

Ascendancy of agricultural biotechnology in the Australian political mainstream coexists with technology criticism by a vocal-minority

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Abbreviations: ALP, Australian Labor Party; APVMA, Australian Pesticides and Veterinary Medicines Authority; CSIRO, Commonwealth Scientific and Industrial Research Organisation; COAG, Council of Australian Governments; FSANZ, Food Standards Australia New Zealand; LGFFR, Legislative and Governance Forum on Food Regulation; LGFGT, Legislative and Governance Forum on Gene Technology; OGTR, Office of the Gene Technology Regulator; SPS, Sanitary and Phytosanitary Measures.

Australia is a federation of States. This political structure necessitates collaborative arrangements between Australian governments to harmonize national regulation of gene technology and food standards. Extensive political negotiation among institutions of federal government has managed regulation of GM crops and food. Well-developed human resources in Australian government provided numerous policy documents facilitating a transparent political process. Workable legislation has been devised in the face of criticisms of gene technology through the political process. Conflicts between potential disruptions to food commodity trade by precautionary proposals for environmental protection were one cause of political tensions, and differences in policy priorities at regional political levels versus national and international forums for negotiation were another. Australian policy outcomes on GM crops reflect (a) strong economic self-interest in innovative and productive farming, (b) reliance on global agricultural market reforms through the Cairns trade group and the WTO, and (c) the importance of Codex Alimentarius and WTO instruments SPS and TBT. Precautionary frameworks for GM food safety assurance that are inconsistent with WTO obligations were avoided in legislation. Since 2008 the 2 major parties, Australian Labor Party (ALP) and the Liberals appear to have reached a workable consensus at the Federal policy level about an important role for agricultural biotechnology in Australia's economic future.

TBT Technical Barriers to Trade

Government in Australia as it is known today started some 200 years ago with the establishment of independent parliamentary governments by British colonists in the several individual independent colonial States. In the late 1800s these States negotiated the formation of the Commonwealth of Australia, which came into being in 1901. In forming the Commonwealth as a federation, the States placed limitations on the powers they ceded to the national Government,¹ and these constitutional limitations have constrained how gene technology legislation has developed in Australia. This paper explores the nature of these constraints and their outcomes. First a brief summary of the Australian political context is presented; the political events that are closely linked to major policy initiatives are then summarized, followed

with an assessment of recent changes to the Australian Government policy stance on agricultural biotechnology. Ref. 1 is representative of literature on Australian politics that can provide further context for this report.

One theme that emerges from this current study is that Australian politics mirrors the international conflicts between trade issues settled by negotiations at WTO forums and environmental issues negotiated at United Nations forums. A second theme is the prominence of key negotiation forums for resolving the tensions between the policy priorities prevailing at different political levels. Within Australia, (see Table 1) the Council of Australian Governments (COAG) and associated Inter-Governmental Legislative and Governance Forums that involve all of Australia governments play a major role. COAG comprises the Prime Minister, the Australian State Premiers and Chief Ministers, and the President of the

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Table 1. Main agencies and organizations involved in regulation of Australian genetically modified crops and food products (around M/S page 13)

Jurisdiction	Agency name	Main roles	Accountability	Oversight and negotiation
International	World Trade Organization including SPS and TBT agreements International Standards Organization Cairns group	Promotion of free trade Definition and continual improvement of generic international standards Reform of international trade in agricultural commodities	By agreement in GATT negotiations By agreement between partners	Role in trade dispute settlement
	Codex Alimentarius Commission	Definition and improvement of food safety and quality standards	By consensus agreement between participants and to WHO/FAO	Procedures defined by protocol manual
National	Council of Australian Governments (COAG)	Whole of government decision-making and policy development	To the Australian electorates	Includes oversight of LGFGT and LGFFR
	Legislative and Governance Forum on Gene Technology (LGFGT) Office of Gene Technology Regulator (OGTR)	Whole of government decision-making and policy on gene technology	To COAG To LGFGT	Oversight of OGTR Australian gene technology users
	Legislative and Governance Forum on Food Regulation (LGFFR) Food Standards Australia New Zealand (FSANZ)	Whole of government decision-making and policy on food regulations Develop food standards and scientific risk assessment methods	To COAG To LGFFR	Oversight of FSANZ Oversight of the Australian food chain from farm to fork. Advises OGTR Works with State agencies
	Australian Pesticides and Veterinary Medicines Authority (APVMA)	Centralized registration of all agricultural and veterinary chemical products	Works with COAG process	Includes herbicide and genetically modified insect protected crops where Bt protein is treated as pesticide product) Advises OGTR
	Department of Agriculture (DAFF)	Biosafety considers disease and pest ramifications of GM seed imports Certifies imports and exports of GM produce		Works with State agencies Includes oversight of GM seed for sowing and grain imports Certification of GM status of exports. Advises OGTR

Australian Local Government Association. In resolving policy tensions the Commonwealth has largely made decisions that promote Australian farm and agricultural trade interests but these have been contested by special interest groups and minority political interests who often advocate policies which support other stake-holders.

There are 3 tiers of governance in Australia: (i) the Federal (or Commonwealth) level with jurisdiction over the complete country, and involved in harmonizing national standards for industry and negotiating foreign policy and international agreements, (ii) regional State or Territory level governments – often essential for implementation and enforcement of national laws, and (iii) numerous local council administrations within a State or Territory. There are 2 houses in the Commonwealth Government—an executive chamber called the House of Representatives, and a house of legislative review called the Senate.

Executive power in the Commonwealth rests by political convention with the Prime Minister and Cabinet, who are accountable to the House of Representatives. Members of the House of Representatives are representatives of particular geographical regions within a State and their numbers are determined by population size. Negotiation between the States and the federal government are a regular feature of federal politics.¹

There are 2 main political parties, the Australian Labor Party (ALP), and its traditional opponent the Liberal party (who for

many decades have formed a coalition when in national government with a minor rural based Party called the National Party).² These 2 major political groupings have dominated the political scene for most of Federal parliamentary history, and together they consistently command first preference support from near 80 percent of the electorate. Currently the other minor party of significance is the Australian Greens which currently has about 10 percent voter support.

Since the ascendancy of Robert Hawke as ALP Prime Minister in 1983 with Treasurer Paul Keating (the next Prime Minister), the historical separation between the major parties of displaying a pro-labor as opposed to a pro-business affiliation has blurred, and both major parties now pursue essentially neoliberal economic policies that have been associated with a long period of economic growth and increasing prosperity.^{1,3} National government regularly alternates between the ALP and a Liberal-National coalition, but at the Federal level neither major party group has been hostile to agricultural gene technology. Typically one major party in power at the Federal level will face governments of an opposing political persuasion in some or all of the States, and several of the State Governments have disagreed with the Commonwealth on GM crop policy, and imposed moratoria on GM crop cultivation. There can even be disagreement within the one party about policies concerning gene technology. In the period

2007 to 2013 national ALP governments pursued policies that promoted a constructive role for gene technology in agriculture, while during the same period, ALP State governments in Western Australia, South Australia, and Tasmania maintained moratoria that prevented commercialization of GM crops in those states.

Because of the proportional voting system used in the State-wide geographical constituencies of the Australian Senate, a significant number of minor party and independent Senators are elected, and with the approximately even support for the 2 major parties, a Senate minority may hold the balance of power in the Senate and attract media attention. Minor parties in the Senate (formerly the Australian Democrats, but with their recent demise, the Greens) and particular Independent Senators tend to give gene technology more critical and dismissive commentary and to voice the concerns of the organic farming sector and other vocal critics of gene technology, such as the various movements expressing anti-Globalization sentiments. For example Australian Greens leader Senator Christine Milne announced in September 2012 that genetically modified crops will not be given any support by the Australian Greens party, and in December 2013 South Australian independent Senator Nick Xenophon called for a Senate enquiry into GM crop farming and what it costs non-GM farming neighbors. In February 2014 Greens Senators Scott Ludlum and Rachel Siewert called for reinstatement of the GM crop moratorium in Western Australia. Anti-corporate and food sovereignty sentiments are illustrated in a crowd-rousing speech by Senator Ludlum to a 2013 March against Monsanto rally in Perth, Western Australia.⁴

The Senate does not fully represent the political activities of all of the main critics of gene technology in Australia, but these are documented in the alliances of some the more active anti-GM activists. Firstly, anti-globalization convictions of the Gene ethics and MADGE activist networks are demonstrated by their affiliation with The Australian Food Sovereignty Alliance (www.australianfoodsovereigntyalliance.org) which has linkages with the international Via Campesina group. Second, Greenpeace Australia, Gene ethics, and MADGE have participated in the Alliance for Health Freedom Australia (www.health-freedom.com.au), which includes alternative medicine marketing organizations, anti-vaccine networks, un-registered cancer treatment vendors, anti-fluoridation activists and numerous health-related announcements by American alternative health product entrepreneur Dr J. Mercola.⁵ This alliance illustrates the commonality of interests between the financially profitable 'Lifestyles of Health and Sustainability' (LOHAS) food and medical supplements sector and many of the more vocal the gene technology critics in Australia.

Other informal coalitions of political interests are exemplified by the Australian based Safe Food Foundation that has been active in political activism centered on GM food safety issues. Founded by organic retail food store-chain proprietor Scott Kinnear, (formerly of the Organic Federation of Australia and the Biological Farmers of Australia), The Safe Food Foundation also includes businessman George P Kailis (whose family has extensive Australian food industry investments, including organic olive groves, seafood, farming, processed food, restaurants, and fast food chains). George P Kailis also sits on the board of the UK based Sustainable food Trust which styles the Safe Food

Foundation as a sister organization.⁶ Evidence he presented at hearings in the West Australian Parliament⁷ documents George P Kailis' business dealings with both John Fagan and Steven Druker, of Fairfield, Iowa who are both associated with Maharishi meditation religious group activities.^{7,8}

In the quoted parliamentary testimony, Kailis promotes a submission from highly successful Australian food industry proprietor Doug Shears (with horticultural, pastoral, and food processing interests such as, at one time, Uncle Toby's and Berri Juices companies). In the period before State GM crop moratoria were introduced in 2004 Shears was forcefully opposed to cultivation of GM crops in Australia.⁹

Safe Food Foundation partnered with the United Kingdom's Sustainable Food Trust to actively publicize Gilles-Eric Seralini and colleagues subsequently retracted September 2012 rodent feeding trial report on herbicide tolerant maize NK603.¹⁰

This publicity occurred in Melbourne virtually simultaneously with Sustainable Food Trust press conference announcements about this paper made in the United Kingdom.

Although domiciled in the State of Victoria, on 5th September 2008 during a Western Australian State electoral campaign, Kinnear placed a large color advertisement implying adverse health effects from GM soybeans in the West Australian newspaper and urging a vote against the Liberal party. More recently, Safe Food Foundation have partnered with Friends of the Earth Australia to raise money to support a legal suit in Western Australia mounted by an organic farmer against a neighboring farmer (Marsh v Baxter (CIV 1561/2012) before the Supreme Court of Western Australia. The unsuccessful suit by farmer Steve Marsh, now under appeal, sought compensation to Marsh for alleged damages due to Marsh's organic decertification after the accidental presence of genetically modified canola on the organic farm paddocks. The case has enlisted much anti-GM food activism in Australia (for example being mentioned in the previously mentioned 2013 March Against Monsanto speech by Senator Ludlum). Michael Baxter was supported by the Pastoralists and Graziers Association of Western Australia.¹¹ Full court documents relating to this dispute about farmer's rights have been made electronically available by the Supreme Court of West Australia.¹²

Australian Public Contributions to Technology Development

The Australian public service makes a strong professional contribution to policy development and technical standards development for industries, and this is reflected by the availability of well researched policy and technical documents which are well represented in the current publication's citations (e.g. ref. 3, 13, 14,15). There is also a significant publicly funded media network named the Australian Broadcasting Commission (ABC) who will often break news items relating to agricultural biotechnology.

Government also has a long tradition of carrying out scientific and technical research and development through the Commonwealth Scientific and Industrial Research Organisation (CSIRO), State Departments of Agriculture and funded research at Universities, and rates of public investment in research are high.¹⁶ Research

by CSIRO led to the early development of transgenic insect protected cotton varieties in Australia in the early 1990s. GM cotton was commercialized in 1996 in Australia by CSIRO, Cotton Seed Distributors and Monsanto Australia. This was prior to passage of Federal legislation governing environmental release of genetically modified crops. In the early 2000s commercialization of GM canola varieties were held up for some time by the already mentioned State moratoria on commercial planting of GM crops but they were eventually commercialized by 2008 in Victoria and New South Wales, and 2010 in Western Australia. Close to 99.5 per cent of the Australian cotton crop, grown in Queensland and New South Wales, is insect protected GM cotton.¹⁷ International seed companies also operate as part of the Australian commercial seed industry by licensing traits to other seed companies.

General Australian Public Opinion About Agricultural Biotechnology Is Not Strongly Polarized

Technology for genetic modification of food crops is a marginal political issue within Australia. Consumer surveys show that strong consumer opposition to crop gene technology (and strong support) are both minor components of public opinion. For example, opinion surveys in 2005 and 2007 asked Australian consumers the level of their support or opposition the use of genetic technology in food and agriculture, and these surveys revealed that about 8 per cent were strongly opposed to use of gene technology for foods, and a wide range of values for level of support were displayed by survey participants¹⁸ with overall responses evenly divided between support and disapproval of crop biotechnology. A survey carried out in 2001 reported similar results (cited in ref 18).

A 2014 study summarising analysis of over 10 years of Australian opinion surveys indicated that high public trust in scientists and watchdogs was associated with a positive attitude toward genetically modified organisms for food. Australians were less positive toward gene technology for food in years when media coverage was high. Despite transient changes as part of the media cycle, there has not been any major change in public attitude over this overall time interval.¹⁹ A 2007 study of nationwide Australian public opinion had also shown that general receptiveness toward science and technology was a primary predictor of the acceptance of gene technology; surprisingly, 'pro-nature' values did not predict acceptance or rejection.²⁰

Other farm issues figure more prominently in the political discourse than does crop gene technology. These include water-resource management in the Murray-Darling river system basin, market-power of retail supermarket chains, and agricultural competitiveness²¹ (see numerous recent papers in the Farm Policy Journal).

Commonwealth Legislative Power on Trade and Commerce Is Constrained by the Constitution and Action Can Be Resolved by Collaborative Federalism

Impetus to introduce Commonwealth Statutes to identify and manage risks posed by genetic technology gained momentum in

the 1990s, but the political pathways to do this were constrained by the Australian Constitution.

Part V - Powers of Parliament, section 51(i) of "An Act to constitute the Commonwealth of Australia 9th July 1900," restricts the legislative powers of the Federal parliament on trade and commerce to "Trade and commerce with other countries, and among the States."

Despite this constitutional limitation, many economic advantages can be identified for having a consistent and harmonized set of national standards across all Australian States and Territories, and the Australian governments have developed a cooperative process known as collaborative federalism to enable legal agreements to be forged between the states and the Commonwealth that foster coherent national legislation concerning trade and commerce. Collaborative federalism institutions linked to COAG were used to reform Australian national food safety regulation and include provisions for genetically modified foods over several years of extensive political negotiation over the interval 1996 - 2003. This reform process included provision for national gene technology regulation, mandated pre-market safety assessment of GM food, and mandatory GM food labeling as part of a new food standards regulatory scheme that is described later in this paper.

Collaborative Federalism Allows the States to Modify the Federal GM Policy Stance

As mentioned, the Australian States can disagree both with one another and with the Commonwealth government with respect to policies on gene technology. This disagreement is not necessarily related to differences in party affiliation. As previously alluded to, the ALP governments in less economically powerful States Tasmania and South Australia have consistently maintained bans on commercial growing of GM crops since 2003-4, but the cotton growing State of Queensland has never banned GM crops, even with ALP government. Post- 2004, changes of State GM moratorium policies to allow previously disallowed cropping with GM herbicide-tolerant canola have occurred in Victoria, New South Wales and West Australia. Late 2007, New South Wales and Victorian governments made announcements in concert that they would allow the state moratoria which had disallowed growing of GM canola to expire. The decision to permit commercial growing of GM canola in Western Australia was made several years later in 2010 in the form of exemption order under the Genetically Modified Crops Free Areas Act 2003 (WA) after the ALP had lost power at the 2008 State election.

This was followed in Western Australia by significant expansion of GM canola hectares since 2010. A consistently demonstrated yield advantage of hybrid GM glyphosate tolerant canola over the widely grown non-GM triazine tolerant canola has been associated with this expansion.²² In the 2013 National Variety Trials, several newly developed hybrid glyphosate tolerant canola varieties such as Hyola 500RR and IH30RR performed well in terms of yield and oil content,²³ and this encouraging trial performance may give impetus to continued expansion of Australian GM canola hectares, particularly in Western Australia.

During the Western Australian 2013 election the ALP opposition fought an unsuccessful political campaign that included anti-GM arguments against the incumbent Premier Colin Barnett who had led the Liberal-National alliance government that had permitted for the first time commercial farming of GM canola crops in that state by exempting canola from the GM moratorium. In contrast, after the recent 2014 State election in South Australia, an incumbent ALP government closely retained State government even after a state-wide voting swing against them, but in March 2014 the new ALP Minister for Agriculture Leon Bignell continued with the State policy stance against genetically modified crops, likening GM crops to tobacco and asbestos in terms of health risks. This stance may reflect advice given to Mr Bignell by anti-GM activists, as in March 2014 the decades long opponent of all GM crops in Australia, Bob Phelps of Gene ethics, was reported to have been meeting with Mr Bignell for some time.²⁴

Several National and International Institutions Play Roles in Regulation of Agricultural Biotechnology in Australia

A significant number of institutions have been invented or co-opted for regulation and policy formation relating to genetically modified crops and foods in Australia (summarized in Table 1), and the politics of GM crops and food has involved communication and advice and sometimes trade-offs and compromise between these organizations and agencies.

Of particular relevance to the politics of genetically modified foods are the obligations Australia has as a member of WTO to fulfill the Agreement on Sanitary and Phytosanitary Practices (SPS) and the Agreement on Technical Barriers to Trade (TBT) and a lack of harmony between WTO instruments and Cartagena Protocol on Biosafety legal instruments²⁵ to which Australia is not a signatory.

Australian Institutions Dealing With GM Crop and Food Regulation

Within Australia there are a number of distinct institutions that have developed to specialize in different regulatory functions and work to counterbalance one another in the regulation of genetically modified crops and food (Table 1).

Two governance forums mentioned in the table that were created by COAG provide a particularly central role in whole of government oversight of GM crops and food in Australia. These are (a) the Legislative and Governance Forum on Food Regulation (LGFFR, formerly called Australian and New Zealand Food Regulation Ministerial Council), and (b) Legislative and Governance Forum on Gene Technology (LGFGT, formerly Gene Technology Ministerial Council).

LGFFR provides whole of government oversight of food standards and regulation (including GM food) and the independent food safety agency Food Standards Australia and New Zealand (FSANZ). LGFGT provides whole of government oversight

of genetically modified organisms, the gene technology regulations and the independent scientific and technical agency run by the Gene Technology Regulator (Office of the Gene Technology Regulator, OGTR). LGFGT has ministerial representatives from all of the States and Territories of Australia and the Commonwealth. LGFFR has similar membership and also the New Zealand Minister for Food Safety and a representative from the Australian Local Government Association. Together the 2 forums provide a harmonized whole of government approach to management of genetically modified crops and food.

The OGTR and FSANZ are regulatory agencies largely confined to specifying standards, undertaking risk assessments and scientific aspects of risk management. The Office of the Gene Technology Regulator (OGTR) is overseen by LGFGT, and FSANZ is overseen by LGFFR. FSANZ and OGTR liaise with one another and with other appropriate agencies that include Australian Pesticides and Veterinary Medicines Authority (APVMA), who regulate agricultural and veterinary chemicals, and the Australian Department of Agriculture, who are responsible for quarantine matters and food imports (see Table 1).

FSANZ have issued an up-to-date Risk Analysis in Food Regulation framework that provides a good introduction to all their activities and their scientific basis. Appendix 2 of this risk framework usefully reviews the regulatory framework for food in Australia.¹⁴ The Gene Technology Regulator has also issued a similarly useful Risk Assessment Framework.¹⁵ These framework documents establish the consistency of GMO food and environmental risk assessment with Codex Alimentarius principles of risk assessment and other systematic risk assessment principles developed by the toxicology and risk profession since 1983 (well illustrated by the US National Research Council's "Red Book," ref. 26 and subsequent US Presidential/Congressional Commission reports on risk management.²⁷⁻²⁹

The arrangements mentioned above effectively separate policy-making, politics and governance (achieved by the Legislative and Governance Forums) from independent, evidence based standards formulation and risk identification, assessment and management carried out by the national statutory agencies FSANZ and the OGTR.

Because of the major economic and public health significance of food chain safety and integrity, the LGFFR is arguably more important in political terms than LGFGT, and there is a strong Ministerial development of food regulation policy in the Federal Department of Health that hosts the LGFFR.³⁰

Australian governance also has a counterbalance to the burden of overregulation, and this is provided to Federal government by the Productivity Commission (Table 1), as well as by other policy activities in government.

Marketing Postures Adopted by the States

One of the important functions of the LGFGT is to resolve differences of opinion between the States and Territories.

In 2003-4, coinciding with the time at which herbicide tolerant GM canola was first approved as safe for human health and

the environment by the OGTR, the State governments took up different postures on commercial GM crop cultivation – some were pro-GM, and several others anti-GM. The separation of responsibilities between the OGTR and the LGFGT enabled the States to exercise judgments in this context that were truly political, in the Machiavellian sense of the word.

Although State Government political concerns were primarily fuelled by public allegations by activist groups such as Gene ethics of lack of safety of GM crops, there was a less public, but political powerful set of business threats influencing State Government decisions.

These are illustrated by the announcement made by Victorian Premier Steve Bracks in March 2004 when he announced a State ban on commercial cultivation of GM crops:

The Office of the GTR has determined GM canola is safe for human health and the environment but the State Government has a responsibility to consider market implications for our exporters. Victoria is the largest exporter of food and fiber products. In particular, the State is Australia's largest dairy export the products worth about \$2.5 billion each year – on average, Victoria exports more than \$1 billion of grain a year.³¹

At this time, the State Government hypocritically promoted the State as having a “GM-free stance.” This did not mean GM free, as the Victorian dairy industry was accepting a 5 percent level of genetically modified animal feed for feeding as part of a 20-30 per cent of diet feed supplement to dairy cattle (which could well be GM cottonseed meal from NSW or Queensland, or imported GM soybeans or GM corn, such as those GM soybeans carried on the cargo ship *The Rein* which Greenpeace attempted to blockade in Australian ports in 2004).³²

Marketing posturing ruled the day. Victoria could not afford to be GM free, because that would cut it off from emergency animal feed imports that are necessary in years of drought, but it cynically exploited an ambiguously worded “GM-free stance” to falsely imply absence of genetically modified materials from the agricultural feed chain of that State (see article by journalist Graeme O'Neill “Political science: Green blackmail and the Victorian government” for more detail, Ref. 32).

Legal Instruments for GM Crop and Food Regulation and the Process for their Development

Table 2 summarizes some of the important legal agreements, Acts of Commonwealth Parliament, subordinate regulations and important working policy documents pertaining to regulation of genetically modified crops and food. The inter-governmental agreements that established the LLGGT and LGFFR forums document the main thrust of policy decisions (Table 2) and these are discussed below.

These documents and the processes that led to their creation represent a lengthy far-reaching process of political negotiation and compromise between numerous different parties, ranging from the Commonwealth government, the different States and Territories of varying political persuasions in Australia, House of

Representatives and the Senate, industry associations and non-government organizations, to scientific and technical specialists and individual interested parties among the general public. The diversity of such submissions is exhibited in several government reports (e.g., Refs. 33 and 34).

Inter-Governmental Gene Technology Agreement Signed by COAG

The Inter-Governmental Agreement on Gene Technology was signed by members of COAG in 2008. It contains important Recitals A and B carried over from an earlier 2001 Inter-governmental Agreement) and these provide a record of considered political policy decisions involving the whole of Australian government at both the Federal and State and Territory levels:

Recital A

there is a need for a cooperative national legislative scheme to protect the health and safety people and to protect the environment, identify risks posed by, or as a result of, gene technology by managing those risks through regulating certain dealings with genetically modified organisms and that,

Recital B. the Scheme should:

- a. provide an efficient and effective regulatory system for the application of gene technologies;
- b. operate in a seamless manner in conjunction with existing Commonwealth and State regulatory schemes relevant to genetically modified organisms and products derived from such organisms (for example, the schemes that regulate food, therapeutic goods, agricultural and veterinary chemicals and industrial chemicals)
- c. be nationally consistent, drawing on power conferred by the Commonwealth, State and Territory Parliaments;
- d. be based on a scientific assessment of risks undertaken by an independent regulator, his decisions must be consistent with policy principles issued by a Council of Ministers concerning social, cultural, ethical and other non-scientific matters (which principles must not derogate from the health and safety of people or the environment);
- e. ensure that the regulatory burden is commensurate with the risks and consistent with achieving the objectives referred to in Recital A
- f. be characterized by decision-making that is transparent, and that incorporates extensive stakeholder and community involvement;
- g. be able to be amended to respond to the development of gene technologies and their uses; and
- h. be consistent with Australia's relevant international treaty obligations.

Noticeably, there is no mention of a Precautionary Principle in this agreement. The language of the agreement and especially item h) is consistent with Australia's obligations as a WTO

Table 2. Major agreements, statutes, legislative instruments used in regulation of GM crops and foods in Australia (around M/S page 21)

Jurisdiction	Agreements between parties	Legislation	Legal instruments and other legal documents	Working documents
International	GATT-WTO Sanitary and Phytosanitary measures (SPS) Technical Barriers to Trade (TBT) Australian and New Zealand Treaty on Joint Food Standards 1995 amended			ISO 22,000 international generic food safety management system Codex Alimentarius particularly guidelines relating risk assessment GL30, GL46, GL62, GL68, GL76 Codex Alimentarius Commission Procedural Manual
National	Inter-Governmental Agreement on Gene Technology Inter-Governmental Agreement on Food Regulation	Gene Technology Act 2000 Gene Technology Regulations 2001 FSANZ Act amended 1991 Legal Instruments Act 2003 Imported Food Control Act 1992 Export Control Act 1982 Agricultural and Veterinary Chemicals Administration Act 1992 Quarantine Act 1908	Explanatory Guide to the Gene Technology Bill 2000 (Interim OGTR document) Gene Technology (Recognition of Designated Areas) Principle 2003 Food Standards Code 1.5.2	OGTR Risk Analysis Framework 2013 FSANZ Risk Analysis in Food Regulation 2013 Overarching Strategic Statement for the Food Regulatory System-LGFFR 2013 Labelling Logic Review of Food Labelling Law and Policy 2011

member and the SPS and TBT Agreements negotiated as part of that membership (see Ref 25 and 36 for a discussion).

Gene Technology (Recognition of Designated Areas) Principle 2003

State and Territory governments would only undermine the coherent national approach to food safety if they were to disagree about release of crops on food safety arguments, and possibly be acting inconsistently with Australia's WTO obligations. Accordingly the States and Territories had negotiated into the Gene Technology Act (Commonwealth) 2000 rights (assigned through the executive powers of the LGFGT) to designate special areas in which growing of genetically modified crops may be disallowed for marketing purposes, as distinct from safety arguments. Marketing of dairy produce from Victoria and wines from South Australia are examples of products whose marketability might in principle be claimed to be influenced by whether the State was permissive to cultivation of genetically modified crops.

The LGFGT (previously called a Ministerial Council) issued the Gene Technology (Recognition of Designated Areas) Principle 2003 on 31st of July 2003 to designate the mechanisms by which states could make marketing-based determinations about areas in which GM crops could be grown. It is the only policy principle issued by this forum.

Inter-Governmental Food Regulation Agreement Signed by COAG

An analogous series of items to those in the Agreement on Gene Technology appears in the Inter-Governmental Agreement on Food Regulation (2008). They, like those in the Inter-Governmental Agreement on Gene Technology are explicitly framed so as to provide a measured level of regulatory burden.

Notably the items include:

- reducing the regulatory burden on the food sector;
- facilitating the harmonisation of Australia's domestic and export food standards and their harmonisation with international food standards
- providing a consistent regulatory approach across Australia through nationally agreed policy, standards and enforcement procedures;
- supporting the joint Australia and New Zealand efforts to harmonise food standards.

These items reflect the need for consistency with Australia's obligations as a WTO member. They were the outcome of a 6 year long period of political consultation and engagement with stakeholders, which delivered substantial reform of the Australian food standards code and changed the operations and functions of the trans-Tasman food standards agency FSANZ.³⁷⁻³⁸

This reform period was initiated in 1996 with a change from ALP government to a Liberal-Coalition led by John Howard. In 1996 a Small Business Deregulation Task Force report entitled *Time for Business* was delivered to the Prime Minister. This report noted that the food industry was being hampered by the cost and complexity of existing food regulations.

In March 1997, major policy statement from the Prime Minister entitled *More Time for Business* included an announcement of a Food Regulation Review Committee. This review committee engaged in widespread community consultation.

In 1998 the Food Regulation Review Committee, Chaired by Dr Bill Blair Delivered its report *Food: a growth industry*. This review recommended ways to reduce the regulatory burden on Australia's food industry while maintaining public health and safety priorities.

The years 2000-to 2002 delivered numerous changes to the Australian food regulation system. There was substantial reform the Food Standards Code, Amendment of the FSANZ Act (Commonwealth) 1991, changes to the LGFFR, and increased responsibilities for FSANZ. Responsibility for food policy was given to LGFFR and FSANZ focused more strongly on standards development.

Food Standards for genetically modified food were introduced into the Food Standards Code (Table 2) as well as separate new gene technology legislation. The Gene Technology Bill 2000 reached the Senate 30 August 2000 and was subjected to a substantial public enquiry by the Senate Community Affairs Reference Committee that is documented in a book entitled *A Cautionary Tale: Fish Don't Lay Tomatoes*.³³ This Committee included ALP, Liberal, National Party, Australian Democrat, Australian Green and other minor party participants. The enquiry attracted 125 written public submissions (Appendix 1 of ref. 17) and more than 50 witnesses appeared at 5 oral hearings (Appendix 2 ref. 17).

Fish Don't Lay Tomatoes records a substantial debate about the Precautionary Principle in Chapter 3, which discusses the objectives of the then proposed Gene Technology Bill. This chapter records that:

3.39 however the precautionary principle as written in Australian environment policy and Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) applies a lesser test than 'absolute 100 per cent certainty that there is no risk'. The obligation on regulators is to consider identified risks carefully:

where there are threats of serious or irreversible environmental damage, a lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

and later the chapter continues:

3.59. The Committee notes that the Cartagena Protocol's objective reaffirms the 'precautionary approach' enshrined in Principle 15 of the Rio Declaration on Environment and Development rather than the precautionary principle itself. The committee also notes that CSR was unable to identify any legislation of similar scope and intent as the Gene Technology Bill 2000 and where the precautionary principle was intended but not explicitly stated [bold as in the original].

This Senate Committee discussion was reflected in a key amendment (4. (aa) detailed below) concerning environmental risk management of the Act as passed by the parliament.

The finalized Gene Technology Act (Commonwealth) 2000 under 4 Regulatory framework to achieve object, has what are often called the 3 pillars of the Act:

4. The object of the Act is to be achieved through a regulatory framework which:

(aa) provides that where there are threats of serious or irreversible environmental damage, a lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation; and

(a) provides an efficient and effective system for the application of gene technologies; and

(b) operates in conjunction with other Commonwealth and State regulatory schemes relevant to GMOs and GM products.

Item (aa), indistinguishable from Principle 15 of the 1992 Rio Declaration, was added to the original Bill as an amendment, and its features have been extensively analyzed by Weier and Loke.³⁵ Of the many possible versions of the Precautionary Principle it is narrow in scope and seemingly confined to prevention of environmental damage. Item b provides for food safety measures described in other Australian legislation.

These include The FSANZ Act (Commonwealth, compilation of 20 Sep 2013) 1991 gives under 3 Object of the Act one of several goals for FSANZ as:

(d) the establishment of common rules for both countries and the promotion of consistency between domestic and international food regulatory measures without reducing the safeguards applying to public health and consumer protection.

Codex Alimentarius³⁹ has also developed internationally accepted documents for food risk management that have undergone systematic consensus peer development through the Codex Alimentarius Commission (See the several Codex guidelines documents (GL) listed in Table 2). Section IV: Risk Analysis of the Codex Commission Procedural Manual also refers to general and specific texts on risk analysis for application in the framework of the Codex Alimentarius Commission and its subsidiary bodies dealing with protection of consumer health.⁴⁰

As noted by the Codex, risk analysis should follow a structured approach comprising 3 distinct but closely linked components of risk analysis, namely risk assessment, risk management and risk communication, as defined by the Codex Alimentarius Commission. This structure is widely known and taught within food industries of most if not all countries of the world.

Elsewhere in the Codex manual one notes: Precaution is an inherent element of risk analysis. Taken together, Codex, the FSANZ and OGTR risk frameworks⁶⁻⁷ and the toxicology risk framework mentioned earlier,^{14-15,26-29} form a comprehensive science based risk assessment of GM food intake by humans.

Unsurprisingly, several of these international standards for risk assessment and risk management are explicitly referred to in

the Australian food regulation system. A key arrangement is in the Inter-Governmental Agreement on Food Regulation which designates the responsibilities of LGFFR to include:

- i. the development of domestic food regulatory policy;
- ii. the development of policy guidelines for setting food domestic food standards;
- iii. the promotion of harmonised food standards within Australia between the parties (harmonisation of domestic standards between States and Territories and of domestic standards with export standards) and with Codex Alimentarius (harmonisation of domestic and export standards with international food standards set by Codex Alimentarius);
- iv. the general oversight of the implementation of domestic food regulation and standards; and
- v. the promotion of a consistent approach to the compliance with, and enforcement of, food standards;

Quite likely this reliance on Codex formulations of risk management is because of their substantial methodological strengths compared to the sometimes vague and often criticized Precautionary Principle.^{33,41,42}

A Change in Food Politics: From a Focus on Fear to a Focus on Opportunity

Until about 2008 much of the Australian public discussion of GM crops and food was risk management orientated, and consumer worries and fears dominated much of the public conversation.³³⁻³⁵ Such pervasive expression of public concern though the political process is hardly surprising, given the fundamentally risk averse nature of human psychology.⁴³

Quite clearly there are complex cultural, economic, food safety and nutritional issues entering into food politics, and in GM food politics in particular.⁴⁴ In an Australian setting the relative complexity of political issues involved is well illustrated by commentary in policy document Labelling Logic released by the Australian government in 2011.⁴⁵ It pointed out that (page 18):

“Food is a complex element of human existence. Rather than being merely a source of sustenance, it has individual, social and cultural functions and meanings that are intricately embedded in people’s lives. Social and cultural factors strongly influence the foods that people classified as ‘good’ or ‘bad’ in terms of safety, healthiness and taste. The consumption of food is linked to expressions of family and community connectedness, beliefs related to health and well-being, perceptions of appropriate ways to celebrate and reward, and as a means of coping with stress and boredom. People can seek confirmation of all these meanings, beliefs and perceptions when they read labels and select their food.”

As a psychologist Paul Rozin has observed elsewhere, “food is fundamental, fun, frightening, and far-reaching.”⁴⁶

The Labelling Logic report characterizes the drivers of food labeling policy as being the demands of 3 principal actors in the field – consumers, industry and government – and it recognized

that some of these demands overlap, and that others are in potential conflict.

Labelling Logic recommendation 2 advocated “that food labelling policy be guided by an issues hierarchy in descending order of (i) food safety, (ii) preventative health, (iii) new technologies and (iv) consumer values issues.” Genetic technologies were considered under the new technologies category. This hierarchy and the ways in which the Labelling Logic report was received by government and opposition shows the emergence of scientifically realistic weighting of risks for establishing policy priorities.

The Labelling Logic review is one several reviews of legislation that have relevance to gene technology. A review of the Gene Technology Act (Commonwealth) 2000 has been carried out twice and some improvements to the Act have been identified. These reviews illustrate the value of the systematic review processes for all Acts and Legislative Instruments carried out by the Australian Parliament, and that there is value in considering a broader perspective on labeling issues that is not solely confined to gene technology.

Food Security Crisis of 2008

November 2007 had marked a change of Australian government from Liberal-Coalition to ALP with the ascendancy of Prime Minister Kevin Rudd. Prime Minister Rudd returned from a world tour in April 2008 with a changed vision for Australia’s global agenda, and announced “We had 10 major sets of food riots across the world. . .the national agenda, [is now] how do we contribute to better food security around the world?” There was now an alignment between economic opportunities for Australian agriculture and traditional Labor values of social justice. Mr Rudd continued drawing attention to food security issues over the following years.

The ALP government subsequently changed its leaders, but continued to highlight in policy announcements aspirations to an innovative and productive agriculture that is emerging as a central buttress to Australia’s future economic development. New ALP Prime Minister Julia Gillard enthusiastically promoted an economic policy White Paper called Australia in an Asian Century³ prepared by a task force led by ex-Treasury Secretary Ken Henry. This white paper looks to a future involving “the transformation of the Asian region into the economic powerhouse of the world.” Prime Minister Julia Gillard stated, in the introduction to this White Paper, that “thriving in the Asian century therefore requires our nation to have a clear plan to seize the economic opportunities that will flow and manage the strategic challenges that will arise.”

Chapter 7 of the Henry (2012)³ report was devoted to “Operating in and connecting to growing Asian markets” and was directed toward tapping into regional opportunities and linking with value chains. It projected strong growth in Australia’s trade with Asia, and noted Asia’s surging demand for food. It mentioned the need for removal of unnecessary regulatory impediments to doing business, and it had a prominent case

study on Australia's agriculture and food sector. It saw a future role for improved agricultural innovation through joint government industry investment.

The Henry report signaled a major pivot in Australian economic policy toward greater reliance on exports of agricultural and processed food products for economic growth and was followed by a National Food Plan White Paper which gave explicit support to consider the use of crop biotechnology as a platform for productivity growth.⁴⁷

The National Food Plan noted that an expanding Asian middle class was an important opportunity for Australia's food industry. It noted that Australia needs to work persistently to break down barriers to trade and promote open markets. It advocated that Australia should market its expertise in agricultural innovation and research. The plan pointed to the challenge of not just growing more food, but lifting Australia's productivity—doing more with less. Section 4.1.3 of the Food Plan welcomed biotechnology:

“Biotechnology, including genetically modified (GM) food products, will be essential to meeting future food needs in Australia and around the world. Although biotechnology alone is unlikely to meet world food demand, we need to use all available technologies to confront the challenges of increased world food needs.”

In this food plan, there was a prominent statement about genetically modified foods.

“People have been manipulating the genetic make-up of plants and animals for thousands of years using traditional cross-breeding methods, selecting plants and animals of the most desirable characteristics to breed the next generation.” It noted that the safety assessment in Australia is one of the most rigorous in the world, and said “this ensures that approved GM foods have no greater risks than comparable conventional foods and that they offer the same or greater benefits. With this safety net in place, we support the use of GM foods.”

Major Party Consensus on Crop Biotechnology at the Federal Level

The 2 main political parties are currently in broad agreement at the Federal level that the current legislative arrangements for genetic technology are appropriately structured. For example, during the 2010 Federal election campaign technology critic activist group Gene ethics wrote to several political parties to ascertain their position. A Gene ethics activist “election report card” which included proposals to label all foods made by genetic manipulation and reduce research investment on GMOs used for agriculture, gave failure ratings to both the ALP and the Liberal National coalition, and only gave ticks of approval to The Greens and the Socialist Alliance, which are both minor parties in Australia. The report card by Gene ethics accurately summarizes the considered political responses of the main Australian political parties at that time.

In the 2010 Federal election in the House of Representatives the parties given a fail by Gene ethics got 81.3 per cent of first

voting preferences nation-wide. The Greens got 11.76 per cent and the Socialist Alliance got 0.08 per cent first preference votes. In the subsequent 2013 election the percentages were very similar. Strong rejection of food and crop biotechnology is clearly a minority political stance in Australia, and the centrist major parties that give it considered support command the first preference of close to 80 per cent of the electorate.

Convergence of views between the main political parties to a position of measured support for agricultural biotechnology can also be identified in party policy statements that were made in response to the previously mentioned 2011 Review of Food Labelling Law and Policy requested by COAG.⁴⁶ This review provided a formal parliamentary process for a robust and transparent discussion of potential changes to Australian food labeling codes in response to concerns about genetically manipulated food ingredients. Policy suggestions that advocated more precautionary labeling of GM foods were abundantly recorded in the submissions to that review. In its response to this report, the Australian Government (then ALP led) declined to take up several of the restrictive Labelling Logic report recommendations about GM food labeling, and they were supported in doing this by the Federal (Liberal-National coalition) opposition who in a press release, took the politically rare step of commending their political opponents for “adopt[ing] a sensible approach to communicating information to consumers about genetically modified food technologies.”

Although the Liberal-National coalition did not adopt the National Food Plan when it replaced ALP government after the 2013 election, gene technology continued to fit with rural sector policy proposals. In early 2014 Liberal-National coalition Agriculture Minister Barnaby Joyce issued an Agricultural Competitiveness Issues Paper calling for a White Paper that will help “ensure that agriculture, as one of the 5 pillars of our economy, realizes its full potential through innovation, productivity, investment and trade.”²¹ The terms of reference in this document included “Improving the competitiveness of inputs to the supply chain” and “Reducing ineffective regulations” and these are compatible with continued exploration of a productive role of gene technology in Australian agriculture in the context of other initiatives to enhance agricultural competitiveness.

Conclusions

The Liberal-National coalition (1996-2007) delivered regulatory reforms that ensured effective and credible risk management of GM crops and GM food, and this provided a platform on which ALP-led governments subsequently have included crop and food biotechnology as part of a major policy pivot that emphasizes agricultural exports to Asia as a major opportunity for growth. Crop biotechnology was specifically included as part of productivity improvement in the 2012 National Food Plan policy strategy⁴⁸ which looked to expansion of export trade in food products for growing Asian markets in coming decades. Subsequently other reports have reinforced the evidence for this opportunity but emphasized that gene technology is only one

part of a wider range of factors that are important for a renewal of farm productivity increases. For example liberalizing economic reforms carried out by both the Hawke Keating ALP government's and the Howard Liberal-National coalition government over the last several decades are recognized as providing a more favorable enabling environment for increased agricultural productivity.^{3,13,21}

Australian government policy papers and reports of legislative review panels provide a comprehensive and transparent documentation of most aspects of this process of policy change. One of Australia's competitive advantages is the existence of an educated and skilled public service that is largely politically neutral, with the development of policy decisions being carried out by well-developed set of institutions and parliamentary processes structured with inbuilt checks and balances in the liberal political tradition (Tables 1 and 2). This political framework has enabled decision-making to proceed expeditiously in the face of differences of political opinion and free expression of criticisms about the possible outcomes of the technology. Risks of GMOs are balanced against science-based risk assessment and risk management.

Australian economic self-interest rests in providing its low-subsidized agricultural producers with unfettered access to performance enhancing innovations. Australia's free-trade policies expressed through WTO forums and SPS and TBT instruments are central to prioritizing continued access of Australian farmers to gene technology in the face of extremely effective populist rhetoric about their possible adverse health and social welfare consequences from dissenting sectors of Australian society. Unrealistic fear mongering about gene technology plays into the interests of more highly subsidized competitors for Australia's farm export industries. What is perhaps surprising is that this

conclusion has not been widely discussed in Australian news media. This may be an indication of the lack of importance of rural matters in city-centric Australian news outlets, and the political subtlety of the politicians seeking to gain office with votes from an electorate with diverse opinions.

One political decision about regulation of gene technology which was very finely adjusted was the precise framing of statements about precaution in the Gene Technology Act 2000 (Commonwealth) and in the Inter-Governmental Agreement on Gene Technology 2001 Recitals A and B that were provided earlier. These were included after political debate in the Senate (as discussed earlier),³³ but avoid any implication that the Precautionary Principle is needed to assure GM food safety for human health. The Australian legislation provides scientifically justifiable GM food and environmental risk identification rules that meet its WTO obligations while including a precisely defined definition of a precautionary approach for environmental protection that is a political agreement that has avoided unjustified delays of Australian risk management decisions seen in some other jurisdictions.

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No potential conflicts of interest were disclosed.

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