Australian Government
Department of Agriculture, Fisheries and Forestry

Food Standards Australia New Zealand
Irradiation of tomatoes and capsicums
**Application A-1069**

I am writing with regard to the Queensland Department of Agriculture, Fisheries and Forestry's (QDAFF) (formerly Department of Employment, Economic Development and Innovation) request (Application A1069) to amend the Food Standards Code, Standard 1.5.3 – irradiation of food, to permit the irradiation of tomato and capsicum as a phytosanitary measure. The Department of Agriculture, Fisheries and Forestry (DAFF) appreciates the opportunity to provide comment on the proposed amendment for tomatoes and capsicums and endorses the approval of irradiation as a phytosanitary treatment for these commodities.

***APVMA Review of dimethoate and fenthion***

DAFF understands that the application by QDAFF was precipitated by the Australian Pesticides and Veternary Medicine Authority's (APVMA) review of dimethoate and fenthion – two chemicals widely used in Australian horticultural production. The APVMA review[1] recommended the suspension of the post harvest use of dimethoate on a range of commodities, including tomatoes and capsicums. The post harvest use of dimethoate (dip or inline spray) was used as a phytosanitary measure for Queensland fruit fly (*Bactrocera tryoni*) which enabled market access for these commodities to New Zealand and domestic markets that regulate for this pest. Similarly, the APVMA review for fenthion has recommended the suspension of post-harvest applications for this chemical on tomatoes and capsicums.

The APVMA suspension of a number of dimethoate uses came into effect on 6 October 2011 and the trade of tomatoes and capsicums to New Zealand ceased on this date, pending the acceptance and establishment of a new phytosanitary treatment(s) for these export pathways. The loss of this export market for the Australian industry has been significant for the 2012 season and it has had downstream impacts on prices for the domestic market, as well as for the long term viability of producers. The production of tomatoes and capsicums for trade to New Zealand is largely centred in two regions of Queensland, Bowen and Bundaberg. The Department has been actively working with industry and State Government agencies to determine suitable treatment alternatives to re-establish this trade.

A FSANZ approval for irradiation of tomato and capsicum as a phytosanitary treatment would allow the Department to propose irradiation as an alternative treatment for market access in these commodities to New Zealand. New Zealand already accepts tropical fruits treated with irradiation as a phytosanitary treatment (mango, papaya and lychee) so they are familiar with this treatment and the benefits it presents as a disinfestation treatment for regulated pests. Once a FSANZ approval has been finalised, this treatment will be proposed as a replacement for the existing chemical phytosanitary treatment (dimethoate) that is currently suspended. Once this proposal has been considered by the Ministry for Primary Industries New Zealand, this would potentially allow for trade in these commodities to New Zealand to re-commence.

[1] APVMA 2012 - http://www.apvma.gov.au/products/review/current/dimethoate.php

T +61 2 6272 3933
F +61 2 6272 5161
18 Marcus Clarke Street
Canberra City ACT 2601
GPO Box 858
Canberra ACT 2601
daff.gov.au
ABN 24 113 085 695

### *Established regulatory frameworks governing the use of irradiation as a phytosanitary treatment*

Since the Food Standards Code 1.5.3 was originally amended in 2002 to permit the use of irradiation as a treatment on fresh tropical fruits for human consumption, irradiation has been more broadly accepted and applied as an effective and safe phytosanitary treatment in international trade.

In 2003, the International Standards for Phytosanitary Measures (ISPM) No. 18 *Guidelines for the use of irradiation as a phytosanitary measure*[2] was endorsed, and which provided guidance to SPS members in relation to the acceptance and application of irradiation as a phytosanitary treatment. Whilst a range of regulatory and operational aspects of irradiation are provided, ISPM 18 also denotes that pest risks may be mitigated through a range of treatment target objectives, including:

- mortality – target pests killed by the applied irradiation dose
- non-emergence –preventing the successful development of target pests
- sterility – target pests are unable to reproduce
- inactivation – rendering micro-organisms incapable of development

In 2006, the United States Department of Agriculture (USDA) published a final rule in their Federal Register, [Docket No. 03–077–2], which established a new generic dose of irradiation at 400Gy as an effective treatment against all pests within the phylum *Arthropoda*, excluding adults and pupae of the order *Lepidoptera* (USDA APHIS 2006)[3]. Additionally, there is acceptance that a generic dose of 150Gy for all fruit flies of the family *Tephritidae* ) is effective[4], with some lower minimum doses developed for certain fruit flies. For example, a dose of 100Gy is internationally accepted as a suitable treatment for Queensland fruit fly[5].

Consistent with ISPM 18 and the USDA regulations, DAFF also recognises 400Gy as an effective treatment dose for most life stages of quarantine pests of concern which are associated with the movement of horticultural commodities into Australia. Additionally, DAFF recognises that for some pests or pest groups, irradiation doses below 400Gy are effective in mitigating the potential risks posed, as has been reflected in the USDA treatment manual. However, the generic 400Gy dose can often simplify market access given it will address the majority of regulated arthropod pests.

### *Benefits and safety of irradiation treatments*

A number of countries utilise irradiation, not just as a phytosanitary treatment for the movement of agricultural commodities, but also as a treatment to prevent the development of pathogenic micro-organisms that cause food borne illness. Irradiated food has been extensively tested through a number of studies including reviews by the scientific community and international organisations (Raymond et al 2012)[6]. In 1981, The FAO/IAEA/WHO conducted a joint study on irradiation and concluded that any food irradiated up to 10kGy presents no toxicological hazard and introduces no special nutritional or microbiological problems (WHO 1981)[7]. Since that time, further reviews into the safety and nutrition

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[2] IPPC 2003 *ISPM 18 – Guidelines for the use of irradiation as a phytosanitary measure* https://www.ippc.int/file_uploaded/1146658925161_ISPM18.pdf

[3] USDA APHIS 2006 http://www.gpo.gov/fdsys/pkg/FR-2006-01-27/pdf/06-746.pdf

[4] IPPC 2009 *ISPM 28 part 7–* Irradiation treatment for fruit flies of the family Tephritidae (generic) https://www.ippc.int/file_uploaded/1323950176_PT_07_2009_En_2011-12-01_Reforma.pdf

[5] IPPC 2009 *ISPM 28 part 5 –* Irradiation treatment for *Bactrocera tryoni* https://www.ippc.int/file_uploaded/1323950176_PT_05_2009_En_2011-12-01_Reforma.pdf

[6] Raymond, Hallman and Blackburn 2012 *The pros and cons of using irradiation for phytosanitary treatments.* Outlooks on Pest Management. June 2012 108-114

[7] WHO 1981 *Wholesomeness of irradiated food.* Report of a joint FAO/IAEA/WHO expert committee. WHO technical report Series 659.

of irradiated food have been undertaken and have confirmed that irradiated food is safe to eat (WHO 1994[8], WHO 1999[9], CODEX 2003[10]).

With increasing volumes of commodities being traded worldwide, there is a need to find efficacious and cost effective treatments to prevent the dissemination of regulated pests. Low dose irradiation has the ability to ensure absolute sterility in pests which provides quarantine security by ensuring any contaminating pests are unable to reproduce, and subsequently, prevent their establishment in the recipient country (Heather and Hallman 2008)[11].

Factors that have affected the increased use of irradiation as a treatment include concerns over chemical residues in a range of commodities, pressure on and suitability of current phytosanitary treatments (e.g. the banning of methyl bromide for all purposes in Europe) and the International Plant Protection Organisation's development of guidelines for the use of irradiation as a phytosanitary measure.

DAFF is required to consider all quarantine treatments which meet Australia's appropriate level of quarantine protection and as such, irradiation treatment is provided as a potential phytosanitary measure for a number of import policies. Relevantly, Australia currently exports tropical fruits (mango, papaya and lychee) to New Zealand under an irradiation treatment pathway which has been successful in managing the pest risks since its commencement (mangoes) in 2004.

Irradiation as a phytosanitary treatment is particularly attractive for fresh fruits from fruit fly infested regions, as irradiation allows fruits of higher quality to be traded. Other phytosanitary treatments e.g. heat, cold, and fumigation treatments can often cause phytotoxic effects i.e. damage to the fruits, lowering the quality of the fruit and the price that it will receive. These alternative treatments are often used on fruit that is harvested before it is fully ripe, whereas irradiation tends to be used on fully ripe fruit (USDA APHIS 2006)[3]. Additionally a number of the nutritional studies conducted have shown that potential nutritional losses in irradiated foods are not basically different from losses in foods treated by other processes. Some other traditional methods (including heating and drying) may cause higher nutritional losses than irradiation (Diehl 1995[12], Advisory committee on irradiated and novel foods 1986[13])

***Scope for class wide approval of irradiation as a phytosanitary treatment***

Given the increased interest in this method of pest disinfestation for traded commodities, the Department would additionally like to raise the issue of, and provide support for, a class wide approval for fruit and vegetables for irradiation up to 1kGy similar to the US and UK systems. The US has approved fruit and vegetables for irradiation up to 1kGy, the UK up to 2kGy for fruit and 1kGy for vegetables (Raymond et al 2012)[6].

A number of Australian horticultural industries have already, or are currently developing, nutritional data to support FSANZ applications for the use of irradiation as a phytosanitary treatment. The potential workload associated with assessing each of these submissions individually will likely become unmanageable and delay access to this treatment for those waiting for assessment.

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[8] WHO 1994 Safety and nutritional adequacy of irradiated food. World Health Organisation, Geneva 1994.
[9] WHO 1999 High dose irradiation: wholesomeness of food irradiated with doses above 10kGy. Report of a Joint FAO/IAEA/WHO expert committee. Geneva 1999.
[10] CODEX 2003 General Standard for Irradiated Foods CODEX STAN 106-1983, REV.1-2003 www.codexalimentarius.org/input/download/standards/16/CXS_106e.pdf
[11] Heather and Hallman 2008 *Pest Management and Phytosanitary Trade Barriers.* Chapter 1, CABI Publishing, Wallingford, UK
[12] Diehl 1995 *Safety of irradiated foods* 2nd Edition. Marcel Dekker Inc, New York.
[13] Advisory Committee on Irradiated and Novel Foods 1986 *Report on the safety and wholesomeness of irradiated foods.* London, Her majesty's Stationary Office.

Irradiation has been extensively studied for both the safety and nutritional components up to (and beyond) 10kGy. The approval of a 1kGy treatment for all fruit and vegetables is well within the bounds of this extensive existing work. Additionally, the data that has been generated for the FSANZ assessments completed to date, as well as the nutritional data sets that have been developed by Australian horticultural industries but are awaiting submission to FSANZ, will provide FSANZ with a substantial dataset on the safety of irradiation as a phytosanitary treatment across a range of fruit and vegetables. This information would hopefully allow for a class wide approval to be considered in the future.

I thank you again, for this opportunity to comment on the FSANZ assessment and recommendations for the irradiation of tomatoes and capsicums as a phytosanitary measure and I look forward to the finalisation of this assessment and subsequent amendment to the food standards code in due course.

Yours Sincerely

[redacted]

A/g Assistant Secretary
Plant Biosecurity, Horticulture
Department of Agriculture, Fisheries and Forestry

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