

Supporting Document 2

COAG Consultation Regulation Impact Statement – Proposal
P1016

Hydrocyanic Acid in Apricot Kernels & other Foods



Raw unhulled (with skin) raw apricot kernels



Raw hulled (without skin) raw apricot kernels

Contents

TABLES AND CHARTS	2
EXECUTIVE SUMMARY.....	3
1 INTRODUCTION	5
2 THE PROBLEM.....	6
3 OBJECTIVES	8
4 OPTIONS	9
4.1 OPTION 1 – MAINTAIN THE STATUS QUO	9
4.2 OPTION 2 – MANDATORY LABELLING	9
4.3 OPTION 3 – SET A MAXIMUM LEVEL	9
4.4 OPTION 4 – PROHIBITION ON THE SALE OF RAW UNHULLED (SKIN ON) APRICOT KERNELS	9
4.5 OPTION 5 – PROHIBITION ON THE SALE OF RAW APRICOT KERNELS.....	9
5 IMPACT ANALYSIS.....	9
5.1 AFFECTED PARTIES	9
5.2 OPTION 1 – MAINTAIN THE STATUS QUO	10
5.3 OPTION 2 – MANDATORY LABELLING.....	10
5.3.1 <i>Applying mandatory labelling requirements</i>	10
5.4 OPTION 3 – SET A MAXIMUM LEVEL	11
5.5 OPTION 4 – PROHIBITION ON THE SALE OF RAW UNHULLED (SKIN ON) APRICOT KERNELS	12
5.6 OPTION 5 – PROHIBITION ON THE SALE OF RAW APRICOT KERNELS.....	13
5.7 COMPARISON OF OPTIONS	14
6 CONSULTATION	15
7 CONCLUSION.....	16
8 IMPLEMENTATION AND REVIEW	17
ATTACHMENT 1 – A SUMMARY OF REPORTED POISONING INCIDENTS FROM RAW APRICOT KERNELS IN NEW ZEALAND AND AUSTRALIA	18
ATTACHMENT 2 – CONSULTATION WITH INDUSTRY	21
ATTACHMENT 3 – QUESTIONS FOR CONSUMERS	27

Tables and Charts

Table 1	<i>Costs and benefits of option 4 – Prohibition on the sale of raw unhulled (skin on) apricot kernels</i>	14
Table 2	<i>Costs and benefits of option 5 – Prohibition on the sale of raw apricot kernels</i>	15
Table 3	<i>New Zealand Poisons Information Centre (1 January 2003 to 1 February 2013)</i>	21
Table 4	<i>Victoria Poisons Information Centre (1 May 2005 to 6 February 2014)</i>	22
Table 5	<i>NSW Poisons Information Centre (1 Jan 2004 to 5 Jan 2014)</i>	22
Table 6	<i>Western Australia Poisons Information Centre (23 March 2002 to 31 August 2013)</i>	23
Table 7	<i>Queensland Poisons Information Centre (Jan 2003 to Feb 2013)</i>	23

Executive summary

This Consultation Regulation Impact Statement (Consultation RIS) has been prepared for Proposal P1016 – Hydrocyanic acid in Apricot Kernels and Other Foods. The Consultation RIS examines whether measures can be put in place to manage future potential public health and safety issues from consumption of raw apricot kernels in a way that addresses the risk for consumers, yet is mindful of the cost to industry.

The risk assessment undertaken by Food Standards Australia New Zealand (FSANZ) indicated that consumption of raw apricot kernels, both unhulled (with skin) and hulled (without skin), poses an acute public health and safety risk for consumers due to the risk of cyanide poisoning (from the release of hydrocyanic acid) which can lead to death. General symptoms of sub-lethal doses have been reported as abdominal pain, headache, dizziness, short-term memory loss, confusion, flushing, palpitations and general illness.

There have been confirmed reports of poisoning incidents in Australia, New Zealand and other countries (Canada, United Kingdom and other European countries) following consumption of raw apricot kernels. Recently, FSANZ requested data on poisoning incidents from both Australian and New Zealand poisons information centres. Data clearly show that there have been a number of calls to poison information centres following either accidental (children and adults) or intentional ingestion (by adults only) of raw apricot kernels (Attachment 1).

Several raw apricot kernel products are available in Australia. There are a range of websites that are marketing these products. Claims exist of the health benefits, for example, for the prevention of, or curing cancer but not all have warnings in regard to the risk of cyanide poisoning. However, claims of cancer related health benefits associated with raw apricot kernels are not supported by the Australian medical community or Cancer Council Australia and there is no reasonable basis nor reliable scientific evidence or expert medical opinion to support them. Despite action having been taken against an apricot kernel retailer by the Australian Competition and Consumer Commission (ACCC) for misleading cancer related health claims these claims continue to be made directly and indirectly by a variety of individuals and businesses both in Australia and overseas.

The fact that raw apricot kernel products are used by cancer patients further raises FSANZ's concerns about the capacity of information alone to prevent harm. The most recent poisoning incident occurred despite the presence of clear warning labels on the packaging and on the website from which product was purchased.

This consultation RIS considers five options for addressing the problem:

- Option 1: Maintain the status quo
- Option 2: Mandatory labelling of both unhulled (skin on) and hulled (skin off) raw apricot kernels
- Option 3: Set a maximum level for unhulled (skin on) and hulled (skin off) raw apricot kernels

- Option 4: Prohibition on the sale of unhulled (skin on) raw apricot kernels with exemptions for raw apricot kernel-derived foods that are safe for consumption. In parallel, require manufacturers to provide advice for consumers on the maximum amount of hulled (skin off) apricot kernels that could safely be consumed on their labels.
- Option 5: Prohibition on the sale of unhulled (skin on) and hulled (skin off) raw apricot kernels with exemptions for raw apricot kernel-derived foods that are safe for consumption.

FSANZ undertook targeted consultation with industry and food enforcement agencies in 2012 and 2013 (Attachment 2). This work has informed the development of the options explored in this Consultation RIS as well as the analysis of the impacts of each option. However, difficulties have been experienced in obtaining sufficient information to understand the true scope and nature of this industry.

Prior to public consultation, FSANZ considers that overall Option 5, a regulatory approach (prohibition on the sale of both unhulled (skin on) and hulled (skin off) raw apricot kernels in Standard 1.4.4 with exemptions for raw apricot kernel-derived foods that are safe for consumption) is likely to have the greatest net benefit and is therefore the preferred option. The determination that this option is likely to have the greatest net benefit is based on qualitative analysis due to difficulty obtaining quantitative information from industry. This prohibition relates only to food use of apricot kernels and does not extend to a prohibition on use of foods derived from apricot kernels which does not pose health risks (e.g. as an ingredient in other foods).

FSANZ is seeking information from submitters on a range of questions in relation to this Proposal. These questions are provided on page 15 and 16, in Attachment 2 (pages 27 and 28) and in Attachment 3 (page 30). Information from submissions will be used to conduct further impact analysis and to prepare a decision RIS that will be presented to decision makers and also made publically available. The preferred option in the decision RIS may be changed if new evidence provides sufficient grounds to recommend another option.

1 Introduction

Some plant-based foods contain cyanogenic glycosides which can pose potential risk to consumers. The toxicity of cyanogenic glycosides and their derivatives depends on release of hydrocyanic acid (HCN) from plant tissue. This may occur either after damage to the plant or as a result of the action of gut bacteria in animals or humans after ingestion. The concentration of HCN in seeds varies widely; however, in raw apricot seeds (kernels) it can reach toxic thresholds (Haque and Bradbury, 2002; Codex Committee on Contaminants in Foods, 2008¹). These levels can be sufficiently high to cause death in humans and the amounts in any particular kernel can be hard to predict or control.

Throughout this report, the term 'raw apricot kernel' refers to the edible nut-like object found within the shell or stone of *Prunus armeniaca* either unhulled (with skin) or hulled (without skin). Hulled, raw apricot kernels are usually pale white in colour.

There have been confirmed reports of poisoning incidents in Australia, New Zealand and other countries (Canada, United Kingdom and other European countries) following consumption of raw apricot kernels.

Therefore, in light of these poisoning incidents and the results from a recent survey on cyanogenic glycosides in a range of plant-based foods,² Food Standards Australia New Zealand (FSANZ) prepared Proposal P1016. The Proposal was prepared to assess the public health risks of some foods derived from plants containing cyanogenic glycosides and to develop appropriate risk management strategies to manage these risks, including consideration of a need for food regulatory measures in the *Australia New Zealand Food Standards Code* (the Code)³.

Various apricot kernel derived foods were analysed in the survey, including amaretti biscuits, almond finger biscuits, apricot jams, apricot nectar and were found not to pose any risks to public health and safety. Therefore, this Consultation Regulatory Impact Statement (RIS) focuses just on apricot kernels.

FSANZ has prepared this Consultation RIS to examine the costs and benefits of various options for managing future potential public health or safety issues from consumption of raw apricot kernels in Australia and New Zealand.

FSANZ has made considerable effort to engage with and understand the raw apricot kernel industry, but the collected information was not sufficient for detailed quantitative analysis of the proposed options. Therefore, much of the analysis that has been done is qualitative. Although the prohibition on the sale of both unhulled (skin on) and hulled (skin off) apricot kernels is presented as a preferred option in this Consultation RIS, this may change if evidence is presented that another option is more appropriate to manage the acute dietary risks from consumption of raw apricot kernels.

¹ Haque MR, Bradbury JH (2002) Total cyanide determination of plants and foods using the picrate and acid hydrolysis methods. *Food Chemistry*, 77(1): 107-114.
Codex Committee on Contaminants in Foods. (2008) Discussion paper on cyanogenic glycosides. CX/CF 09/3/11. Rome: FAO/WHO.

² A survey of the levels of HCN in a variety of plant-based foods available in Australia and New Zealand was conducted as part of the Implementation Sub-Committee for Food Regulation's (ISFR) Coordinated Food Survey Plan to determine whether there are any public health and safety concerns for the Australian or New Zealand populations arising from the consumption of these foods.

³ <http://www.foodstandards.gov.au/code/Pages/default.aspx>

This document, in accordance with COAG best practice regulation requirements includes the following sections:

- a statement of the problem – explaining the need for government action
- a statement of the objectives of any intervention
- a statement of the possible options to address the problem
- an impact analysis of the options (costs and benefits)
- details of the consultation undertaken
- a clear statement as to which is the preferred option and why
- details of how the preferred option would be implemented, monitored and reviewed.

A summary of reported poisoning incidents in Australia and New Zealand is included in Attachment 1 and more detailed information in relation to targeted consultation with industry to date is included in Attachment 2.

FSANZ is seeking information from submitters on a range of questions in relation to raw apricot kernels. Questions for importers and domestic producers are provided on page 15 and 16, in Attachment 2 (pages 27 and 28) and in Attachment 3 (page 30). In addition to this information, we would welcome any general comments, data or information on the proposed options. If information of sufficient quality and volume can be obtained from submissions, it will be used to conduct a more detailed quantitative impact analysis of the proposed options and to prepare a Decision RIS that will be presented to decision makers and also be made publicly available.

2 The problem

The problem that this Proposal seeks to address is the potential health outcomes of hydrocyanic acid (HCN) poisoning caused by consumption of raw apricot kernels, which, if the levels are high enough, can include death. General symptoms of sub-lethal doses have been reported as abdominal pain, headache, dizziness, short-term memory loss, confusion, flushing, palpitations and general illness.

The risk assessment undertaken by FSANZ indicated that consumption of raw apricot kernels, both unhulled (with skin) and hulled (without skin), poses an unacceptable acute risk to public health and safety for consumers due to HCN poisoning.

In May 2011 a consumer in Queensland was hospitalised after consuming raw apricot kernels with high levels of HCN. In addition, there have been a number of confirmed reports of poisoning incidents in other countries following consumption of raw apricot kernels.

Recently, FSANZ requested data on poisoning incidents from both Australian and New Zealand poisons information centres. Data clearly shows that there have been a number of calls to poison information centres following either accidental (children and adults) or intentional ingestion (by adults only) of raw apricot kernels (Attachment 1).

During the preparation of this Consultation RIS FSANZ was notified about a further poisoning incident that occurred in Western Australia in July 2014. The consumer was hospitalised after consuming unhulled raw apricot kernels with high levels of HCN. The product was recalled from the market due to high HCN levels (i.e. >3000 mg/kg)⁴.

⁴ Although the actual value was not confirmed (it was not relevant for the purpose of testing), this is the highest level measured in Australia and New Zealand. Any level above 3000mg/kg could lead to exceedance of the ARfD or poisoning.

The product packaging did contain a warning statement and directions for use with a recommended maximum amount/day of unhulled apricot kernels that could be safely consumed. The website from which the product was purchased also has a warning statement with a recommended maximum amount/day of unhulled apricot kernels that could be safely consumed.

Several apricot kernel products are available in Australia. There are a range of websites that are marketing these products with claims of health benefits, for example, for the prevention of, or curing cancer but not all have warnings in regard to the risk of cyanide poisoning. However, these claims have not been proven and there is no reasonable basis nor reliable scientific evidence or expert medical opinion to support them⁵.

In 2009, the Australian Competition and Consumer Commission (ACCC) took action against a business/individual in regard to misleading claims. The business suggested that a treatment program they were promoting was effective in the treatment of cancer by ingesting high levels of Laetrile (also known as Amygdalin) sourced in such foodstuffs as raw apricot kernels. However, an expert oncologist engaged by the ACCC, whose evidence was accepted by the court, indicated that high levels of Laetrile can result in cyanide toxicity. The Federal Court, Brisbane ruled that the business/individual engaged in misleading or deceptive conduct in relation to certain cancer prevention and treatment claims. The ACCC chairman stated that the ACCC acted in the public interest to protect vulnerable people who are fighting serious or terminal illnesses. However, despite this ruling and attempts by the NSW Food Authority and the Department of Health and other regulators to stop these misleading claims, these claims continue to be made directly and indirectly by a variety of individuals and businesses in Australia, New Zealand and overseas⁶. There appears to be clear difficulties in preventing these claims being made.

The fact that these products are being used by cancer patients further raises FSANZ's concerns about the capacity of information alone to prevent harm.

There are identified acute dietary risks (exceedance of the acute reference dose (ARfD)) and potentially severe acute poisoning associated with the consumption of raw apricot kernels. This is supported by multiple published cases of adult and child cyanide poisoning resulting from eating raw apricot kernels and a narrow margin of safety following consumption before an exceedance of the ARfD or poisoning might occur⁷.

Raw apricot kernels consumed by the hospitalised consumer in Queensland were reported as having levels of HCN of 2300mg/kg. This is consistent with previous reports of raw apricot kernels having an average HCN levels of 1450 mg/kg, although internationally there have been reports of up to 4090 mg/kg of HCN. The fact that we import a significant percentage of raw apricot kernels from overseas and the limited size of sampling to date would suggest that these higher levels are definitely possible in the Australian food supply. In the most recent case, raw apricot kernels consumed by the hospitalised consumer in WA were reported as having levels of HCN above 3000 mg/kg, which is the level where consumption of just one kernel is likely to lead to exceedance of the ARfD, particularly for children.

There is currently no standard in the Code for HCN (hydrocyanic acid) levels in raw apricot kernels. However, the Code does either prescribe levels of HCN or have requirements for appropriate preparation of specific foods (e.g. sweet cassava, bamboo shoots, confectionery, stone fruit juices, marzipan, ready-to-eat- cassava chips, etc.) to ensure safe consumption.

⁵ <http://www.cancer.org.au/news/blog/treatment/medical-myth-natural-cancer-therapies-cant-harm-you.html>

⁶ Numerous direct and indirect claims were quickly located by conducting an internet search

⁷ The exceedance of the ARfD can be up to nine-fold if adults consume apricot kernels at the highest levels (2,800 mg/kg) identified in the ISFR survey. Only three kernels (with skin on) could be safely consumed by adults and even fewer (1 or less with skin on) can be consumed safely by children.

A range of measures have been adopted overseas to manage the risk of poisoning incidents. These include:

- Advice for consumers on a recommended maximum number of apricot kernels to be consumed per day (United Kingdom and Canada).
- Apricot kernels with very high HCN levels would be captured within the scope of the European Union Food Safety Regulations, which makes it an offence to sell or possess for sale food which is injurious to health (28 member states of the EU).
- Prohibition on sale of apricot kernels as a food since they are regulated as a drug (laetrile (amygdalin)) under import legislation (USA)⁸.

In Australia, the only state that regulates Laetrile (amygdalin) is Queensland, although this is not applicable to apricot kernels or other foods containing cyanogenic glycosides⁹.

A clear case exists for government intervention due to the clear risk of mortality, with children particularly vulnerable. The purpose of the following analysis is to determine whether a non-regulatory or regulatory intervention is the most appropriate option to manage future potential public health or safety issues from consumption of raw apricot kernels.

3 Objectives

In developing or varying a food standard, FSANZ is required by its legislation to meet three primary objectives 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.

In developing and varying standards, FSANZ must also have regard to:

- the need for standards to be based on risk analysis using the best available scientific evidence;
- the promotion of consistency between domestic and international food standards;
- the desirability of an efficient and internationally competitive food industry;
- the promotion of fair trading in food; and
- any written policy guidelines formulated by the COAG Legislative and Governance Forum on Food Regulation.

The principal objective of this proposal is to assess what measures can be put in place to manage future potential public health or safety issues from consumption of raw apricot kernels.

⁸ The USA does not have any formal limits on HCN in foods. They previously took a case-by-case approach and if the product was marketed as food, they looked at it from the perspective of whether it contains excessive levels of cyanide that may render the food injurious to health and enforced on that basis. However, in 1977 the USA considered apricot kernels to be "laetrile" (also known as amygdalin) and now detain it as a new drug under relevant import legislation [Import Alert 62-01](#).

⁹ In Queensland, oral amygdalin is not permitted and special approval is required to obtain, possess and use intravenous or intramuscular preparations. Approval is only considered for patients with an advanced malignancy where all possible conventional treatment has been exhausted.

4 Options

In order to decide on the most cost-effective approach to achieving these objectives, this proposal considers five options.

4.1 Option 1 – Maintain the status quo

Under the status quo FSANZ would rely on the current website advice which describes the number of raw apricot kernels that can be safely consumed per day.

FSANZ has produced an advisory statement, published on the FSANZ website, which highlights that for adults consuming more than three raw apricot kernels per day is unsafe¹⁰. Children are advised to consume no raw apricot kernels.

4.2 Option 2 – Mandatory labelling

This regulatory option requires FSANZ to consider whether labelling could appropriately manage the public health and safety risk associated with the consumption of raw apricot kernels. Labels on packages of apricot kernels would have a statement relating to the risk associated with consuming the product.

4.3 Option 3 – Set a maximum level

This regulatory option involves setting a maximum level (ML) in Standard 1.4.1 – Contaminants and Natural Toxicants for raw unhulled and hulled apricot kernels.

4.4 Option 4 – Prohibition on the sale of raw unhulled (skin on) apricot kernels

This regulatory option involves preparation of draft variations to include a prohibition on the sale of raw unhulled (skin on) apricot kernels only in Standard 1.4.4 with exemptions for kernel-derived foods that are safe for consumption. In parallel, manufactures would be required to provide advice for consumers on the maximum amount of raw hulled (skin off) apricot kernels that could safely be consumed on their product labels.

This option allows the continued sale of raw hulled (skin-off) apricot kernels; however, there would be advice provided on FSANZ's website and on labels on the recommended maximum amount/day of hulled apricot kernels that could be safely consumed.

4.5 Option 5 – Prohibition on the sale of raw apricot kernels

This regulatory option involves preparation of draft variations to include a prohibition on the sale of all raw, unhulled and hulled apricot kernels in Standard 1.4.4 Prohibited and Restricted Plants with exemptions for raw apricot kernel-derived foods that are safe for consumption.

5 Impact analysis

5.1 Affected parties

Parties that have been identified as potentially being affected by this Proposal include:

¹⁰ <http://www.foodstandards.gov.au/consumer/safety/Pages/Apricot-kernels-raw.aspx>

- industry (importers, producers and retailers);
- consumers of apricot kernels; and
- government.

From the consultation with industry to date, FSANZ has managed to identify only one business that imports/produces greater than 500kg of apricot kernels per year. Based on the information collected in 2013, (from 3 respondents) approximately 20,000kg of apricot kernels for human consumption is imported/ produced in Australia every year. The selling (retail) price per kg is around \$30 per kilogram; therefore, the current data suggests that the total value of the apricot kernel industry in Australia is approximately \$600,000. All three businesses are both retailers and wholesalers. Together they supply between 6 and 3000¹¹ retail business. More detailed information in relation to targeted consultation with industry to date is included in Attachment 2¹².

5.2 Option 1 – Maintain the status quo

FSANZ would maintain the status quo and rely on the current website advisory statement which describes the number of raw apricot kernels that can be consumed by adults without harm, noting that children are advised to not consume raw apricot kernels.

As noted in the Objectives section above, the principal objective of this proposal is to assess whether measures can be put in place to manage potential public health or safety issues from the consumption of raw apricot kernels in a way that is appropriately mindful of the cost to industry, consumers and government, relative to risk.

The status quo will not achieve this objective because:

- A significant potential harm exists from high levels of HCN, particularly for children.
- This option is unlikely to allow FSANZ to adequately ensure public safety due to the uncertainty surrounding the absolute maximum levels of HCN that could potentially be present in unhulled or hulled apricot kernels.
- Effectiveness of website advice is likely to be limited, as it is dependent on consumers seeking and being aware of this information.
- Costs to the government of future incidents and health treatments.

5.3 Option 2 – Mandatory labelling

5.3.1 Applying mandatory labelling requirements

FSANZ has considered whether labelling could appropriately manage the public health and safety risk associated with the consumption of raw apricot kernels.

Labelling is not considered an appropriate risk management option for the following reasons:

- Labelling is not appropriate to mitigate a potentially serious public health risk for the general community where public awareness of the risk is low.
- The variability in the HCN levels and in particular maximum limits of HCN means that, similar to option 1, it is difficult to predict a safe number of kernels that could be consumed per day.

¹¹ The figure of 3,000 was reported to FSANZ from an importer/domestic producer of raw (skin on) apricot kernels.

¹² Survey was sent to 46 businesses in both, Australia and New Zealand. FSANZ has not received any responses from New Zealand business.

This variation means that it would be impractical to determine a labelling statement that would be adequate to address the acute public health implications for all potential consumers. Furthermore, any advice on maximum consumption could become out-of-date as more information on the maximum levels which may occur becomes available¹³.

There are identified acute dietary risks (exceedance of the acute reference dose (ARfD)) and potentially severe acute potential poisoning associated with the consumption of raw apricot kernels. This is supported by multiple published cases of adult and child cyanide poisoning resulting from eating raw apricot kernels and a narrow margin of safety following consumption before an exceedance of the ARfD or poisoning might occur. Therefore, the general availability of raw apricot kernels, including for children (which is the group at greatest risk of exceeding safe doses) means that it would be inadequate to rely on specific labelling statements to protect public health and safety.

The most recent poisoning incident occurred in WA despite the presence of clear warning labels on the packaging and website from which product was purchased.

Average cost of a labelling change would be somewhere around \$5,624 per single stock keeping unit (SKU)¹⁴.

5.4 Option 3 – Set a maximum level

5.3.2 Set a maximum level (ML) in Standard 1.4.1 – Contaminants and Natural Toxicants for raw unhulled unprocessed kernels and/or hulled processed apricot kernels

An ML is usually established where it serves an effective risk management function, at a level which is consistent with the protection of public health and safety, and which is reasonably achievable. Therefore, FSANZ considered whether an ML option would be appropriate for raw apricot kernels.

The Implementation Subcommittee for Food Regulation (ISFR) survey found that all apricot kernel samples analysed contained detectable levels of HCN. However, there was a significant difference and large variability in the range of HCN concentrations between individual kernels with and without skin. Levels of HCN in 18 kernels with skin ranged from 1,240-2,820 mg HCN/kg; and for the ten kernels without skin a range of 49-440 mg HCN/kg was present.

FSANZ considers that it is inappropriate to set an ML, as it would not serve as an effective mitigation measure for HCN in raw apricot kernels, for the following reasons:

- If an ML was set, it would need to be at a level significantly below the range seen in the test samples (at least ten-fold). The numbers of kernels analysed were low (18 in total) so they do not represent the worst case in terms of maximum levels of HCN attainable and therefore the risk may be underestimated based on current information. Therefore, an ML set on current data would require the use of uncertainty factors in order to be protective of human health. It is therefore very unlikely that an ML could be set that is achievable.

¹³At the time of the first poisoning incident in Queensland, FSANZ's advice was to consume no more than 4 kernels / day. However, due to more recent data from the ISFR survey, that advice has now needed to be updated to advise consumers of the reduced number of kernels that can now be safely consumed.

¹⁴[Cost Schedule for Food Labelling Changes](#) - 2014 PricewaterhouseCoopers Report commissioned by Department of Health

FSANZ does not believe that it would be possible to obtain or process raw apricot kernels to achieve an HCN level that would be compliant with an ML that would be protective of human health and safety.

- The wide variation in levels of HCN in raw apricot kernels would make any process control arrangements (including sampling plans) complex and difficult to achieve consistency. This variability and uncertainty increases when considering unhulled and hulled raw kernels.
- The FSANZ Risk Assessment was completed prior to the latest poisoning incident in WA. The results of testing in that incident suggest that the levels of HCN in apricot kernels can be higher than those found in the ISFR Survey report.

5.5 Option 4 – Prohibition on the sale of raw unhulled (skin on) apricot kernels

Prepare draft variations to include a prohibition on the sale of raw unhulled (skin on) apricot kernels only in Standard 1.4.4 with exemptions for raw kernel-derived foods that are safe for consumption. In parallel, advice on FSANZ’s website and on food labels for consumers on the maximum amount of raw hulled (skin off) kernels that could safely be consumed.

This option allows the continued sale of raw hulled (skin-off) apricot kernels only; however, there would be advice provided on FSANZ’s website on the amount/day of hulled apricot kernels that could be safely consumed per day. Additionally mandatory labelling of raw hulled (skin off) kernels would be required to advise consumers of the health risks of exceeding recommended consumption levels. The costs and benefits relating to labelling are discussed under Option 2 above. The costs and benefits of prohibiting the sale of unhulled apricot kernels are compared below:

Table 1: Costs and benefits of option 4 – Prohibition on the sale of raw unhulled (skin on) apricot kernels

Affected party	Impacts
Government	
Costs	Associated costs to enforce the prohibition of raw unhulled apricot kernels.
Benefits	<p>Gives certainty in enforcing the state and territory food acts (under the safe and suitable legislation).</p> <p>Partially reduces likelihood and subsequent health costs of further poisoning incidents caused by consumption of raw unhulled apricot kernels.</p>
Industry	
Costs	Immediate costs to profits and reduced revenue for industry on account of the removal of all raw unhulled apricot kernels, which are not intended to be further processed before sale, from the market. Revenue loss might be reduced if consumers switch purchases to raw hulled kernels.
Benefits	Reduce the risk of food poisoning events from raw unhulled apricot kernels and associated costs of such events.

Affected party	Impacts
Consumers	
Costs	Denies access to raw unhulled apricot kernels for those consumers who seek to buy raw unhulled apricot kernels. However, it should be noted that much of this demand may be a result of unreliable information.
Benefits	For consumers, a reduction in risk of dietary exposure to HCN from raw unhulled apricot kernels. Avoids consumers inappropriately relying on apricot kernels to avoid or cure cancer.

This option was considered because there is a difference in the maximum concentration of HCN between skin on and off varieties. For the skin on kernels, a maximum level of HCN of 2,820 mg/kg from the ISFR survey was used in the risk assessment. Calculations showed that adults could consume only three kernels per day before the safe level is exceeded and that children would be at risk from consumption of only one kernel per day. Whereas, for the raw hulled, skin off kernels, the maximum level of HCN was 440 mg/kg and adults could consume 21 kernels per day and children could consume 6 kernels per day before the safe level is exceeded. However, due to the variability in HCN levels in both varieties, there is still considerable uncertainty in estimating maximum numbers that could be safely consumed (particularly for children) as there have been reports of up to 4,090 mg/kg for skin on varieties in the international scientific literature. As noted above higher levels were found in the recent (July 2014) incident, indicating it is also likely that higher levels will be found in hulled (skin off) varieties than was determined in the survey meaning even a small number could cause adverse health effects.

1. **How many additional steps are involved in removing skin from raw unhulled (skin on) apricot kernels?**
2. **How much would it cost to set up additional production processes for removing the skin from raw unhulled (skin on) apricot kernels?**

5.6 Option 5 – Prohibition on the sale of raw apricot kernels

5.6.1 Prepare draft variations to include a prohibition on the sale of raw apricot kernels in Standard 1.4.4 with exemptions for apricot kernel-derived foods that are safe for consumption.

Prohibition on all raw, unhulled and hulled apricot kernels in Standard 1.4.4 – Prohibited and Restricted Plants and Fungi with an exemption for raw apricot-kernel derived oils and foods that do not have safety concerns. The costs and benefits are compared below:

Table 2: Costs and benefits of option 5 – Prohibition on the sale of raw apricot kernels

Affected party	Impacts
Government	
Costs	Associated costs to enforce the prohibition.
Benefits	Gives certainty in enforcing the state and territory food acts (under the safe and suitable legislation). Reduces likelihood and subsequent health costs of further poisoning incidents.

Affected party	Impacts
Industry	
Costs	Loss of revenue and profits from the prohibition for sale of all raw unhulled and hulled apricot kernels, which are not intended to be further processed before sale from the market.
Benefits	Reduce the risk of food poisoning events and associated costs of such events.
Consumers	
Costs	Denies access to raw unhulled and hulled apricot kernels for those consumers who seek to buy them. However, it should be noted that much of this demand may be a result of unreliable information.
Benefits	For consumers, a reduction in risk of dietary exposure to HCN from raw unhulled and hulled apricot kernels and the associated negative health consequences. Avoids consumers inappropriately relying on apricot kernels to avoid or cure cancer.

Some consumers may feel aggrieved about losing access to the product but this sense of loss is based on unreliable information that consumption of raw apricot kernels assists in the avoidance and cure of cancer and as a 'natural cancer therapy' there are no harmful effects.

Laetrile, an extract from apricot kernels, was for years promoted as a natural alternative therapy for cancer; yet its efficacy for cancer is unproven with clinical trials in humans failing to find any benefits. Taking Laetrile, or eating apricot kernels in large amounts, is not only ineffective at treating cancer but could also cause fatal cyanide poisoning¹⁵. The successes claimed by its supporters are based on individual reports, testimonials, and publicity issued by promoters. Concerns exist about individuals relying on this type of treatment alone, and avoiding or delaying conventional medical care for cancer. This could have serious health consequences¹⁶.

The intent of option 5 is not to prohibit the use of apricot kernels for safe uses as an ingredient in other foods (e.g. confectionery). FSANZ does not regulate the use of kernels in cosmetic products, which are unaffected by this proposal. It is acknowledged that whole kernels may be purchased for home-cooking or possibly catering use, although we believe this market is very limited. Therefore loss of availability of this ingredient is likely to be of minor impact.

Questions for importers and producers are provided on page 15 and in Attachment 2, pages 27 and 28. If you have previously supplied any of this information to FSANZ, there is no need to provide it again.

Questions for consumers are provided on page 30, Attachment 3.

5.7 Comparison of options

FSANZ concludes that due to the serious nature of the acute risk to human health, option 5 (prohibition on the sale of apricot kernels) is the preferred option to address the public health and safety risks posed by consumption of raw unhulled and hulled apricot kernels.

¹⁵ <http://www.iheard.com.au/question/eating-apricot-kernels-cure/>

¹⁶ [American Cancer Society - http://www.cancer.org/](http://www.cancer.org/)

Whilst it is recognised that there will be costs to industry arising from a strict regulatory option, consumers will benefit by lowering or elimination of the potential serious adverse effects and misleading claims of improved health benefits from consumption of raw apricot kernels (that has never been proven or supported by adequate scientific evidence).

FSANZ considers that maintaining the status quo (a non-regulatory approach) or other regulatory options are not appropriate options for the following reasons:

- A significant potential harm exists from high dietary levels of HCN particularly for children.
- Options 1, 2, 3 and 4 are unlikely to adequately ensure public safety due to the uncertainty surrounding the absolute maximum levels of HCN that could potentially be present in raw unhulled or hulled apricot kernels.
- Effectiveness of website advice and labelling is likely to be limited, as it is dependent on consumers seeking and noticing and taking account of this information.
- Option 3 – even if an ML was set, it would be at such a low level that, in effect, it would lead to a similar outcome as the proposed prohibition in Option 5.

Based on the experience from previous poisonings and the latest poisoning incident in WA we can conclude that options 1, 2, 3 and 4 would not adequately protect public health and safety.

The determination that this option is likely to have the greatest net benefit is based on qualitative analysis. Further development of this option and additional information from the consultation may enable FSANZ to conduct a more quantitative analysis for the Decision RIS, depending on the quality of data/information received from affected parties. This could potentially result in FSANZ arriving at a different preferred option.

6 Consultation

FSANZ has made considerable efforts to engage with and understand the raw apricot kernel industry.

Through targeted consultation FSANZ has been seeking data and/or information on the nature, size and costs of production of the apricot industry.

In April 2012, a targeted consultation seeking data and/or information on the nature of the industry, size and costs of production or importation for raw apricot kernels was undertaken with four apricot kernel business identified by an online search. Identified businesses were approached via email. FSANZ received two responses (see Attachment 2).

In September 2013, a letter was sent out to 46 businesses in Australia and New Zealand (importers, producers and retailers) to invite participation in FSANZ's considerations of this Proposal. FSANZ received five responses (see Attachment 2).

In November 2013, a more detailed questionnaire was sent out to 46 businesses (importers, producers and retailers). FSANZ received eight responses; all from Australia (see Attachment 3). Two businesses indicated that they no longer import apricot kernels. Another two businesses import either apricot kernel oil¹⁷ or apricot kernels as part of ingredients used in soup mixes. One importer indicated that they would provide some information, but to date no response has been received. Three other businesses provided their import/production numbers, costs and other information.

¹⁷ They have a requirement from their suppliers that Apricot kernel oil is Hydrocyanic acid free.

From the consultation with industry to date, FSANZ has managed to identify only one business that imports/produces greater than 500kg of apricot kernels per year. Based on the information collected in 2013, (from 3 respondents) approximately 20,000kg of apricot kernels for human consumption are imported/ produced in Australia every year. The selling (retail) price per kg is around \$30 per kilogram; therefore, the current data suggests that the total value of the apricot kernel industry in Australia is approximately \$600,000¹⁸. All three businesses are both retailers and wholesalers. Together they supply between 6 and 3000 retail business. More detailed information in relation to targeted consultation with industry to date is included in Attachment 2. This work has informed the development of the options explored in this Consultation RIS, but collected information was not sufficient for the detailed quantitative analysis of the proposed options. In this report most of the analysis is done qualitatively.

FSANZ is seeking further information and feedback from industry, consumers and other stakeholders through this document.

All public comments received are reviewed and considered before approval of a variation to the Code by the FSANZ Board.

Individuals and organisations making submissions on this Proposal will be notified at each stage of assessment.

Work plan and timelines for this proposal are available on FSANZ website at <http://www.foodstandards.gov.au/code/changes/workplan/Pages/default.aspx>

7 Conclusion

Having reviewed the five options described above, FSANZ concludes that, due to the serious nature of the acute dietary exposure risk, a regulatory approach (namely a total prohibition) is the preferred option to address the public health and safety risks posed by consumption of raw unhulled and hulled apricot kernels for the following reasons:

- it lowers the risk of future poisoning incidences from consumption of raw apricot kernels that may contain high levels of HCN
- it protects new consumers unaware of risks of consumption of raw apricot kernels and enhances community confidence that regulatory authorities are acting to ensure public health and safety of the food supply
- it provides certainty in enforcing the state and territory and New Zealand food acts (under the safe and suitable legislation)
- it does not impose a burden on governments of ongoing surveillance of levels of HCN in raw apricot kernels.

FSANZ considers that maintaining the status quo (a non-regulatory approach) or other regulatory options are not appropriate options.

Option 5 (prohibition on the sale of apricot kernels) would also apply to any food derived from raw apricot kernels with an exemption for the following:

¹⁸ Survey was sent to 46 businesses in both, Australia and New Zealand. FSANZ has not received any responses from New Zealand business.

- apricots containing raw apricot kernels
- alcoholic beverages
- oil
- flavourings
- stone fruit juices
- marzipan
- cakes
- biscuits
- confectionery

Non-food uses are not affected by this proposal. In practice the prohibition would mainly affect consumers of whole kernels. Based on the information we have available to date we predict there would be a very limited or insignificant impact due to the removal from retail sale of kernels for catering and home-cooking.

As this is a Consultation RIS we welcome additional comments, information and data that you believe we should take into account in developing the Decision RIS. If information of sufficient quality and volume can be obtained from submissions, it will be used to conduct a more detailed quantitative impact analysis of the proposed options for the decision RIS. This could potentially result in FSANZ arriving at a different preferred option.

8 Implementation and review

Details on the implementation and transition times for any regulatory changes will be determined at a later stage of this process. Decisions regarding implementation and transition will be informed by submitters' comments received in response to this Consultation RIS.

State and territory regulatory agencies and the Department of Agriculture would be responsible for implementing any standard in Australia. The Ministry for Primary Industries would be responsible for implementing the standard in New Zealand.

Attachment 1 – A summary of reported poisoning incidents from raw apricot kernels in New Zealand and Australia

It has been suggested that acute HCN poisoning is qualitatively similar between children and adults, but children may be more vulnerable than adults to poisoning from some sources¹⁹.

FSANZ found two publications describing lethal consequences from consumption of apricot kernels:

- Sayre and Kaymakcalavu (1964) report that between 1957 and 1962, two children died of cyanide poisoning in a hospital in Central Turkey after eating apricot kernels. No information was provided on how many kernels were consumed²⁰.
- Lasch and Shawa (1981) report two more deaths of children in Gaza. One had been part of a group that had been “feasting on apricot kernels,” according to their parents, and another had consumed a sweet prepared from apricot kernels. Once again, there was no information on how much was consumed²¹.

Recently, FSANZ requested data on poisoning incidents from both Australian and New Zealand poisons information centres. Data clearly show that there have been a number of calls to poison information centres following either accidental (children and adults) or intentional ingestion (by adults only) of raw apricot kernels.

Table 3: New Zealand Poisons Information Centre (1 January 2003 to 1 February 2013)

Circumstances	Total number of calls/reports on poisons centres' databases	Further information
Adult intentional	4	Adults ingested a large number of apricot kernels as an alternative medicine and developed symptoms of cyanide toxicity: abdominal pain, headache, dizziness, short-term memory loss, confusion, flushing, palpitations and general illness. The then New Zealand Food Safety Authority managed these incidents by providing general advice on consumption of apricot kernels.
Adult unintentional	9	Accidentally ingested as part of a kernel or a whole kernel intact.
Child unintentional (accidental or exploratory)	7	
Total	20	

¹⁹ <http://www.ncbi.nlm.nih.gov/pubmed/17079589>

²⁰ Sayre and Kaymakcalavu (1964)

²¹ Lasch and Shawa (1981)

Table 4: Victoria Poisons Information Centre (1 May 2005 to 6 February 2014)

Circumstances	Total number of calls/reports on poisons centres' databases	Further information
Adult intentional	15	Taken as a cancer treatment. Three cases of poisoning reported with symptoms of cyanide toxicity reported as 'grey-looking', lightheaded, loss of consciousness, nausea and vomiting.
Adult for reasons other than cancer treatment	12	One caller said he was taking the kernels for 'health benefits'; another said she was taking them 'as a tonic'; the others did not specify why they were taking them.
Child unintentional (accidental or exploratory)	6	
Total	33	

Table 5: NSW Poisons Information Centre (1 Jan 2004 to 5 Jan 2014)

Circumstances	Total number of calls/reports on poisons centres' databases	Further information
Adult intentional	11	As a cancer treatment. Reported as ingesting between 20-50 kernels in a few hours or a number of kernels daily over a period of weeks or years to treat cancer. General symptoms of cyanide toxicity: swelling of face, increased heart rate, vomiting, difficulty breathing, and dizziness. Some callers advised to attend hospital immediately, particularly those that had ingested 30 or more kernels.
Adult unintentional or other than cancer treatment or unknown	26	To improve general health, accidental (e.g. mistaken for almonds or using kernels in a home-made jam recipe) or reasons unknown. Reported as ingesting some, few, handful or specific amounts (2-30) of apricot kernels.
General queries	27	General queries for advice and concerns about or following consumption of apricot kernels (including recalls) to NSW poison information centre.
Child unintentional (accidental or exploratory)	13	Children (accidental) were asymptomatic but reported as sucked on a kernel, ingested a bit of a kernel or 1 whole kernel consumed.
Total	77	

Table 6: Western Australia Poisons Information Centre (23 March 2002 to 31 August 2013)

Circumstances	Total number of calls/reports on poisons centres' databases	Further information
Adult intentional	7	Used as a complementary medicine, or suicide or other reasons. Reported as ingesting 20-40 kernels and lead to neurological, cardiovascular or gastrointestinal symptoms.
Adult unintentional	11	Accidental food poisoning. Reported as ingesting between 1 to 20 apricot kernels.
Adult unknown	2	
Child intentional	2	2 children were fed ground up apricot kernels by the mother over several months. There was a concern as both children were losing weight. Strongly recommend for a medical review.
Child unintentional (accidental or exploratory)	4	Generally reported as ingesting 1 whole kernel
Total	26	

Table 7: Queensland Poisons Information Centre (Jan 2003 to Feb 2013)

Circumstances	Total number of calls/reports on poisons centres' databases	Further information
Adult intentional	9	Ingestion of apricot kernels as an alternative medicine (8) and deliberate self-poisoning (1) Amounts consumed varied from a single apricot kernel swallowed whole to 20 kernels a day for 4 weeks Symptoms reported: stomach upset and cramps, flushed, breathing problems, swollen face, headache, light headedness, confusion, numbness in feet. No patient outcomes are available.
Adult unintentional (accidental)	4	
Child unintentional (accidental or exploratory)	1	
Total	14	The number of patients (includes all patient types) that were symptomatic= 11

Attachment 2 – Consultation with industry

Consultation in April 2012

In April 2012, a targeted consultation was undertaken with four apricot kernel business (importers and retailers) identified by online search. Identified business were approached via email.

At that time, FSANZ asked two specific questions:

1. Do you import or produce apricot kernels in Australia or New Zealand?
2. What is the size of your production and/or imports and the associated costs of production of apricot kernels?

Responses were received from two businesses that both produce Australian grown apricot kernels. One business indicated that their apricot kernels are not being used as food and another business produces around 7 tons of apricot kernels that are used as food.

One of the producers mentioned that they are also looking to import approx. 4 - 6 tonnes for certified organic apricot kernels to supply the Australian market. Organic apricot kernels are non-existent in commercial quantities in Australia so they stated that they need to look abroad to meet the demand in Australia for this popular food.

Letter to industry in September 2013

In September 2013, a letter was sent out to 46 businesses (importers, producers and retailers) in both Australia and New Zealand. Approached businesses were identified by online research and from customs import data. FSANZ received five responses.

The purpose of this letter from FSANZ was to inform the apricot kernel industry about Proposal 1016 and invite them to subscribe to FSANZ standards management mailing list for P1016, and let them know that we will be calling for data and/or information to assist FSANZ in estimating impacts on industry.

Please see below a copy of the letter sent to apricot kernel business in September 2013.

Dear Sir/Madam

Food Standards Australia New Zealand (FSANZ) is a bi-national scientific government agency responsible for setting food standards in Australia and New Zealand.

FSANZ is currently progressing a Proposal (P1016) to identify potential public health and safety risks associated with the consumption of raw apricot kernels and food products derived from them. For more background information refer to the following links:

<http://www.foodstandards.gov.au/foodstandards/changingthecode/standardsworkplan.cfm> and <http://www.foodstandards.gov.au/code/proposals/Pages/proposalp1016hydrocy5438.aspx>

As part of our assessment, FSANZ will consider appropriate risk management strategies to manage any identified public health and safety risks. We are obliged to consider the potential benefits and costs that may result from any proposed food regulatory measures (non-regulatory or regulatory). There are a number of options that could achieve the desired outcome of protection of public health and safety and FSANZ will need to examine the regulatory impacts of each option.

These consist of:

- a non-regulatory approach (e.g. consumer education) that may incorporate advice on the recommended maximum number of apricot kernels/day)
- complete prohibition on the sale of raw apricot kernels with an exemption for safe food products derived from them
- setting a maximum limit (ML) for HCN in raw apricot kernels and if needed, for food products derived from them
- labelling (with advice on the maximum number of raw apricot kernels that could be consumed in a day without adverse health effects)

FSANZ expects to have completed its risk assessment and options for consideration by the FSANZ Board in December this year. We will be calling for data and/or information that can assist in estimating impacts on industry. While any data provided will be used to arrive at a general profile of the apricot kernel industry across Australia and New Zealand, you will not be identified as the source of information.

The information you provide will be treated in confidence and will not be published by FSANZ. However, the information may be subject to a freedom of information request once it is in FSANZ's possession. Exemptions to the release of data do exist. However, exemptions are qualified and businesses do not get a right of veto over disclosure.

Therefore, in order that you can assist FSANZ at the time of public consultation on this Proposal, we invite you to supply your details on our submitter's data base, as follows:

Keeping informed

You can be placed on a mailing list for future advice on a specific application or proposal by contacting the Standards Management Officer at standards.management@foodstandards.gov.au and attaching this [completed form \(word 101 kb\)](#).

You can also register online to read about applications and proposals FSANZ is developing by registering to our [subscription service](#). For assistance in registering online contact the FSANZ Information Officer in Australia email information@foodstandards.gov.au

If you have any specific clarifications or require further information, please contact the Project Manager, Dr Glenn Stanley or (02) 62712643 or glenn.stanley@foodstandards.gov.au.

Consultation in November 2013

In November 2013, a questionnaire was sent out to 46 businesses (importers, producers and retailers) in both Australia and New Zealand. Businesses were identified by online research and from customs import data. Please see a copy of the questionnaire sent to apricot kernel businesses below.

FSANZ received eight responses, all from Australia. Two businesses indicated that they no longer imported apricot kernels. Another two businesses import either apricot kernel oil¹⁷ or apricot kernels as part of ingredients used in soup mixes. One importer indicated that they would provide some information, but to date no response has been received. Three other businesses provided their import/production numbers, costs and other information.

Responses were received from three businesses, two of which only import apricot kernels, and one business that imports and domestically produces apricot kernels. One of those businesses imports only apricot kernels without skin (hulled) and the other two only apricot kernels with skin on (unhulled). They import between 450–7,000 kg of apricot kernels with skin on (unhulled) for about \$5–7 per kg and around 500kg of apricot kernels with skin off (hulled). Also, a third business produces around 9,000–12,000 kg of dried apricot kernels with skin on (unhulled) for around \$9.5/kg.

All three businesses do retail and wholesale. Together they supply between 6 and 3000 retail business.

Questions sent to targeted stakeholders in 2013

Further information in response to these questions is requested. If you have previously supplied any of this information to FSANZ there is no need to supply it further.

a) Questions for apricot kernel importers

If your business is based in Australia we will assume your answers to the following questions are in Australian dollars. If it is based in New Zealand we will assume answers are in New Zealand dollars. If it is in both countries please provide answers in Australian dollars.

In which country is your business based? Write Y in the box next to the country(ies) in which your business is based.

Australia

New Zealand

How many kilograms of apricot kernel products do you import per year?

What type of apricot kernel products do you import? (e.g. dried apricot kernels, apricot kernel oil). And how many kilograms of apricot kernel product do you import?

Apricot kernel product	Quantity imported per year (in kilograms)	Price your business pays for imports \$
Dried apricot kernels with skin on (unhulled)		
Dried apricot kernels without skin (hulled)		
Apricot kernel oil		
Other foods²² (please specify)		

What percentage of your imported dried apricot kernels goes in to further processing for foods derived from apricot kernels²³? This includes both processing your business undertakes and processing by other businesses you sell to.

Does your business also sell apricot kernel products directly to consumers?

²² For example (amaretti biscuits, almond finger biscuits, apricot jams, apricot nectar)
²³ For example (apricot kernel oil, amaretti biscuits, almond finger biscuits, apricot jams, apricot nectar)

How many retail businesses do you supply apricot kernel products to?

b) Questions for domestic apricot kernel producers

If your business is based in Australia we will assume your answers to the following questions are in Australian dollars. If it is based in New Zealand we will assume answers are in New Zealand dollars. If it is in both countries please provide answers in Australian dollars.

In which country is your business based? Write Y in the box next to the country(ies) in which your business is based.

Australia

New Zealand

What type of apricot kernel products do you produce? (eg. dried apricot kernels, apricot kernel oils) And how many kilograms of each type of apricot kernel products do you produce?

Apricot kernel product	Quantity produced per year (in kilograms)
Dried apricot kernels with skin on (unhulled)	
Dried apricot kernels without skin (hulled)	
Apricot kernel oil	
Other foods²⁴ (please specify)	

What are the costs your business incurs in producing apricot kernels with skin on (unhulled) and apricot kernels without skin (hulled)? (e.g. – agricultural costs, harvesting costs, storage costs, processing costs, packaging, labelling, etc.)

Apricot kernel product	Production costs \$
Apricot kernels with skin on (unhulled)	
Apricot kernels without skin (hulled)	

Does your business sell apricot kernel products directly to consumers?

²⁴ For example, (amaretti biscuits, almond finger biscuits, apricot jams, apricot nectar)

How many retail businesses do you supply apricot kernel products to?

Attachment 3 – Questions for consumers

Apricot kernels are nut-like seeds found in the stone of fresh apricots. They can be bought with the skin on (unhulled) or with the skin off (hulled). Some processed foods, such as amaretti biscuits and apricot jam can include apricot kernels as an ingredient.



1 Skin on (unhulled) apricot kernels



2 Skin off (hulled) apricot kernels

Question 1. Have you ever bought dried apricot kernels...? Please tick all that apply.

- A On their own (e.g. a bag of dried apricot kernels)
- B As part of a soup mix?
- C In a food in which they're used as an ingredient (e.g. biscuits, apricot jam)?
- D As apricot kernel oil?
- E In some other form. Please specify

If you did not tick 'On their own' (Box A above) please do not complete any further questions in this survey. At this stage, FSANZ is interested only in consumers purchasing or consuming apricot kernels on their own. Thank you for your time.

If you did tick 'On their own' please go to [Question 2](#).

Question 2. When you have bought apricot kernels on their own (e.g. a bag of dried apricot kernels), which of the following types have you bought? Please tick all that apply.

- Kernels with skin on (unhulled)
- Kernels with skin off (hulled)

Question 3. If apricot kernels with skin on (unhulled) are unavailable would you switch to buying apricot kernels without skin (hulled) if they were available?

- Yes
- No

Question 4. Thinking about all of the times you have bought apricot kernels, which of the following have you used them for? Please tick all that apply

- A To prepare a particular food (e.g. biscuits, apricot jam) in which the kernels are cooked?
- B To prepare something other than food (e.g. a body scrub)
- C To eat for health reasons

If you did not tick 'To eat for health reasons' (Box C above) please do not complete any further questions in this survey. At this stage, FSANZ is interested only in consumers purchasing or consuming apricot kernels to eat for health reasons. Thank you for your time.

If you answered 'To eat for health reasons' (Box C above), please answer [Question 4](#), below.

Question 5. When you eat apricot kernels, how do you usually prepare them?

- A I usually eat them raw (uncooked) and whole
- B I usually eat them raw (uncooked) and crushed
- C I usually cook them

Question 6. Which of the following health effects (if any) are you hoping to achieve by consuming apricot kernels?

- A I'm not trying to achieve any health benefits from consuming apricot kernels
- B I don't currently have cancer, but I am trying to reduce my risk of developing it (i.e. cancer prevention)
- C I currently have cancer, and am trying to treat the cancer
- D I am trying to strengthen my immune system
- E I am trying to manage arthritis pain
- F I am trying to lower my blood pressure
- G I am hoping to achieve some other health effect. Please specify

Apricot kernels contain hydrocyanic acid, and so can cause cyanide poisoning when consumed. Processing apricot kernels (for example by cooking them) reduces the cyanide to safe levels. So products, such as biscuits, jams, etc. do not pose a risk to consumers.

Please see the Food Standards Australia New Zealand website if you would like further information on the risks of consuming raw apricot kernels:

<http://www.foodstandards.gov.au/consumer/safety/Pages/Apricot-kernels-raw.aspx>

Question 7. Were you aware, before reading this survey, that eating raw apricot kernels can cause cyanide poisoning?

Yes

No