Comments on

Application A1069:
Irradiation of Tomatoes and Capsicums

prepared by

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Executive Summary

We recommend that FSANZ adopt option two and reject proposal A1069 on the following grounds:

- Irradiation of tomatoes and capsicums would adversely affect the nutritional value and safety of significant components of the Australian and New Zealand food supplies, probably with greater impacts on the nutrition and health of Southern European communities for which tomatoes and capsicums are a larger part of their diet;

- The federal and state governments are proposing many more foods for irradiation in the future and, taken together, they would constitute a major reduction in the nutritional value and safety of the human food supply in both countries, yet A1069 is assessed in isolation from its total dietary context;

- Irradiated pet food is responsible for the death and injury of a significant number of cats in Australia, where now the irradiation of cat food is banned. The US FDA is now investigating whether irradiation is the cause of sickness and death in dogs in the USA. Until the mechanisms of these adverse health impacts are fully explored and understood, and their negative impacts on other species including humans are absolutely ruled out, all irradiated foods should be removed from the human food supply;

- The Queensland government has a clear conflict of interest in being both the applicant for A1069 and one of the final arbiters of the decision on its own application. This conflict also now extends to other states, such as NSW and Victoria, that have fruit fly infestations as a result of poor phytosanitary regulation, monitoring and controls, and climate change;

- The Legislative and Governance Forum on Food Regulation (the Forum) has been derelict in its duty to canvass all potential management, chemical and technical replacement options to follow the final phase-out of fruit fly insecticides which have been under APVMA review since the mid-1990s because of their known toxicity to humans. A thorough process to review all fruit fly control options should precede any further hasty approvals of food irradiation;

- FSANZ also ignores the numerous alternatives to irradiation that exist for achieving the stated phytosanitary goals of A1069;

- The Forum and FSANZ have been derelict in their duty to protect the public health and safety by failing to facilitate the much earlier and more timely phase out of highly toxic dimethoate and fenthion in which fresh fruits and vegetables are now dipped to control fruit fly larvae;

- In its cost/benefit statement, FSANZ inflates the claimed benefits of approving A1069 while diminishing the impacts of the known hazards, risks and costs of irradiating tomatoes and capsicums, impacts that the whole community will bear;

- Labelling requirements are weak and there is no way to visually distinguish between irradiated and non-irradiated foods. Thus shoppers depend on the integrity and comprehensiveness of irradiation labeling;

- As there is no simple, reliable and affordable test for irradiated foods, it is difficult for state and local authorities to monitor them in the marketplace and to enforce the labelling requirements;

- Despite the assessment's claims that the public has the right to know and decide what foods to buy, the future labelling of irradiated tomatoes, capsicums and other foods approved for irradiation is not assured, as the Forum appeared to resolve in December 2011 to commission FSANZ to review and terminate all labelling requirements on irradiated food products by the end of 2013 at the latest;

- Despite FSANZ' assessments claim, there is no reliable and contemporary evidence that the Australian and New Zealand public are aware of, or will consent to, the widespread irradiation of the fresh fruit and vegetable supply;

- No other countries expressly require or allow the irradiation of tomatoes and capsicums, so approval of A1069 cannot rely on the prior regulatory assessments in other countries that FSANZ uses to strengthen the applicant's case for approval.

In brief: We call on FSANZ to decide on option 2 and reject A1069 which seeks permission to irradiate tomatoes and capsicums. The grounds for our recommendation are:

- the safety and nutritional integrity of irradiated foods is not established;
- the application and the assessment are flawed in the ways we discussed;
- the technological need for this irradiation has not been established;
- irradiation is not the only option for fruit fly control that exists or is used now;
- the assessment has no cost/benefit analysis of other phytosanitary measures;
- FSANZ must ensure a whole systems approach is used that would guarantee - or at least make accessible – other approaches to quarantine solutions;
- A1069 offers no credible benefits to Australians or New Zealanders;
- if A1069 were approved, the Australian and New Zealand public would be unfairly and unnecessarily exposed to further risks, costs and hazards;
- exporting irradiated tomatoes and capsicums may expose local growers to greater competition from imported tomatoes and capsicums, further reducing or wiping out local production;
- only full, honest irradiated food labelling would support public confidence in the wholesomeness of Australian foods and the integrity of the food industry itself.

As a matter of urgency, and in the public interest, we call on FSANZ to:

- **Decline approval for the irradiation of tomatoes and capsicums,**
- **Refuse any further irradiation approvals *and to***
- **Cancel all previous irradiation approvals.**

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2. Introduction

FSANZ's Food Regulation Review Process has a clear, legislated mandate to protect public health and safety. This mandate is also reflected in the UN *Codex Alimentarius*, where protection of public health and safety is paramount, and issues of free trade and food promotion are also secondary.

FSANZ consideration and approval of Application A1038 to allow the irradiation of persimmons revealed serious shortcomings in the process of safety assurance. The major areas of our concern relate to the lack of objective standards for safety and risk assessment, the processes used to determine these, and the quality of dietary modeling used to predict likely consumption patterns. Our legitimate concerns and representations were ignored.

Similar flaws are apparent in FSANZ's assessment of Application A1069, which represents quantum leap in risk to public health, because of the much larger per capita intake of tomatoes and capsicums by the Australian and New Zealand public.

We therefore recommend that Application A1069 be **rejected** on the basis that:

1. Public health and safety has not been adequately demonstrated by the scientific data available and therefore **cannot** be guaranteed
2. The technical data that the nuclear industry and the Queensland Government submitted are an inadequate basis for a robust
3. FSANZ risk assessment process relies on **weak, erroneous** and **outdated** data
4. The test data presented is from foods (e.g. meat) which are **biologically and compositionally different** from either tomatoes or capsicums, and is therefore of questionable relevance
5. Claims for commercial and economic benefits from approving A1069 are **erroneous** and **unsubstantiated**
6. Claims for consumer acceptance of irradiated foods are **biased** and **unsubstantiated**.

We also recommend that the appropriate, precautionary public health response to official advocacy for irradiation technology and its sterilized products is to:

- Initiate a **moratorium** on the irradiation of all foods in Australia and New Zealand, and the importation of irradiated food products, until independent and competent experts have fully explored the etiology of the toxic effects observed in cats that ate irradiated animal feed
- Maintain this **moratorium** until the demonstrated increase in allergenicity associated with irradiation has been specifically and experimentally discounted in tomatoes, capsicums and other food approved for irradiation
- **overhaul** FSANZ assessment protocols used to evaluate the safety of irradiated foods, to incorporate these new understandings of potential toxicity in mammalian species (Specifically, leukoencephalomyelopathy and allergenicity)
- Place the onus for addressing these **safety concerns** on the applicant government, and the nuclear and horticultural industries which utilize food irradiation
- In response to FSANZ inadequate risk assessment some other important areas of particular concern - to be addressed include:

- The **absence** of direct evidence, specific to tomatoes or capsicums, - that would rule out the potential for accumulation of radiolytic compounds in irradiated foods
- A consequent reliance on **sparse** and unreliable data from small-scale experiments with irradiated foods that are unrelated either biologically or from a dietary perspective to tomatoes and capsicums
- **Inadequate** dietary modeling and consequent unsubstantiated conclusions
- Lack of serious analysis of the emergence of a **mammalian *in vivo* model** (domestic cats) for severe adverse effects of the consumption of irradiated food,
- Reliance on anonymous “expert” opinion to attempt to trivialize this crucial issue
- **Incorrect** assumptions that people will consume irradiated fruits and vegetables in close proximity to the packaging and thus be aware they are consuming irradiated foods
- Downplaying the safety impact of irradiated tomatoes and capsicums in the human diet by considering their potential impacts in isolation, without reference to the **expanding range of irradiated fruit** which industry and governments intend will be available for consumption in Australia and New Zealand.
- **Disregard** for the potential for irradiation to undermine general patterns of fruit and vegetable consumption, since fruit is rightly perceived as a key component of healthful, natural and fresh human diets.

Though labelling is not the subject of Application A1069 per se, the promise of labelling is used to suggest that shoppers will have their right to know met and will have the option of avoiding irradiated food if they so choose. However, the current labelling regime is inadequate as it leaves a majority of irradiated foods either unlabelled or deceptively labelled. For instance, irradiated Tomatoes and Capsicums will not require individual labeling.

We call on policy-makers to amend Food Standard 1.5.3 to require irradiated is all labelled as such and that non-packaged irradiated foods such as fruit and vegetables are individually labelled. Labelling must include the words "**irradiated**" or "**treated with radiation**” or **“treated with irradiation”.**

Our call for strict labelling is made in the public interest, to satisfy every-one’s right to know that foods were made or processed using technologies specified in Food Standard 1.5. This does not signify our support for food irradiation.

The scientific evidence on irradiated foods is, at best, divided and unresolved in its conclusions on their safety. New research and real-life experience in Australia suggests that irradiation can have serious health impacts, at the very least on domestic animals. The precautionary principle should, therefore, be rigorously applied. No monitoring or long-term studies have been conducted on the human consumption of irradiated foods yet a clear health impact has been demonstrated in cats in Australia.

The onus is on the irradiation industry to prove food irradiation safe but this Queensland Government application and FSANZ assessment fail this test.

3. Overview of Concerns

On Sept 26, 2012, Food Standards Australia New Zealand (FSANZ) announced a six week public consultation for Application A1069, an application made by the Queensland government for approval to irradiate tomatoes and capsicums.
Herbs, spices, herbal infusions and nine tropical fruits had been approved for irradiation in Australia and New Zealand. Pet foods, medicinal goods, and seeds and grains for animal consumption may also be irradiated. These are not classified as "food" under Australian law as they fall under different regulations and require no labelling.

While acknowledging in its assessments and fact sheets that irradiation may deplete vitamin and nutritional content, FSANZ has so far justified irradiation approvals on the basis that the approved foods made up a minimal part of the Australian and New Zealand diet.

But that will dramatically change if irradiated tomatoes and capsicums are approved as these foods are regularly consumed as a core part of the diet by the Australian and New Zealand public. People from Southern European cultures in particular have a high consumption of both vegetables.

Recent surveys show that 59% of Australians purchase fresh tomatoes in their weekly shopping [i] and the average Australian consumes an estimated 23kgs of tomato-based products per year. [ii]

Tomatoes are second to potatoes and potato products as New Zealand's top selling vegetable. [iii]

Despite FSANZ's support and proponents' claims, irradiation has not been proven safe as no long term studies of consumption of an irradiated diet have been conducted.

Between 2008 and 2009, approximately 100 Australian cats developed neurological disorders which led to their paralysis and, in some cases, death. The cause was identified as the consumption of irradiated cat food imported from Canada. These cases of harm to animals are clear evidence that irradiation may also have negative health impacts on humans. As a result, irradiated cat food is now banned in Australia.

FSANZ suggests that the impact of irradiated food on cats was species-specific. However, the US Food and Drug Administration (FDA) is now currently investigating the possibility that consumption of irradiated food has also led to the deaths of 360 dogs and 1 cat, and illness in 2,200 dogs since 2007.

The FDA says: To date, product samples have been tested for contaminants known to cause the symptoms and illnesses reported in pets including, *Salmonella*, metals, furans, pesticides, antibiotics, mycotoxins, rodenticides… ethylene and diethylene glycol, melamine, and maleic acid... [and] toxic metals…None of the testing results have revealed a link between any causative agent and the illnesses and deaths… The FDA is expanding its testing to include irradiation by-products and is consulting with NASA to discuss this option." [iv]

Exposing food to ionizing radiation disrupts its molecular make-up, producing free-radicals and potentially other toxic chemicals such as benzene and formaldehyde.

Ionising radiation also creates new chemicals called "radiolytic products", some of which do not usually occur naturally in food. The impacts of these have not been adequately studied. One, 2-ACBs, has recently been found "to promote the cancer-development process in rats, cause genetic damage in rats and cause genetic and cellular damage in human and rat cells." [v]

“Irradiation destroys and disrupts vitamins, proteins, essential fatty acids and other nutrients in food – sometimes significantly. It can destroy up to 80 percent of vitamin A in eggs and 48 percent of beta-carotene in orange juice.” [vi]

Irradiation produces free radicals in food and has been linked to health problems such as nutritional deficiencies, immune system disorders, and genetic damage.

Another concern is the risk of irradiation being used to mask poor production practices and breach of standards. Irradiation can kill most bacteria in food, but it does not remove the faeces, urine, pus and vomit that often contaminate meat or the pests, faeces, or other matter that may contaminate herbs, spices, or fruit and vegetables. Re-irradiation is also permitted under revised Standard 1.5.3 to deal with post-irradiation contamination and is inadequately monitored.

Application A1069 suggests that irradiation is necessary to kill fruit fly larvae, in particular Queensland fruit fly, to enable increased trade of tomatoes and capsicums grown in areas that are potentially fruit fly infested.

But this use of irradiation as a “phytosanitary” measure enables corporations to transport and trade food at the expense of the public health, a cost that we all bear.

Providing shoppers with nutritionally depleted and potentially harmful foods to protect and expand interstate or overseas trade is unacceptable.

Aware that members of the public see irradiation as a “high risk, low benefit” technology, [vii] FSANZ repeatedly seeks to legitimise the process by stating that a technological “purpose” [viii] for irradiating food has been established. In fact, a technological “need” for irradiating food does not exist. The many other alternatives for fruit fly treatment must be thoroughly explored before resorting to irradiation but this process has not been undertaken.

3. Flawed Assessment and Regulatory Bias

Australians and New Zealanders expect our food regulator to be scrupulous, stringent and non-biased in its assessment of new foods under Standard 1.5. Research shows that the public have faith in the government to look after public interest.[ix] FSANZ is also expected to adhere to internationally recognised standards of peer-review for the science it relies upon when making decisions and present relevant science with honesty and integrity.

But in this case FSANZ has let the public down by basing its assessment on evidence tainted with a pro-irradiation bias.

A1069 and the FSANZ assessment of it are based on primary, unpublished research conducted by Qld DEEDI, the applicant itself. Both the Queensland government and FSANZ admit the existing literature on the irradiation of tomatoes and capsicums has “limited”[x] value or relevance. They then emphasise that their own unpublished research was conducted under conditions similar to those expected when tomatoes and capsicums are irradiated here in Australia and appear to rely on this as the basis for their argument that they do not need to have their own research peer-reviewed or tested by an independent agent.

If we presented such unpublished, untested, and uncorroborated science as a basis for our arguments that irradiated food is unsafe, FSANZ may publicly refute it. Even with the peer-reviewed studies, FSANZ goes to great length to dismiss any questioning of its assumptions. In the case of genetically modified foods, for example, FSANZ has dedicated a webpage to dismissing critical peer-reviewed scientific papers: “FSANZ

Response to Studies Cited as Evidence of Adverse Effects from GM Foods":
http://www.foodstandards.gov.au/consumerinformation/gmfoods/gmtableofstudies.cfm

FSANZ is mandated to ensure that our food is as safe as other foods already in the food supply so we expect FSANZ to withhold approval of this application until the science on which it decides has survived the rigours academic and scientific scrutiny.

FSANZ's bias in its assessment of this application is clear from the pro-irradiation spin on the science presented in its risk assessment. The summary of FSANZ's risk assessment begins with a highly flawed dot point justification for FSANZ's proposed approval. None of the claims in this summary are footnoted or referenced.

Introductory Claim: "There are no public health and safety risks associated with the consumption of tomatoes and capsicums which have been irradiated up to a maximum does of 1kGy." [xi]

But no long-term monitoring or studies have been conducted to provide the evidence for such a categorical statement. Credible evidence would be needed of the threshold level of radiation exposure at which negative impacts can be detected.

Following are the claims upon which this conclusion is said to be based and our responses:

Claim # 1: "Compounds potentially formed during food irradiation, such as 2-alkylcyclobutanones (2-ACBs), are found naturally in non-irradiated food." [xii]

Response: To date, only one study produced by the Bhabha Atomic Research Centre, part of the Government of India Department of Atomic Energy, has indicated that 2-ACBs were found in non-irradiated cashews and nutmeg. This research has not been replicated. After conducting an extensive irradiation literature review, in 2011 the European Food Safety Authority (EFSA) states: ***"As no further evidence of the natural occurrence of 2-alkylcyclobutanones (2-ACBs) has yet been reported, it would be pertinent to treat these findings with some caution until the results are validated by further experimental work."*** [xiii] FSANZ has not heeded this cautionary warning.

Whether or not these chemicals are unique to irradiation or may occasionally be created naturally, they have been linked to cellular damage and their artificial induction in foods should be avoided. Many naturally occurring substances, such as uranium, asbestos or even carbon dioxide, can be also harmful and we take steps to avoid exposure to them.

Claim # 2: "There is a low potential to generate 2-ACBs because of the low lipid content of capsicums and tomatoes." [xiv]

This claim seems to suggest that despite an attempt to minimize their significance in claim #1, 2-ACBs may actually be of concern.

Some genotoxicity of cyclobutanones has been established, though interpretations of their potential impacts are varied. No *in vivo* genotoxicity studies are available to rule out the hazard so FSANZ again assumes that the hazard is minimal or unlikely.

Furthermore, 2-ACBs are not the only potentially harmful chemicals produced by irradiation, as claim # 3 affirms.

Claim # 3: "Furan, a genotoxic carcinogen, was not detected (Limit of Quantitation = 1 ppb) in tomatoes and capsicums irradiated at 5 kGy." [xv]

Again, FSANZ begs the question of a threshold of harm which it mentioned with reference to 1kGy in it most general claim, above. This claim also suggests an acceptance that the genotoxic carcinogen, furan, can be produced in food exposed to radiation. The fact that it was not found at a 5 kGy dose – in research submitted by the proponent - only further confirms that it is a dangerous product which can be induced in irradiated foods.

Genotoxicity is only one aspect of toxicity and of an acceptably thorough assessment of risks associated with food irradiation. Impacts on gene expression and immunogenicity, for instance, must also be measured for this report to be comprehensive.

It appears the neurological damage to cats in Australia between 2008-2009 was neither genotoxic nor immunogenic. And it was very unexpected as the data then available from in vivo experiments in some other animal species was inconclusive. As yet unknown effects might become evident if irradiation were extended to other foodstuffs or different varieties of fruits and vegetables.

Claim #4: Available data indicate that the carbohydrate, fat, protein and mineral content of foods are unaffected by irradiation at doses up to 1kGy.[xvi]

More evidence is required. FSANZ should mandate the design and conduct of further independent studies, to be funded by the proponents at arm's length from the researchers.

Claim #5: Difference in vitamin concentrations between irradiated and non-irradiated fruit are within the range of the vitamin losses that normally occur during the storage of non-irradiated fruit.[xvii]

But the basis of this comparison must be how irradiated food compares to the nutritional value of fresh fruit and vegetables not stored for extended periods. As well as killing fruit fly, irradiation is designed to extend the shelf life of fruits and vegetables, long past the time when they would otherwise be unfit to eat. Thus, the impact on nutrition of irradiated foods is likely to be great.

Claim #6: Other food processing techniques have been demonstrated to have a larger impact of the vitamin content of fruits and vegetables than irradiation. [xviii]

Maybe so, but fresh fruits and vegetables should be delivered to shoppers as nutrient intact as possible. They should not sustain the nutrient losses of cooking, canning or dehydration that irradiation will always impose without those impacts being self-evident to those who buy them.

Claim # 7: Nevertheless, even assuming an upper estimate of vitamin A and C loss of 15% following irradiation from all fresh tomatoes, capsicums and tropical fruits (with existing irradiation permissions), estimated mean dietary intake of these vitamins would decrease by 2% or less and remain above Estimated Average Requirement following irradiation at does up to 1 kGy, with dietary intake typically derived from a wide range of foods.[xix]

"Assuming an upper estimate", "estimated mean dietary intake" and "Estimated Average Requirement" betray the imprecision of this assessment report. An application based on such guesses and assumptions should obviously not proceed.

Claims 4-7 all rely on the unpublished, unverified scientific report prepared by the applicant. They acknowledge that irradiation depletes the vitamin and nutritional value of foods. Also, irradiation may be used in conjunction with other food handling or processing techniques – not as a complete substitute for them. Thus, irradiated foods will still be placed in cold storage, cooked and processed in ways that compound the further depletion of their nutritional value. Compared to surface treatments, such as some chemicals and washing, which could be used instead for pest disinfestation, irradiation depletes the

vitamin and nutritional content of tomatoes and capsicums. Adding irradiation to the chain of food handling events, adds a major nutritional depleter to our food supply.

Although this application is for tomatoes and capsicums only, all our governments and regulators are already participating in preparations for numerous other fruits and vegetables to be irradiated, in response to the phase out of dimethoate and fenthion. We were assured that they were also safe. Assessing the nutritional impacts of irradiated tomatoes, capsicums and foods already approved begs the question of nutrient loss if up to 16 more fresh fruits and vegetables are also irradiated. Serial processing of individual applications allows proponents to avoid a bigger picture overview or a long term of whole of food supply impacts. This is akin to the discredited and dangerous practice of approving individual agricultural chemicals without assessing non-active ingredients and the cumulative impacts of chemical interactions.

Claim #8: The safety of irradiated food has been extensively assessed by national regulators and international scientific bodies.[xx]

This claim is a non-sequitur. A consensus would be expected among the like-minded, applying the same methodologies and criteria in their assessments. It neither claims irradiated food to be safe nor unsafe. Numerous research and reports raise legitimate and unresolved questions about the safety of irradiation. The findings of science around irradiation are, at best, divided in its opinion on the safety of irradiated foods.

The European Food Safety Authority, an Authority FSANZ references in its materials, calls for further investigation into the Australian cat food saga. **EFSA says: "**Considering that only a very limited quantity of food is irradiated in Europe currently, the Panel is of the view that there is not an immediate cause for concern. However, the relevance of the cat studies for human health should be clarified."[xxi]

"Information on the cause and pathogenesis in cats should be collected, including data on the relationship between irradiation dose, composition of feed, the amount of consumed irradiated feed and the elicitation of the leukoencephalomyelopathy**.** In absence of this understanding, the relevance for humans cannot be ruled out."[xxii]

Claim #9: There is a history of safe consumption of irradiated food in many countries.[xxiii]

Once again, this is a scientifically indefensible statement. There has been no systematic data collection or research to support this claim. Only relatively small amounts of a small selection of food items have been irradiated, for various lengths of time.

New research and real-life experience in Australia suggests that irradiation can have serious health impacts, at least on animals, and that is not a trivial or irrelevant impact. The precautionary principle should be applied by our regulators but officially they use a cautionary approach.

No long-term studies around the human consumption of irradiated foods have been conducted yet a clear health impact has been demonstrated on cats in Australia. The onus should be on the irradiation industry to prove food irradiation safe. Until that time, the irradiation of food for both human and animal consumption should be banned.

Detailed Comments re Safety, Dietary Modelling and Consumer Preference

The letters of support for Application A1069 are from small New Zealand and Australian growers and suppliers. So the public is asked to assume the risks of irradiation for the benefit of a few minor operators who want to trade freely in fruits and vegetables. This application places the health and safety of tens of millions of citizens below the interests of the Queensland Government and its backers, even though they have many other options for managing fruit fly.

For instance, while treatments may vary according to desired outcome, some of the alternatives currently in use include:

- Cold storage
- Cold treatment
- Heat/steam, vapour treatment
- Hot water dips
- Atmospheric control with oxygen, carbon dioxide or nitrogen
- Physical disinfestation, i.e. cleaning or washing
- Hygienic and safe production management practices
- Pest exclusion zones
- Early harvesting
- Organic production and handling methodologies

5a. Dietary Modelling

FSANZ's approval of the previous application A1038 Irradiation of Persimmons was justified partly on the basis of the relatively low intake per capita of persimmons. Also that the persimmons would be mainly for export. The present application represents a quantum leap in the risk to Australian and New Zealand public health, given the very high levels of intake of tomatoes. Dietary modeling indicates that the inclusion of tomatoes in the already excessive list of allowable foods is a substantial increase in what amounts to an experiment on the effects of intake of irradiated food on a national population.

The apparent domestic consumption of tomatoes in Australia comprised 317 kilotonnes in 2010/11, compared to 2 kilotonnes of fresh tomato exports.[xxiv] This translates to an approximate consumption of 14 kilos annually per capita. It highlights the substantial increase in the amount of irradiated fruit that Australians are likely to consume, whilst at the same time promoting as an advantage, the trivial proportion of export this application will allegedly facilitate through fruit fly larvae control.

Contrary to the Application and FSANZ's analysis, approval would not greatly benefit the already substantial supply of tomatoes in Australia.

5b. Safety Assessment

The content and arguments presented in FSANZ's Supporting Document 1 (Food irradiation in Australia, New Zealand and other countries – Application A1069) is remarkable in terms of the superficial analysis of the potential health and safety implications, its reliance on outdated and non-peer reviewed literature, and its apparent permissive bias in support of this clumsy, outdated, unneeded and potentially dangerous technology.

Further, we are highly concerned that the issues we raised about FSANZ's general approach to safety assessment and dietary modeling in a previous assessment (A1038 - Persimmons) have been either ignored or trivialised in this latest assessment.

The FSANZ position of "no toxicological hazards" is incorrect, since it makes no reference to new evidence of an allergenic effect from low doses of irradiation. [xxv] This allergenicity is due to the protein, rather than lipid, content of the food, which undermines FSANZ's contention that the low lipid content of tomatoes and capsicums makes toxicity unlikely.

The scant, and largely outdated, information the applicant submitted, about vitamin deterioration, seeks to mislead by referring to "vitamins" collectively. But cited studies only investigated a single vitamin (ascorbic acid) and beta-carotene (a pro-vitamin). The effects of irradiation on the amounts and integrity of most vitamins in tomatoes is not known, although folic acid levels have been shown to deteriorate by up to 30% due to irradiation within a food matrix. [xxvi]

FSANZ belatedly acknowledged the feline pathogenic model for toxigenicity related to consumption of irradiated food [xxvii] [xxviii]despite providing no insight into the exact mechanisms involved in this toxic effect. To arrive at the conclusion that these effects are indeed cat-specific, other animal models would need to have been tested. It is incumbent upon FSANZ to present these data to substantiate their conclusions, rather than relying on anonymous "expert" veterinary opinion (the lowest level of evidence, generally discounted in the medical literature since it is inconsistent with evidence-based practice – i.e. Level IV[xxix]). Until the specific mechanisms of toxicity are elucidated, it is irresponsible to declare these observations "not relevant" to humans. A pertinent analogy is that thalidomide is not teratogenic in rodents, but is devastating for humans *in utero.* [xxx] On this basis, it is remarkable, and indeed irresponsible, that FSANZ categorically deems this model to be irrelevant to human health.

Documentation that the applicant and FSANZ provided assumes that it is only irradiation at the upper end of the exposure spectrum (e.g. 25 Gy) which is problematic in terms of potential toxigenicity in food. However, a recent study has shown that smaller irradiation dosages (~1 Gy) can render protein more allergenic than either non-irradiated protein, or protein irradiated at a higher dosage. [xxxi] It has been speculated that this effect may be due to increased exposure of conformational and linear epitopes resulting from the formation of partially unfolded and aggregated species in response to irradiation. Prevalence of allergies to vegetables and fruits are low, but not insignificant, and most likely due to reactions to glycoprotein food components. The applicants make no reference whatsoever to this emerging potential food safety risk, reflecting further the inadequacies of the FSANZ literature review.

Contrary to FSANZ's implications, irradiated food is not "chemical free" since irradiation causes the accumulation of radiolytic compounds, such as alkylcyclobutanones, [xxxii] to levels not seen in untreated food. There are at least five radiolytic biomarkers available to test for irradiated food (namely **n**-pentadecane, 1-hexadecene, 1,7-hexadecadiene, **n**-heptadecane and 8-heptadecene). [xxxiii] The chemical changes to meat in response to irradiation are detectable, repeatable and specific. [xxxiv]

The applicant claims that no significant change to tomato composition occurs due to irradiation. Yet in a subsequent paragraph admits that irradiation leads to delayed ripening – which is indicative of a major, biologically significant compositional change. The applicant's claim that macronutrient content is unaffected is also incorrect and misleading. Irradiation causes substantial documented changes to both proteins and lipids.

APVMA, FSANZ and other authorities have deemed the agricultural chemicals now being removed from use as dangerous. Thus, the agricultural production industry has knowingly been feeding dangerous chemicals to the Australian public for decades. They cannot be trusted to be a custodian of public health.

5c. International precedents

FSANZ justifies Option 1 – approving the application - in part "by virtue of consistency with other international regulations on irradiated food". This is incorrect since, according to FSANZ's own summary of current international regulations on irradiated food, only Indonesia (specifically) and USA (fruits in general) currently approve irradiation of tomatoes for human consumption. Other countries do not.

A search on the IAEA irradiation authorisation database "***Irradiated Food Authorization (IFA) Database (IFA)***" [xxxv] found neither tomatoes nor capsicums/bell peppers are listed specifically for any country.

FSANZ also cites the Codex revised standard on irradiated food (2003) in support of their proposed approval. However, this Codex document predates the emergence of well-documented, but little understood, serious toxic effects of the consumption of irradiated food.[xxxvi] [xxxvii] [xxxviii]

FSANZ's background document places reliance on EFSA to provide objective and critical safety assessment. However, a recent critique of EFSA's assessment processes in the British Medical Journal[xxxix] raises major concerns about the objectivity and competence of this organization in safety assessment.

5d. Summary of available literature on consumers and food irradiation

It is unclear as to why the issue of consumer preference should take such prominence in the FSANZ analysis, since it is irrelevant to safety assessment, and only of very limited use in dietary modeling.

In terms of the methodology and context of this review, the keyword and search strategies are not disclosed. Therefore there is no way for the public to assess the comprehensiveness or narrowness of the review. This missing information is an essential component of any competent and systematic review.[xl]

FSANZ' Charter claims:

We comply with APS (Australian Public Service) values and extend these values to all contacts with stakeholders in the food regulatory process. In our dealings with partners and stakeholders, we will:

- be impartial, open and accountable
- use the best available science and evidence to guide our decision-making
- be mindful of our governing legislation when making decisions
- regard all individuals and organisations as legitimate stakeholders in the standard-setting process
- seek, respect and be responsive to the issues raised by others
- act with integrity, empathy, professionalism and mutual respect.

However, the inadequacies of the review aside, the FSANZ review document appears to have a substantial bias towards a permissive approach to food irradiation, rather than a critical approach, as highlighted by the following points:

- Categorising food irradiation as just another food technology as per Cox et al 2007 is dismissive, and misleading. Comparisons of food irradiation with canning and pasteurization are invalid on a number of counts:
    - it is obvious that the technology has been applied to the food (in the case of canning and pasteurization), which will therefore affect consumer perceptions

- there are clear, well-documented and unequivocal health and safety benefits from canning and pasteurization technologies which substantially outweigh any risks (contrary to the case of food irradiation).

- The turn of phrase in the FSANZ assessment is highly oriented in favour of the application. For example: "benefits may not accrue directly to the consumer, but rather to others such as producers, exporters and the environment". This implies that benefits will definitely flow to consumers, but not directly. There is no basis for this view, and the sentence should more honestly read: "benefits may not accrue to the consumer, but rather to others such as producers, exporters and the environment."

- The study by Gamble et al (2002) is used to substantiate consumer preference of irradiated food over pesticides, but needs further details provided. In their survey, was "no treatment to food" an option? What were the specific characteristics of the study population (including sample size and representation)?

- The low prevalence of concern towards food irradiation reported in the non-peer reviewed TNS Social Research 2008 survey is erroneous. This level of interest is quite likely due to food irradiation currently not being very prevalent in the Australian food system. (Obesity is obviously going to be a concern if >67% of the population is overweight or obese – it's an erroneous, and misleading, comparison). The context of the TNS survey needs to be detailed much more clearly to enable appropriate analysis.

- We propose the following edit: "of those who were aware of food irradiation, 37% of Australians and 25% of New Zealanders (correctly) believed it would reduce the nutritional quality of the food …"

- The statement: "The lack of understanding and knowledge about food irradiation may contribute to the negative risk perceptions …" is biased and does not belong in an objective literature review. There is clear recent evidence [xli] [xlii] [xliii] which vindicates negative risk perceptions among people with a better understanding about food irradiation than the FSANZ assessment provides.

- The statements: "… positively impacted actual purchase. Other studies similarly find that information provision about food irradiation will have an impact on consumers' acceptance…" seem to indicate an agenda, not only to allow irradiated fruits and vegetables to be introduced to the food system, but to encourage their consumption. It is not within FSANZ's brief (nor in the public's interest) to develop ways to promote the consumption of irradiated food.

- "While labeling may inform consumers that a particular food is irradiated, it is likely that many consumers will not be able to interpret what that means for them," is a bizarre and patronizing statement. FSANZ first duty if to fulfill people's right to know. Labeling will enable those who wish to buy or avoid irradiated foods to do so. FSANZ main duty according to its own objectives is to ensure that labelling is fair, honest and not deceptive, yet it seeks to promote irradiation.

- The statement that: "consumers are willing to purchase food that has been irradiated," is substantiated by a reference (Bruhn 1995) that is long out of date, and by a report conducted 17 years ago in a range of Asian countries. Such findings have very little, if any, relevance to the Australian food system and public sentiment in 2012. Our regulator is empowered to consider evidence and has no brief to speculate on or judge whether shoppers will accept or reject irradiated foods.

- Irradiated beef is an inappropriate analogy to understand likely consumption patterns of irradiated vegetables and fruit, since the determinants of beef consumption differ substantially from

determinants of vegetable and fruit consumption. This is a rudimentary concept in dietary modelling which the FSANZ authors should have critiqued.

6. Failure to Benefit Consumers: Critique of Cost Benefit Analysis

The cost-benefit analysis makes dubious claims of benefit for the consumer and fails to mention a single potential negative safety and nutritional impact of consuming an irradiated diet.

According to FSANZ, the only potential cost is 'a possible transient increase in price of irradiated tomatoes and capsicums because of the cost of establishing new equipment to effectively irradiate tomatoes and capsicums." This is also a dubiously worded statement, as there will be no "increase in the price of irradiated tomatoes and capsicums", as they are not currently irradiated. The statement would more accurately read that: "irradiated tomatoes and capsicums may cost more than non-irradiated ones." Irradiated tomatoes and capsicums will not (initially at least) be the only tomatoes and capsicums on the market. Thus, provided labelling continues, shoppers will be able to make a choice between irradiated and non-irradiated tomatoes and capsicums.

Following is FSANZ' list of: "potential benefits for consumers":

Claim 1: possibly greater year-round availability of tomatoes and capsicums in some markets/regions in Australia and New Zealand [xliv]

This claim is outright conjecture. "Possibly" greater year-round availability of tomatoes and capsicums. As outlined in detail later in our submission, there is no shortage of tomatoes and capsicums in Australia and New Zealand. There is great scope in growing climate and production practices which enable both countries to supply their markets. Imports of these commodities are already impacting on the ability of local growers to sell their produce. It is therefore unlikely that irradiating them would significantly impact on their availability.

Claim 2: **possibly better quality fruit depending on the dose of irradiation, as other treatments (such as heat and cold) can affect fruit quality** [xlv]

This claim is also conjecture and clearly implies that irradiation has a dose-related impact on the quality of the treated fruit. Stating "Possibly" better quality fruit does not ensure that irradiation will provide better quality fruit, nor does it substantiate any costs associated with the "other" non-chemical treatments listed, such as heat and cold treatment. New Zealand will already accept cold-treated Australian produce yet there is no assessment of that as a safer and more rational option. Irradiated fruit will most likely also be subject to cold storage yet the compound impacts are unassessed.

Claim 3: fruit may be able to be transported for longer periods while maintaining desirable sensory qualities for consumers[xlvi]

Transporting fruit for longer periods is not beneficial as further vitamins and nutrients are lost. It is alarming that FSANZ would even mention: "maintaining desirable sensory qualities for consumers" in its assessment. FSANZ should not promote food that may look, smell and taste nice but is depleted in nutritional value. Though FSANZ is charged with protecting us from deception it is complicit.

Claim 4: provides choice to consumers wanting to avoid exposure to other treatments such as chemicals [xlvii]

Claims that irradiation offers “choice” to consumers wishing to avoid chemicals are disingenuous. Irradiation is proposed as an “alternative” to toxic chemicals that are being phased out so we will not be making a choice between them and irradiation. Furthermore, irradiation is a post-harvest treatment which would be used in conjunction with other chemicals or treatments used in fruit production. And irradiation itself induces the production of chemical residues and new research suggests that radiolytic products may also be induced in the food.

Finally, those consumers who avoid chemically-treated fruit are likely also to reject irradiated fruit, since the rejection may be deemed to arise from a similar philosophical perspective. Thus no potential enhancement of consumption or choice can be claimed.

Claim 5: **approval of irradiated tomatoes and capsicums may increase competition in the marketplace, improve selection and seasonal availability and increase price competition.**[xlviii]

These claims are also conjecture and they cannot be quantified. As mentioned above, there is a surplus of tomatoes on the market already. The industry is severely impacted already by imports, which may increase if irradiation is approved. There can be no substance to any of these speculations if the following outrageous decision runs its course:

Legislative and Governance Forum on Food Regulation
(convening as the Australia and New Zealand Food Regulation Ministerial Council)

Response to the Recommendations of *Labelling Logic*: *Review Food Labelling Law and Policy (2011)* - The Blewett Review

Irradiation

Recommendation 34: That the requirement for mandatory labelling of irradiated food be reviewed. **Response:** Supports **Timeframe for commencement:** < 2 years

Analysis:
The review panel identified that foods treated with ionising radiation have been in the food supply for at least a generation (i.e. 30 years' experience) and there have been no problems for human health resulting from the consumption of foods treated with irradiation.

Comment:
It is timely that FSANZ review the need for mandatory labelling of irradiated food and assess whether there is a more effective approach to communicate the safety and benefits of irradiation to consumers. Improving consumer confidence in irradiation will reduce disincentives for increased uptake and broader application of the technology by industry. This review will not encompass a broader assessment of the requirement for irradiated food to be subject to a pre-market safety assessment.

Removal of the mandatory labelling requirement for irradiated food will not prevent the food industry from providing this information voluntarily to consumers. Evidence from other countries indicates that irradiation labelling is being used voluntarily to provide consumers with assurance of product safety and quality.

Proposed action:
The FoFR will request FSANZ to review *Standard 1.5.3: Irradiation of Food,* specifically with a view to assessing the need for the mandatory labelling requirement for all irradiated food to continue. [xlix]

FSANZ is mandated to ensure that Australians and New Zealanders have access to safe and healthy food. Despite dismissing even the known and accepted detrimental impacts of irradiation and omitting any risks from the Cost/Benefit Analysis, FSANZ fails to show that this Application would provide any benefits to shoppers. . At best, FSANZ claims irradiating tomatoes and capsicums may provide "possibly better quality" which we refute and "possibly greater availability." Which is unnecessary.

Either way, these and the other claimed possible benefits are irrelevant to guaranteeing the public a nutritious, safe and healthy food supply. A1069 provides no tangible benefits but carries many known risks, hazards and costs.

We recommend that FSANZ adopt Option 2 and reject the application.

7. Failure to Demonstrate a Technological Need

The technological need to use irradiation as a quarantine measure for tomatoes and capsicums has not been established in this Application.

No other country in the world requires the irradiation of tomatoes and capsicums. Indeed, neither is specifically mentioned on the International Atomic Energy Agency's (IAEA) irradiation authorization information portal as being approved for irradiation.

Application A1069 suggests that irradiation is necessary to control the spread of fruit fly, in particular Queensland fruit fly, to allow greater trade of food grown in potentially fruit fly infested areas. Though Queensland has lodged this application, the Victorian Government recently acknowledged that its attempts to contain fruit fly infestations in the state had failed and that it would not continue to fund control measures. This suggests that irradiation may also become a fruit fly control measure throughout the country if other options remain unexplored.

7a. The false choice between irradiation and pesticides

Two toxic chemicals, fenthion and dimethoate, nerve inhibiting pesticides are used in Australian horticultural production. They are both under review, with dimethoate already prohibited and fenthion to be phased out over the next 12 months. Use of these organophosphates is severely restricted overseas because of their public health impacts. Australian growers have known about potential health problems with these chemicals since the review of fenthion began in 1994 and dimethoate was announced in 1995, but not begun until 2005. [I] Despite the reviews, Australian growers, under pressure from supermarket chains and large food corporations, continued to use these chemicals because it was cheaper than to establish good production practices that produce quality, healthy food. The many years since the reviews were announced have not been used to develop positive, safe and healthy food production practices or to explore options for growing fruit and controlling fruit fly without chemicals. The status quo continued.

Now, governments and industry claim fenthion and dimethoate were necessary for "cost-effective" market access. They are urgently pushing for another dubious post-harvest decontamination treatment to be used in their place: food irradiation. Other potential methods, systems and materials are ignored.

The phase out of toxic chemicals is a cause to celebrate and should be lauded as a chance to review and improve food production practices. As it is, however, we are being offered a false choice, the swapping of one toxic industry for another dangerous and toxic one.

Irradiation as a “phytosanitary” measure, in this case irradiating food to control fruit fly, benefits food corporations wishing to transport and trade volumes of food at the expense of the public health. Providing nutritionally depleted food and putting us all at risk in order to protect or expand trade and markets is unacceptable and not in keeping with FSANZ objectives.

As mentioned earlier, FSANZ is aware that the public see irradiation as a “high risk, low benefit” technology, [li]and repeatedly attempts to legitimise the process by falsely claiming that a technological “purpose” [lii] for irradiating food has been established. A technological “need” for irradiating, however, has not been established.

Irradiation to control bugs

Irradiation is not a “clean” alternative to chemicals. Irradiation for “phytosanitary control” is actually a prime example of the use of irradiation in lieu of healthy and environmentally sustainable production systems and practices.

In 1986, Queensland DPI produced research promoting the post-harvest use of dimethoate and fenthion for controlling fruit fly on tomatoes. The research states: “the insecticides dimethoate and fenthion as high volume spray (flood) treatments can disinfect tomatoes post-harvest with levels of security similar to ethylene dibromide for other fruits, but with the added advantage of handling efficiency and without phytotoxic or tainting effects.” [liii]

35 years on, this research has proven faulty. APVMA is in the process of banning this use of these chemicals because they harm human health. Queensland is Australia’s largest producer of fresh tomatoes and the pressure is on to maintain its markets. (Victoria produces the most tomatoes for processing and also now has widespread fruit fly infestations) The Queensland government now presents its own, new, unpublished research to secure approvals to irradiate tomatoes and capsicums in lieu of using these toxic chemicals.

Once again, the Queensland government is getting it wrong.

Irradiation will not be used as a total substitute for chemical use in food production. Irradiation is a post-harvest treatment that would be used in conjunction with other chemicals applied pre-harvest. Unless there is a thorough review of all chemical uses in food production, or fruit and vegetables are organically grown, chemicals will still be used in the growing of fruits and vegetables.

There is no technological need for irradiation to replace dimethoate and fenthion.

Australia was the only country permitting dimethoate to be used for post-harvest pest control so other producers found other options.[liv] Indeed, the chemicals taskforce phasing out dimethoate has proposed numerous chemical alternatives. Non-chemical options, such as organic production also exist.

There is simply no need to irradiate fresh fruits and vegetables as there are numerous alternatives.

For instance, New Zealand quarantine already accepts Australian tomatoes if they are grown in pest-free zones, which remain feasible in most states.

As mentioned above, some of the alternatives currently in use include:

- Cold storage
- Cold treatment
- Heat/steam, vapour treatment
- Hot water dips

- Atmospheric control with oxygen, carbon dioxide or nitrogen
- Physical disinfestation, i.e. cleaning, washing
- Hygienic and safe production practices
- Pest exclusion zones
- Early harvesting
- Organic production

7b. Irradiation-free trade

Numerous practical chemical-free and irradiation-free options are available. They pose little or no health risk to the public so using irradiation as a phytosanitary measure – to protect markets – is insupportable.

Irradiation as a mandatory protocol for trade in food is the exception, not the rule, around the world. This is highlighted by the existence of non-chemical and non-irradiation trade protocols to and from Australia for the products approved for irradiation in Australia and New Zealand. For example, some Australian chemical and irradiation-free treatments of Rambutans, Mangoes, Longans and Lychees follow:

Australian Fruit Growers wash their fruit for access to Japan
The method is simple: after harvesting, the fruit is washed. It is then coated with food-grade/edible oil to seal the fruit against contamination and pests. Australian Rambutans are now exported to Japan using this method. Water and edible oil maintains the integrity of organic products, which are not allowed to use synthetic chemicals or irradiation, facilitating trade in both organic and conventionally grown fruit.

North Queensland Mango growers expand market with "Modified Atmosphere"
"Mango growers in the Burdekin and Atherton Tablelands have created a small operation to process second grade mangoes. (Tableland Export Coop Ltd). This has been based on R&D commissioned to create a sliced mango product using MAP (Modified Atmosphere Technology). This produced a "fresh" mango slice with an extended shelf life (up to 6 weeks in a commercial environment). It has the advantage of being no mess, ready to use, discards 60% by weight of a whole fruit, with a high value to weight ratio and easier access to markets as a processed product ... The distributor has advised that market enquiries already far exceed the capacity of the plant to produce.

The same group hopes to produce a fresh avocado product ... Trials have been completed with positive results using second grade fruit ... Trials have also commenced on a similar pawpaw product.

Initial discussions have been held with growers in the Northern Territory, with the prospect of expanding and extending these operations across Northern Australia." [lv]

Non-chemical alternatives for trade and intrastate commerce
Many products are already traded globally without the use of chemicals or irradiation, including foods Australia has approved for irradiation. A combination of regulation, specific harvest practices, non-chemical cleaning, inspection and certification can be sufficient to allow products into Australia or to facilitate intrastate trade. Australia should promote these alternatives in its own production and advocate for these methods for import and export approvals.

Longan and lychees may be imported from China and Thailand after:
- cold treatment (CT) or vapour heat treatment (VHT) for the management of fruit flies;
- cold treatment or orchard control, inspection and remedial action for the management of litchi fruit borers;
- inspection and remedial action (i.e. withdrawal, re-export, destruction or further treatment) for the management of mealybugs and soft scales; and

- operational maintenance and verification systems.[lvi]

Mangos may be imported from India after:
- vapour heat treatment (VHT) or hot water treatment (HWT) for the management of fruit flies;
- designated pest free places of production or production sites for the management of mango pulp weevil and mango seed weevil; and
- inspection and remedial action (with VHT or HWT) for other quarantine pests such as red-banded mango caterpillar, mealybugs and scale insects. [lvii]

Alternatives used in interstate trade in Australia:
- standard physical treatments, such as washing;
- maturity and condition standards like hand-green condition - picking unripe fruit to avoid its infestation with pests, and unbroken skin;
- cold treatment or heat treatment;
- area freedom, such as Fruit Fly Exclusion Zones.

The Organic option:
Organics is one of the fastest growing industries in Australia. Irradiation is not allowed in "Organic" production practices. Organic producers have been successfully supplying the increasing global organic market without using either synthetic chemicals or irradiation.

More examples:

Radio frequency Heating of Persimmon Fruit as a Treatment for Control of the Mexican Fruit Fly, Hot water dips kills insects in bananas and pawpaw, cold storage kills fruit fly in grapefruit, steam treatment kills some forms of fruit fly in mangoes ... The US Department of Agriculture developed an "acoustic coupler" which detects fruit fly larvae vibrations when the larvae eat the fruit, and infested fruit can then be removed. CSIRO has been conducting feasibility trials for the use of Ultra-high Pressure (UHP) processing for juices, jams and purees. [lviii]

7c. International Phytosanitary obligations

The claim that irradiation is accepted as an international phytosanitary measure is repeated throughout the A1069 Assessment. But International Standards for Phytosanitary Measures, that mention irradiation, also identify many possible phytosanitary technologies and management processes and recommend a systems approach. Though irradiation is one possibility for post-harvest treatment it is easily avoidable as the existence of numerous other options shows. There is no technological imperative or requirement to irradiate, nor a situation in which irradiation is the only choice.

"In principle, systems approaches should be composed of the combination of phytosanitary measures that can be implemented within the exporting country. However, where the exporting country proposes measures that should be implemented within the territory of an importing country and the importing country agrees, measures within the importing country may be combined in systems approaches.

The following summarizes many of the options commonly used:

Pre-planting

- healthy planting material
- resistant or less susceptible cultivars
- pest free areas, places or sites of production
- producer registration and training.

Pre-harvest

- field certification/management (e.g. inspection, pre-harvest treatments, pesticides, biocontrol, etc.)
- protected conditions (e.g. glasshouse, fruit bagging, etc.)
- pest mating disruption
- cultural controls (e.g. sanitation/weed control)
- low pest prevalence (continuous or at specific times)
- testing.

Harvest

- harvesting plants at a specific stage of development or time of year
- removal of infested products, inspection for selection
- stage of ripeness/maturity
- sanitation (e.g. removal of contaminants, “trash”)
- harvest technique (e.g. handling).

Post-harvest treatment and handling

- treatment to kill, sterilize or remove pests (e.g. fumigation, irradiation, cold storage, controlled atmosphere, washing, brushing, waxing, dipping, heat, etc.)
- inspection and grading (including selection for certain maturity stages)
- sanitation (including removal of parts of the host plant)
- certification of packing facilities
- sampling
- testing
- method of packing
- screening of storage areas.

Transportation and distribution

- treatment or processing during transport
- treatment or processing on arrival
- restrictions on end use, distribution and ports of entry
- restrictions on the period of import due to difference in seasons between origin and destination
- method of packing
- post entry quarantine
- inspection and/or testing
- speed and type of transport
- sanitation (freedom from contamination of conveyances). [lix]

7d. Summary of concerns re Technological Need:

The Applicant has not established a technological need for using irradiation as a quarantine measure for tomatoes and capsicums:

- Irradiation is not required by Australia’s trading partners and can be avoided for inter-state trade or trade between Australia and New Zealand.
- The benefits of using irradiation over cold-storage or other treatments have not been demonstrated.
- Comparative models have not been provided or assessed.
- No evidence is provided to ensure the safety of eating irradiated tomatoes and capsicums.

- Numerous alternatives to irradiation exist, are already approved by trading partners and avoid the risks of potentially harmful chemicals and irradiation.

8. Harmful to Australian Farmers: Market access is only half the story

While promoted as a "tool" to protect or broaden Australian markets, irradiation is more likely to further destroy the livelihoods of local small producers, family farmers, local horticulture, agriculture, organic and alternative food production systems.
Irradiation is a tool of large agri-business. Irradiation approvals in Australia would not benefit our farmers in the long term; as such approvals will also facilitate importation of those irradiated foods from overseas, where food can be typically produced more cheaply. Imports already play a key role in the demise of Australia's tomato producers.

Since 2007, tomato imports have reportedly increased 40%[lx], due to low domestic production, the high value of the Australian dollar, higher Australian labour costs and a legal challenge upholding market access through international trade agreements**.** [lxi] As it stands, only 2 out of 10 cans of tomatoes sold in Australia are locally made. [lxii] There is a surplus, not a shortage of tomatoes on our domestic market.

Therefore, irradiation cannot provide the solution to what is causing the tomato market's demise: market saturation and competition created by large food corporations and supermarket chains.

In a move to increase output and lower production costs, Australia is already seeing its tomato industry move to large hothouse-style production, which has brought devastating impacts to smaller growers – closing Queensland's (and Australia's) largest tomato producer, SP Exports.

Ironically, there is a potential silver lining to this for the public. Hothouses are just one example of an infrastructure that could eliminate or lower the probability of fruit fly infestation in crops where they were used as pest exclusion zones, or pest free areas. Used judiciously, they may eliminate the need for other fruit fly control measures such as pesticides or irradiation altogether.

In the long term, it would be in Australian farmers' interests to use alternatives to chemical fruit fly control and also reject irradiation. If public perception alone is not enough to deter food producers from irradiation, add the threat of increased competition from cheaply produced irradiated imports.

8a. Irradiation facilitates imports

FSANZ suggests that irradiating tomatoes and capsicums will have a trade enabling effect, facilitating interstate and international trade of Australian and New Zealand tomatoes and capsicums and providing shoppers with year-round access to tomatoes and capsicums.

Approving the irradiation of these products in Australia and New Zealand, however, is also a de-facto approval for the importation of irradiated tomatoes and capsicums from overseas.

As noted above, there is no shortage of supply of tomatoes and capsicums. The fact that Australian tomatoes are grown in both tropical and temperate climates, using a variety of methods, shows there is great capacity to supply our domestic market throughout the year. New Zealand also grows tomatoes, importing only approximately 8% of its consumption from Australia [lxiii] and exporting about 5% of its production to Australia, the Pacific Islands and Japan. [lxiv]

Supporting the importation of irradiated tomatoes and capsicums seems contradictory to the underlying intention of this application – to protect Australian tomato and capsicum markets. Yet facilitating this trade may disadvantage Australian tomato and capsicum producers, and shoppers. Irradiated tomatoes and capsicums appear not to be traded globally and there is no need or pressure to import them.

Yet one of the stated purposes of A1069 and research into irradiation is to expand our markets.

While it would allow interstate and international trade of irradiated tomatoes and capsicums, it also opens the Australian and New Zealand markets to importation of irradiated tomatoes and capsicums from more powerful markets such as the world's largest tomato producer, China. [lxv]

Trade harmonization is a major consideration for the WTO and irradiation proponents. Australia's attempt to protect its tomato industry has been successfully challenged in the past. Allowing irradiation will potentially open the floodgates for irradiated imports while, at the same time, Australia's failure to adhere to international labeling standards may penalize Australian export potential.

As Australia and New Zealand's trading partners do not at the moment require the irradiation of tomatoes and capsicums there is no foreseeable trade/market benefit from this proposal and more likely a negative impact on local growers.

9. Consumer Awareness and Labelling

Both industry and governments know that irradiation is highly unpopular with Australians and New Zealanders and that synthetic chemicals have fallen out of favour too. So many people will find a problem with the unpleasant "choice" this application purports to offer: irradiation or organophosphates. Appendix B also comments on Australian's rejection of irradiated foods.

One of Canada's largest ever food recalls took place In September/October 2012: E. coli contaminated beef. Canadians are responding skeptically to the immediate promotion of irradiation as a solution. An overwhelming majority of those commenting on an article on the Canadian Broadcasting Corporation website oppose irradiation and see this as a false solution. [lxvi] In Australia, when food irradiation applications have been open for public comment, an overwhelming majority of respondents have also been opposed. And public concern is well-founded.

Food Standard 1.5 requires novel food products with no history of safe use, and those from new technologies such as genetic manipulation and irradiation to undergo pre-market assessments and to be labeled. Another rationale for labeling is that the public has a right to know and make informed decisions about radically new foods that are unfamiliar and have no history of use.

It is unacceptable that governments and irradiation proponents are simultaneously pushing to expand the irradiated food industry and also want to remove the labels from all irradiated food.

So far irradiation approvals in Australia and New Zealand have claimed to offer shoppers more food options. However, most irradiated food is either poorly labeled or not labeled at all and the Forum, which represents all governments, is moving for removal of all labeling in 2013.

In 2011, the Blewett National Food Labelling Review asserted that as food irradiation was no longer a new technology the requirement to label its products be reviewed. This recommendation was based on the claim that irradiated foods had been on the market for over 30 years and are safe. In adopting or rejecting the Blewett recommendations last December, the Forum resolved that FSANZ review the labelling requirements with the intention that they be terminated by within two years.[lxvii]

But while irradiation technology has been under development since the early days of the nuclear age in the 1950s, irradiated food has only been in the Australian market for since 2001. A huge campaign against food irradiation in the 1980s resulted in a 10-year moratorium, lifted in 1999, with little public fanfare. Opinion surveys conducted for FSANZ, along with other reports, have repeatedly found that irradiation is still a little known process and that irradiated foods do not have wide public acceptance.

The first approval, for irradiated herbs, spices and herbal infusions was in 2001, nine tropical fruits approved in 2003. But apart from a small amount of irradiated Australian mangoes and lychees sold in New Zealand, very few irradiated foods have been sold in either country. Interstate trade protocols for the sale of irradiated fruit on the Australian domestic market were only finalised this year. Any claim that Australians and New Zealanders have 30 years of safe experience of irradiated foods and that they have been widely available is clearly untrue. No long-term research has been done on the patterns of consumption of irradiated foods.

Irradiation has a longer history in a few other countries and the international food standards Codex Alimentarius requires that all irradiated foods be labelled. The USA, UK and Canada all have more stringent guidelines than Australian and New Zealand labelling regulations. Instead of abandoning labeling altogether at the behest of the nuclear and food industries, we should be improving our labeling requirements to be equal to or better than our trading partners. Weakening our already compromised labeling regulations even further would allow the products of an unwanted and unsafe technology while denying everyone's right to know how these novel products were made, so we can make fully informed choices.

9a. Labelling inadequacies

A lack of mandatory statements for irradiation labeling is unprecedented amongst other English-speaking nations and our trading partners. The mandatory individual labeling of individual products is the only mechanism that observes our right to make fully-informed choices about whether or not we, our families, pets and livestock will eat irradiated foods.

Yet FSANZ suggests that irradiating tomatoes and capsicums will provide greater choice and assures us that labeling will enable this to happen. However, we are not reassured as existing labeling requirements fail the public, are inadequate by global standards, and are under threat of complete removal.

The current labelling regulations fail because they do not:

- prescribe mandatory labeling statements;
- ensure individual labelling of irradiated products;
- require that products such as pet food and animal feed are labeled.

They also allow:

- wording such as "treated with ionizing electrons" which may be technically incorrect;
- wording that does not include "irradiation" or "radiation";
- positive statements that may mislead;
- a sign near a point of sale to be displayed instead of individual products being labelled.

Misleading and deceptive labels have been used in Australia and NZ. For example:

- **Ongoing:** Use of the labelling statement “treated with ionizing electrons” when the irradiation source used in Australia is actually gamma rays is technically inaccurate and misleading because of its failure to use any words that signify the treatment uses radiation;

- **2005:** Mangoes exported to New Zealand from the Northern Territory carried stickers on which the average letter size was 0.6mm. The words “irradiated fruit” measured just 1cm;

- **2006:** Mangoes exported to New Zealand were removed from an export case and sold without any labelling or signage;

- **2010:** “Radurised” irradiated spices were imported from South Africa **and** sold in a major supermarket chain. A sticker on the top or bottom of the box named the importing company and the words “irradiated spices” (1.5cm) or “radiated spices” (2.5cm), product of South Africa. The actual packaging included the term “radurised” (7mm) which is not used in Australia and in some cases carried the Radura mark (total size with word radurised 8mm)

- **2012:** On Feb 5, WA Senator Scott Ludlam received an answer to a question on notice at the October 19 2011 Senate Estimates informing him that a irradiated curry spices that he displayed to the committee were not properly labeled. The company had labeled the box that contained packaged irradiated curry spices but had failed to label the individual packets. [lxviii]

It is imperative that FSANZ and state governments (the Forum members) enforce stricter labeling for irradiated products and ensures that all are labelled individually, fully and factually.

9b. Australia and New Zealand: Failing to meet world labeling standards

The international food regulatory body Codex Alimentarius, the EU and other trading partners all require mandatory labelling of irradiated foods. Their standards are:

9c. Codex Alimentarius

GENERAL STANDARD FOR THE LABELLING OF PREPACKAGED FOODS (CODEX STAN 1-1985) Adopted 1985. Amended 1991, 1999, 2001, 2003, 2005, 2008 and 2010.[lxix]

5.2.1 The label of a food which has been treated with ionizing radiation shall carry a written statement indicating that treatment in close proximity to the name of the food. The use of the international food irradiation symbol, as shown below, is optional, but when it is used, it shall be in close proximity to the name of the food.

5.2.2 When an irradiated product is used as an ingredient in another food, this shall be so declared in the list of ingredients.

5.2.3 When a single ingredient product is prepared from a raw material which has been irradiated, the label of the product shall contain a statement indicating the treatment.

GENERAL STANDARD FOR IRRADIATED FOODS (CODEX STAN 106-1983, REV.1-2003)[lxx]

7.3 Foods in Bulk Containers
The declaration of the fact of irradiation should be made clear on the relevant shipping documents. In the case of products sold in bulk to the ultimate consumer, the international logo and the words “irradiated” or “treated with ionizing radiation” should appear together with the name of the product on the container in which products are placed.

9c. Overview of regulations in other countries

The European Union:

> According to Article 6 of Directive 1999/2/EC any irradiated food or any irradiated food ingredient of a compound food must be labelled with the words “irradiated” or “treated with ionising radiation.” [lxxi]

The United States of America:

> Since 1986, all irradiated products must carry the international symbol called a radura. This must also be accompanied by the statement: “**Treated with irradiation”** or **“Treated by irradiation.”**
>
> The Food and Drug Administration requires that both the logo and statement appear on packaged foods, bulk containers of unpackaged foods, on placards at the point of purchase (for fresh produce), and on invoices for irradiated ingredients and products sold to food processors.
>
> Processors may add information explaining why irradiation is used; for example, "treated with irradiation to inhibit spoilage" or "treated with irradiation instead of chemicals to control insect infestation." [lxxii]

New Zealand:

While FSANZ is a shared Australia and New Zealand authority, the New Zealand Food Standards Authority has in the past been more candid than FSANZ when informing its public on irradiated food labelling. New Zealand’s material clearly says that irradiated products like fruit will not be individually labelled.

> “Under the Australia New Zealand Food Standards Code, which the New Zealand Food Safety Authority is responsible for enforcing in New Zealand, foods that have been irradiated must be clearly labelled showing that they have undergone this treatment.
>
> For items such as fruit that do not carry labels, a statement must be displayed beside the produce stating that it has been treated with ionising radiation.” [lxxiii]

Canada:

Canadian law requires both the Radura mark and a written statement about irradiation to be on packaged irradiated products. Non-packaged irradiated products must carry both the Radura symbol and written statement to be “displayed immediately next to the food.”

The Radura symbol is required to “appear in close proximity on the principal display panel” or on the sign to one of the following statements or a written statement that has the same meaning:

> (a) "treated with radiation";
> (b) "treated by irradiation"; or
> (c) "irradiated". [lxxiv]

9d. Labelling Recommendations:

Australia and New Zealand must label in accordance with global standards.

Appendix A includes our further concerns about the current Australia New Zealand labeling regime and a more detailed list of labeling recommendations. To ensure customer awareness and accurate information we recommend that Australia and New Zealand uphold international standards by requiring labelling with the words:

- irradiated (name of the food)
- treated with radiation
- or treated by irradiation

Our call for comprehensive labeling is intended to rectify the serious failings of the current regime and is not tacit support for irradiation. People have shown an aversion to irradiated food. Comprehensive, objective, factual, honest and mandatory labeling is the only assurance that shoppers can know and make the decision that suits them. Failure to do so is contrary to the public interest and unjust.

10. Conclusion: A1069 Must Be Rejected

We call on FSANZ to decide on option 2 and reject A1069 which seeks permission to irradiate tomatoes and capsicums. In brief, the grounds for our recommendation are:

- the safety and nutritional integrity of irradiated foods is not established;
- the application and the assessment are flawed in the ways we discussed;
- the technological need for this irradiation has not been established;
- irradiation is not the only option for fruit fly control that exists or is used now;
- the assessment has no cost/benefit analysis of other phytosanitary measures;
- FSANZ must ensure a whole systems approach is used that would guarantee - or at least make accessible – other approaches to quarantine solutions;
- A1069 offers no credible benefits to Australians or New Zealanders;
- if A1069 were approved, the Australian and New Zealand public would be unfairly and unnecessarily exposed to further risks, costs and hazards;
- exporting irradiated tomatoes and capsicums may expose local growers to greater competition from imported tomatoes and capsicums, further reducing or wiping out local production;
- only full, honest irradiated food labelling would support public confidence in the wholesomeness of Australian foods and the integrity of the food industry itself.

11. APPENDIX A

OTHER PROBLEMS WITH LABELLING

Rather than loosening labelling regulations, Australia and New Zealand need to develop stricter, more accurate and more comprehensive labelling guidelines.

To ensure that the public has the right to choose, we also call on FSANZ to:

- Prohibit the use of the wording "Treated with Ionising Electrons – as proposed
- to mandate individual labelling of irradiated products, including fruit and the containers holding products irradiated in bulk
- to remove positive statements re the irradiation process ***and***
- to prohibit the Radura symbol

Removing the use of the terms "'TREATED WITH IONISING ELECTRONS' from the Standard:
The phrase "Treated with ionizing electrons" must be prohibited. It is difficult to understand in its use of unfamiliar terms, does not indicate to the general public the use of radiation, and depending on the type of radiation used is technically inaccurate. Australian irradiation facilities use gamma radiation. Gamma radiation bombards the exposed product with high energy electromagnetic radiation and does not consist of electrons. X-ray irradiation, which is also permitted in Australia, is also high energy electromagnetic radiation.

Mandate for Labelling and not signage
FSANZ's Fact Sheet about A1069 states that "Australia and New Zealand require the labelling of any whole food that has been approved to be irradiated, or food that contains an approved irradiated ingredient, however small the percentage of that ingredient. Consumers can use this information to make informed choices about the product they buy." As with this statement, FSANZ's information about irradiation continuously misleads the public into believing that each irradiated product will be labelled. The fact is, as it is not packaged, most fresh fruit falls into the category of food not otherwise required to bear a label. The requirement in this case is signage nearby at the point of sale.

According to the Cambridge English Dictionary, 1990, a "label" is "a slip of paper, &c., affixed to something stating name, contents &c." [lxxv] A sign nearby at point of sale is not a label.

We have previously mentioned the case Australian irradiated mangoes imported into New Zealand, removed from a labelled carton and sold without any labelling or signage. This case was exposed simply because a person who saw the mangoes for sale was an environmental and consumer advocate who knew that Australian mangoes sold in New Zealand were irradiated. This coincidental discovery of an infraction of labelling regulations begs the question "how many other such cases are there that are not being monitored?" While the EU conducts regular checks into irradiation and labelling, we are not aware of any checks being conducted by FSANZ. In light of the lack of regulatory follow-up, a regulation that allows products to go unlabelled is begging to be breached! Comprehensive and mandatory individual labelling would alleviate this problem and would provide the public with the assurance that when FSANZ says a product is labelled, it is actually labelled.

Positive statements: FSANZ currently allows the inclusion of positive statements alongside irradiation labelling. Examples of such that have been used in Australia or New Zealand are: treated with irradiation – "to protect New Zealand's environment" or "to destroy harmful micro-organisms". Irradiation is known to change the molecular structure of a product and to deplete vitamin and nutritional content. Permitting the use of a positive statement about the process without any requirement for potential negative impact of the process is biased and inappropriate for fair consumer education.

Radura symbol: Furthermore, we oppose the use of the Radura symbol and call for FSANZ to disallow its use as it is misleading and deceptive, therefore breaching FSANZ's duty of care and legal obligations to the public.

The Radura symbol, permitted but not required, on irradiated products in Australia, has clearly been designed to lead the public to believe that the process is "clean and green". The design consists of a plant inside a circle, which is dashed on the top, reported to represent radiation. There are two commonly used versions of this symbol, (below) the international version and the version required on irradiated food in the US. The Radura symbol is strikingly similar to the US Environmental Protection Agency logo and bears no resemblance to the commonly used and easily recognizable symbol for radiation. (also below)

The international Radura mark

US –FDA Radura mark

US Environmental Protection Agency logo

Radiation symbol

New International Atomic Energy Agency sign warning about ionizing radiation

The original intention of the Radura mark is reported to have been to represent a high quality product that had a long shelf life.

"The word "Radura" is derived from radurization, in itself an artificial word combining the initial letters of the word "radiation" with the stem of "durus", the Latin word for hard, lasting.[lxxvi]

The inventors of the symbol Radura - knowing this proposal for a new terminology - came from the former Pilot Plant for Food Irradiation, Wageningen, Netherlands, which was the nucleus for the later Gammaster today known as Isotron. The director at the time, R.M. Ulmann, introduced this symbol to the international community. Dr. Ulmann in his lecture also provided the interpretation of this symbol: denoting food - as an agricultural product - i.e., a plant (dot and two leaves) in a closed package (the

circle) - irradiated from top through the package by penetrating ionizing rays (the breaks in the upper part of the circle).[lxxvii]

The Radura was originally used in the 1960s exclusively by a pilot plant for food irradiation in Wageningen, Netherlands that owned the copyright. Jan Leemhorst, then president of Gammaster, untiringly propagated the use of this logo internationally. The use of the logo was permitted to everybody adhering to the same rules of quality. The symbol was also widely used by Atomic Energy of South Africa, including the labelling by the term 'radurized' instead of irradiated. By his intervention, the new logo was also included in the Codex Alimentarius Standard on irradiated food as an option to label irradiated food. Today it is found in the Codex Alimentarius Standard on Labelling of Prepacked Food.[lxxviii]

It is clear that irradiation proponents developed, designed and promoted this logo with the intention of making irradiation seem attractive to consumers and removing any recognizable reference to radiation in the process.

Recent research shows that consumers are inclined to accept products irradiated with the Radura symbol, despite having little knowledge of the irradiation process.

"*In Chile the "Radura" symbol is not frequently present on food labels. The irradiation treatment is normally identified by the statement "tratado por energía ionizante" (treated by ionizing energy); 95.8% of the responders in the present study were not familiar with this symbol for irradiated food. However, 55.8% said that they would buy irradiated food because of the symbol, affirming that the "Radura" transmits the sensation of confidence and safety.*

The association of the symbol "Radura" with the statement "treated by ionizing energy" might facilitate the consumer's acceptance of irradiated food in Chile since most of the interviewed persons affirmed that the symbol means confidence and safety. A similar situation exists probably in many other countries." [lxxix]

While the logo denotes a plant, and is usually green in colour suggesting life or freshness, the purpose of irradiation is to use radiation to extend the shelf life – allowing irradiated products to appear fresh though they are not. Irradiation does not clean a product or remove contaminants, such as animal feces in poorly produced herbs or on hastily slaughtered beef, it simply acts to neutralize or mask these contaminants.

The reality of the process is far removed from the image suggested by the logo.

The logo is suggested by irradiation proponents as a means to encourage consumption of irradiated products – in this sense it is a marketing tool. We call on the FSANZ to actively ban its use and ensure that this logo will not be permitted on packaging or products in Australia or NZ.

Summary of Labelling recommendations:

Labelling is in the public interest and information provision is a duty of FSANZ. We, therefore, recommend:

Mandatory labelling or all irradiation food with the words:

- Irradiated…
- treated with radiation

  or
- treated by irradiation

and

- Prohibition of the terms ‘treated with ionizing electrons”
- Individual labelling of irradiated products, including fruit and the containers holding products irradiated in bulk
- Removal of positive statements re the irradiation process.
- Prohibition of the use of the Radura symbol

12. APPENDIX B

Australian and New Zealand consumers' knowledge of and attitudes towards irradiation

Over the past 30 years, Australians have shown considerable opposition to food irradiation. In the 1980s there was a huge movement against food irradiation in Australia and worldwide. International consumers' conventions in Europe and Australia called for a moratorium on food irradiation. Politicians came on board the campaign and in Australia; a Public Inquiry into irradiation saw the participation of all major environmental organizations, including Australian Conservation Foundation, Greenpeace, Friends of the Earth Australia as well as consumers' organisations and women's organisations.

"In 1987, the Australian Consumer's Association joined with all the major national and international consumer bodies in voting for a worldwide moratorium**…"** [lxxx] Records show that thousands of Australians signed petitions opposing food – making it a stand-out issue during its time.

A moratorium was put on the practice in 1989. This moratorium was lifted without much public awareness in1999, coincidentally within weeks the Caboolture Shire Council gave approval for the building of a nuclear irradiation plant at Deception Bay.

It is our understanding that most young Australians are unaware of food irradiation and that older Australians who were aware of the issue believe that the practice was successfully stopped in 1989.

Between 1999 and 2003 a renewed campaign was waged against a nuclear irradiation facility in Queensland and the first–ever application to irradiate food in Australia – Application A413 by the irradiation company Steritech for herbs… Again thousands of petitioners petitioned both the state and federal governments on these issues and many made submissions against the application. In 2003, a further application A443 for the Irradiation of Tropical fruits saw an overwhelming majority of submissions opposing the application 675 in against, 16 in favour- the application was nonetheless approved.

As a testament to the political understanding that the broader community does not support food irradiation in August 2003, the Australian Senate passed a motion calling for the Australian government to commission further research and disallowing further irradiation approvals until such research had been done. (chamber/journals/2003-08-14/0010)[lxxxi]. The motion passed with the support of the Labor Party, the Greens and the Democrats.

We have no reason to believe that Australian consumers' attitudes towards irradiation have changed since the strong shows of opposition in the 1980's and early 2000s.

Food Irradiation Watch speaks with people from all walks of life who are alarmed by the prospects of food irradiation. In 2005, FI Watch surveyed 1000 Australian food companies on their food irradiation policies, attitudes and practices. The research enabled us to produce the Irradiation-free Food Guide, which was reprinted with slight changes in 2007. Though FI Watch has been fairly inactive since 2008, the Food Irradiation Watch website and Irradiation-Free Food Guide continue to be popular. To date, approximately 25,000 hard copies of the Guide have been distributed, and orders for the Guide and/or other information continue to be received via email almost weekly.

We receive frequent requests for our Irradiation-free Food Guide and information from concerned consumers who have contacted food manufacturers about irradiation. Since the Guide's original publication, several major food producers have developed irradiation-free policies, which we understand is due to consumers concern about this issue expressed through their contacting the companies.

The research that has been done in Australia and overseas consistently indicates consumer resistance to the technology.

In December 2001 the report: Qualitative Research with Consumers – Food Labelling Issues, produced for FSANZ (then ANFA) found that:

> *"There was even less awareness and more misunderstanding about irradiated foods [than Genetically Modified foods.] The word 'irradiation' is almost synonymous with 'radiation' [also connoting 'nuclear'] (their brackets) and is consequently suspected to be unsafe or bad for you.*
>
> *Much would need to be done by ANZFA to educate people about exactly what irradiation means, how irradiated foods compare safety-wise and nutritionally to similar products preserved in other ways, and what the potential benefits are before it would be acceptable to consumers at large."* [lxxxii]

Despite the apparent research bias towards promoting irradiation, the researchers found that there is little consumer acceptance of the technology.

The same research found that Australian consumers believe that:

- they have the right to access to information about their food and
- that the government will facilitate that right.

This was demonstrated by the fact that:

> *"Consumers expressed an absolute right to know about any GMOs included in any products..."* [lxxxiii]

Consumers, also, expected all genetically modified food to be labelled as such.

> *"It was generally thought by most people that even if a product was not specifically labelled as 'GMO-free' it would not be genetically modified. That is, they would expect any product that contained genetically modified organisms to be clearly labelled that this was the case."* [lxxxiv]

Overall, consumers expressed general concern about the food supply and regulation and suggested that they trust their government to inform them about products and to label products clearly.

> "*The concern over the use of GM illustrates the level of general apprehension about the food supply and the perceived importance of maintaining stringent control over it..."* [lxxxv]

However,

> "*There is an over-riding belief that the food system in Australia and New Zealand is safe, and this sense of trust is extended to food labels. People generally have faith that the labels will be fairly accurate and reliable - as long as the governing body continues to check the products to ensure compliance. In this way there is a belief in 'good' governance."* [lxxxvi]

This research has great significance for FSANZ when considering labelling regulations and, in particular, labelling proposals linked to this Application.

Consumers' reported concerns over irradiation must be met with access to comprehensive and accurate information about the process to ensure FSANZ lives up to its mandate to enable consumers' rights to choose. We can extrapolate from this research that if a product is not labelled as irradiated then the public will assume that it is not.

Incidences such as the illness of Australian cats after eating irradiated food has highlighted an area of ongoing concern for FI Watch and the public: the lack of understanding that many products consumed by Australians and New Zealanders are not labelled as they are not legally "food" under Australian and New Zealand law. It is the case in Australia that one company's irradiated herbal teas and irradiated "therapeutic quality" herbal teas appear similarly packaged, side by side or near each other, on shelves in stores. The packaging of the tea regulated as food contains a statement re irradiation, the packaging of the tea regulated as therapeutic goods do not. The average consumer cannot ascertain that the "therapeutic quality" teas may also be irradiated – nor can they be expected to.

As a result of ten years work culminating in the distribution of 25,000 consumer guides on the issue, is our opinion that consumers are not aware that products they consume may fall under different regulatory regimes and therefore have different labelling requirements.

Consumers are unaware of the "food-drug interface", and have no obvious means by which to assess that products which may be marketed in one store may fall under differing regulatory bodies and therefore have no labelling requirement. The average consumer has no way of knowing that some fall under the "food" regulatory regime – while others fall under the therapeutic or veterinary regulatory systems and consequently do not require labeling. This is a grave failure of the regulatory system.

When conducting its Review of Food Labelling Law and Policy Review, the government acknowledged an "optimism bias whereby consumers assume that unmentioned factors are favourable." [lxxxvii]

Coupled with "optimism bias" felt by Australian consumers, the current flawed labelling regimen leads consumers to believe that products that are not labelled "irradiated" are not irradiated.

Australian cat owners whose cats were disabled by eating irradiated food were shocked to find that the food they bought for their cats was not "food" by law.

The fact is that the majority of irradiated and genetically modified products are not labelled as they either fall into the category of foods that don't require individual labelling – such as fruit – or are classified as animal feed, pet food or therapeutic goods.

The current status and definition of "food" denies consumers the right to make an informed choice around whether they will consume irradiated products or feed them to their animals.

Australian consumers – and their counterparts overseas - have shown ongoing resistance to irradiated food – which has been expressed by campaigning over 30 years, opposition to food irradiation applications, rejection by informed consumers of irradiated foods on the market, community campaigns to close irradiation plants and community campaigns to support local and organic agriculture.

Pushes by industry to remove labelling and/or to use labelling that does not include the words "radiation" or "irradiation" and/or to use euphemistic terms such as cold-pasteurisation", or "pasteurization", "ionizing electrons" suggest that industry also acknowledges consumer rejection of the technology.

Consumers do not want to eat irradiated food. In light of this rejection Australia should move towards banning irradiated foods – or at a minimum ensuring that comprehensive, non-biased labelling is guaranteed so that consumers can make an informed choice.

13. APPENDIX C

Concerns about the nuclear aspects of the food irradiation industry.

Nuclear industry

From the mining of uranium to the use of nuclear power or development of nuclear weapons, the nuclear industry produces intractable waste. The use of nuclear materials for the purpose of irradiating food continues the dangerous and unjustifiable nuclear industry, which we oppose.

There are three commercial irradiation facilities in the Australia and one in New Zealand. All of these commercial irradiation facilities in Australia and New Zealand, and the majority of irradiation plants around the world, are nuclear facilities that use radioactive Cobalt-60 as the source of ionizing radiation.

Caesium 137, a nuclear waste product, is also permitted in the US and other countries. The nuclear cycle is neither clean nor sustainable. It produces waste that is radioactive for thousands of years and leaves a legacy of environmental destruction and human health impacts, such as cancer, leukemia and birth defects. Uranium mines, nuclear reactors and irradiation facilities are often pushed on unwilling communities violating democratic principles and indigenous land rights.

The Cobalt-60 used by Australia's only commercial irradiation company, Steritech, is imported from Canada and transported to Steritech's three locations, Dandenong, VIC, Wetherill Park, NSW and Deception Bay, QLD.

The transport, storage and ongoing use of Cobalt-60 put the community and environment at risk. Accidents and incidents have occurred in Australia and overseas.

Not covered by insurance: A major concern to the Narangba and Deception Bay communities located near the then proposed nuclear irradiation plant at Deception Bay was the fact that insurance companies would not cover them in case of nuclear accident.

14. Supporting Organisations

Food Irradiation Watch

PO box 5829
West End QLD 4101
www.foodirradiationwatch.org

Food Irradiation Watch is a not-for-profit consumer advocacy organization aimed at raising awareness about food irradiation. We are an affiliate of Friends of the Earth Australia. We oppose the irradiation of food and work to ensure the consumer's right to choose to avoid irradiated foods, pet foods and therapeutic goods.

Food Irradiation Watch works with, educates and advocates for the community on the issue of food irradiation, alternatives to food irradiation, and related food, environment and social justice issues. As a community organization, we play a role in supporting the rights of citizens where government and corporations have failed them. We act in response to a need in the community that should not exist – or we feel would not exist if governments and corporations acted along principals of ecological and social justice in relation to food – its production and distribution.

While we act in a necessary role as a watchdog, we believe that it is in fact the role of the government to inform the community about food and food processes, and to create legislation and regulations that protect the consumer's "right to know" about what they consume.

Food Irradiation Watch (FI Watch) formed in 2003 from a partnership of Friends of the Earth Brisbane and several community networks opposed to the development of the food irradiation industry in Australia. FI Watch works closely with U.S. advocacy organization Food and Water Watch and international campaigns around food irradiation awareness in the E.U. and Japan.

FI Watch has a considerable understanding of both the public's and industries' attitudes towards food irradiation. In 2005, FI Watch surveyed 1000 Australian food companies on their food irradiation policies, attitudes and practices. The research enabled us to produce the Irradiation-free Food Guide, which was reprinted with slight changes in 2007. Though FI Watch has been fairly inactive since 2008, due to an increase in family responsibilities of the two key campaigners, the Food Irradiation Watch website and Irradiation-Free Food Guide continue to be popular. To date, approximately 25,000 hard copies of the Guide have been distributed, and orders continue to be received via email almost weekly. The Guide is also available online. FI Watch continues to work with people living near the nuclear irradiation facility at Deception Bay and to monitor food and food regulations in Australia. It is our understanding that Australians do not wish to consume irradiated foods or feed them to their pets and that at a minimum Australians expect their food to be accurately and comprehensively labelled when "novel" technologies such as irradiation and GMOs are used.

Friends of the Earth

Friends of the Earth is a community based social change organisation that addresses local, regional, national, and international environmental issues. Friends of the Earth is working towards the creation of an ecologically sustainable and socially just society through community action. Friends of the Earth is part of an international grassroots environmental network. Friends of the Earth aims to support local communities in gaining environmental and social justice through mobilising resources, and resisting destruction of global eco-systems. FOE opposes all forms of the nuclear industry and supports sustainable agriculture as the viable alternative.

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