requested information from States and Territories about what sort of effective programs of information exchange or education or, you know, whatever, States have in place with their local governments, what works in terms of getting the information out there because at the moment we do talk to the overarching Local Government Association and when we do our consultations on the bill, some local governments come along and are interested and actively engage. But there is a lot of them, over 600 out there, and we think it is something that we should put some processes in place to have that more active relationship.

The Hon. J. R. JOHNSON: Let me give you an example of where that could fall down. Wendouran Council has 129 ratepayers. You can well and truly imagine how many staff it has. The competence would not be there and you could almost bet your bottom dollar on that and there would be other local government areas where the expertise is not held. There is no repository.

It may be that on a collective basis or a regional basis that there could be a regional co-ordinator as distinct from letting it lie with individual councils without the expertise.

Ms CAIN: Yes. It would be very wrong of me to leave you with the impression that, in the absence of input from a local government area, risks were overlooked because the regulator's responsibility is to identify risks and manage risks.

The regulator does that under the draft legislation through a variety of processes. One is to notify local governments and State governments and State governments have their environment protection authorities and people like that.

Another one is to notify broadly in the community, and there are a number of groups and individuals within the community that I know even now in advance of the regulatory system that provide very useful input and guidance about where possible risks are. But in addition, the regulator has to examine the data that the proponent makes available.

The regulator has to conduct risk assessments in the regulator's own right, which includes literature searches, and we built in a capacity in the bill for the regulator to undertake or commission independent research in his or her own right, so there is a multi-faceted --

Ms MATTHEWS: Certainly the call for advice from a wide range of stakeholders will not be subtle. It will be advertised in the newspapers, in the Commonwealth *Government Gazette.*

The Hon. J. R. JOHNSON: Everybody reads that.

Ms MATTHEWS: And in newspapers, national newspapers, but also direct mailed to everyone on the GTR [Gene Technology Regulator] database who has

registered an interest in receiving information on gene technology. At present there are about 3000 people who have registered an interest.

The Hon. J. R. JOHNSON: Where was that made available to attract that 3,000?

Ms CAIN: We have done it through a variety of mechanisms. GMAC over the last number of years built up a database of around about 1,500 or a bit less than 2,000 names. When we went out last year and this year for national consultations and public forums, we circulated forms and said, "Put down your name and address, contact details, so we can add you to the database."

Ms MATTHEWS: It has been advertised that people can lodge with the IOGTR - I think we advertised in 40-odd newspapers when we called for public submissions so people could register with us to get information, but also on the IOGTR's website and through the reporting of GMAC.

The Hon. J. R. JOHNSON: How long has the bill lain on the table?

Ms CAIN: It was introduced last Thursday.

The Hon. J. R. JOHNSON: That is not the answer to my question.

Mr SLATER: The draft bill was released for consultation on 24 December, 1999. It was out for three months for public consultation. It has then been drafted and finally introduced to the Parliament last week.

The Hon. J. R. JOHNSON: Were there many submissions?

Ms CAIN: If I could just go back a step, round about October last year, what we released and advertised in 40 different newspapers and on the website as broadly as we possibly could was a discussion paper. It was about how the regulatory system might work, and that was developed with New South Wales input and a lot of State input.

That went out and we invited submissions on that and did one round of national consultations. I would have to get back to you with the exact number of submissions that we received on that initial discussion paper.

Ms MATTHEWS: I think it was in excess of 300.

CHAIR: You can take that on notice. When you get the transcript back, if there are any explanations you want to make, by all means do so.

Ms CAIN: Then on the basis of the input received on that initial discussion paper, we developed the draft bill that Terry mentioned went out in December. That was out there for a round of national consultations and after it had been out

there three or four months, we then began to finalise the final bill which has been the subject of on-going discussion through until when it was tabled in Parliament last week.

Ms MATTHEWS: Again, we can get you the numbers. We held public forums in 11 cities. In Rockhampton I think we had eight or 10 people, right through to 250-odd in Victoria.

CHAIR: You were going to go through the interface.

Ms CAIN: Sure. Probably the easiest way to do it is to use an example. Suppose a research centre in Australia was wanting to develop a banana plant that was genetically modified to contain a vaccine. All the research and development proposals in developing that genetically modified banana would be regulated under the national regulatory system we have been talking about.

That would happen through all the laboratory work at the bench in a contained facility through to, you know, maybe some greenhouse work so there was still a level of containment through to small scale plot work, field trial work outside a greenhouse. But you would also need, because it is a potential crop growing in the field, approval from the national registration authority for any chemicals that you were going to apply to the plant when it was growing.

Because it is expressing a vaccine, you would need approval from the Therapeutic Goods Administration for the therapeutic properties at the plant in terms of their safety and efficacy. You may need to involve ANZFA because a banana is a food product and there would be some interest there from ANZFA. I guess if you were going to export it, AQIS, the Australian Quarantine and Inspection Service would want to know about it.

So you have multiple layers and approval from the Gene Technology Regulator to deal with a genetically modified organism is not all that is necessary to undertake that dealing. You also have to have regard to the existing --

Ms MATTHEWS: But similarly, if it had been a non-genetically modified banana, it would have required approval from the NRA to have pesticides put on it and from ANZFA for it to be sold as a food. I guess the difference with this system is that what we have tried to do is to set up this centralised source of expertise in the Gene Technology Regulator on genetic safety and biosafety so that the Gene Technology Regulator is responsible at all those early stages for the assessment of risk in relation to the GMO, and then, when other regulators are involved the Gene Technology Regulator is central for providing advice to those other regulators about the biosafety and genetic safety of the particular genetically modified product that resulted from the GMO.

CHAIR: So you can make a banana that will emit a vaccine to the people eating the banana.

Ms CAIN: Theoretically.

CHAIR: So, theoretically, you could have a Viagra banana.

The Hon. J. R. JOHNSON: Straight ones.

CHAIR: Theoretically.

Ms CAIN: My mind is just boggling.

CHAIR: Could you very quickly tell me the difference between hybrid plants or hybrid seeds and GMOs? What is the significant difference?

Ms CAIN: What we can tell you, and as I said earlier --

CHAIR: Hybrid plants were supposed to produce more crops and use less chemicals. I am a market gardener. This year I put in hybrid and non-hybrid, traditional, watermelons. I can tell you that the traditional stuff did four times as good as the hybrid.

Ms CAIN: I think you might have some scientists here who might be able to explain the difference.

CHAIR: That might be an appropriate question for the experts.

Ms CAIN: But what I can say is that you are right. There are a lot of different techniques out there.

CHAIR: I will leave that to them, if you would prefer.

Ms CAIN: Yes. But while there is selective breeding, mutagenesis, chemical bombardment and a whole range of different techniques, we are only regulating gene technology, which is one subset of the systems that are used in agriculture and other areas.

CHAIR: Are there any other questions? We are over time, but it is very interesting. Thank you very much for your time. I am sure my compadres who did not quite make it, particularly Ian Cohen, will have some questions he would have loved to have asked you so we may ask you some questions on notice. We will send you a copy of the transcript, as I said. If you want to make some additional comments, by all means do so. Thank you very much for coming along.

(The witnesses withdrew)

THOMAS JOSEPH HIGGINS, Research Scientist, CSIRO Plant Industry, 71 Banambila Street, Aranda, Australian Capital Territory, before the Committee:

CHAIR: I welcome the media and members of the public to the hearing of the Standing Committee on State Development and advise that Standing Order 252 of the Legislative Council states that any evidence given before this Committee and any documents presented to the Committee which have not yet been tabled in Parliament:

> . . . may not, except with the permission of the Committee, be disclosed or published by any member of such Committee or by any other person.

Copies of the guidelines are available on the table by the wall.

Dr Higgins, I cannot get you to take the oath or the affirmation just yet. In what capacity do you appear before the Committee?

Dr HIGGINS: As a scientist and representative of the CSIRO.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Dr HIGGINS: I did.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Dr HIGGINS: I am

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be heard or seen only by the members of the Committee, the Committee would be willing to accede to your request and resolve into confidential session, but I should warn you that the Parliament can override - it never has, but it can - that decision at any time and may make your evidence public. Perhaps, Dr Higgins, you might like to make a preliminary statement first and then we will ask you some questions.

Dr HIGGINS: I would like to make a presentation. I have some overheads. Is that okay?

CHAIR: I do not know whether the other members would like to see that.

The Hon. J. R. JOHNSON: They are not here.

CHAIR: Can I ask you one question first?

Dr HIGGINS: Yes.

CHAIR: What is the difference between hybrid seeds or plants and genetically modified plants?

Dr HIGGINS: I was going to explain that using my overheads as well.

CHAIR: I will let you go to the overheads, then.

Dr HIGGINS: Today I come from CSIRO Plant Industry, one of the largest divisions of 20 divisions in the CSIRO, the mission of which is to apply strategic research in the plant science to promote profitable and sustainable agrifood, fibre and horticultural industries, develop novel plant products and improve natural resource management.

The focus of my own research work is the area of gene technology, which is the subject of today's hearing. I work particularly in this area of plant science to promote profitable and sustainable agrifood production. In the research area where I work in Plant Industry, the funding for the research that we do comes from both appropriation and from external funding, about half and half - 50 to 60 per cent of the funding comes from appropriation and 40 to 50 per cent of it, depending on the research area, comes from external sources.

CHAIR: How is that funding going? Is it reducing from the appropriation?

Dr HIGGINS: It is reducing in appropriation and it is expected to increase in the external funding. When the external funding requirement started a number of years ago, the Government set it at 30 per cent. It has gradually been increasing since then and it is now up for us to about 44 per cent overall.

CHAIR: Where does that funding come from?

Dr HIGGINS: The funding comes from various sources. For instance, for much of our work it comesfrom farming communities through levies, say, in the grains industry. The Grains Research and Development Corporation provides quite a bit of this external funding. Researchers have to compete for that funding. There is a levy put on the product and the Government matches that levy and we compete for that funding in a competitive grants scheme.

The grains industry, the dairy industry, the meat industry and the wool industry are some of the major contributors to the kind of work that I do, but there is also funding from government departments, for example, Environment Australia supports climate change research - multinational companies and national companies. Of the total of the 44 per cent external funds, about 20 per cent, that is, almost 9 per cent of the total funding, comes from multinational companies.

CHAIR: So it could come from chemical companies.

Dr HIGGINS: Yes, agrichemical companies like Monsanto.

CHAIR: Or Aventis.

Dr HIGGINS: Aventis, yes..

The Hon. J. R. JOHNSON: For the purpose of doing research for them?

Dr HIGGINS: Yes. In collaboration with them, we have strategic alliances in which we do research with them. Our plant improvement targets are to increase yield - by "yield" I mean biological yield - harvest index by reducing stress. Plants have better yields by reducing some of these problems such as drought stresses, heat stresses, and frost stresses. We also try to reduce losses due to diseases and pests and, of course, post-harvest spoilage. Post-harvest spoilage in some horticultural crops can be as high as 40 per cent.

Another target for us is to increase or maintain high quality, more concentrated products, better nutritional value or new raw materials. The way in which plant improvements are achieved is frequently through genetic approaches, using the genetics of the plants themselves, for instance, to yield that improvement, but that is not the only way in which we get improvement. There is farm management as well. I am going to focus on genetics because that is really the focus of the hearing today.

The methods of genetic improvement are selection, which is the very first way that people used genetics. They went out and picked out the best plants and then grew them on and multiplied them, probably beginning 10,000 years ago. That is still a very important component in how we get genetic improvement.

When sexuality was discovered in plants - this relates to your point about hybrids, and I will come back to that in a moment - and it was found that it was possible to cross two different plants, each having two different characteristics we might like to put together, we then selected out the best plants from the progeny of that sexual cross.

Later, in the 1900s, mutation was discovered as a means of generating variability and thus providing more prospects of selecting good plants. That was introduced in the 1920s and 1930s when X-rays and chemicals were used to introduce mutations. Again we could select from the progeny of those plants after they had been mutated.

More recently, in the last 20 years or so, genetic markers have been used to combine different characteristics together in a plant. We can use genetic markers to put those two genes together in the one plant.

Finally, the most recent of these refinements in genetic improvement is the use of genetic modification, using recombinant DNA, that is, DNA from two different sources combined together and put back into a plant. That is what is

generally referred to these days as GMOs or transgenics. That is the jargon word to describe genetic modification using recombinant DNA. That is the sort of work we are here to talk about today. It differs from the hybrid approach to improvement of plants, where basically what we do is take two plants, both of which have the desired characteristics, cross them to give F1 progeny and then grow those plants on hoping to have the benefits of the two parents in the hybrid..

CHAIR: So it is more a matter of luck, the hybrid, the F1?

Dr HIGGINS: Not so much. We know pretty well what we are going for. The trouble with the hybrid is that you cannot save their seed and grow them on the following year because the progeny will not breed true. When a company has figured out a way of selling you a hybrid from two good parents, then it will keep making those hybrids and selling them to you every year because there is a benefit to you and a profit to them. You will not buy them if they do not have that benefit.

CHAIR: At $1,000 a kilo instead of $50.

Dr HIGGINS: The gene technology research that we are talking about here is the latest in what I think of as a series of improvements that have been made in genetics over many thousands of years. Plant gene technology (or GMOs) has been in use now since the early 80s. The first recombinant plants were produced in 1983. Since then, this technology has been used in a number of different ways.

It has been used to produce plants that will respond better to stresses like pests, diseases or weeds, respond to adverse or bad soils, salty soils or acidic soils; respond better to flooding and high or low temperature. So gene technology can be used to introduce into plants ways of dealing with these adverse environmental conditions.

Gene technology is used also to improve plant performance in the field. Better and more efficient use of nutrients, such as nitrogen or phosphorus. Better control of flowering and flowering time, so that we can harvest the crop at a particular time. Better plant architecture; better roots for capturing water, for instance, so that it does not raise the water table. Better animal nutrition through more digestible energy; or a better balance of the amino acids for muscle or wool production. Bloat safety may be achievable, for instance, in pasture species like clover and lucerne.

This group of possible benefits, the Interim Gene Technology Regulator classified as producer benefits mostly, but there are ways in which gene technology can be used to produce direct consumer benefits as well, such as improved food quality and more vitamins and minerals in plants. Then there is post-harvest quality and better taste. I think tomatoes came up a few minutes ago. That has been a problem area that needs some attention. There will be better quality proteins for people at certain stages of their lives, for instance, very young children or lactating

mothers, better quality oils for better health; and better quality carbohydrates such as fibres in plants.

Plant gene technology in the future may lead to new industries, plants that would produce new chemical feed stocks or even pharmaceuticals such as vaccines or diagnostics. These are the sorts of things for which this technology is either already being used or is likely to be used in the future.

This technology, as I said, started out in the early 1980s. The first commercial crops started to be produced in 1994, 1995, 1996, and the technology has been taken up rapidly by people who have had access to it since then. This is the increase in area between 1996 and the end of 1999. It has gone up to about 40 million hectares in that time, and the value of these products has gone up to $2.5 billion. It is projected that the value of these products will increase. By 2010 it will probably be $10 billion and by 2020 it may be $25 billion of products from this technology. So this technology has been taken up rapidly in those areas, particularly in North America, in Canada and the United States, and in Argentina.

The very first thing that has become available is insect resistance, for instance, and this is from some of my own research work here, where peas have been made resistant to a pea weevil, the major pest that has grown up with peas. As the industry has increased in Australia, the weevils have threatened the industry, and we have taken a gene from beans, transferred it across to peas using gene technology for total resistance against this insect pest.

The Hon. J. R. JOHNSON: Did you say has resulted in total eradication?

Dr HIGGINS: No, total protection. This work is still at the field trial stage. I do not think that it will eradicate the insect, but the peas will be protected with this single gene.

There is herbicide tolerance showing where weed control could be practised using Roundup to protect cotton plants against weeds. So those are two examples of what you might call the first wave of this technology.

Some examples of the second wave are shown here. They include better post-harvest storage of horticultural crops or tailoring existing foods, such as oils, to be more healthy, or adding pro-vitamin A to rice. Three genes have been added to rice, so it now has the precursor to vitamin A to give what we call golden rice. This rice is now in experimental evaluation.

The third wave of plant gene technology outcomes would be industrial products from plants, such as oil, from canola for industrial uses rather than food uses and using vegetables to produce pharmaceuticals.

Just going back to the previous questions that you had; these plants undergo a series of stringent tests before they go out for commercialisation.

First, the Genetic Manipulation Advisory Committee, which is part of the Office of the Gene Technology Regulator, oversees laboratory and glasshouse studies which can take place over a period of two to three years or maybe longer, depending on what the gene is, before the plants are allowed out into experimental field release. These releases occur over a period of three to five years when the plants are evaluated for safety in the environment and, in some cases, in animal feeding trials.

There is then an application for general release and eventually for commercial release. The Genetic Manipulation Advisory Committee overseas this assessment. If the plant is approved, then any food from it will be assessed by the Australian and New Zealand Food Authority. The Therapeutic Goods Administration if appropriate, the National Registration Authority if it is a pesticide, State departments of agriculture if it is a stock feed, Environment Australia and the shire councils. They all have input into the evaluation of these plants before they get approval.

There was a question that came up earlier about field trials of plants in Australia at the moment. The only plants that have been approved for commercial release are cotton and the two carnations, but here is a list of some of the field crops that have been or are currently being evaluated in field trials around Australia.

These will not necessarily all end up being commercially released, but they are being evaluated. The trials include canola, cotton, sugarcane, wheat, barley and oilseed poppy. You can see that some of the characteristics that are being evaluated for canola include agronomic performance, herbicide tolerance, resistance to fungal diseases, response to daylight, anti-nutritional factors, dwarfed cultivars and reduced pod-shatter.

For cotton: insect resistance (that is the Bt cotton that is already commercialised), herbicide tolerance (I have referred to Roundup), water logging resistance, Verticillium wilt tolerance, a fungal disease.

Sugarcane that is modified for sugar metabolism, juice colour, scald and virus disease are also being tested in experimental plots.

The Hon. J. R. JOHNSON: What difference does juice colour make to sugarcane?

Dr HIGGINS: Well, people want the final product to be white. They do not want any browning to come through the process, juice colour can be modified using this technology so you have reduced browning and therefore less clean up of the sugar during the processing phase of refining.

The Hon. I. COHEN: You are saying that you have actually got experimental plots of sugarcane in New South Wales at the moment?

Dr HIGGINS: I think they are in Queensland.

The Hon. I. COHEN: Do you know where that is?

Dr HIGGINS: No, I do not know personally, but it is in the GMAC Reports where that is precisely. Modified grain qualities for wheat, for instance, modified protein or starches for nutritional or baking benefits.

Virus resistance in barley is being evaluated. Barley yellow dwarf virus is a major problem for barley. In oilseed poppy, attempts are being made to modify pharmaceutical content of poppies. There is a restricted area in which poppies are grown in Tasmania. That area cannot be increased. The only way to increase the product is to have more of the morphine from that particular area. That is 7,000 hectares that is approved for use.

Other field crops that are being evaluated, and pastures are shown here, are subterranean clover and white clover, the nutritional enhancement of subterranean clover to herbicide tolerance to control weeds like Paterson's curse and capeweed, and immunity to a virus of white clover. Lupins made of grains, grain legumes in the west, particularly herbicide tolerant, virus resistant and enhancement of the seed protein.

Field peas: Nutritionally enhanced seeds, pea weevil resistance that I mentioned before and fungal disease resistance.

CHAIR: Just to go back one step about the poppies. Did you say 7,000 hectares is approved?

Dr HIGGINS: Yes.

CHAIR: In Australia of normal poppies?

Dr HIGGINS: Of morphine poppies.

CHAIR: Okay, because actually 200,000 acres of poppies in total have been approved for poppies this year.

Dr HIGGINS: Okay, that may be correct. The number that I had was much less than that. In any case, there was a restricted area. That is the major point, I think.

Horticultural crops that are being evaluated in the field include tomatoes, fruit ripening and flavour development, herbicide tolerance and insect resistance.

The Hon. J. R. JOHNSON: Would they not just have to reverse what they did to tomatoes to get the flavour back?

Dr HIGGINS: Yes. Potatoes, pineapples, grape vines, papaya, lentils, apples, carnations, chrysanthemums and roses are some of the other examples there in horticultural crops. They are all trials and these trials vary in size from one-tenth of a hectare probably up to - most of these would be in the one-tenth of a hectare category, but there are some others, such as cotton, where the areas are larger than that. For instance, in the case of peas, this year we are applying to do a one-hectare trial.

The Hon. I. COHEN: In all of those trials, what is your confidence to guarantee that there is no escape? For example, papaya --

CHAIR: I might just break in if I can. Do you mind if I get you sworn in so that you are protected?

Witness affirmed

The Hon. I. COHEN: Dr Higgins, I have a concern about these trial crops. There have been issues about canola crops and escape. I look, for example, at papaya. Do you see the importance of actually isolating those crops?

Dr HIGGINS: Yes, I do. I strongly subscribe to the regulatory system that we have in place at the moment. When putting these plants out, I think it is very important to reassure and inform the public about what has been done.

The Hon. I. COHEN: Bats go for papayas immediately they ripen and, bang, they can travel huge distances, even more so than the issue with canola and bees and cross-pollination. How can you control that?

Dr HIGGINS: This is not something I am involved in myself, but the proponents of that research must convince GMAC that those safety requirements are in place. Part of the requirements of the small, state field trials are to show what are the possible risks in growing these plants. Gradually as the proponents assure GMAC that there are no risks, that there are no untoward or adverse consequences, they would be allowed to go on to the next stage.

Just on that point, I wanted to finish off my presentation on gene technology. There are a lot of comments in the press about the technology, both benefits and risks. There is a lot of emphasis particularly on risks, but I would also like to question whether or not all the benefits will be there and whether all the risks are as great as imagined.

In the case of benefits, more sustainable production, people like myself believe that this technology will lead to more sustainable production. I think there

have been a lot of problems with agriculture and horticulture in the past and I believe it is important to try to correct some of those problems.

The aim behind this technology is to make agribusiness more sustainable and, at the same time, make it more profitable.

Those two things go hand in hand. I believe that healthier foods will be possible with this technology, that it will be possible to modify the oil content of oilseeds to make them more healthy. It will be possible to improve fibre content of some of the plants as well. Higher quality food and feed will be possible using this technology.

I do not think gene technology on its own will be able to feed the increasing population of the world. I think that those kinds of claims are outrageous claims. They need to be tempered with the fact that this technology has to be used in conjunction with the best technology for management and the best of classical breeding. Gene Technology is really a complement to plant breeding and by itself there is no way that it is going to feed the world.

But I think we do need to use every possible technology to feed the increasing population. We do know the population will increase to at least eight billion or nine billion people and we are going to need to increase the efficiency of production. Otherwise we will need to clear more land and have more degraded land. I believe this technology will contribute to the aim of more efficient production.

Does gene technology pose a risk and a threat to biodiversity? This is something that people worry about. I do not see this technology as posing any more of a risk than conventional plant breeding. Agriculture does pose a risk to biodiversity. It is a monoculture by the very nature of its practice. It does pose a threat to diversity in the field in which it is grown. There is a low level of plant diversity within a field of wheat. So agriculture in general does contribute to lowering plant biodiversity. Gene technology, I do not think, is going to alter that.

New weeds and pollen transfer? Is there a chance that plants produced by gene technology will in themselves become new weeds? There is a chance, I think it a very low chance. Any new plant that is introduced into agriculture could potentially become a weed, and it has happened - not very often, but it has happened - and some of them have presented serious problems.

The Hon. J. R. JOHNSON: Of recent times?

Dr HIGGINS: Yes, relatively recent times.

The Hon. I. COHEN: Are you talking about a genetically engineered [GE] crop or any kind of crop?

Dr HIGGINS: No, not a GE plant, just any plant that you bring in, for example, a horticultural plant. Bitou bush is now up and down the New South Wales coast, for instance. This was brought in to stabilise sand dunes, and has become a real problem. It was deliberately brought in from South Africa and has become a weed and is difficult to control.

CHAIR: Johnson grass was brought in for cattle feed.

Dr HIGGINS: This can happen, and it has happened. But does a gene technology plant pose any more of a risk? I do not think so. That is my opinion. Pollen transfer will occur - I think the question was just raised a few minutes ago - from any existing canola plant to other canola plants, and that does happen.

With gene technology you cannot stop that happening either. It is a matter of what does that pollen carry? Does it carry a gene that is going to confer weediness on another canola plant or not, and that is something that is assessed carefully by the Genetic Manipulation Advisory Committee, as you go through the process of seeking permission for release. It is considered very carefully, not just by the proponents but by ecologists and people who are expert in this area.

Toxins or allergens: is it possible that introducing a gene may introduce a gene for a toxin or allergen? It is possible that you could transfer a toxin or allergen into a transgenic plant. It is possible to do that now because the genes for many toxins and allergens are known, but I am not aware of anyone deliberately doing that. The Genetic Manipulation Advisory Committee system would, I think, ensure that that would not happen.

There was an instance of a gene being transferred from Brazil nuts into soy beans to improve the nutritional quality of the protein of the soy bean for feeding animals. It turned out that that gene coded for the major allergen in Brazil nuts. It was not known beforehand, but as part of the work it was found out that that was the case. As soon as that was discovered, that research was stopped.

The regulatory system worked. It evaluated that plant and said, "This work should not continue," and it did not continue. That has not gone on to any kind of commercial production. For instance, the gene that I have put into peas to confer resistance against the pea weevil stops the insect. Therefore, since it is anti-nutritional to the insects, is it anti-nutritional to humans? Potentially, it could be anti-nutritional to us, too.

The Hon. I. COHEN: You are saying that it stops the insect and therefore it is anti-nutritional to the insect, but is it actually a poison to the insect?

Dr HIGGINS: It is, yes. That is how you define a poison. The insect larvae use the starch of the seeds to live on as a source of energy. As the seed develops, the larvae develop within the seed by digesting the starch. The gene that I have put into the peas codes for an inhibitor of the enzyme that digests the starch. The larvae of

the insect cannot now digest the starch. They die at the first or second stage, so it is anti-nutritional in that sense.

We digest starch too, so the question is: would those peas now be anti-nutritional for us? That is one of the first questions that I asked. I did feeding trials with animals - rats and now chickens - to answer the question is it toxic. The results were that it was not toxic to the rats – the chicken trials are not yet completed.

Human trials have been carried out on this same protein as well over the last 20 years, for a different reason. The protein was shown to be not toxic to humans as well. These are the processes that a researcher must go through to show that the product is safe.

The Hon. I. COHEN: How much guarantee can you have in terms of long-term safety in a product such as the pea, which is a staple, if it is to be eaten over a lifetime? Can you, with confidence, say that that is totally safe given the trials that you have had so far?

Dr HIGGINS: It is my belief that it is safe. I would not be doing this research if I thought that there was any risk associated with it, of course. The gene came from the common green or French bean. Humans have been eating beans for a very long time, so I do feel confident that we are not introducing a toxic food into the food chain.

The Hon. I. M. MACDONALD: What has it meant to the weevil in terms of the production of peas to have that inhibitor or that toxic element of gene? Has it changed the amount of spraying that has to be done? What impact has it had on the actual production of peas?

Dr HIGGINS: To control pea weevil at the moment farmers spray once or twice in a season, and then peas have to be fumigated when they go into the silos for storage. The fumigant that is used to control pea weevil is likely to be banned in the next 10 years or earlier, so the situation was we have these chemical options, to control the problem. We raised another option that growers could have - to use this biological solution where they use the seed's own ability to protect itself.

The Hon. I. M. MACDONALD: By transferring into the genetic make-up of the pea a normally produced gene that is in beans?

Dr HIGGINS: Yes, that is right.

The Hon. I. M. MACDONALD: What sprays do they use?

Dr HIGGINS: They use mostly synthetic pyrethroids to control pea weevil at the moment. The pea industry is not a big industry in Australia. It is worth about $100 million to $130 million a year but it is a very important crop in

sustainable agriculture because it is very important for breaking the disease cycle. When you grow cereal after cereal after cereal, it is very important to put in a break crop such as a legume, like peas, for instance, or lupins in the west or chick peas in the north, to fix nitrogen and to break the disease cycle. The pea crop is more important than the $120 million that farmers get by selling the seed.

CHAIR: Do you have some final presentations that you want to make?

Dr HIGGINS: People are concerned about multinational control of the food chain. This is something that is beyond my scope to deal with but it is a major concern. This type of risk is handled in other situations. The risk is managed in the pharmaceutical industry, so I believe that it perhaps can be managed in the agribusiness area as well.

Finally, increased chemical usage. People are concerned that herbicide tolerance, for instance, when it is introduced into something like cotton will mean that there will be a much greater or increased use of herbicides. Again, this is an arguable point. The herbicides like Roundup are probably more benign than some of the herbicides that are currently used to control weeds, so I believe that there are benefits in the gene technology that will allow growers to use chemicals that are better for the environment.

CHAIR: Just in relation to that chemical use and Bt cotton, that reduces endosulfans, as you say - use more Roundup and less endosulfan - but the problem seems to be that a lot of farmers are actually saying that the cost of the seed is now outstripping the savings they are making in chemicals, so some of them are not using the Bt cotton any more. I suppose that is a bit of a worry until the multinationals have decided they have jacked up the price too high.

Dr HIGGINS: Yes, it is. So far in Australia it is fair to say that the Bt cotton has not meant that it is cheaper to produce, but there is a full subscription still to all the available seed for Bt. The farmers can sow only 30 per cent of the area to Bt cotton. They have access to the conventional varieties, but GMAC requires that they sow only 30 per cent as Bt cotton at this stage while it goes through a five-year safety testing period. Farmers do have an option to sow one or the other, and they are fully subscribing to the Bt cotton that is available.

The Hon. J. R. JOHNSON: Has the price reduced to growers in other countries, particularly its home base country, in the same proportion that it has in Australia?

Dr HIGGINS: No, the price imposed in the United States was about $100 per hectare, whereas in Australia it was about double that, $200 to $240 per hectare. This was an assessment made by the commercial partner as to the value of their technology in Australia.

The Hon. J. R. JOHNSON: Ned Kelly is not dead. Let me ask another question. You spoke of post-harvest stress and it costing about 40 per cent.

Dr HIGGINS: Yes, up to 40 per cent of farm products are destroyed, frequently in spoilage. This is particularly bad, for instance, in the horticultural area.

The Hon. J. R. JOHNSON: Is that through bad packaging, bad transportation, bad warehousing?

Dr HIGGINS: Yes, and fungal diseases as a result of damage to the plants after harvest if they are harvested when they are soft. As soon as you take a product off a plant, it is basically dying from there on. It is a matter of how quickly you can get to use it before it has rotted away, so it is very important to be able to protect plants against that post-harvest spoilage and damage.

The Hon. J. R. JOHNSON: Is there better management that is necessary?

Dr HIGGINS: Yes, and there is a lot of research going on, including in the division where I work, into better packaging of horticultural products, such as better ways of taking up moisture. These are purely physical methods, nothing to do with genetics. There are better forms of packaging that can be used, for instance, including silica gel or better forms of paper even, in the cardboard boxes, so that the products do not spoil so quickly.

CHAIR: Can we see some of that tomorrow?

Dr HIGGINS: No, we will not. That research is being done in Sydney.

The Hon. J. R. JOHNSON: I noticed in Japan, which is recognised as having, probably, the best packages in the world, particularly mangoes and apples and pears in their own little capsule.

Dr HIGGINS: Yes.

The Hon. J. R. JOHNSON: I have not found that anywhere in Australia.

Dr HIGGINS: It is very appealing when you see a single melon or cantaloupe in its own little box in Japan selling for $80. That is the sort of way in which we would like to be able to get packaging to work for products now, to get better packaging systems for products that are still affordable. People generally cannot afford to pay those prices. The aim of the research is to get affordable packaging that will protect horticultural products for longer.

The Hon. I. M. MACDONALD: I am just wondering whether, perhaps, the community has created a bit of a monster in the sense that it has touted the uniqueness, if you like, of gene modification and built it up as some great new

technology. From my reading of a lot of the works on gene modification, it strikes me that it is speeding up a process of evolution that has occurred over many generations.

Do you think there is any basis for that, where there has been chemical cross-overs between various plants and animals?

For instance, I was struck by grapes and grape chemistry when we were looking at the analysis that had been done at Charles Sturt. In the grape a lot of the chemicals are the same chemicals that are in a whole range of other fruits, for instance.

Everyone says they like the black current taste in shiraz or something and they are looking at being able to refine those chemicals produced in those grapes to enhance certain parts of its chemical make-up. Do you think that gene modification to some degree is the recombining of naturally occurring things within a product or within a plant?

Dr HIGGINS: My own view, as you would gather from an early slide slide, is that I see gene technology being a progressive in refinement of the methods of plant improvement using genetic methods. Other people would not agree with that. They would say that this is very different, whereas to me gene technolgy is an incremental increase in plant improvement because of our enhanced knowledge about genes.

DNA is DNA, whether it comes from a microbe, an animal or a plant. The products that they code for are similar, too. For instance, haemoglobin made by plants is similar to the haemoglobin in humans. So, as we have increased our knowledge about genetics and the products of genes, I think that this technology is a natural, evolutionary incremental advance in plant breeding. But there are people who would disagree with that.

If I could use an analogy, for instance, a mobile phone in information technology, to some people you could say, that is not really an extension of a normal phone. You now can bring information in on a mobile phone that is basically from newspapers or from radio or from television and you have all this capability in a mobile phone. Is that really a natural evolution of information technology or not? I think it is and I think gene technology is a bit like that as well.

We can now bring in information in the form of DNA from microbial sources, animal sources and other unrelated plants. I do not see that as being unnatural. We have been doing it with selection and breeding for a long time, mixing up genetic information from very widely disparate plants. For instance, Triticale, which is a cross between rye and wheat. The genetic information from those two very different plants hase been brought together to produce a useful, safe new plant.

The Hon. I. M. MACDONALD: Just on this multinational control, can you tell us how in the pharmaceutical industry they have controlled or brought better controls over multinationals?

I am mindful of the fact that I have campaigned against multinationals since university days but they appear to have control of so many arms and gene technology may be just one arm of many arms. How do they go about taking rational steps to try to limit the control in that area you mentioned in your contribution?

Dr HIGGINS: The point I was making there was that our health-based industry is managing to cope with the multinationals and there is a relatively small number of multinational companies involved in health just as there are starting to appear in the agrichemical industry. I feel that the same situation will probably apply in the agrichemical industry.

There will be probably half a dozen to 10 companies that will have a major role in a limited number of crops. They are not interested in all crops. They are interested in probably 10 crops or less, and the point I was trying to make was that we have managed to cope with a limited number of pharmaceutical companies.

I believe we will probably be able to manage the risks associated with a limited number of companies in the agribusiness area as well.

The Hon. I. COHEN: I was interested to see that you debunked the concept of being able to feed the world's population so I thank you for that.

You also said healthier foods were possible. From the point of view of a scientist, do you not have misgivings in terms of the accumulated effects on the body over a period of time? I have an article here about equating the predictions that science has made with the nuclear industry with the recent biotechnology industry in that we do not know, you cannot guarantee.

You did keep saying possible benefits. Is there not a major, unanswered question there of the long-term success of these types of technologies? Also, when you were talking about the radical developments of breeding plants and such, this is still a major step. It is like stepping into another universe, is it not, in terms of taking totally unrelated species genes from one to the other and manufacturing something else?

Dr HIGGINS: Just going back to your first question about the dangers associated with the products of genetically modified plants going into food and possible dangers associated with that for the future, well --

The Hon. I. COHEN: We found it with pesticides and the nuclear industry. With the knowledge of history, we have learned that substantial mistakes have been made.

Dr HIGGINS: I could not guarantee that people will do the right thing. When you think about the way people deal with food in the developed world, we do eat what is demonstrably unhealthy food by choice. People will go out and eat far too much fat and so forth.

The kind of research that I talked about today is aimed at providing people with options to have healthier foods. We know it is possible to have healthier fibres and healthier oils, but I cannot guarantee that people will still consume them at the end.

The Hon. I. COHEN: As a scientist, on the precautionary principle, that you cannot guarantee, is that not unsound science?

Dr HIGGINS: No, I do not think so. We produce good quality foods by conventional breeding and we have to recognise that sometimes people will not necessarily use them in the best possible way.

The Hon. I. COHEN: That is another argument. Are you aware that there have been experiments on GM potatoes and there was actually a change in the gut of rats that were fed on them? Are you aware of that at all?

Dr HIGGINS: Yes, this work was in the very early stages of the research where a gene for a protein was taken from snowdrops and put into potatoes. Those potatoes were then fed to rats in a feeding trial. The results were prematurely released to the press and the person doing that work then had to publish the work (in the *Lancet)* also prematurely, the results of just one experiment. The work was in the preliminary stages and it was clearly very incomplete. The work has since stopped completely --

CHAIR: Did it kill a rat?

Dr HIGGINS: No.

The Hon. I. COHEN: They actually found a change --

Dr HIGGINS: In the immune system.

The Hon. I. COHEN: If that can occur to that degree on a fairly simplistic experiment over a relatively short time of feeding rats a genetically modified potato, does not that possibility argument transfer in other foods, even your example of the pea, of animals or human beings consuming that type of material over a lifetime, that it can have those effects?

Dr HIGGINS: It is possible. I could not absolutely guarantee that it would not happen, but we would take every possible precaution beforehand to ensure that

it was safe. We would do everything possible to show that there is no adverse effect. But, of course, you cannot guarantee it 100 per cent.

In the potato with snowdrop lectin story, it turns out that the material that Dr Pusztai at the Rowett Institute in Scotland was testing was not well matched. It was a preliminary study and the effect was largely due to the protein content of the tubers. It probably had nothing to do with the transferred gene at all. Those potatoes would not have gone on, I think, to commercial release.

The Hon. I. COHEN: Studies have shown that beneficial insects can be adversely affected and there is an issue about the monarch butterfly that fed on genetically engineered crops and that had an adverse effect.

Dr HIGGINS: This was also a controversial study published prematurely. It was pollen from corn that had been genetically modified for insect control with a Bt gene and the pollen contained some of the Bt toxin. In a laboratory study the pollen was spread on to the leaves of milkweed where the monarch butterfly larvae were allowed to develop. There were no controls in that experiment to show whether the level of pollen was what you would find in the field.

That experiment has since been repeated in a properly replicated field study and that early data has not been confirmed. In face there is no effect on the monarch butterfly in the field situation. A further point is they did not spray the plants with the insecticide which would normally be sprayed to control that insect.

The Hon. I. M. MACDONALD: Is insecticide good for Monarch?

The Hon. I. COHEN: In addition to that, do you think there is a little bit of an imbalance when arguing against or arguing for genetically modified organisms, that there is always the comment that it is better than pesticide? Do you think that makes sense really?

CHAIR: That is on notice. We will have a chance to speak to you tomorrow. I have a number of questions on notice.

Questions on Notice

1. Can you explain your role in CSIRO Plant Industry and identify the interrelationships the NSW Government and CSIRO need to play to facilitate safe and beneficial introduction of genetically modified food?

2. What avenues of genetically modified technology should be actively pursued to improve the international competitiveness of agriculture in New South Wales?

3. Are there areas of genetic food modification that may not be financially viable for the private sector that will need Government research and development assistance?

4. How are the risks of genetically modified food technology being viewed by your colleagues in Australia and internationally?

5. What are the possible adverse consequences to trade, food safety and the environment from the introduction of genetically modified food technology?

6. What is your understanding of the areas of benefit to agriculture, food processing, the environment and human health that may be achieved in the short term and over the next ten years from pursuing genetically modified food technology?

7. What role can the NSW Government play in planning, coordinating or legislating genetically modified food technology in New south Wales to achieve greatest benefits and minimal health and environmental risks?

8. There are public concerns that the intellectual property of many GM products will be owned by very few agrichemical companies. How is the research that is conducted by the CSIRO commercialised and who ultimately will own the intellectual property of this research?

9. When an agrichemical company is involved with the CSIRO in conducting research, how is the intellectual property ownership shared?

(The witness withdrew)

ADRIAN JOHN GIBBS, Private Citizen, 7 Hutt Street, Yarralumla, Australian Capital Territory, affirmed and examined:

CHAIR: Did you receive a summons issued under my hand in accordance with the Parliamentary Evidence Act 1901?

Professor GIBBS: Yes.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Professor GIBBS: Yes.

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may like to give should be considered or seen only by members of the Committee, the Committee would be willing accede to your request and resolve into private session, but I have to warn you that Parliament may override our decision.

Professor GIBBS: I retired three years ago but I am still a visitor at the Australian National University working full time. I am a full-time superannuant. I have worked for 44 years on viruses, have they evolve and how you might use the information from that sort of thing best for various practical things, such as identifying viruses.

Why have I agreed to appear or been asked to appear? Firstly, because I am part of a group that is rarely heard and who is in favour of any sort of technology that will improve production of foods and those sorts of things but have worries about the fact that I am also in favour of it all being totally safely, and so if ever you make any criticisms about the way things are being done to GM, there seems to be the idea that you are then anti-GM. I am not anti-GM. I am pro-GM but I am pro it being done safely.

The majority of the claims of the benefits and risks are fairly wild. The majority of them, I guess, will be found in the long run to be quite wrong, but the real problem at the moment is that it is only the benefits that are being worked on. The majority of the benefits are being studied, but there is not a commensurate amount of work being done on the potential risks and actually putting some sort of scientific back-up to that.

Most of the comments that you will get from people about GM work come from people who directly or indirectly have clear potential conflicts of interest. For example, you have just heard from a scientist. Twenty per cent of his budget comes from stakeholders - not just stakeholders, shareholders - so there will be a clear potential conflict of interest there.

CHAIR: Forty-four per cent, I think, was the figure.

Professor GIBBS: Forty-four per cent, but a lot of that from State governments. But he was clear to mention that it was 20 per cent actually coming from the genetic engineering companies. Most of the people who have made comments in the debate have clear potential conflicts of interest. As far as I know I do not have any. I am not on anybody's payroll.

At the moment I get support from the university for my work, from AQIS, the Australian Quarantine Inspection Service - I am helping on an identification project - and also from the Diabetes Foundation of America. I believe that the community supports universities as a source of independent opinion so I am, in essence, trying to represent a source of independent opinion from universities. The other major thing which I hope will come up again --

CHAIR: Sorry, I missed that. Independent from universities or independent universities?

Professor GIBBS: I think that the community supports universities in the hope that they will provide independent opinion of things. They are not tied to the political arena and not tied to the commercial arena, and I think, therefore, it is a responsibility. I have been paid by the community for that long.

The final point I would like to make is that my particular interest all along, because I was one of the first people to suggest that it might be a useful thing to do, is the use of viruses or virus genes in GM-type work. I was particularly interested that it was not on TJ's list of potential risks because only three weeks ago in the only major meeting of scientists to discuss GM risks in this country 220 people went to old Parliament House and discussed it.

Out of the recommendations at the end of that most of them - which I have got here, and I can read them to you - were about the fact that we just did not know enough about the risks associated with viruses and the use of virus genes. I will just finally say that I have tried, therefore, to keep up with the current GM debate and what is going on.

I hope we will get down to how the debate actually is being talked about, because I do not think it has been handled at all well. I have tried to keep up with all the major things. I have attended all the major meetings that have been held in Australia and also an OECD meeting in Hungary on the subject of virus genes and their use in things, and I have tried to read the flood of paper which has been coming out of the Interim Office of the Gene Technology Regulator and the food authority and so on over the last two or three weeks.

The Hon. J. R. JOHNSON: The European Economic Community has approached these projects with almost extreme caution and has made certain decisions of recent times. Is it being overcautious?

Professor GIBBS: I think not. I think that in fact they have learned from past problems. They have got a whole string of past problems where scientists with conflicts of interest or with political pressure have assured them that things are okay and have said, "Trust me. It is perfectly okay," but in the long-term it has turned out that it has not been okay.

They have been through that process so many times that they are really worried, and finally, public opinion has now started a backlash against the products of gene technology, so there is even now a question for the commercial people to realise they have got to do something about handling the public debate better.

The Hon. J. R. JOHNSON: Have you examples of where the politicians or the bureaucrats were misled?

Professor GIBBS: Well, I do not know the details. One can only go on what one hears. For example, I believe that there was a lot of pressure brought to bear on the scientists involved in the early stages of the mad cow disease problem in the UK to say, "Trust me. It is perfectly okay." That Committee was headed by Dicky Southwood, Sir Richard Southwood, and subsequently it seems that a lot of pressure was brought by the bureaucrats to say that this was the preferred line and we will sort it all out.

The Hon. J. R. JOHNSON: English bureaucrats.

Professor GIBBS: That is right, English bureaucrats. I do not know of pressures within Australia because I am not in that sort of circle.

The Hon. J. R. JOHNSON: Could you envisage it?

Professor GIBBS: Oh, sure. It could be direct or indirect that pressures of one sort or another would be brought or suggestions would be made that perhaps we should do so and so, but I know of no direct evidence for that. I know that, for example, the Government has held various meetings of committees of bureaucrats at which they have discussed things and one cannot find out what goes on in those committees or who appeared or what was said other than by getting a parliamentarian on side to ask questions in Parliament.

For example, SCARM, the Standing Committee on Agricultural Research and Management, I think, has had meetings and it is impossible, as I understand it, on the public register to find out what has gone on in those committees or who has reported on them until questions are asked in Parliament and it comes out in that way, including on genetically modified foods or the GM debate.

The Hon. J. R. JOHNSON: The presentation of what we will call evidence that there are only certain products being worked on, do you believe it?

Professor GIBBS: As far as I know, yes, I do not believe it. I would suggest that under the present circumstances there is no reason for anybody in Australia to do otherwise than fit in with the existing regulatory system run by GMAC. However, if it becomes incredibly expensive, as it looks as though it might do under the new gene technology regulation, I suspect that there therefore might be the temptation for some people to avoid doing things openly or move it off shore.

The Gene Technology Bill envisages complete recovery of all the funding required for running it. I believe that there are certain things that are done in the public interest that should therefore be paid for by the public through taxation and it should not be all on a 100 per cent cost recovery basis.

The Hon. J. R. JOHNSON: Why do you hold that view?

Professor GIBBS: Because I think that one of the reasons I pay taxes is in order for things to be done on my behalf that I could not personally pay for. I think that is what the taxation system is for. That is why we have a defence force and so on.

CHAIR: On the question of labelling, have you got a view on what percentage perhaps of GM foods in the product should be on the label?

Professor GIBBS: I think it should be totally labelled. I think if you can bother to label something and tell somebody okay, they are buying peanut butter, there should not be any greater difficulty in telling them that it contains a GM product.

CHAIR: The Prime Minister is suggesting that up to 1 per cent is okay. You would not accept that?

Professor GIBBS: I would not accept that, no. One per cent, for example, of aflatoxin, I presume, could be lethal. I do not know. You have to have things properly labelled.

CHAIR: We are told that there are certain trials in Australia. Kellog's, for example, recently said that most of its products are sourced in Australia with no GM foods going into them except that it is importing some soy products from America, where there could be some contamination, and it is suggested that there is. We would probably need to look at imports.

Professor GIBBS: Yes.

CHAIR: Rather than just the products grown in Australia.

Professor GIBBS: The five commodities that were listed for public comment last week by the food authority were of that sort. As I understand it, all they are seeking is permission to import GM products - five of them were listed -

for incorporation in food, but not growing them in Australia, when they would have to go through the gene technology regulations as well.

CHAIR: Just let me get that clear. There has been an application for five products to be imported that may have GM foods in them?

Professor GIBBS: Yes.

CHAIR: But what about the set-up that is coming in now that they have not applied for?

Professor GIBBS: I do not know the details but I assume that things have been brought in for trial. Nothing has been brought in that can enter the food chain, as far as I understand it.

CHAIR: In Kellog's All-Bran, soy and fibre.

Professor GIBBS: So it is already in the food chain. For example, a number of the comments made last week were that we know of no example of GM foods having had any proven disadvantageous effect on people. How would they know? They would not know at the moment.

There have been no long-term trials on people. The only long-term trial is the release of these foods into the food chain but people knowing that they are having a GM food versus a non-GM food. So it is an entirely hollow assertion that there is no adverse effect of GM food until it has been properly labelled and you know whether or not you have got it.

The Hon. I. COHEN: Professor Gibbs, I am just wondering whether you know of any independent or peer review assessment that has taken place and been published in relation to the transfer of antibiotic resistance to humans from GM foods.

Professor GIBBS: I do not know and I cannot quote you the details but I could get you some information. There was a paper published fairly recently in the scientific press. Somebody who was, I think, fair minded, sought to try to assemble all the experiments which have been done on this area.

As I understand it, the summary was that there was no proven example of antibiotic resistance genes having been transferred to the gut. But the evidence as presented in that the paper was the fact that really not a lot had been done on it. That is a general point that I wish to make again and again, that the risk-type of work has not been funded to anything like enough compared with the amount of effort that has been put into the promotion of trying to make these sorts of products.

The Hon. I. COHEN: So, on those grounds, how do you feel about the controversy often in the media that GM foods today are similar to the impact of the nuclear industry and also the pesticide industry now? Are we faced with potentially the same danger?

Professor GIBBS: You cannot say whether the danger is similar or not but it is certainly true, I think. With the use of DDT and the introduction of all of those other types of new technology, if you were to ask them at this stage in the use of those things were they safe, they would have said, "Yes, of course, it is perfectly safe," and later complications have been found.

On the whole, I think, though, that the majority of these things which are being attempted by gene modification seem to me to be potentially fairly safe but there are some of them that I think have potential problems for the environment, and one of them is virus genes.

The Hon. I. COHEN: When you say virus genes, which we all hear about, for arguments' sake, and the HIV virus and its potential, is it a viral thing, that potential to mutate, that rapid change, and how does that impact in terms of virus insertion in food crops and such like?

Professor GIBBS: No, the particular worry that I have is that virus genes are being used, as far as I know, in at least a couple of ways, or three ways. One way they are being used is sort of as tools in the biotechnology process because they are very good at controlling other genes, so they are being used as ways of putting genes into things and seeing what is going on. So that is one way they are being used.

The other way they are being used is that the first virus into a plant often keeps out its relatives. You can put a virus gene into a plant, so, for example, as mentioned by TJ, you can put a gene for papaya ring spot virus into a pawpaw plant and, in theory, you can protect it against infection. You only have to put a bit of it in.

The third suggestion of using virus genes is growing virus proteins in plants so that you could have your lettuce full of the HIV protein and you would thereby become immune to it because it would go through your gut system and, hopefully, enough would get in and you would build up antibodies against it. So all of these are ways in which virus genes are being potentially used.

Now, the problem is that the past evolutionary history of viruses shows that they readily swap genes with one another, whereas if you look at a virology textbook you can see that for cellular organisms like us and plants there is a sort of tree of life, you know, starting off at the simplest and building up a tree of hierarchically diverging branches, but with viruses it is like a strangler vine. They have been swapping genes all through their history.

By putting genes out into the environment, even bits of genes out into the environment in plants or so on, you are standing the chance of actually increasing the biodiversity of viruses, because if the gene is out there another virus coming by can pick up that gene. It has been shown experimentally. They can pick up the gene from plants and thereby change into another virus. That virus may not trouble the plant that it is found in, for example, the pawpaw or lettuce, but it might spread off into another crop and cause environmental problems.

The Hon. I. COHEN: What do you think of the experimental crops and the guarantees of the limited secret field trials at the present time in terms of that debate? Is it secure? Are the experiments being conducted in an appropriate scientific manner and are we going to be guaranteed safe foods as a result of that?

Professor GIBBS: Going back to are they being run properly, I do not know the specific details. The actual information given out about field trials and how they are conducted and what is being required by GMAC of the people who are conducting these trials is only available to me on the Internet, and the amount of information they give out is totally trivial.

You cannot work out what is actually specifically being required, but there is no reason for the trials on the escape of pollen to be done badly because there is very good scientific evidence about what is required that comes from the UK from the fact that they have gone into it in detail over the elite breeding schemes, where they have elite crops and elite lines, so they have had to work out what are the right sorts of boundaries to put round things and so on.

The Hon. I. COHEN: We were told, I think it was, 300 metres from other crops in Australia in secret trials. In terms of those elite experiments, how does that register with you?

Professor GIBBS: I do not know the specifics, and it will vary from crop to crop. With a wind-blown pollen, it is probably not enough because, as we know, pollen can go that far. If it is an insect-transmitted pollen that the plant relies upon, again, I think 300 metres is totally trivial because bees will fly those sorts of distances, but the sort of information, the sorts of requests that GMAC has been making are not there for me to assess.

However, the sort of general point is that GMAC has been operating in a fairly secretive way, in my opinion, by not putting out information, and in my particular area they have been deliberately misleading. I have tried to find out information - they refuse to give it to me - about what they are doing with specific regard to viruses, but if you look at what came out last week, for example, from the food authority, it is a complete generational change there in that for each of those five products they have put out apparently getting on towards 3,000 pages of data, so a scientist like me can look at it and actually realise that they have not done some things, as I realised by reading this.

You can get on to them from the Internet and say, "Have you thought of doing so and so?" They reply and say, "We have not yet had a chance to do that, but what a good idea." So the food authority gives me real hope for the future. All I hope is that the Gene Technology Regulator realises that the public will definitely flourish by being given information and that the debate will calm down.

The Hon. J. R. JOHNSON: Is the food authority a self-regulatory body of the food industry?

Professor GIBBS: No, it is another government one.

CHAIR: That is the Australia New Zealand Food Authority?

Professor GIBBS: That is right, ANZFA. It is equivalent to the Interim Office of the Gene Technology Regulator, and it is the other regulator that the first group were talking about here this morning. But it only controls the food process, whereas the Interim Office of the Gene Technology Regulator controls general gene manipulation-type work.

The Hon. I. COHEN: I am told that some 71 per cent of GM crops planted in 1998 were designed to be resistant to herbicides. There is a push to raise the current level of herbicide usage, particularly regarding Roundup. How does that auger for the direction of GE products and the argument that it is going to reduce herbicide use and therefore be safer? Do you have any comment on that?

Professor GIBBS: I agree with you. What is being said is illogical.

The Hon. I. COHEN: Is this true?

Professor GIBBS: I think it is illogical. I do not know the details of exactly how much they would use, but it strikes me as being totally illogical. If you are bothering to put the genes for Roundup into a plant, you would therefore want to spray all of that crop, so it is illogical to say you are going to use less herbicide because you would not be able to use any herbicide on the crop as it stood.

The Hon. I. COHEN: Is this something that is happening in other areas as well, other crops, other industries?

Professor GIBBS: As I understand it, the genes for Roundup-readiness are being put into crops other than cotton. I think they are being put into soya bean. In those crops there will probably be the use of a greater amount of herbicides but, again, in paperwork which came out last week from the food authority, it said that therefore there are particular regulations about how much herbicide can be in those crops when they come to the food chain, but they did not say who is responsible for insisting that those limits are not exceeded and who is testing for that.

The Hon. I. COHEN: Roundup is often seen as a relatively harmless pesticide. In Sweden there has been a link up with Roundup regarding non-Hodgkin's lymphoma and in California there has been reported a lot of illness from Roundup. Do you have any information about that?

Professor GIBBS: No, I do not, I am sorry.

The Hon. I. M. MACDONALD: My understanding of Roundup-ready crops is that because Roundup is such a general usage herbicide, any major crop, if you could get that crop Roundup-ready, you could eliminate all those other sprays you have to use for all those other crops that specific sprays do not hit. I have to do four or five sprays per annum.

If I have a Roundup-ready crop I can hit that crop with Roundup, knock the full spectrum of the weeds and not have to do three or four sprays, for which I have to put on a whole lot of gear or get other people to do that, so I do not think it is very safe.

Professor GIBBS: My sort of pseudo calculation was based just on Roundup. You are pointing out that, in fact, you would then not have to use these other sprays.

The Hon. I. M. MACDONALD: Yes. I do not really have many questions to ask but seeing as you have specialised in virus genes, you have not actually seen some really negative, full, scientifically accepted research in relation to it?

Professor GIBBS: There is a limited amount of research done principally in America. For example, if you put a transgene into a plant in order to prevent infection, you can then put in another virus and it will swap genes with that and become, in essence, a new virus. So there is some evidence for that. There is even evidence to suggest that that will be selected form.

The Hon. I. M. MACDONALD: Who is doing that in Australia at the moment?

Mr GIBSON: At the moment nobody that I know of. The other way of looking at this business of "is it likely that such a thing could produce a difficult virus", the answer is, of course, the only way you can look at it is by working out what has gone on in the past with viruses. It is clear that all major groups of viruses have arisen by the swapping of genes between existing viruses. That is the way viruses spread or are able to spread.

The Hon. I. M. MACDONALD: Do you believe we should stop this research on virus genes?

Professor GIBBS: No, I think we should have proper research to check on the possibilities.

CHAIR: Are you suggesting the Government should put in more funds so it is independent?

Professor GIBBS: That is right. It is clear that by looking at the sort of fossil record that is written in the genes of the past, some virus groups go in for a lot of recombination and some go in for very little in the whole of their past history. If we could find out what the differences were between them, and that is basic research, we might be able to exploit that to ensure that the viruses that we are really interested in trying to control are done safely.

It so turns out that the two major groups of viruses that cause problems in crops seem to have gone in for a lot of recombination. Two groups of viruses, luteovirus and the potyvirus, have done a lot of recombination in the past. We really need to find ways to try to stop that. The other viruses might be the clue for telling us, but unless we are doing the research we will not know.

The Hon. I. M. MACDONALD: There is not enough research going on nationally, but it is internationally?

Professor GIBBS: A certain amount of research is now being done in America. They completely changed the attitude in Britain in the last couple of years and realised that you cannot have a debate in which you say, "Trust me, it is perfectly okay." The public will not take that on. They are having to disclose properly to the public and funding research.

The Hon. I. M. MACDONALD: You would not be so worried about some of these chemical gene recombinations as distinct from virus, where you are taking a specific gene from another crop but it is not of a viral form?

Professor GIBBS: You were asking the question about the difference between hybrids and the new gene technology. The answer is that with hybridisation, you are putting together the genes from two totally viable organisms and you are trying to sort out of that the ones of interest. The thing about GM technology is that you fish out the gene that you think is really of interest and move that across.

The Hon. I. M. MACDONALD: That is quickening the selection process.

Professor GIBBS: Then you have to select downstream. First, you have to guess what that gene is and then somehow or other select it and put it across. The important difference in the technology is that if you are dealing with a gene coming from a nearby relative that you wanted to move across, all you are doing is speeding up something that you could do by the old conventional method.

The other thing you could do is put in genes that would not normally ever go across or there is no evidence that they have ever in the past gone across. So,

you know, putting fish genes into things. We have heard of all sorts of things, or putting virus genes into things. A limited number of virus genes have been found in cellular organisms but now we can do it whenever we want to. So it is a complete change.

The Hon. I. M. MACDONALD: I will accept a lot of what you are saying in relation to virus gene technology.

Professor GIBBS: But there are a whole lot of other genes. The gene which is currently being used for Roundup-ready is a bacterial gene. There is no evidence of many bacterial genes outside the nodulation genes, rhizobium genes.

The Hon. I. M. MACDONALD: Presumably there is a lot of research going into Roundup-ready? There would be substantial research going into its appropriateness?

Professor GIBBS: Sure.

The Hon. I. COHEN: Is that independent research?

Professor GIBBS: Yes, a lot of work is going on I think all over the place. Another very good thing about ANZFA, the food authority documents, is that they actually said where they are getting the information from and also put in the fact that a lot of those laboratories have been accredited independent laboratories.

One thing that was missing, which was raised here earlier, was the fact that they really need to also use, as it were, as a check up, an extension, work going on in Australia. For example, in the business of the food that they were talking about, the criteria they are using for whether or not the genes that have been put into the food are a worry, is really missing a whole lot of potential problems, but that could be solved by work which is being done here in Australia and in which Australia and Switzerland are leading the world.

The Government has set up the Australian Proteome Analysis Facility in Sydney. These foods coming in should go through a proteome analysis and not just check whether the gene they put in is producing something nasty or the gross, over all composition of the plant has been changed, but look at all the individual proteins that are in there because another gene might be switched on which in a normal plant is a low level and not causing any problem but as a result of the genetic manipulation has suddenly increased in amount.

Now, Australia is leading the world. We set up a national facility for doing proteome analysis and that should be applied as a sort of final Australian seal of approval on these plants.

CHAIR: They do not do it now. What you are suggesting is that all imports should go through that process?

Professor GIBBS: All of those ones, these five that they started and subsequent ones, this is a way in which Australia can be setting the world standard.

CHAIR: Why could we not do it to imported Bananas from the Philippines and not let them be imported until we got through the process?

Professor GIBBS: Well, it is a complicated and expensive business, but on all these sorts of attempts to generally release GM foods, the GM stocks, that should be one of the things which is part of the pile of evidence as to whether or not it is safe, and we are doing it.

The Hon. I. M. MACDONALD: It is a vexed question. You keep raising this conflict of interest scenario. The way government funding is going internationally for research, they are handing more and more to private enterprise. What is really different between people working on gene therapy and scientists working on finding the genes for cancer which gets big funding from American or other corporations that are interested in finding markets for a whole range of cancer genes? We would all like to have millions of extra government dollars but --

Professor GIBBS: You need to have a basis of curiosity-driven research and attach to that research that is funded for deliberate commercial interests. The stuff which is funded for deliberate commercial interests, however it is done, the community needs to have the safety and the efficacy of that checked on their behalf. They cannot do it individually because the funds require too much, but the safety regulators really should have independent money in order to be able to check that on behalf of the community.

The Hon. I. M. MACDONALD: Frankenstein foods is a bit over the top.

Professor GIBBS: Completely over the top.

The Hon. I. M. MACDONALD: I read about how the experiments of crops in Britain have been treated by, you know, Greenpeace and other anarchical-type organisations racing in and burning the crops down, ploughing them up. What does that have to do with scientific experimentation and curiosity?

Professor GIBBS: It is the way the debate was handled in public. Instead of telling the public so the majority of people would not support those activities, all they have done is the reverse of saying, "Trust me, it is perfectly okay." What needs to happen here, and I was worried because Wooldridge was on the box, I think it was two or three days ago, saying that under the new regulations we will let the area where the crops are being grown known but it will be commercial-in-confidence as to where they actually are. The person who is going to do that really should let everybody around there know. There is no need for it to be on a public register so that some loony could go and wipe it out.

The Hon. I. M. MACDONALD: But once that happens people will talk.

Professor GIBBS: But the farmer, just out of good neighbourly practice, needs to let his neighbours know that he is doing this.

The Hon. I. M. MACDONALD: But let us get real. If you tell your six or seven neighbours that you are doing a properly controlled scientific experiment in this area, with the emotions that have been generated, one of them is likely to tell someone. They are not going to be bound by any in-confidence stuff. It will be burnt out a week later.

Professor GIBBS: Then how do you keep openness, which is what they keep on talking about?

The Hon. I. M. MACDONALD: I think the results of it. I agree with you that the results of it should be more public information on it. I do not know about locations.

The Hon. I. COHEN: Would you not agree that there is real concern, particularly with Australia's position in the potential world niche market for organics, that this could destroy our reputation overseas, and it could destroy the livelihood of organic farmers in a region?

Professor GIBBS: Yes.

The Hon. I. COHEN: Given that, do you have any opinion on the liability and how that should be dealt with in terms of conflict of interest, real and perceived?

Professor GIBBS: I agree with all that you are implying, that there really are conflicts here between are we going to go green and clean or are we not going to know where things are going on so that nobody can give an assurance about anything and then how is liability covered?

CHAIR: And you are saying that the answer to that is more information?

Professor GIBBS: I think it is more information, more proper education, more openness, and more research.

CHAIR: I think on that note we might conclude. We will give you a copy of the transcript and with that there will be a number of questions on notice. Some of the members might include some further questions on notice, and there will be a reasonable time to get that back. It will probably be a couple of weeks before you get the transcript, anyway. Thank you very much for coming along.

Questions on Notice

1. Will genetically modified food technology have any impact on the gene pool for agricultural crop varieties?

2. What farm management techniques can be applied to limit opportunities for cross-pollination of related wild species?

3. Could you comment on how genetically modified food is being viewed by our Asia-Pacific trading partners?

4. How are the risks of genetically modified food technology being viewed by your colleagues in Australia and internationally?

5. What is your view of the potential problems with the introduction of genetically modified food technology in the short term and over the next 10 years?

(The witness withdrew)

(Luncheon adjournment)

GEOFFREY ANNISON, Scientific and Technical Director, Australian Food and Grocery Council, 28 Caley Crescent, Narrabundah, Australian Capital Territory, sworn and examined:

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Dr ANNISON: I did receive a summons.

CHAIR: Are you conversant with the terms of reference of this inquiry?

Dr ANNISON: I am conversant with the terms of reference.

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be heard or seen only by the Committee, the Committee would be willing to accede to your request and resolve into confidential session. However, I have to warn you that the Parliament may overturn that decision and release the details.

Dr ANNISON: That is fine.

CHAIR: Would you like to make some preliminary statements or comments first before we go into questions?

Dr ANNISON: Yes, certainly. Thank you, Mr Chairman. Before I do start I would just like to thank the Committee for inviting me here today to talk to you. I thought I would introduce you extremely quickly to the Food and Grocery Council.

The Australian Food and Grocery Council [AFGC] is the peak organisation representing Australian food and beverage manufacturers and other grocery products. It was actually originally convened as the Australian Food Council in 1995 but it merged with the Grocery Manufacturers Association at the beginning of last year to become the Australian Food and Grocery Council.

The current membership is about 165 companies and we represent in the order of 80 per cent of the gross dollar value of the industry. The terms of reference indicate that information is being sought about the importance of gene technology in terms of benefits and cost to New South Wales and the impact on agriculture and food processing industries and any possible adverse consequences of the technology.

A number of you may be aware that the AFGC, formerly as the Australian Food Council but now the AFGC, has had gene technology as a priority on its agenda for a number of years. We have made a number of submissions to the Commonwealth Government in its consideration of the issues and, in fact, I have brought copies of those along with me which I now place on the table.

Documents tabled.

They are basically a submission to Standard A18, which is the ANZFA labelling and safety assessment regulation; a submission to the Inquiry Into Primary Producer Access to Gene Technology; a submission in response to proposed amendments to the Environmental Protection and Bioconservation Act; two submissions about the Gene Technology Bill, which I think you would all be aware the Government is deliberating at the moment; and there is also a genetically modified food background paper, which just spells out some of the policy principles that the Australian Food and Grocery Council has in this area.

To underscore the importance of this technology and also the importance of the food processing industry, I will just mention a couple of statistics about its size. The current size is about $47 billion a year turnover in Australia. Our exports of highly processed food items from Australia are of the order of $6 billion per annum, and they have enjoyed 10 per cent growth per annum for at least the last 10 years.

Australia became a net exporter of processed foods about 15 years ago - not many people are aware of that fact - and we now enjoy a considerable trade surplus in processed foods. By this year, the year 2000, 75 per cent of the value of the internationally traded agricultural goods will be in the form of processed foods and, as you are probably aware, the processed food industry is Australia's largest manufacturing industry, employing about 170,000 people.

The Hon. J. R. JOHNSON: Does at a include animal foods?

Dr ANNISON: No, it excludes animal feeds. Did you mean animal feeds or --

The Hon. J. R. JOHNSON: Foods?

Dr ANNISON: Foods as animals? Do you mean things like meat?

The Hon. J. R. JOHNSON: Pal.

Dr ANNISON: Yes, it includes pet food but not intensive livestock feed, which Australia does not export a lot of, but it does export small amounts of livestock feed, from memory. Regarding gene technology itself, we have argued that potentially, or prima facie, gene technology has the potential to be a critical source of innovation, productivity and competitiveness for the food industry.

We do not advocate the technology itself but the food industry feels that it has a responsibility to examine the opportunities offered by the technologies and how they might assist the industry to bring better food to consumers.

There is no doubt that the technology will have a tremendous impact on all our life science-based industries - that is, agriculture, food and textiles, the pharmaceutical industry, medical, fisheries and forests - and it could well be a key tool for environmental protection. It certainly will be a source of diversification and better products produced more efficiently and sustainably across these industries.

Regarding the food industry, I am sure you are very familiar with the possibilities of the technology. It promises greater yields, foods with enhanced nutritional characteristics, low allergenic foods, foods with better quality in terms of enhanced shelf life, new food processes. It can assist in sustainable food production, enhance the environment in terms of bioremediation and securing biodiversity, and it has an opportunity to produce designer plants with more efficient insect-resistant plants and fertiliser-efficient plants, and so on, but essentially our view is that gene technology risk management techniques are essential to ensure that the benefits do outweigh any detriments that the technology might bring.

It represents significant opportunities for reducing the risk and impact of agriculture on the environment, providing food products which are at least as safe as conventionally produced foods. We believe that scientific methodology can be used to estimate hazards and to minimise them. But against that backdrop of what the science offers, of course it will only do that if there is a regulatory and a market environment which is conducive to the technology being adopted, and for that consumers confidence in the environment, and indeed consumers' confidence in a regulatory system, is critical.

The Australian Food and Grocery Council has always advocated a regulatory system for gene technology. Since the Australian Food and Grocery Council was formed in 1995, our basic position in this area has not changed. We have really had three planks. We have always advocated for a central agency governing the research and development through to commercial release of gene technology.

Originally there were discussions, as I am sure you remember, of a gene technology authority. The Government more recently has responded in forming first the Interim Office of the Gene Technology Regulator, which is currently within the Department of Health and Aged Care, the Therapeutic Goods Administration. Of course, once the Gene Technology Bill has gone through Parliament, that will become a gene technology regulator.

We have argued for current regulatory systems to govern the products of the technology. In the case of food, this would be the Australia New Zealand Food Authority. In that regard, we have argued really for two planks. One is a case-by-case, pre-market safety assessment of the products considering both public health and, of course, in other agencies such issues as environmental issues, but we have also argued that the provision of meaningful information about the products of

gene technology is particularly important. This can be through food labelling or through other means of providing information to consumers.

We believe that the current Standard A18, Food Produced Using Gene Technology, of the Food Standards Code provides that rigorous framework which is necessary for establishing the safety of food products. It also provides the critical keys to consumer choice through the labelling provisions of that standard.

Now, just to go on about labelling and information, we accept that public information is critical to the acceptance of gene technology. Consumers' confidence and business acceptance of the technology will be founded on how well the technology is regulated and how well information about the technology is disseminated to the community from independent sources.

We have welcomed the Commonwealth Government's Biotechnology Australia initiative, which kicked off last year, as a useful mechanism for providing information to the community. Indeed, the Australian Food and Grocery Council itself has been disseminating information through what we term the Food Science Bureau, which has been a specific capability established to disseminate scientific and technical information which is independently verified about the use of gene technology in foods. It also addresses other technical topics which might be of interest to the community in relation to food and food production and the food manufacturing industry.

In terms of providing information, the Australian Food and Grocery Council has also drafted, and it is only in draft form at the moment, a code of practice for the provision of information on food labels derived from gene technologies. This is intended to complement any regulatory requirements there are for labelling to bring consistency in labelling terms that might be used on food labels and also consistency on the provision of other information to the community to assist consumers making their decisions about the technology and food products for it. It will also provide companies with the capacity to differentiate food products in the market by virtue of their origin and source and also ensure the accuracy of such labelling.

We recognise that research and development is critical in gene technologies. It is important to establish the skills base across the nation for our scientists assisting industry, and that is not just the food industry.

We recognise that to really harness the capability of this technology, research and development across sections is important. We welcome the Government's initiative in the 1999 Federal budget in terms of its national biotechnology strategy and its commitment to biotechnology research and development.

We recognise that there are critical intellectual property issues that need to be addressed in relation to gene technology, and the Government has made some progress in that regard.

Now, just to make a couple more specific comments perhaps, in terms of the likely benefits of genetically modified organisms, innovation has always been an imperative for business, as I am sure all of you are aware.

The future value and the importance of genetically modified organisms is essentially unbounded. I imagine that it is really beyond our imaginations what it might provide ultimately. But it will be a source of innovation and, in the short term and medium term, of course, it will be critical for underpinning competitiveness in the food industry and other industries.

We think that the scope for rapid change will be constrained by the market-place. Gene technology will be for a long time used alongside other technologies, which might be used for improving plant and animal varieties, and it will ultimately be adopted by business only if it can demonstrate that it has advantages over those other technologies. All products will have to compete in providing those advantages and be cost competitive.

We consider that the immediate challenge to the technology is to demonstrate that it does not hold any inherent risks to the environment or to the public health greater than those imposed by other technologies.

We believe that it must be used in a careful and responsible manner with an effective and transparent regulatory oversight and that it is through those processes that it can offer benefits to the environment and the community.

In terms of impacts, history has revealed that businesses using better technologies ultimately compete more successfully than businesses retaining earlier technologies.

On the primary producer front, gene technology can improve plants and the varieties, of course, which will be more competitive than traditional varieties, but there will still be opportunities for niche marketing based on traditional varieties and production systems.

In terms of identification of any possible adverse consequences to trade, food safety and the environment, food safety and the environment and the risks that threaten them can be assessed using sound science as a basis.

Most recently, inquiries have concluded that with appropriate safeguards there are huge opportunities to exploit these technologies, and I am sure you are aware of the recent one from Fran Bailey's committee on primary producers access to gene technology. An OECD report came out last week as well.

There was the report from ANZFA and its safety assessments into gene technology foods, and in April the report "An Assessment of the Benefits, Safety and Oversight of Plant Genomics and Agricultural Biotechnology" was handed down in the US Congress from a subcommittee looking at the safety assessment of foods and how this gene technology should be regarded.

The Hon. J. R. JOHNSON: Are you making those available to the Committee?

Dr ANNISON: I can make copies available to you. Certainly, with the ANZFA document you probably have copies of already, I imagine. I will certainly make them available.

With regard to possible adverse consequences or benefits to trade, those really depend on the confidence of the community and the regulatory framework and ultimately it is dependent upon the market.

Certainly, if consumers are offered a choice of products without fear or trepidation sponsored by misinformation about the technology, then the consequences to trade will be determined on how the technology performs compared with other technologies against which it must compete.

There is a critical imperative that the Food and Grocery Council considers to providing widespread information about gene technology and the benefits it might bring and the regulatory framework which provides for it. As I mentioned before, the AFGC is committed to playing a leading role in the provision of information to the community through its Australian Food and Grocery Council food science bureau activities.

Basically, and to conclude, we believe that the technologies, gene technology and any other technology, must be introduced only with appropriate rigorous and transparent regulatory oversight. It must provide safeguards for the environment and for public health protection and, of course, it must be provided with effective communication about the technologies and how they are regulated and their potential benefits for the community.

That, Mr Chairman, is a fairly brief overview of the Australian Food and Grocery Council's position on gene technology.

CHAIR: Thank you, Dr Annison.

The Hon. I. M. MACDONALD: The question that I would like to start with is labelling, which seems to be one of the key issues about gene technology and information. What is your council's view of labelling and, I guess in a sense, you are not responsible for actual products as such, how practical is it and what reasonable steps can be taken to be able to overcome problems that some people have in this area?

Dr ANNISON: Well, the Australian Food and Grocery Council has been very close to the labelling debate for a long time. We made original submissions to ANZFA when they were drafting standard A18 which, if memory serves, essentially came into force on 13 August, 1998, but notwithstanding the fact that the health Ministers had previously intimated that they intended looking at the labelling regime again, and they did so in December 1998. That opened up the labelling debate which we have been having now for the last two years in Australia.

The original standard A18 states clearly that if a food is changed through the use of gene technology, then that change needs to be indicated on the label. It really reflects one of the fundamental principles of food labelling and, that is, in terms of regulatory requirements and anything that appears on the food label, it relates to the nature of the product itself rather than its source.

Now there is one glaring exception to that and, that is, country of origin labelling where there are mandatory country of origin labelling requirements, as I am sure you are aware, and the industry has a view on that. Essentially, we have said that our labelling policy has always been very clear and, that is, we will label clearly and substantiate our label claims.

We have said for a number of years that the food industry will go beyond any regulatory requirements to label to give information on food labels that the consumer seeks. Our position, going through 1998, was that we could do that by having a straight-forward regulatory system which would be standard A1.18 as it currently exists and as it existed then, backed up by a commitment from industry to provide further labelling of a voluntary nature and in accordance with the code of practice which I mentioned, as well as a commitment to provide further information about foods.

The food industry already does this. It provides information to consumers about all sorts of issues through all sorts of ways. The labelling debate is really going into the end game now. At least, I think everybody hopes it is. On 28 July, the health Ministers are considering what the regulatory options are for extending the current labelling, and they are extending it into the area of foods which is substantial equivalent, and I trust everybody is familiar with that term.

To blanket label everything, as I am sure you have heard, is going to be extremely difficult in terms of identifying which products have had gene technology used in their preparation and which ones have not had gene technology used in their preparation. It is difficult for a number of reasons. Those reasons relate to the fact that food companies import food ingredients in forms of processing aids, additives, refined ingredients as well as commodities from all over the world to include in food products in Australia.

Whereas we may be able to put in segregation systems in Australia, it will be difficult to insist on those segregation systems in jurisdictions that do not have

similar regulatory frameworks or requirements. So, tracing the material back through the very complex distribution system that we have would be extremely difficult. So there are practical constraints to how easy it is to blanketly label food products.

There are also issues of whether any labelling that food products did have was potentially misleading in any case. I am sure you are all familiar with the debate about whether processing aids should be included in the labelling, whether additives should be included, whether refined ingredients should be included and whether there should be thresholds.

The Australian Food and Grocery Council's position on this is that if we do extend labelling, then we need to be looking at some elements that have already been incorporated into labelling regimes overseas, which include those such as the European Union. The European Union now has labelling regulations specifically for genetically modified soy and maize products.

They provide for some exemptions based on whether - they do not address processing aids in their labelling, so they are effectively exempting them, anyway, but certainly additives from soya beans, for example, are considered on whether they contain DNA or protein from the genetic modification. That, in itself, is valuable because it is bringing it back to the nature of the product rather than the source of the product, whether there is or there is not DNA or protein there.

It is a little problematic at the moment because the assay systems are less than perfect. Whereas they are highly sensitive, they are not very robust and they are yet to be standardised by regulatory agencies in a way that we have confidence that they will be able to be used for law enforcement and, indeed, they are not even at a level yet where the industry itself has confidence in them in terms of routine quality insurance. It is possible you have heard about that term from other people.

So we think that the labelling issue is clearly unresolved from a regulatory point of view. We think that the market will provide or should be allowed to provide on top of any regulatory requirements, and there are examples of that now.

For example, in Australia the organic food movement brings food to the market in Australia in the total absence of regulation about the labelling of those products, except they are covered by general Trade Practices Act legislation at both Commonwealth and State level where, if they make a claim, it basically has to be accurate. But there is no provision in the food standards code for organic food.

The Hon. I. COHEN: They do have NASA now, which is a standard organisation where they get accreditation from.

Dr ANNISON: That is voluntary.

The Hon. I COHEN: To be able to label that there is that regulation, surely?

Dr ANNISON: It is not captured in the food standards code, which is the primary regulatory instrument that the industry looks to. Two more examples are kosher food and halal food. There is no regulation in the food standards code describing what kosher food and halal food is. Yet we have the food industry in Australia providing for these niche markets or these subgroups of the population very effectively in terms of the labelling and giving guarantees to those communities about the nature of those products, and it does so in the absence of regulation.

We believe that the market can provide that sort of response as well for gene technology foods. We believe that because we know that some members of the Australian Food and Grocery Council are getting a lot of calls about the nature of their products and whether gene technology is used. No doubt they will be providing information to their consumers and they will go on to provide information to their consumers about that, whereas other members are receiving no calls.

So, clearly, there is a range of interest among consumers and consumers will seek out those food companies that provide them with the information they require about their food products.

The Hon. I. M. MACDONALD: That was an answer to 10 questions. I do not think I have much more. I mean, this labelling issue is obviously going to be a key factor in the GM debate over the next six to eight months. We have legislation coming before our Parliament in relation to these matters.

It has been said that you should add that this food contains a GM product. That is one of the things that people are raising. How far can we sensibly go? Can we say 1 per cent or 2 per cent of the product, under 1 per cent you forget it, or do you have to be right down to .0.1? If it is an additive --

Dr ANNISON: The food council's position on this at the moment is that if labelling should be extended, then a threshold is appropriate and 1 per cent is probably an appropriate amount. Thresholds are well established in food regulation. For example, in Europe where they do have organic food regulations, they have a 5 per cent threshold for non-organic material in organic food products.

There are a lot of other examples where thresholds are set, and they are set, really, because you cannot legislate for zero because you can never actually test for zero. You can never actually assess there is a zero amount there. You can talk about limits of detectability, but ultimately that is a threshold, anyway, depending on what you are assaying for and the particular assay you intend to enshrine in regulations as a standard assay.

Now, whether it is 1 per cent or .1 per cent, my understanding of the techniques at the moment is that in some food materials, some commodity food materials, the testing can reliably distinguish between zero and 1 per cent, which is really what is required. So it will pick up something at 1 per cent and distinguish it from zero but it will have more difficulties distinguishing between .1 per cent and zero. So, if there is to be a threshold value, 1 per cent is probably more sensible than .1.

The Hon. I. COHEN: I am a little perplexed when you talk about percentages, and I know this has been discussed to a great extent, but surely there is a difference between a pesticide residue level in, say, an organic product and finding a percentage in certain classifications? Whilst it may not be mandatory, there are self-imposed or industrial classifications within the organic produce area.

Surely there is a difference when you are looking at genetically engineered product in materials? So, if it is a virus or bacteria input, does not that make it a little different from a quantifiable pesticide residue or something like that?

Dr ANNISON: My reference to a threshold in the organic food regulations in Europe was not related to the presence or absence of a pesticide. It is just material grown in a non-organic way is allowed to be in material that is grown in an organic way up to 5 per cent. There are other examples. For example, I think the standard for, I think, yellow maize, they tolerate maize up to non-yellow maize into that maize up to a certain amount and it is in agricultural commodities as well.

If we have wheat, for example, it can have other grains in there, barley up to point 5 per cent. It is the nature of our distribution systems not to segregate in absolute terms as it comes through because to do so requires absolute attention to ensure that material does not cross over.

To date that has not seemed to be necessary. It has not been deemed to be necessary because, apart from the cost, there has been no problem associated with a minor cross-over of material, certainly not from a public health and safety point of view. That is being addressed with the caveat on that in terms of cross-over of allergens which is a slightly different issue.

I think the point about thresholds is that in a system where we do not have perfect testing procedures so we cannot measure absolutely an amount that is there, the threshold provides a degree of protection to companies and agricultural systems to account for the movement of material between them at very low levels. So I would say the position of the Council at the moment is that it supports the concept of a threshold.

The Hon. I. COHEN: It was interesting that you mentioned kosher and halal food. There was an article in the *Sydney Morning Herald* I think a couple of days ago talking about source material, be it pig, in GE food saying that it might be

an entirely different product. How do we deal with a situation like that where there are certain philosophical and ethical concerns?

Dr ANNISON: That can be handled in the same way again. So far as kosher food is concerned, my understanding was that the Rabbinical Council in 1996 initially assessed gene technology. I think the example they had was the presence of a gene from a pig in food. They considered that not to be an issue for the religion.

I did hear somewhere that they are looking at that issue again, and no doubt they will continue to revise it. My answer there would be that if it was determined that kosher foods should not be made from products which had pig genes in them or any gene technology was used, then that would be an initial specification that the religion would put into the preparation of its foods and the market could provide for that.

The Hon. I. COHEN: How do you see your organisation's role in terms of both reality and popular perspective in terms of the Asian-Pacific and also the European markets in terms of labelling and the value of a non-GE product compared to a GE product? Unless I am mistaken, the world is divided in terms of its marketing on those issues.

Dr ANNISON: I think certainly we would think that for a long time gene technology products will be offered alongside non-gene technology products and it will go on a market-by-market basis. I do not know, and I do not think anybody can estimate exactly where the markets are going. Where they go will be dependent to some extent on the level of information that is out in those communities and, if you like, the level of confidence those communities have in regulatory systems overseas and their own regulatory systems.

Just from a technical point of view, I would have hoped that in the longer term the gene technology issue would no longer be an issue because, from a technical point of view, I do not believe there is a real issue that cannot be addressed by appropriate regulation and the application of sound science in this area. But the market will respond in any case.

Food companies in Australia will be marketing product only if it is acceptable to those markets, and we will see where those markets go. It is commonly said, for example, that Japan is shunning all gene technology food, yet I was informed the other day that they are currently buying canola from Canada which is 50 per cent GM.

The Hon. I. COHEN: But they are also, I think, for example, starting up a business around soy beans in the US. They are actually getting non-GE soy beans sourced because of the ban in the Japanese market. How do you balance from your industry's perspective the value of a non-GE product in terms of Australian exports with a GE product?

Dr ANNISON: We have not valued it at all in any commercial sense. We have always said that it is the role of the authorities to ensure that we have a regulatory system that we can have confidence in. We have said that the market environment requires the full and open dissemination of information about gene technology. Then the market itself will determine the products which it uses and our food companies will determine individually whether to use the products or not and serve their market.

The Hon. I. COHEN: You would support truth in labelling given the constraints of the percentage you were talking about before, yet Dan Glickman - he was the US agricultural secretary, and he still might be - is very much a supporter of the GE industry. He stated that ultimately if the consumer does not buy the technology is not worth a damn. Is there a problem with the labelling and then the selling of the product and the concept? Do you see a problem there? How do you see a way around that?

Dr ANNISON: I think, and I am sure most members of the Committee would agree, that the debate about gene technology foods has been one which has had a certain amount of emotion injected into it and, certainly in countries overseas, a certain amount of disinformation.

We are heartened by the fact that in Australia it has been a little bit more levelled. But, really, information is only as good, if you like, as the backdrop to it. A statement about a food being gene-technology derived or not will have different impacts depending on the information that accompanies it in the broader environment.

We are aware that in a situation where there is fear and trepidation in consumers about gene technology, perhaps sponsored by misinformation campaigns that are picked up by the media, then that becomes a de facto warning statement and, to be quite frank, our members are concerned that that is exactly what gene technology labelling will become - a de facto warning statement on food products.

However, if the converse is true and consumers do have access to good information and they realise that gene technology when it is used either for agronomic uses - it can provide benefits for the environment - or when they ultimately have access to products which are derived from gene technology but have tangible benefits built into them, such as enhanced nutritional properties, then the labelling will be a benefit to the food product, and it will be a point of differentiation for food companies and a valid means of product identification for consumers.

It really depends, as I am sure everybody would agree, on the nature of the market and how much confidence consumers have in the foods and the food supply and the regulators and the authorities.

The Hon. J. R. JOHNSON: Doctor, is your organisation totally funded by industry?

Dr ANNISON: Totally.

The Hon. J. R. JOHNSON: Has it a code of practice that would encourage, advise and promote the use of toll-free numbers to advise on, say, storage, cooking, performance, risk, dosage, remedy, shelf life? A considerable number of products now are showing a toll-free number for advice on all sorts of things, including some of those I have listed there.

Dr ANNISON: The organisation has a toll-free number for the Australian Food Science Bureau, the Australian Food and Grocery Council's Food Science Bureau.

The Hon. J. R. JOHNSON: But it does not deal with every product that a manufacturer makes?

Dr ANNISON: No, it certainly does not, and that is because we are a single organisation, but individual companies often have toll-free numbers on their food products.

The Hon. J. R. JOHNSON: My question was: in your code of practice do you advise, encourage and promote the use of toll-free numbers by your constituent bodies?

Dr ANNISON: The draft code of practice as it is currently written, and it is only a draft, from memory, encourages the dissemination of extra information about gene technology by a number of avenues, including toll- free numbers.

The Hon. J. R. JOHNSON: Whilst we have heard a considerable amount about product security, with Herron, Smith, Kline and French and Arnotts, are you developing a process that one could have absolute confidence in the product that is offered for sale by your constituent body of members so that we do not run into these difficulties?

Dr ANNISON: The Herron, Smith, Kline and French and Arnotts episodes resulted from product tampering. My understanding is that those products were tampered with in a way that rendered them toxic. Now, the Australian Food and Grocery Council has done a lot of work in this area, and it really is a separate issue to the gene technology issue, of course.

The Hon. J. R. JOHNSON: I realise that.

Dr ANNISON: We have disseminated guidelines to our members about appropriate responses that they should go through if tampering should occur.

Those guidelines have been drafted in full consultation with the police in different States and Territories. In fact, the Australian Food and Grocery Council has helped co-ordinate the move that has been going on to bring consistency across States in terms of how product tampering issues are held.

The Food and Grocery Council takes this issue extremely seriously. But I see that as a different issue from the gene technology issue, really, whereas one is malicious intent --

The Hon. J. R. JOHNSON: I do too, but I wanted to go to the issue, since you were here.

Dr ANNISON: That actually is not my jurisdiction within the Food and Grocery Council but certainly if you phone the Food and Grocery Council I have a director, a colleague of mine, whose work in that area can provide you with a lot more information than I can.

The Hon. I. COHEN: Dr Annison, I am wondering how you might envisage that farmers growing GE crops can indemnify themselves against putting neighbouring organic farmers out of business and if that reflects across to your organisation or members in terms of labelling dispute?

Dr ANNISON: I am not an expert in legal matters such as that, so I do not feel entirely free to comment, but when organic farms are situated next to non-organic farms now there is already a potential for there being some movement of pesticides or agricultural chemicals from one farm to the other. I would imagine that similar legal redress exists in those situations as would exist with the gene technology issue. It is not clear to me why there would be any difference.

CHAIR: I have some questions that we would like to put on notice, but what role can the New South Wales Government play in planning and co-ordinating and legislating for GM food technology in New South Wales to achieve the greatest benefits and minimal health and environmental risks?

Dr ANNISON: What can you do?

CHAIR: Because we will need some legislation complementary to the Federal legislation later in the year.

Dr ANNISON: It is my understanding that the legislative framework has been constructed by the Commonwealth with the intention that the States and Territories are brought into that and are part of that legislative framework. In a similar way that, for example, the food regulations are adopted by reference in the other States to the Australia New Zealand Food Standards Code, then it could be done in a similar way at a State and Territory level.

My view is, and I am sure this would be reflected by the Council, that New South Wales in developing its regulations should look for consistency with what is happening at the Commonwealth level and consistency with what is happening in other States and Territories because, ultimately, the industry - this is the agricultural industry but also the food industry - in order to minimise the costs would be looking for consistency across jurisdictions. That is a well-established philosophy that has been in train for some years now.

CHAIR: What does your organisation believe is the consumer sentiment towards GM foods? Can you take that three ways - in America, Australia and in Europe? Do Australia first.

Dr ANNISON: Well, it is our information that there is no such thing as an average consumer, and different consumers have different concerns. We heard from ANZFA the other day that as far as the food issue is concerned food safety from microbial food hazards rates higher than gene technology as a possible concern.

I think there was also a survey done not so long ago that indicated that consumers were not overly concerned about gene technology foods when contrasted with other issues such as the GST, job security, health and education, so it has different levels depending on what you are considering.

Our information also, as I mentioned earlier, from our food companies is that there is certainly a group of consumers, and it might even be a substantial group of consumers, who are very concerned and they choose foods and food companies on the basis of how they think they can most effectively benefit or get the most benefit in terms of health and lifestyle issues. There are other consumers out there who are much less concerned.

Some companies are receiving a lot of inquiries about the use of gene technology and, indeed, just receive a lot of inquiries, period, about gene technology and nutrition and health issues. Other companies receive very few inquiries in spite of the fact that they have put 1800 numbers on their food packages.

I think it is almost certain that if you start looking at different countries, you have consumers with different concerns. In Europe, all the evidence is that the consumers are more concerned about food safety issues than in the United States, and people have proffered views on why that should be, ranging from their unfortunate episodes with BSE [bovine spongiform encephalitis], through to my own pet theory which is that it relates to the rural nature of England.

I was brought up in England in a small town called Bedford which is near London. I could get on my bike and cycle out 10 miles and be in the midst of rolling wheat fields and see cows in the field. So the rural environment in a lot of England and in a lot of large population centres in England is extremely close to the population centres. You have the farming areas coming almost up on to your own

doorstep. Not only that, we used to go walking in it so it was an area for recreation as well.

Whereas in Australia, we do not spend our time in the wheat fields. We spend our time down at the beach and in national parks. I think most people are much less sensitive to their agricultural systems than they are in Europe. But that is a personal view. Different consumers in different parts of the world will have different concerns about gene technology.

CHAIR: It was stated that they are more concerned about the GST [goods and services tax] than in gene technology.

Dr ANNISON: I think there was a survey, and I cannot quite remember where I read it, that those issues are higher than gene technology.

The Hon. I. COHEN: Given your English background, how do you feel about at one stage the British were promoting gene engineering food and Sainsbury, for example, has banned it from its business? That is a fairly substantial step in terms of the impact of organisations you represent here in terms of export of food?

Dr ANNISON: We certainly have companies that export to Europe and to Great Britain. The Food and Grocery Council does not have a view on that because we have never really considered it. However, as somebody who reads of the newspapers, I quite frankly was dismayed by what happened in England in the way the debate was turned around. I think gene technology became a story in its own right. I think truth and common sense went out the window.

I have never seen any evidence that there is anything inherently risky about gene technology or what we are doing. I have been reminded in the way this technology is being considered is the story of pasteurisation in Britain. In 1908 or 1909 Sir Robert Cock demonstrated conclusively in a meeting to the royal society that tuberculosis was caused by a micro organism that was transmitted in milk and that it could be controlled and eliminated through pasteurisation.

Well, the British Government went through a series of what can only be described as policy debates about whether to mandate pasteurisation of milk. It went well into the 1940s and it only really became widespread, complete blanketing of pasteurisation in England as they went into the 50s.

Now, prior to that they had all sorts of criticisms thrown at pasteurisation, being that it was an unnatural process, that it was likely to change the food in some way with unpredictable consequences, that they already had a perfectly good supply system and distribution system and there was no need to intervene in that through pasteurisation.

We all know that you have to have rocks in your head to drink anything other than pasteurised milk these days because the health benefits associated with pasteurisation are so evident. Technology can sometimes take a long time to find its way through, and it is my belief that gene technology ultimately will find its use in foods and it will bring benefits to consumers and benefits to industry.

Human beings do not have a history of turning their back on technology and I believe as a scientist, as a practising research scientist of 20 odd years, it would be an appropriate use of sound science as a basis to estimate risks, the benefits will far outweigh the detriments.

The Hon. I. COHEN: You are satisfied that research has been adequate?

Dr ANNISON: I think the research is on-going. I think as the technology gets adopted more and more and opportunities come, the way the technology is used will advance. Certainly I think it might even have been Dan Glickman who said that there has not been one cough, one rash associated with gene technology.

CHAIR: I think that is an appropriate time to pull you up. I think your last two answers gave the Hon. Ian Cohen more questions than we have time to ask. We may well put some questions on notice.

The Hon. I. M. MACDONALD: It has been said that people equate the gene technology debate with the debate of nuclear power and energy. Do you think the more equivalent discussion is pasteurisation of milk?

CHAIR: On notice if you can because we have run out of time. We will give you a copy of the transcript in the next couple of weeks and if you see something there that you did not answer enough or you want to give us further information, please do so. Thank you very much for your time.

(The witness withdrew)