

**18 January 2016**  
**[01–16]**

## **Consultation Paper – Labelling Review Recommendation 34: Review of mandatory labelling of irradiated food**

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In 2009, the then Australian and New Zealand Ministerial Council for Food Regulation (now known as the Australia and New Zealand Ministerial Forum on Food Regulation (Forum)) agreed to a comprehensive independent review of food labelling law and policy. An expert panel, chaired by Dr Neal Blewett, AC, undertook the review and the panel's final report, *Labelling Logic: Review of Food Labelling Law and Policy (2011)* (*Labelling Logic*) was publicly released on 28 January 2011. This consultation is about recommendation 34, one of the 61 recommendations in *Labelling Logic*. Recommendation 34 states: *That the requirement for mandatory labelling of irradiated food be reviewed.*

In the government response to recommendation 34, the Forum asked FSANZ to review the need for the mandatory labelling requirement for all irradiated food to continue, and assess whether there is a more effective approach to communicate the safety and benefits of irradiation to consumers. As a first step in analysing the issues associated with recommendation 34, FSANZ is seeking stakeholder views and any relevant information.

**To aid submitters in providing comments, questions are provided. Submitters are encouraged to provide comments in response to each question, as appropriate.**

For information about making a submission, visit the FSANZ website at [information for submitters](#).

All submissions to the consultation paper will be published on our website. We will not publish material that is provided in-confidence, but will record that such information is held. In-confidence submissions may be subject to release under the provisions of the *Freedom of Information Act 1991*. Submissions will be published as soon as possible after the end of the public comment period. Where large numbers of documents are involved, FSANZ will make these available on CD, rather than on the website.

Under section 114 of the FSANZ Act, some information provided to FSANZ cannot be disclosed. More information about the disclosure of confidential commercial information is available on the FSANZ website at [information for submitters](#).

Submissions should be made in writing, be marked clearly with the word 'Submission' and quote the correct project number and name. While FSANZ accepts submissions in hard copy to our offices, it is more convenient and quicker to receive submissions electronically through the FSANZ website via the link on [documents for public comment](#). You can also email your submission directly to [submissions@foodstandards.gov.au](mailto:submissions@foodstandards.gov.au).

There is no need to send a hard copy of your submission if you have submitted it by email or via the FSANZ website. FSANZ endeavours to formally acknowledge receipt of submissions within 3 business days.

### **DEADLINE FOR SUBMISSIONS: 6pm (Canberra time) 29 March 2016**

Submissions received after this date will not be considered unless an extension had been given before the closing date. Extensions will only be granted due to extraordinary circumstances during the submission period. Any agreed extension will be notified on the FSANZ website and will apply to all submitters.

Questions about making submissions or the application process can be sent to [standards.management@foodstandards.gov.au](mailto:standards.management@foodstandards.gov.au).

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## Executive summary

In 2011 an independent review of food labelling was completed and a final report was published—*Labelling Logic: Review of Food Labelling Law and Policy (2011)* (Labelling Logic) (Blewett et al 2011).

The report made 61 recommendations including recommendation 34 which states: *That the requirement for mandatory labelling of irradiated food be reviewed.*

The Government (through the Australia and New Zealand Ministerial Forum on Food Regulation (Forum)) responded to the recommendations in December 2011. In relation to recommendation 34, the Forum asked FSANZ to review Standard 1.5.3 – Irradiation of Food of the *Australia New Zealand Food Standards Code*, with a view to assessing the need for the mandatory labelling requirement for all irradiated food to continue. The Forum also asked FSANZ to assess whether there is a more effective approach to communicate the safety and benefits of irradiation to consumers.

Consumer exposure to irradiated foods in Australia and New Zealand has, to date, been low and the number of foods permitted to be irradiated has only recently increased. The value consumers currently place on irradiation label information is made in this context and could change as permission for more products to be irradiated is given. The effectiveness of different communication approaches on the safety and benefits of irradiation in the Australian and New Zealand context is difficult to assess given there has been limited education or communication on these subjects.

FSANZ is seeking to characterise the current environment by investigating stakeholder understanding and views on food irradiation labelling, and by identifying economic and technical issues associated with the mandatory labelling requirement.

The information received through this consultation will help FSANZ to better understand the current environment. Submitters are encouraged to respond to the questions in this paper. Background information and our initial consideration of issues relating to recommendation 34 are presented in this paper to help stakeholders prepare submissions.

The Forum did not ask FSANZ to change Standard 1.5.3, so no changes to the Standard are being proposed at this time. In addition, the Forum explicitly excluded the pre-market safety assessment requirement from this review.

After submissions are received FSANZ will prepare a review report for the FSANZ Board. Subject to FSANZ Board approval, the review report will be submitted to the Food Regulation Standing Committee and then to the Forum for consideration in late 2016. If FSANZ is asked to consider amending Standard 1.5.3, any proposed change would be subject to public consultation as part of the formal proposal process.

# 1 Introduction

## 1.1 Background to recommendation 34

In 2009, the then Australian and New Zealand Ministerial Council for Food Regulation (now known as the Australia and New Zealand Ministerial Forum on Food Regulation (Forum)) agreed to a comprehensive independent review of food labelling law and policy. The review included extensive public consultation to identify and prioritise labelling elements of concern. An expert panel, chaired by Dr Neal Blewett AC, undertook the review and the panel's final report, *Labelling Logic: Review of Food Labelling Law and Policy (2011)* (Labelling Logic)<sup>1</sup>, was publicly released on 28 January 2011.

Recommendation 34 from Labelling Logic states: *That the requirement for mandatory labelling of irradiated food be reviewed.*

The labelling review panel noted that the mandatory labelling of irradiated food should be reviewed because foods treated with ionising radiation have been in the food supply for at least 30 years with no evidence of detrimental effects, and there has not been any convincing evidence published to indicate potential future harm to humans.

Labelling Logic cites a 1999 World Health Organization (WHO) Technical Report (WHO 1999) into food irradiation, which concluded that irradiated food (at any dose appropriate to achieve the intended technological objective) is safe to consume and nutritionally adequate. The labelling review panel noted that subsequent to the release of the WHO Technical Report, its conclusions have not been controverted and have been widely endorsed by international and national bodies.

The labelling review panel also noted recommendation 28, which stated that, as a general principle, all food processed by new technologies (including irradiation as a treatment) should be required to be labelled for 30 years from the time of their introduction into the human food chain. The labelling review panel stated that at the end of the 30 year period and with the accumulated experience of a generation, the mandatory requirement should be reviewed.

## 1.2 Government response to recommendation 34

The Government response to the recommendations in Labelling Logic was publicly released in December 2011<sup>2</sup>. In relation to recommendation 34, the Forum commented that there is a significant body of evidence demonstrating that food processed using irradiation is both safe and nutritionally adequate. It said that irradiation provides significant benefits for consumers in terms of improved food safety and quality. Irradiation is also considered to be a cost-effective approach to managing biosecurity threats and preventing spoilage of fresh produce. The Forum noted the uptake of irradiation in Australia and New Zealand, and therefore the realisation of these benefits, was low.

The Forum stated that it is timely for the mandatory labelling requirement for all irradiated food to be reviewed and asked FSANZ to assess the need for this requirement to continue.

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<sup>1</sup> Labelling Logic is available at:

<http://www.foodlabellingreview.gov.au/internet/foodlabelling/publishing.nsf/content/home>

<sup>2</sup> Government response to Labelling Logic is available at:

<http://www.foodlabellingreview.gov.au/internet/foodlabelling/publishing.nsf/content/home>

FSANZ was also asked to assess whether there is a more effective approach to communicate the safety and benefits of irradiation to consumers. The Forum was of the view that improving consumer confidence in irradiation will reduce disincentives for increased uptake and broader application of the technology by industry. The requirement for irradiated food to be subject to a pre-market safety assessment was not requested to be included in this work.

The Forum also agreed not to pursue recommendation 28 (all food processed by new technologies to be required to be labelled for 30 years from the time of their introduction into the human food chain), opting instead to consider how and when the review of labelling requirements for new food technologies are to be considered as part of the development of policy guidance under recommendation 2 of Labelling Logic.

In June 2014, the Forum endorsed a policy guideline on the *Labelling of Food Produced or Processed using New Technologies*<sup>3</sup>. The policy guideline sets out the expectations of the Forum for the case-by-case consideration of labelling of foods produced or processed using a new technology. It recognises that labelling on such foods can be an issue of consumer interest and that in meeting this need, it is acknowledged that labelling is not a public health and safety issue, because the foods produced or processed using a new technology are subject to a pre-market safety assessment. The policy guideline states that unless reviewed prior, FSANZ should initiate a review of the regulatory intervention every ten years to determine whether it should lapse or continue.

Existing labelling requirements for irradiated foods were specifically excluded from the scope of the policy guideline because the Forum noted that FSANZ was already tasked with reviewing these requirements through recommendation 34.

## **2 Project approach and scope**

### **2.1 Approach**

In response to the Forum's request FSANZ is seeking to characterise the current environment by investigating stakeholder understanding and views on food irradiation labelling, and by identifying economic and technical issues associated with the mandatory labelling requirement.

Specifically, our report will cover the following:

- stakeholder views of recommendation 34
- a literature review, findings from existing surveys and information on consumer understanding and use of food irradiation labelling, and the potential effects of removing this information
- findings of external empirical research estimating the value of food irradiation labelling to consumers
- other approaches used to communicate the safety and benefits of irradiation to consumers

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<sup>3</sup> The policy guideline is accessible from the FSANZ website at <http://www.foodstandards.gov.au/code/fofr/fofrpolicy/pages/default.aspx>

- background information including current Code requirements
- a comparison of the current requirements against labelling approaches used internationally
- an investigation of the opportunity costs associated with the current mandatory requirement.

Our findings will be compiled in a report and submitted to the Forum (refer to section 5 for more on the process). No change to the Code is being proposed at this stage, however, the Forum may ask FSANZ to do further work in response to the report.

## **2.2 Scope**

FSANZ is not considering the evidence for the safety of irradiation as a treatment for food, or the current pre-market safety assessment process for permissions of irradiated produce, as both are considered to not be in scope. Mandatory record keeping requirements for irradiation facilities are also not in the scope of this work.

FSANZ notes that section 5.21 of *Labelling Logic* stated that ‘people have now had 30 years’ experience of irradiated foods’. However approvals for irradiated foods in Australia and New Zealand have only been in place since 2001, with most occurring after 2003. As a consequence, consumer exposure to irradiated foods in Australia and New Zealand has been low, and the number of foods permitted to be irradiated has only recently increased.

Any findings on consumer understanding and the value that consumers place on irradiation label information are made in the context of this low exposure. The effectiveness of different communication approaches on the safety and benefits of irradiation in the Australian and New Zealand context is difficult to assess given there has been limited education or communication on these subjects.

Given that FSANZ’s knowledge of current consumer understanding of irradiation is limited, it is premature to commission empirical research to test whether non-labelling approaches to communicate the safety and benefits of irradiation as a treatment for food will affect Australian and New Zealand consumer confidence in the technology. Such evidence will therefore not be included in the scope of this work.

This work will also exclude a full consideration of the costs and benefits of irradiation labelling or its removal, as FSANZ is not formally assessing the regulatory and non-regulatory options regarding food irradiation information. Should the Forum ask FSANZ to prepare a proposal to assess the option of removing the labelling requirement, then it would be appropriate to undertake this activity at that time. The report provided to the Forum will, however, include information received through consultations on costs and benefits related to the mandatory requirement, as appropriate.

# **3 Background**

## **3.1 Irradiation as a treatment for food**

A variety of processing methods are used to preserve foods and improve safety, such as drying, smoking, salting, pasteurisation, canning, refrigeration, freezing and chemical preservatives. Food irradiation is another effective food processing method that can be used to preserve foods and improve safety to:

- kill or sterilise pests, such as fruit flies and other insect pests (e.g. mealy bugs, mango weevils), that are present in or on fresh produce. This allows fresh produce to be exported to Australian states and other countries that are fruit-fly free (and/or free of other regulated insect pests). Irradiation also decreases the need for other pest control practices that may damage the produce (such as heat/cold treatments).
- extend the shelf life of foods by destroying organisms that cause spoilage or decomposition (e.g. moulds, bacteria, insects)
- inhibit sprouting (e.g. potatoes) and delay ripening of fruit to extend its shelf life
- prevent foodborne illness by destroying bacterial organisms such as *Salmonella* and *Escherichia coli* (*E. coli*)
- sterilise foods used for medical purposes (e.g. food for immune-compromised patients).

Like all preservation methods, irradiation should supplement rather than replace good food hygiene, handling, and preparation practices (Groth 2007; Arvanitoyannis 2010; Follett and Weinart 2012).

Irradiation is used as a treatment for food in more than 50 countries worldwide. In Australia, irradiation is typically used for fruit and vegetables as a final quarantine measure to ensure produce from fruit-fly infected areas does not pose a risk of introducing new species of fruit-fly into fruit-fly free areas of Australia and New Zealand and other countries the produce is exported to. Herbs and spices and herbal infusions are irradiated to control sprouting and pest infestation, including control of weeds, and also for bacterial decontamination purposes.

Research has shown that food irradiation is safe and effective. The process has been examined thoroughly by the World Health Organization (WHO 1994; 1999); the European Community Scientific Committee for Food (SCF 1986); the United States Food and Drug Administration (USFDA, 1986) and by scientists at FSANZ in 2001<sup>4</sup>, 2003<sup>5</sup>, 2011<sup>6</sup>, 2013<sup>7</sup>, and 2014<sup>8</sup>, respectively.

Attachment A provides background on the following:

- how food is irradiated
- safety of irradiated food
- quarantine alternatives to irradiation for fresh produce
- assessments undertaken by FSANZ, including the nutritional adequacy of irradiated foods
- permissions for and purpose of irradiating food in Australia and New Zealand.

### 3.2 Labelling of irradiated food in Australia and New Zealand

The Australian and New Zealand requirements for irradiating food are contained in Standard 1.5.3 — Irradiation of Food<sup>9</sup> of the *Australia New Zealand Food Standards Code* (the Code).

<sup>4</sup> <http://www.foodstandards.gov.au/code/applications/Pages/applicationa413irradiationofherbsandspices/Default.aspx>

<sup>5</sup> <http://www.foodstandards.gov.au/code/applications/Pages/applicationa443irradiationoftropicalfruit/Default.aspx>

<sup>6</sup> <http://www.foodstandards.gov.au/code/applications/Pages/applicationa1038irra4655.aspx>

<sup>7</sup> <http://www.foodstandards.gov.au/code/applications/Pages/applicationa1069irra5511.aspx>

<sup>8</sup> <http://www.foodstandards.gov.au/code/applications/Pages/A1092-Irradiation.aspx>

<sup>9</sup> Standard 1.5.3 – Irradiation of Food is available from: <https://www.comlaw.gov.au/Series/F2015L00406>



Standard 1.5.3 states that if a food has been irradiated, or it contains an ingredient or component of a food that has been irradiated, then a statement to the effect that the food, ingredient or component has been treated with ionising radiation is required. The requirement applies to packaged and unpackaged irradiated foods, for retail and when used in catering.

If an irradiated food or a food containing irradiated ingredients/components is exempt from bearing a label (e.g. unpackaged whole fruits or vegetables, or meals sold in a restaurant foods) then a statement that the food, ingredient or component of the food has been treated with ionising radiation must be stated in labelling that accompanies the food or is displayed in connection with the display of the food. Food containing irradiated ingredients/components must be labelled irrespective of the level they are present in the food (e.g. irradiated herbs and spices must always be labelled if used as an ingredient in food).

The wording of the statement is not prescribed. Food manufacturers can select the wording, so long as the statement indicates that the food has been treated with ionising radiation and is not false and misleading under the requirements of Australian Consumer Law and the New Zealand *Fair Trading Act 1986*.

The Radura symbol (below) is a standard international symbol indicating that a food product has been irradiated. It is usually green and resembles a plant in a circle, however graphical details and colours vary between countries. The Code does not mandate the display of this symbol on the labels of irradiated food, however there is no prohibition on its use. If the symbol is used, the food label must still display the mandatory labelling requirements for irradiated foods.



*Figure 1: International Radura symbol*

Attachment B includes information on the development of Standard 1.5.3.

### **3.3 International food irradiation labelling approaches**

The Codex General Standard for the Labelling of Pre-packaged Foods<sup>10</sup> (the Codex Standard) was adopted in 1985. It specifies that 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 wording of the written statement is specified, and the use of the international Radura symbol is optional. Where the Radura symbol is used, it should be located in close proximity to the name of the food. For processed foods in which irradiated product is used as an ingredient, the Codex Standard specifies that the irradiated product should be declared in the list of ingredients.

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<sup>10</sup> CODEX STAN 1-1985 <http://www.codexalimentarius.org/standards/list-of-standards/>

FSANZ has reviewed the requirements for food irradiation label information in a number of countries<sup>11</sup>. Most of the countries reviewed appear to have based their requirements on the Codex Standard, although some variations occur.

For irradiated whole foods that are packaged, it is common for a mandatory statement to indicate that the food has been irradiated. Some countries prescribe the wording of the statement or statements that may be used, and may or may not require the international Radura symbol to be used. One country (Indonesia) also requires the objective of irradiation (i.e. the purpose) to be included.

For packaged foods that contain an irradiated ingredient(s), most countries require that the ingredient(s) be identified on the label, usually in the list of ingredients. However, some countries (e.g. Canada, Malaysia) exempt the irradiated ingredient from being declared if it is present in the final prepackaged food in amounts below an agreed threshold (e.g. in Canada, an irradiated ingredient that constitutes less than 10 per cent of the prepackaged food does not need to be identified as 'irradiated'). In the United States of America, irradiated ingredients or components do not have to be identified on the label; labelling only applies when the whole food has itself been irradiated.

Most countries require specific signage for unpackaged foods that have been irradiated (e.g. whole produce) and are sold in bulk. The wording of the statement and the use of the international Radura symbol are often prescribed, similar to irradiated whole foods that are packaged. The U.S. permits each item of food to be individually labelled as an alternative to the counter sign or shelf label. Codex requirements for unpackaged foods are specified in the General Standard for Irradiated Foods<sup>12</sup>. The words 'irradiated' or 'treated with ionising radiation' and the international Radura symbol must appear together with the name of the irradiated product when it is sold in bulk.

FSANZ does not know whether other countries have previously considered, or are considering, changing or removing their food irradiation information requirements.

A summary of Codex specifications and international requirements for food irradiation labelling is at Attachment C.

## **4 Questions for stakeholders**

The questions below are also listed at Attachment D.

### **4.1 Consumer awareness and understanding of food irradiation labels**

The availability of irradiated food in Australia and New Zealand has, to date, been low due to the limited number of foods permitted to be irradiated since the Standard was first gazetted in 1999<sup>13</sup>. Consumer exposure has been further limited because of the low uptake by retailers of irradiated produce. FSANZ understands that major Australian and New Zealand retailers are not stocking irradiated produce other than irradiated mangoes. In New Zealand, other imported irradiated produce (e.g. tomatoes) are sold by independent produce retailers.

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<sup>11</sup> United States of America, Canada, the European Union, Indonesia, Malaysia, Vietnam, South Africa.

<sup>12</sup> CODEX STAN 106-1983, REV. 1-2003 <http://www.codexalimentarius.org/standards/list-of-standards/>

<sup>13</sup> Standard A17 of Volume 1 of the Australian Food Standards Code, and later adopted in 2000 as Standard 1.5.3 in Volume 2 of the joint Australia New Zealand Food Standards Code.

FSANZ has previously examined consumer awareness and understanding of the meaning of food irradiation labels.

The findings of a 2003 FSANZ consumer survey (NFO Donovan Research 2003) revealed that less than one per cent of Australian and New Zealand consumers were aware of irradiated food labels. After prompting, only 6 per cent of consumers recognised irradiated food labels. Further, only 3 per cent claimed to use irradiated food labels occasionally when making purchasing decisions.

It is likely that the limited number of foods permitted to be irradiated at that time meant that consumers' exposure to such foods was low and therefore their awareness was low. It is only recently in 2014 that more commonly consumed foods such as tomatoes and capsicums have been permitted to be irradiated and have been offered for sale in both countries. FSANZ understands the avenues for selling tomatoes and capsicums have also been limited (e.g. to small independent produce sellers in New Zealand). Before 2014, the foods permitted to be irradiated were limited to certain tropical fruits, herbs and spices and herbal infusions.

FSANZ recently reviewed the literature on consumer awareness, understanding and acceptance of food irradiation as part of Application A1092 – Irradiation of Specific Fruits and Vegetables<sup>14</sup>. One study (Gamble 2002) found that 60 per cent of Australians and 68 per cent of New Zealanders were aware of the term 'food irradiation'.

While labelling may inform consumers that a particular food is irradiated, no Australian or New Zealand studies were found that collected data on consumers' understanding of food irradiation labelling at the point of purchase.

Opposition to new food technologies appears to be driven in part by perceived consumer safety concerns, which may arise when levels of understanding of the technology itself are low. FSANZ reviewed the literature on risk perception as part of Application A1092. Wariness of consumers to new food technologies such as food irradiation is linked to perceptions of risk associated with the technology and perceived lack of benefits accruing to the consumer (Slovic 1987; Frewer et al. 1997; Henson et al. 2007; Cox et al. 2010).

Food irradiation is often perceived as a high-risk, low benefit technology (Sparks and Shepherd 1994; Frewer et al. 1997; Cardello et al. 2007; Henson et al. 2007). This is not unexpected given the characteristics of food irradiation where the technology may not be voluntarily chosen by the consumer, is not under their control and is unobservable, and where there is a perception of uncertainty surrounding the science. Additionally, benefits may not accrue to the consumer, but rather to others such as producers, exporters and the environment (Frewer et al. 1997; Cox et al. 2010). However, increased choice, quality and shelf life of produce and potentially lower prices are consumer benefits.

FSANZ is interested in consumers' current level of awareness of food irradiation as a treatment, and awareness of food irradiation labelling now that more types of irradiated produce are becoming available for sale, though FSANZ acknowledges that sale of irradiated foods in the Australian and New Zealand markets is currently limited.

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<sup>14</sup> <http://www.foodstandards.gov.au/code/applications/Pages/A1092-Irradiation.aspx> Refer to Appendix 1 to Supporting Document 1 - Food irradiation in Australia, New Zealand and other countries. 16 Dec 2014.

### Questions for Submitters

1. What information (for example, studies, data or consumer feedback) can you provide on consumer awareness, understanding and behaviour, in response to labelling about food irradiation?

## 4.2 Adequacy of current food irradiation labelling requirements

Food labelling is a key source of information for consumers at the point of sale. Labelling of irradiated foods is intended to assist consumers to make an informed choice about the foods they purchase.

Standard 1.5.3 of the Code mandates the inclusion of a statement to inform consumers that the food has been treated with ionising radiation. The safety and benefits of food irradiation are not communicated through the mandatory statement, although an additional voluntary statement of this nature is not specifically prohibited in the Code. An additional voluntary statement could therefore be used providing it is not false, misleading or deceptive. Further, the Code does not specifically refer to the Radura symbol, so there is nothing to prohibit its use when used in association with the mandatory statement.

Examples of labelling statements found in the New Zealand marketplace include 'Irradiated Fruit' without a Radura symbol, and 'Irradiated to protect the New Zealand environment' accompanied by a Radura symbol. However, FSANZ could not find examples within Australia.

### 4.2.1 Stakeholder views

Some consumer advocacy groups would support the current labelling requirement being strengthened, because they consider that the safety and nutritional integrity of irradiated foods has not been established and other treatment options exist. These groups would prefer the wording of the labelling statement to be prescribed and that positive statements are not used. This is because they see the latter as promoting rather than informing consumers about the technology. They consider permitting the use of a positive statement about the irradiation process without requiring labelling on the potential negative impact of the process to be biased and inappropriate.

These consumer advocacy groups are also generally opposed to the Radura symbol because they consider it is designed to lead the public to believe that the process is "clean and green" and therefore it is misleading. Further, they question Labelling Logic's assertion that irradiated foods have been in the Australian and New Zealand food supply for 30 years. (FSANZ notes that herbs and spices were the first foods permitted to be irradiated in Australia and New Zealand in 2001; see Attachment A for further information about the assessments undertaken by FSANZ).

Some consumers may question why irradiated food is labelled at all if it has been assessed as safe. The labelling requirement may raise doubts about the suitability and applicability of the technology. In the absence of information about why food is irradiated, consumers may view the labelling statement as a warning statement.

Some industry stakeholders point out that food that undergoes alternative treatments, such as pasteurisation and chemical disinfestation of pests, is not subject to similar labelling. In their view, labelling unfairly singles out irradiation as a treatment. That is, it is an example of where consumers are informed of one treatment (irradiation), but not informed about other types of treatments, such as pre- and post-harvest chemical treatments (e.g. crop insecticides, methyl bromide).

These industry stakeholders believe this situation is preventing consumers from making truly informed choices about food.

FSANZ is interested in stakeholder views about the adequacy of current labelling information. We invite submitters to provide comment on the questions below.

#### Questions for Submitters

2. Do you purchase, or would you consider purchasing, irradiated food?
  - if yes, then why?
  - if no, then why not?
3. Does the current labelling requirement for irradiated food (see box below) provide enough information for you to make an informed choice about the food you buy?

**Labelling requirement:** If the food, ingredient or component of a food has been irradiated, a statement to the effect that the food, ingredient or component has been treated with ionising radiation is required.

4. What are your views about the wording of the statement not being prescribed?
5. What are your views about the voluntary use of the Radura symbol?

### 4.3 Value of food irradiation labelling

#### 4.3.1 Consumers

New food technologies such as irradiation attract a broad degree of public interest and the literature on this subject shows that opposition to this technology is driven in part by perceived consumer safety concerns.

Gamble (2002) found that the types of concerns identified by Australians and New Zealanders included: exposure to radiation; reduction in nutrition and wholesomeness of foods; damage to the environment and occupational health for workers; and the use of irradiation as a substitute for safe food production.

Lack of understanding may contribute to the perceived safety concerns that some consumers hold. These concerns are likely to influence consumer acceptance of irradiated food and therefore the value they place on food irradiation labelling. However some may still hold safety concerns while understanding the nature and detail of irradiation as a treatment.

Although irradiated foods have been in the Australian and New Zealand market place for over ten years, historically the number of foods permitted to be irradiated and sold has been low. Permission was given in 2013 for tomatoes and capsicums to be irradiated. In 2014, permissions were given for apples, apricots, cherries, nectarines, peaches, plums, honeydew, rockmelons, scallopini, strawberries, table grapes and zucchini to be irradiated.

New Zealand biosecurity approvals<sup>15</sup> are still pending for the irradiated produce granted permission in 2014 (listed above), so these irradiated fruits and vegetables are not yet available in the New Zealand market. However, the future availability of irradiated foods may affect the value consumers place on this type of labelling information.

It is also possible that some irradiated foods are more acceptable to consumers than others. For example, in the New Zealand market, mangoes are imported rather than grown locally. Factors such as the availability of mangoes, their appearance, taste and price may be valued more by consumers than their irradiation status. In contrast to tropical fruits such as mangoes, tomatoes are both locally grown and imported, and are more commonly consumed. Tomatoes are also used more widely as ingredients in a range of processed and ready-to-eat foods. Consumers may consider food irradiation labelling is an important factor in their decision to purchase or consume tomatoes.

FSANZ notes that in Australia and New Zealand, the requirement for restaurant meals containing irradiated ingredients to be labelled is different to that for genetically modified food. In the United States, food containing irradiated ingredients but which is itself not irradiated is exempted from labelling.

### **Consumer studies**

In October 2001, FSANZ commissioned qualitative research to examine Australian and New Zealand consumer understanding and use of various label elements (NFO Donovan Research 2001). A total of 133 people participated in 18 focus groups, held in Australia and New Zealand. The findings of this research indicated these consumers had low awareness and considerable misunderstanding of food irradiation labelling. The word 'irradiation' was deemed almost synonymous with 'radiation'. The report also noted that *the general consensus was that even though the word was alarming and off-putting, that it should be used on packaging rather than a symbol, again because people had a right to know what has been done to their food...*

FSANZ commissioned a representative online study of 1200 Australian and 800 New Zealand consumers in 2007 (TNS Social Research 2008). Participants were asked to rank their level of concern for a number of food issues on a scale, where one was 'not at all concerned', and seven was 'extremely concerned'. Thirteen per cent of Australian respondents and 11 per cent of New Zealand respondents nominated irradiation of food or food ingredients as an issue. Of those participants that did nominate food irradiation, the level of concern for this issue was ranked as a mean of  $5.89 \pm 1.04$  SD and  $5.72 \pm 1.26$  SD for Australian and New Zealand participants, respectively. Thus, while the strength of this concern was high, it is only a small proportion of the sample who indicated they were concerned.

TomatoesNZ (the industry body that represents the fresh tomato sector) commissioned a telephone poll of 1000 New Zealand adults in April 2015 (Curia Market Research 2015). Poll participants were asked if they would like:

- the fruit and vegetables they buy that have been treated with irradiation to be clearly labelled as irradiated. (Eighty-five per cent of participants responded that they would).

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<sup>15</sup> The Ministry for Primary Industries (MPI) conducts an import risk analysis of commodities, including foods, to assess the biosecurity risks from organisms such as insect pests to New Zealand. As part of this assessment, MPI considers the adequacy of proposed phytosanitary measures (including, in some cases, irradiation treatment) to control the risks.

- to know if a dish they ordered in a restaurant, café or takeaways includes irradiated food. (Seventy-eight per cent of participants responded that they would).

The poll focussed on irradiated food only and did not investigate alternative treatment options or consider other factors that could influence food decisions such as price or taste.

#### Questions for all Submitters

6. Do you think the current labelling requirement for all foods permitted to be irradiated should be removed?
  - if yes, then why?
  - if no, then why not?
7. If labelling was to continue for irradiated whole foods, do you think restaurant meals containing irradiated ingredients should still be labelled?
8. If labelling was to continue for packaged foods containing irradiated ingredients, do you think the irradiated ingredients should still be labelled?

#### 4.3.2 Industry

Food retailers have a regulatory obligation to label any food for sale that is irradiated. Some food industry members have noted that this can be onerous for several reasons.

In Australia, irradiation of fruit and vegetables is typically undertaken to enable produce from fruit-fly zones to be exported to fruit-fly free zones, whether to other Australian states or other countries. Horticulturists tend to have short timeframes in which ripe fruit and vegetables are picked and made available to markets. Irradiation is an agile post-harvest treatment method. Exporters are able to identify gaps in the market, irradiate, and transport their produce within a couple of days. Entire pallets of produce are irradiated at a time.

FSANZ understands some retailers require wholesalers to provide food irradiation labelling as stickers on individual produce. However, this means that the produce has to be transported to a labelling facility where it is unpacked, labelled and repacked before being transported to the final destination. In addition to labelling costs, this practice can add significant delay to accessing markets, potentially leading to reduced sales or an inability to take advantage of higher prices.

Labelling each fruit or vegetable individually is not required by the Code, as food irradiation information may be provided as a sign near the whole produce (when sold loose) at the point of sale. The individual labelling of produce is reported to assist in-store segregation and avoid any loss to the retailers' reputation from 'near produce' signage not being adequate. In the absence of individual labelling, segregation of produce increases handling costs and the amount of display space and storage required for a particular fruit or vegetable if there is also non-irradiated produce.

Fruit and vegetables may be sourced through a variety of pathways (imported versus local, treated with irradiation versus alternative treatments, requiring additional labelling versus none). Food retailers need to consider compliance and administration costs associated with regulatory obligations relating to the individual foods. Exporters sourcing from various producers have to 'double handle' produce where there is a mix of irradiated and non-irradiated produce.

Not only is there the additional labelling process for irradiated produce but a separate packing line is required for the irradiated produce to ensure that the external packaging is correctly identified as irradiated.

FSANZ has been informed that major Australian grocery retailers may not be stocking Australian irradiated produce. One reason may be due to the limited availability of this produce. Currently there is only one food-grade irradiation facility in Australia, based in Queensland. The cost of transporting produce inter-state to the irradiation facility and then to a fruit-fly free market (Western Australia, Tasmania, South Australia) is prohibitively expensive for most producers and this may be limiting the availability of irradiated produce for further processing or for retail sale in Australia. The demand for individual stickers on produce from retailers adds to the overall cost.

FSANZ understands that another reason for the limited availability is that some retailers have decided to not sell irradiated food in their stores based on the results of their own customer feedback on the acceptability of irradiated food.

FSANZ also understands that major New Zealand grocery retailers are not stocking imported Australian produce that has been irradiated, other than irradiated mangoes. Imported Australian tomatoes that have been irradiated are only currently being sold by small independent retailers of produce.

FSANZ is aware of anecdotal evidence that food service operators and quick service restaurants are avoiding using irradiated produce as ingredients in the meals they sell, because they view the labelling requirement as an impediment. There may be a variety of reasons for this, such as the costs of keeping labelling up-to-date, record keeping costs, segregation costs and the businesses' concerns that consumer may have negative perceptions about food irradiation.

Manufacturing businesses may either source ingredients solely from a single farming zone or vary the source, depending on seasonality of local ingredients or the price and availability of imported ingredients. This may mean that the presence of irradiated ingredients varies over the year. Needing to track the use of irradiated ingredients for each production batch (through packaging with/without irradiation labelling), and ensuring the batch is appropriately labelled, can add to manufacturing costs. Further, alternating between irradiated and non-irradiated ingredients can be problematic when bulk labels for packaged products are prepared in advance. It is likely that most food manufacturers would choose to avoid using irradiated ingredients.

Post-harvest phytosanitary treatment is often a requirement to access certain markets. Traditionally these requirements may have been met using post-harvest chemical treatments. Fruit and vegetable producers are becoming increasingly interested in alternative phytosanitary treatments such as irradiation, now that permissions for certain post-harvest chemical treatments (e.g. fenthion) have been revoked. Irradiation is a preferred phytosanitary treatment for some commodities for reasons of taste, appearance and speed to market. In other cases, there may be restrictions or prohibitions on the use of alternative phytosanitary treatments (e.g. Thailand does not accept foods treated with methyl bromide) so irradiation is seen as a viable alternative.

FSANZ understands the slow uptake of irradiation in the Australian domestic market (by fruit and vegetable producers and by retailers) has affected the level of experience in, and capacity for, irradiation as a technology. This has in turn affected the ability to grow not only the domestic market, but also new export markets for irradiated produce.



FSANZ is interested in the value stakeholders place in irradiation food labelling and whether there is a need for the requirement to continue. Questions for industry submitters follow.

### **Questions for Industry Submitters**

#### ***Produce growers***

9. Does the mandatory labelling requirement prevent you from using irradiation as a treatment for your produce? Please provide reasons for your answer

#### ***Food manufacturers***

10. Do you use irradiated ingredients in your products? (For example, tomato paste, herbs & spices)
11. Does the fact that irradiated foods have to be labelled impact on your decision to use them?
12. How important is the labelling factor alongside other factors? (For example, price, availability of ingredients, quality of produce, reputation of supplier)
13. If the mandatory labelling requirement was removed for irradiated ingredients used in processed foods, would your company be more likely to use irradiated ingredients?

#### ***Food service providers***

14. Do you use irradiated whole foods in your products? (For example, irradiated tomatoes in sandwiches)
15. If the mandatory labelling requirement was removed for irradiated whole foods, would you still ask suppliers to label the food?

#### ***All industry submitters***

16. Have you conducted any consumer research or received consumer enquiries about irradiated food? If so, are you able to provide the research to FSANZ?
17. Do you think the current mandatory labelling requirement is an impediment to developing existing / new markets? What reasons do you have for this?
18. What do you perceive to be the costs associated with the mandatory labelling requirement? (For example, costs of segregating irradiated produce from non-irradiated produce, specific packaging and/or labelling costs, traceability costs)
19. What do you perceive the costs associated with the **removal** of mandatory labelling to be? (For example, potential for loss of consumer confidence in your products, amending product segregation, handling and display processes)
20. What are the opportunity costs for your business associated with the mandatory labelling requirement? (That is, does the requirement to label irradiated produce cause you to compromise in your business practices? For example, does the time delay involved in labelling your produce prevent you from accessing certain market opportunities?)
21. What are the relative costs and benefits of irradiation and other treatments in terms of cost, efficacy, post-treatment product quality, convenience and timeliness?

## 4.4 Approaches to communicate the safety and benefits of food irradiation

There is a body of evidence to suggest that consumer acceptance of food irradiation improves when information is provided about the technology and its benefits (Bruhn 1986; Resurreccion et al. 1995, Rimal et al. 2004, Nayga et al. 2005).

In the government response to Labelling Logic, the Forum stated that improving consumer confidence in irradiation would reduce disincentives for increased uptake and broader application of the technology by industry. As part of this work, FSANZ is examining the approaches used domestically and internationally to communicate the safety and benefits of irradiation to consumers. The approaches range from information on labels to other communication measures, including media campaigns.

Food labelling may be used to provide additional information about safety and benefits, although this does not appear to be common. FSANZ has seen benefit statements such as *'Irradiated to protect the New Zealand Environment'*. Such statements infer there are benefits but do not describe what these benefits are and how they are achieved. It is possible to extend the labelling information to describe the benefits, for example *'Irradiated to protect against the spread of fruit fly'*. This type of extended statement is not specifically prohibited under current Code requirements.

Another labelling approach is to promote the voluntary use of the international Radura symbol as an identifiable logo consumers can recognise. Its use is currently not widespread in the Australian and New Zealand marketplaces. In a U.S. study where the Radura symbol is mandatory on irradiated whole food, 484 participants were asked about their perception of the symbol. Most respondents (67 per cent) viewed it as an assurance of quality and indicated a willingness to purchase irradiated food, 17 per cent were indifferent to its presence, and 5.5 per cent considered it a warning and would not be willing to buy irradiated food. Only 10 per cent of the participants were unaware of the symbol or its meaning (Nayga et al. 2005).

Fact sheets and store level information displays about the safety and benefits of irradiation at the point of sale are another approach. This approach was used when irradiated mangoes first entered the New Zealand market in 2004, and more recently in 2013 when irradiated tomatoes became available. Educational material can be provided by the irradiation facility, the exporter, the importer, the retailer and by enforcement agencies.

Overseas researchers have suggested a variety of approaches, such as providing irradiation information through traditional and social media (Rodrigues et al. 2007), which could allow consumers to engage in discussion forums. Media campaigns have been identified as a method to reach the largest number of consumers through different communication mediums (Resurreccion et al. 1995). Another survey (Furuta et al. 1998) suggested the school curriculum and education policy be reviewed to provide information about food irradiation at an early age.

FSANZ is interested in stakeholder views about different approaches to communicating the safety and benefits of food irradiation.

### Questions for Submitters

22. What are your views about information on the safety and benefits of food irradiation being on food labels?
23. What other practical approaches other than labelling can be used to communicate the safety and benefits of food irradiation? (Please describe)
24. Do you have any information on the effectiveness of any of these approaches? (If so, please provide)

## 5 Next Steps

It is important to note that no change to the Code (e.g. removal of the current labelling requirement) is being proposed at this stage. FSANZ has not been asked to make amendments to Standard 1.5.3 as part of this work.

Following consideration of information and comments provided by submitters, FSANZ will prepare a report for the FSANZ Board. The report will identify the issues associated with the current labelling requirement and the issues relating to removing the requirement. The report will also examine the different approaches that are currently and could be further used to communicate the safety and benefits of irradiation to consumers.

Subject to FSANZ Board approval, the report will be submitted to the Food Regulation Standing Committee and then to the Forum for consideration in late 2016. Should the Forum ask FSANZ to consider amending Standard 1.5.3, this would be addressed under the FSANZ formal proposal process which includes public consultation.

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## Attachments

- A Irradiation as a treatment for food
- B Background to current labelling requirements
- C Codex specifications and international requirements for food irradiation labelling and worldwide permissions for food irradiation
- D Questions for stakeholders

# Attachment A – Irradiation as a treatment for food

## 1 How food is irradiated

Food is irradiated via exposure to ionising radiation from one of three radioactive sources:

- Gamma rays, which are emitted from radioactive forms of the element cobalt (Cobalt 60) or of the element caesium (Caesium <sup>137</sup>)<sup>16</sup>
- X-rays, which are generated by or from machine sources using electricity
- Electron beam (also referred to as e-beam), which are generated by or from machine sources using electricity.

Cobalt 60 is used in Australia.

Gamma rays and x-rays are a form of radiation that shares some characteristics with microwaves, but with much higher energy and penetration. These sources are also used to sterilise medical, dental and household products, and X-rays are used for medical imaging.

The rays pass through the food just like microwaves in a microwave oven, but the food does not heat up to any significant extent.

Radiation is measured in kiloGrays (kGy). Technology allows for a precise dose to be measured. The doses permitted range from a maximum of 1 kGy for fruit and vegetables permitted to be irradiated, to 30 kGy for herbs and spices.

## 2 Safety of irradiated food

Food irradiation is used in more than 50 countries. Worldwide, the technology has been used to treat food since the late 1950s, and provides food processors with an alternative to chemical and heat treatments.

Irradiation does not make foods radioactive, because the maximum levels set for the amount of radiation (kGy) that can be used to treat food are too low. During irradiation the food never comes into contact with the radioactive source. No radioactive energy remains in the food after treatment.

### International guidance on the safe use of irradiation

The 1983 Codex standard for irradiated foods (revised 2003) requires that the maximum absorbed dose for a food should not exceed 10 kGy, except when necessary to achieve a legitimate technological purpose<sup>17</sup>. No specific foods are mentioned, although the standard states:

- *The irradiation of food is justified only where it fulfils a technological need or where it serves a food hygiene purpose and should not be used as a substitute for good manufacturing practices.*

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<sup>16</sup> Note that Caesium<sup>137</sup> is not approved as a source of ionising radiation for food in Australia and New Zealand

<sup>17</sup> [http://www.codexalimentarius.net/download/standards/16/CXS\\_106e.pdf](http://www.codexalimentarius.net/download/standards/16/CXS_106e.pdf)

International Standards for Phytosanitary Measures 18 (*ISPM No. 18*) – *Guidelines for the Use of Irradiation as a Phytosanitary Measure*, International Plant Protection Convention, 2003 (ISPM, 2003) provides technical guidance on the specific procedures for the application of ionising radiation as a phytosanitary treatment for pests or articles.

The American Society for Testing and Materials, *ASTM F1355-06 Standard Guide for Irradiation of Fresh Agricultural Produce as a Phytosanitary Treatment* (ASTM, 2006), also provides for procedures for the radiation disinfestation of fresh fruits as a quarantine treatment.

### **3 Alternatives to irradiation for fresh produce**

There are some alternatives to irradiation as a phytosanitary measure. These include:

- post-harvest chemicals (e.g. methyl bromide, dimethoate)
- refrigeration
- hot water dips
- vapour heat
- controlled atmosphere
- physical disinfestation, i.e. cleaning or washing.

There are advantages and disadvantages associated with each of these treatments. Depending on the treatment, the disadvantages can be the high cost of the treatment, an adverse effect on the quality of produce and shelf life, environmental concerns, the risk of chemical residues remaining on food and limited effectiveness against a broad range of insects. Some treatments require more handling of produce. Others take longer for produce to be processed, which can lead to missed market opportunities.

When these treatments are used, there is no requirement to declare the use of the treatment on the label.

These alternatives are not under consideration as part of this work. If certain produce presents a biosecurity risk for a particular market, producers need to consider which phytosanitary measures are permitted before the produce can enter that market. If more than one measure is available, the decision on which treatment to use will be based on cost, impact on quality and the effectiveness of the treatment.

Irradiation is one of the ‘tools in the toolbox’ of phytosanitary measures. Currently, Australia has an irradiation facility that treats fresh produce grown in fruit-fly endemic areas. This irradiated produce is sold domestically and is exported to New Zealand and to other countries. New Zealand does not have an irradiation facility to treat food, and any irradiated food available for sale is imported. Further, fruit fly is not established in New Zealand and growers rely on other post-harvest disinfestation options to control other regulated insect pests. FSANZ understands that New Zealand currently has no interest in using irradiation as a treatment, but would consider it if conditions changed (e.g. if fruit fly became established and there were no other appropriate treatment options).

### **4 Assessments undertaken by FSANZ**

FSANZ assessed the safety of irradiated herbs, spices and herbal infusions in 2001 for the following purposes:

- sprout inhibition
- disinfestation
- decontamination

- control of weeds<sup>18</sup>.

The scientific risk assessment concluded that the irradiated foods were safe to consume.

FSANZ has also assessed the technological need, safety and nutrient profile of various fruits and vegetables for a phytosanitary purpose. These assessments were conducted in:

- 2002 for breadfruit, carambola, custard apple, litchi, longan, mango, mangosteen, papaya and rambutan<sup>19</sup>
- 2011 for persimmons<sup>20</sup>
- 2013 for tomatoes and capsicums<sup>21</sup>, and
- 2014 for apple, apricot, cherry, nectarine, peach, plum, honeydew, rockmelon, scallopini<sup>22</sup>, strawberry, table grape and zucchini (courgette)<sup>23</sup>.

For each of these assessments, FSANZ concluded that there was an established need to irradiate and that there were no public health and safety issues associated with the consumption of these foods when irradiated up to a maximum dose of 1 kGy.

In February 2014, FSANZ published a literature review on the nutritional impact of phytosanitary irradiation of fruits and vegetables and concluded that phytosanitary doses of irradiation do not pose a nutritional risk to the Australian and New Zealand populations. The literature review recommended that the data requirements for applications to irradiate fruits and vegetables be streamlined to focus on data for vitamin C, with requirements for other nutrients to be determined on a case-by-case basis<sup>24</sup>.

The assessment of the potential toxicological hazard and nutritional adequacy has demonstrated that there are negligible risks to public health and safety associated with the consumption of the specified fruits and vegetables which have been irradiated up to a maximum dose of 1 kGy.

As noted under section 2.2 of the Consultation Paper, the safety of irradiation as a treatment for food (and the assessment process undertaken to determine safety) is outside the scope of this work.

## **5 Permissions for and purpose of irradiating food in Australia and New Zealand**

Foods permitted to be irradiated in Australia and New Zealand, and the purpose for which irradiation may be used as a treatment for these foods, are shown below in Table 1.

<sup>18</sup> <http://www.foodstandards.gov.au/code/applications/Pages/applicationa413irradiationofherbsandspices/Default.aspx>

<sup>19</sup> <http://www.foodstandards.gov.au/code/applications/pages/applicationa443irradiationoftropicalfruit/a443farexecsummary.aspx>

<sup>20</sup> <http://www.foodstandards.gov.au/code/applications/Pages/applicationa1038irra4655.aspx>

<sup>21</sup> <http://www.foodstandards.gov.au/code/applications/Pages/applicationa1069irra5511.aspx>

<sup>22</sup> Scallopini and zucchini (courgette) are members of the summer squash family

<sup>23</sup> <http://www.foodstandards.gov.au/code/applications/Pages/A1092-Irradiation.aspx>

<sup>24</sup> <http://www.foodstandards.gov.au/publications/Pages/Nutritional-impact-of-phytosanitary-irradiation-of-fruits-and-vegetables.aspx>

**Table 1: Foods permitted to be irradiated in Australia and New Zealand and the purpose of irradiation**

Food	Minimum and Maximum Dose (kGy)	Purpose
Apple Apricot Bread fruit Capsicum Carambola Cherry Custard apple Honeydew Litchi Longan Mango Mangosteen Nectarine Papaya (Paw paw) Peach Persimmon Plum Rambutan Rockmelon Scallopini Strawberry Table Grape Tomato Zucchini (courgette)	Minimum: 150 Gy Maximum: 1 kGy	Pest disinfestation for a phytosanitary objective.
Herbs and spices as described in Schedule 4 to Standard 1.4.2  Herbal infusions – fresh, dried or fermented leaves, flowers and other parts of plants used to make beverages, excluding tea	Minimum: none Maximum: 6 kGy	Control of sprouting and pest disinfestation, including control of weeds.
Herbs and spices as described in Schedule 4 to Standard 1.4.2	Minimum: 2 kGy Maximum: 30 kGy	Bacterial decontamination.
Herbal infusions – fresh, dried or fermented leaves, flowers and other parts of plants used to make beverages, excluding tea	Minimum: 2 kGy Maximum: 10 kGy	Bacterial decontamination.

FSANZ recently accepted a new application that seeks permission to irradiate blueberries and raspberries (Application A1115) for phytosanitary purposes against fruit flies and other regulated insect pests. Work on this project is expected to commence in early 2016.

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Accessed February 2012

## Attachment B – Background to current labelling requirements for Australia and New Zealand

Standard 1.5.3 – Irradiation of Food in the *Australia New Zealand Food Standards Code* prohibits the irradiation of food unless an express permission is given. This applies to food that is either sold or prepared for sale in Australia and New Zealand, or food that is imported from another country.

A pre-market safety assessment is undertaken as part of consideration for permission to irradiate. This assessment considers any risks to public health and safety from consuming the irradiated food and if there is a technological need for irradiation (e.g. a quarantine measure, also referred to as a 'phytosanitary' measure).

Food that is permitted to be irradiated in Australia and New Zealand is limited to those foods which have undergone a pre-market safety assessment by FSANZ and are approved as safe for consumption.

Before Standard 1.5.3 was developed there was a moratorium on the irradiation of food and on the sale of irradiated food in Australia. In New Zealand, irradiated food could only be sold subject to Regulation 264(1) of the *New Zealand Food Regulations 1984*. The only food granted approval for sale was irradiated paprika (one consignment in 1993).

In October 1992, FSANZ (then the Australia New Zealand Food Authority; ANZFA) commenced work on a proposal (Proposal P94 – Food Irradiation) to develop a standard for irradiated food. After an extensive public consultation period, the draft Standard was released for public comment in Australia at the end of 1995.

With New Zealand joining Australia in the joint food standards-setting process, there was a delay while the New Zealand Government considered whether the standard for irradiated food should be adopted as a joint Australia New Zealand standard. In 1998, New Zealand Ministers confirmed that New Zealand was prepared to proceed.

Following public consultation, the draft standard was approved by the then Australia New Zealand Food Standards Council (ANZFSC) (now the Australia and New Zealand Ministerial Forum on Food Regulation) in August 1999.

ANZFSC agreed to a regulatory approach for labelling that:

- was consistent internationally, in particular with the Codex General Standard for the Labelling of Prepackaged Foods<sup>25</sup>
- required all irradiated food to be labelled irrespective of how minor the irradiated ingredients are when present in a processed food, and
- would allow for a voluntary statement of the benefit of food irradiation on the label, provided it was not false, misleading or deceptive.

The reason for labelling irradiated foods is to assist consumers to make an informed choice about the food they buy. Irradiated foods are not labelled for safety reasons, as only those foods assessed by FSANZ as safe are approved for sale.

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<sup>25</sup> CODEX STAN 1-1985 <http://www.codexalimentarius.org/standards/list-of-standards/>

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

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

The labelling requirement therefore meets the second priority objective. The majority of the standards in the Code are, however, aimed at protecting public health and safety (for example, a standard that requires mandatory declarations for food allergens).

Standard A17 of the then Australian *Food Standards Code* came into effect on 2 September 1999. It was replicated in Volume 2 of the joint *Australia New Zealand Food Standards Code* (Code) as Standard 1.5.3. In New Zealand, Regulation 241(1) of the *New Zealand Food Regulations 1984* was revoked when the joint Code came into effect.

In 2012, the labelling requirements were modified further through Application A1038 - Irradiation of Persimmons. The first change was the deletion of the Editorial note example of a labelling statement 'Treated with ionising electrons', because it was potentially misleading to consumers in that they may not understand that it indicates the food has been irradiated. However, the Editorial note had no legal effect, so its deletion did not change the mandatory requirement.

The second change was the deletion of a sub clause relating to labelling of irradiated foods **other than** for retail sale as it was repetitive and unnecessary and was covered by other provisions in the Code. The deletion did not affect the mandatory requirement for irradiated food sold for retail sale to be labelled.

## Attachment C – Codex specifications and international requirements for food irradiation labelling for food, and worldwide permissions for food irradiation

	Irradiated whole foods that are packaged	Packaged foods that contain an irradiated ingredient	Unpackaged irradiated foods
Codex <sup>26</sup>	The label of a food which has been treated with ionising 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 is optional, but when it is used, it shall be in close proximity to the name of the food.	When an irradiated product is used as an ingredient in another food, this shall be so declared in the list of ingredients.	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. <sup>27</sup>
Australia / New Zealand	If the food has been irradiated, a statement to the effect that the food has been treated with ionising radiation.	If the food has an ingredient or a component of a food that has been irradiated – a statement to the effect that the ingredient or component has been treated with ionising radiation.	If the food has been irradiated, this must be stated in the labelling that accompanies the food or is displayed in connection with the display of the food.
United States of America <sup>28</sup>	The label and labelling of retail packages of foods irradiated...shall bear the following logo along with either the statement “treated with radiation” or the statement “treated by irradiation”. The logo shall be placed prominently and conspicuously in conjunction with the required statement.	The labelling requirement applies only to food that has been irradiated, not to a food that merely contains an irradiated ingredient but that has not itself been irradiated.	For irradiated foods not in a package, the required logo and statement “treated with radiation” or “treated by irradiation” shall be displayed to the purchaser with either <ul style="list-style-type: none"> <li>(i) the labelling of the bulk container plainly in view, or</li> <li>(ii) a counter sign, card, or other appropriate device bearing the information that the product has been treated with radiation. As an alternative, each item of food may be individually labelled.</li> </ul>

<sup>26</sup> General Standard for the Labelling of Pre-packaged Foods (CODEX STAN 1-1985)

<sup>27</sup> General Standard for Irradiated Foods (CODEX STAN 106-1983, REV.1-2003)

<sup>28</sup> US Food and Drug Administration Code of Federal Regulations Title 21 CFR 179.30

	<b>Irradiated whole foods that are packaged</b>	<b>Packaged foods that contain an irradiated ingredient</b>	<b>Unpackaged irradiated foods</b>
Canada <sup>29</sup>	<p>Irradiated foods that are prepackaged must include a written statement and the international Radura symbol. Acceptable written statements to accompany this symbol include:</p> <ul style="list-style-type: none"> <li>(i) "irradiated"</li> <li>(ii) "treated with radiation" or</li> <li>(iii) "treated by irradiation"</li> </ul> <p>Or a written statement that has the same meaning.</p>	<p>An ingredient or component of a pre-packaged product that has been irradiated shall, if the food constitutes 10 per cent or more of the pre-packaged product, be included in the list of ingredients and preceded by the statement "irradiated".</p>	<p>Where an irradiated food is not a prepackaged product and is offered for sale, a sign that carries the international Radura symbol shall be displayed immediately next to the food.</p> <p>The symbol shall appear in close proximity on the sign to one of the following statements or a written statement that has the same meaning:</p> <ul style="list-style-type: none"> <li>(a) "treated with radiation";</li> <li>(b) "treated by irradiation"; or</li> <li>(c) "irradiated".</li> </ul>
European Union <sup>30</sup>	<p>If the products are sold as items, the words "irradiated" or "treated with ionising radiation" shall appear on the label as provided for in Article 5(3) of Directive 79/112/EEC.</p>	<p>If an irradiated product is used as an ingredient, the words "irradiated" or "treated with ionising radiation" shall accompany its designation in the list of ingredients.</p> <p>By way of derogation from Article 6(7) of Directive 79/112/EEC, the same words shall be required in order to indicate the irradiated ingredients used in compound ingredients in foodstuffs, even if these constitute less than 25% of the finished product.</p>	<p>In the case of products sold in bulk (and products in which an irradiated product is used as an ingredient), the words "irradiated" or "treated with ionising radiation" shall appear together with the name of the product on display or notice above or beside the container in which the products are placed.</p>

<sup>29</sup> Section B.01.035 of the Food and Drug Regulations (CRC., c.870) Canada

<sup>30</sup> Directive 1999/2/EC of the European Parliament and of the Council of 22 February 1999 on the approximation of the laws of the Member States concerning foods and food ingredients treated with ionising radiation.

	<b>Irradiated whole foods that are packaged</b>	<b>Packaged foods that contain an irradiated ingredient</b>	<b>Unpackaged irradiated foods</b>
Indonesia <sup>31</sup>	<p>On label of processed food experiencing irradiation treatment, the following shall be contained:</p> <p>1) the words “IRRADIATED FOOD” and the</p> <p>2) objective of irradiation.</p> <p>In addition to the inclusion of information, as referred to in 1 and 2, the international Radura symbol may be included on the label.</p>	<p>In case that processed food contains materials which experience irradiation treatment, the label shall only state information on irradiation treatment on the irradiated material concerned.</p>	<p>Unknown.</p>
Malaysia <sup>32</sup>	<p>A package containing irradiated food for sale shall bear on it one of the following written statements:</p> <p>(i) “TREATED WITH IONIZING RADIATION”</p> <p>(ii) “TREATED WITH IRRADIATION”</p> <p>(iii) “TREATED BY IRRADIATION”, or</p> <p>(iv) “IRRADIATED”, and include the international food irradiation symbol.</p>	<p>Irradiated food which is used as an ingredient in another food and constitutes more than 5% of the content of that food must include the declaration “irradiated” in the ingredient list.</p>	<p>Where irradiated food other than in a package is displayed for retail sale, one of the following statements shall be displayed on or in connection with the display of the food:</p> <p>(i) “TREATED WITH IONIZING RADIATION”</p> <p>(ii) “TREATED WITH IRRADIATION”</p> <p>(iii) “TREATED BY IRRADIATION”, or</p> <p>(iv) “IRRADIATED”, and include the international food irradiation symbol.</p>
Vietnam <sup>33</sup>	<p>Food products being manufactured, processed and preserved with the use of irradiation technique must be described with the line “Irradiated foods” or displayed on labels an image of irradiated foods according to the international food irradiation system agreed to be put into practice by Vietnam.</p>	<p>Food products being manufactured, processed and preserved with the use of irradiation technique must be described with the line “Irradiated foods” or displayed on labels an image of irradiated foods according to the international food irradiation system agreed to be put into practice by Vietnam.</p>	<p>Unknown.</p>

<sup>31</sup> Republic of Indonesia Regulation No. HK 03.1.5.12.11.09955 of 2011 concerning processed food registration

<sup>32</sup> Guidelines on Labelling of Irradiated Food (Regulation 13, Food Irradiation Regulations 2011) Ministry of Health, Malaysia

<sup>33</sup> Joint Circular: Guiding the goods label for some foods, food additives and aids for processing packaged foods, issued by the Vietnam Ministry of Health, Ministry of Agriculture and Rural Development, and Ministry of Industry and Trade on October 27, 2014 promulgating Detailed Guidelines on Labelling of Pre-packed Food, Food Additives, and Food Processing Aids

	<b>Irradiated whole foods that are packaged</b>	<b>Packaged foods that contain an irradiated ingredient</b>	<b>Unpackaged irradiated foods</b>
South Africa <sup>34</sup>	All containers of irradiated foodstuffs shall be labelled with the international Radura symbol together with one of the following words: "Irradiated" or "Radurised".	In the case of foodstuffs containing an irradiated component(s) in more than 10% of the mass of the finished product, the words "Irradiated" or "Radurised" shall appear opposite the relevant component(s) in the list of ingredients. Use of the international Radura symbol is optional.	Where bulk containers of irradiated foodstuffs are opened at the point of sale in such a manner that thereafter the statement is obscured from the consumers' view, a notice with the following words "Irradiated" or "Radurised" shall be displayed in immediate proximity to such a food stuff and in clear view of the purchaser.

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<sup>34</sup> Regulations governing the labelling and advertising of foodstuffs, to section 15(1) of the Foodstuffs, Cosmetics and Disinfectants Act 1972. South Africa.

## Worldwide permissions and consumption of irradiated foods

Permissions to irradiate a food vary in different parts of the world (see Table 1).

**Table 1: Summary of specific countries permissions for irradiated foods**

Country	Food	Maximum Permitted Dose (kGy) <sup>35</sup>
European Union	Dried aromatic herbs, spices and vegetable seasonings	10
Canada <sup>36</sup>	Onions Potatoes Wheat, flour, whole wheat flour Whole or ground spices and dehydrated seasonings Fresh Beef to control microbial decontamination Frozen ground beef to control microbial decontamination Poultry to control microbial decontamination Shrimp and Prawns to control microbial decontamination Mangoes (Disinfestation)	0.15 0.15 0.75 10 1.5 to 4.5 2.0 to 7 1.5 to 3 1.5 to 5 0.15 to 1
United States of America <sup>37</sup>	Fruit and vegetables (to control insects and other arthropods and to inhibit maturation (e.g., ripening or sprouting) Poultry to control foodborne pathogens Beef (Refrigerated) to control microbial decontamination Beef and poultry (Frozen) to control microbial decontamination Dry or dehydrated aromatic substances (e.g., spices and seasonings) to control microorganisms Fresh foods to control microorganisms Eggs for control of Salmonella Fresh iceberg lettuce and fresh spinach	1 4.5 4.5 7 30 1 3.0 4
Australia/New Zealand	Herbs, spices and herbal infusions (Disinfestation or decontamination)  Apple, Apricot, Bread fruit, Capsicum, Carambola, Cherry, Custard apple, Honeydew, Litchi, Longan, Mango, Mangosteen, Nectarine, Papaya (Paw paw), Peach, Persimmon, Plum, Rambutan, Rockmelon, Scallopini, Strawberry, Table grape, Tomato, Zucchini (courgette) to control pests of quarantine concern	2 to 30  0.15 to 1
Thailand	Selected tropical fruits (mango, mangosteen, lychee, longan, rambutan and pineapple) for disinfestation	0.4
Philippines	Mangoes for disinfestation Onions for sprout inhibition Garlic for disinfestation	1 0.3 to 1 0.3 to 1
Vietnam	Seafood for decontamination Frozen Fruits for decontamination Dragon fruits to control pests	2 to 7.5 2 to 3 1
Indonesia	Mango to control insects Papaya, mushroom, tomatoes, bananas and broccoli for shelf-life extension Fresh meat and chicken for decontamination of pathogens	0.75 1-2 5-7
India	Mangoes to control insects Fresh meat and chicken for decontamination of pathogens Spices for decontamination Raisins, figs and dried dates to control insects Fresh seafoods for shelf-life extension	0.25 to 0.75 2.5 to 4 6.0 to 14 0.25 to 0.75 1 to 3

<sup>35</sup> Radiation is measured in kiloGrays (kGy).

<sup>36</sup> In Canada, permission to irradiate beef, poultry, shrimp, prawns and mangoes are still in the process of Final Approval.

<sup>37</sup> In the United States of America, food irradiation is considered as a food additive under their legislation.



## Attachment D – Questions for stakeholders

### All submitters

1. What information (for example, studies, data or consumer feedback) can you provide on consumer awareness, understanding and behaviour, in response to labelling about food irradiation?
2. Do you purchase, or would you consider purchasing, irradiated food?
  - if yes, then why?
  - if no, then why not?
3. Does the current labelling requirement for irradiated food (see box below) provide enough information for you to make an informed choice about the food you buy?

**Labelling requirement:** If the food, ingredient or component of a food has been irradiated, a statement to the effect that the food, ingredient or component has been treated with ionising radiation is required.

4. What are your views about the wording of the statement not being prescribed?
5. What are your views about the voluntary use of the Radura symbol?
6. Do you think the current labelling requirement for all foods permitted to be irradiated should be removed?
  - if yes, then why?
  - if no, then why not?
7. If labelling was to continue for irradiated whole foods, do you think restaurant meals containing irradiated ingredients should still be labelled?
8. If labelling was to continue for packaged foods containing irradiated ingredients, do you think the irradiated ingredients should still be labelled?

### **Produce growers**

9. Does the mandatory labelling requirement prevent you from using irradiation as a treatment for your produce? Please provide reasons for your answer.

### **Food manufacturers**

10. Do you use irradiated ingredients in your products? (For example, tomato paste, herbs & spices).
11. Does the fact that irradiated foods have to be labelled impact on your decision to use them?
12. How important is the labelling factor alongside other factors? (For example, price, availability of ingredients, quality of produce, reputation of supplier).
13. If the mandatory labelling requirement was removed for irradiated ingredients used in processed foods, would your company be more likely to use irradiated ingredients?

***Food service providers***

14. Do you use irradiated whole foods in your products? (For example, irradiated tomatoes in sandwiches).
15. If the mandatory labelling requirement was removed for irradiated whole foods, would you still ask suppliers to label the food?

***All industry submitters***

16. Have you conducted any consumer research or received consumer enquiries about irradiated food? If so, are you able to provide the research to FSANZ?
17. Do you think the current mandatory labelling requirement is an impediment to developing existing / new markets? What reasons do you have for this?
18. What do you perceive to be the costs associated with the mandatory labelling requirement? (For example, costs of segregating irradiated produce from non-irradiated produce, specific packaging and/or labelling costs, traceability costs).
19. What do you perceive the costs associated with the **removal** of mandatory labelling to be? (For example, potential for loss of consumer confidence in your products, amending product segregation, handling and display processes).
20. What are the opportunity costs for your business associated with the mandatory labelling requirement? (That is, does the requirement to label irradiated produce cause you to compromise in your business practices? For example, does the time delay involved in labelling your produce prevent you from accessing certain market opportunities?).
21. What are the relative costs and benefits of irradiation and other treatments in terms of cost, efficacy, post-treatment product quality, convenience and timeliness?

***All submitters***

22. What are your views about information on the safety and benefits of food irradiation being on food labels?
23. What other practical approaches other than labelling can be used to communicate the safety and benefits of food irradiation? (Please describe).
24. Do you have any information on the effectiveness of any of these approaches? (If so, please provide).