FOOD STANDARDS
Australia New Zealand
Te Mana Kounga Kai – Ahitereiria me Aotearoa

25 August 2005

INITIAL ASSESSMENT REPORT

APPLICATION A511

DATE-MARKING OF CANNED FOOD

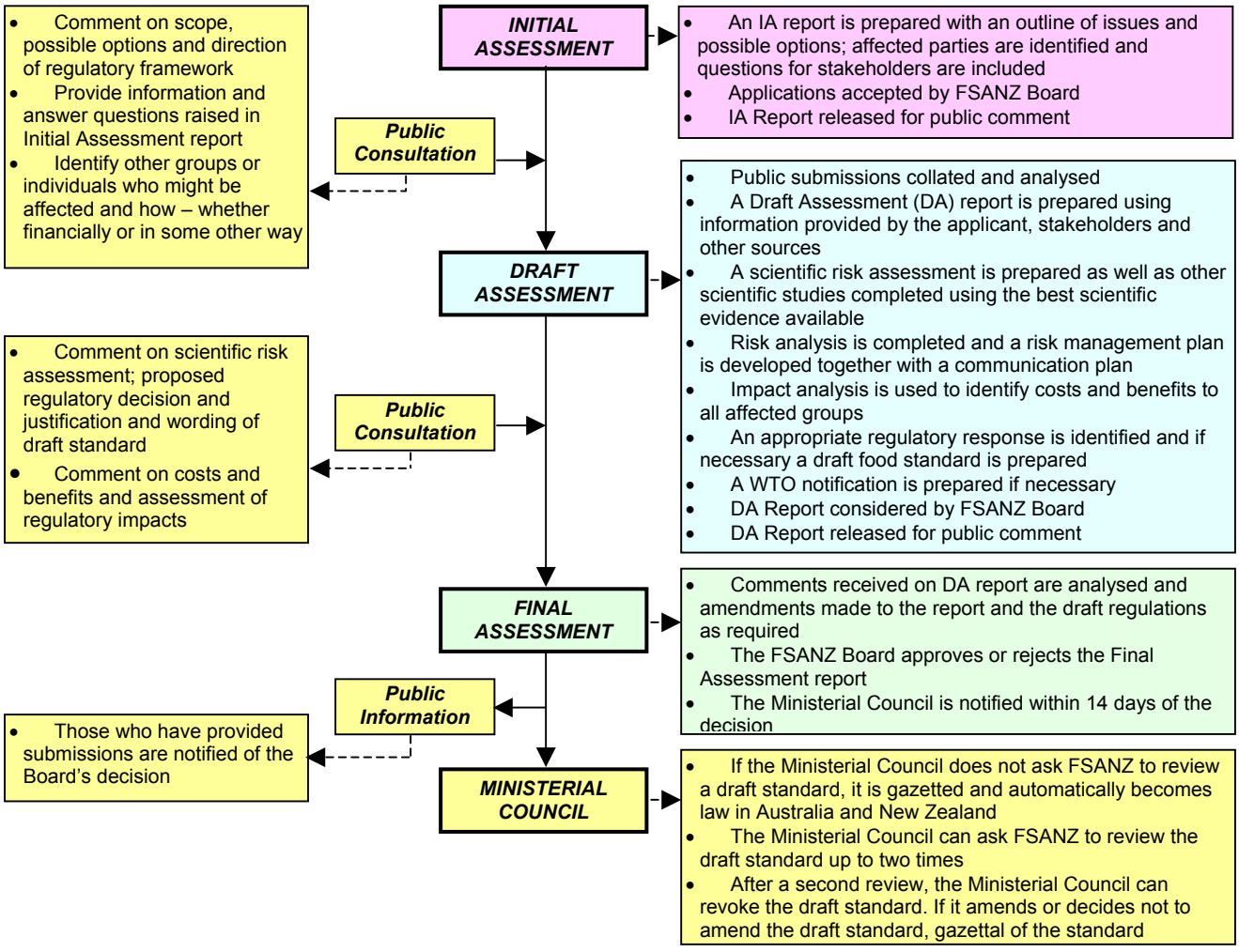
FOOD STANDARDS AUSTRALIA NEW ZEALAND (FSANZ)

FSANZ's role is to protect the health and safety of people in Australia and New Zealand through the maintenance of a safe food supply. FSANZ is a partnership between ten Governments: the Australian Government; Australian States and Territories; and New Zealand. It is a statutory authority under Commonwealth law and is an independent, expert body.

FSANZ is responsible for developing, varying and reviewing standards and for developing codes of conduct with industry for food available in Australia and New Zealand covering labelling, composition and contaminants. In Australia, FSANZ also develops food standards for food safety, maximum residue limits, primary production and processing and a range of other functions including the coordination of national food surveillance and recall systems, conducting research and assessing policies about imported food.

The FSANZ Board approves new standards or variations to food standards in accordance with policy guidelines set by the Australia and New Zealand Food Regulation Ministerial Council (Ministerial Council) made up of Australian Government, State and Territory and New Zealand Health Ministers as lead Ministers, with representation from other portfolios. Approved standards are then notified to the Ministerial Council. The Ministerial Council may then request that FSANZ review a proposed or existing standard. If the Ministerial Council does not request that FSANZ review the draft standard, or amends a draft standard, the standard is adopted by reference under the food laws of the Australian Government, States, Territories and New Zealand. The Ministerial Council can, independently of a notification from FSANZ, request that FSANZ review a standard.

The process for amending the *Australia New Zealand Food Standards Code* is prescribed in the *Food Standards Australia New Zealand Act 1991* (FSANZ Act). The diagram below represents the different stages in the process including when periods of public consultation occur. This process varies for matters that are urgent or minor in significance or complexity.



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Assessment reports are available for viewing and downloading from the FSANZ website www.foodstandards.gov.au or alternatively paper copies of reports can be requested from FSANZ's Information Officer at info@foodstandards.gov.au including other general inquiries and requests for information.

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Executive Summary

The Applicant, Mr Ken Johnson, has made an Application to FSANZ to amend Standard 1.2.5 – Date Marking of Packaged Food of the *Australia New Zealand Food Standards Code* (the Code) to require date marking on foods in hermetically sealed containers, with a shelf-life of two years or more.

Scope of the Application

Standard 1.2.5 prescribes a date marking system for packaged food, including the form in which this information must be provided on labels. There are two forms of date marking in relation to packaged foods; a 'use-by date' and a 'best-before date'. These are defined as follows:

- a 'use-by date' signifies the end of the estimated period, if stored in accordance with any stated storage conditions, after which the intact package of food should not be consumed because of health and safety reasons; and

- a 'best-before date' signifies the end of the period during which the intact package of food, if stored in accordance with any stated storage conditions, will remain fully marketable and will retain any specific qualities for which express or implied claims have been made.

Currently, packaged foods including canned foods, with a shelf-life of two years or more are exempted from date marking.

In conducting the Initial Assessment of this Application, FSANZ has considered the following two issues:

- the format for date marking; i.e. 'use-by date' or 'best-before date' that could be used on 'canned foods' which have a shelf-life of two years or more, by reference to the current definitions of these formats in Standard 1.2.5; and

- whether 'canned foods' should include all foods preserved in hermetically sealed containers, such as metal containers, glass jars and flexible packages (e.g. TetraPaks, retort pouches).

Risk Assessment

FSANZ undertook a comprehensive risk-assessment based on available data on microbiology, chemical safety and food technology.

Canning, if undertaken properly, will produce a commercially sterile food, free of those microorganisms and spores capable of growing at temperatures at which the specific food is to be held during distribution and storage. The microbiological risk assessment indicated there is no food safety risk arising from consumption of canned foods which have undergone prolonged storage. Where there are malfunctions in the process, there may be visible signs of spoilage in the end product, e.g. swollen cans, leakage, or unusual colour or odour of contents. These are typically seen early in the storage of the product. The safety of a canned food cannot be directly correlated to its age.

Exposure to tin by adults in Australia and New Zealand through consumption of foods in hermetically sealed metal containers is very low. The chemical risk assessment did not find any evidence of a public health risk due to exposure to tin in hermetically sealed metal containers. The lacquers used on metal cans do not adversely affect the quality of the food.

The shelf-life of food packaged in hermetically sealed containers is dependent on the nature of food, and exposure to the environmental conditions post-manufacture; namely temperature during transportation and storage in the warehouse, retail outlet and at home. This shelf-life is related to the quality of food, i.e. retention of nutrients.

International Regulations

The date marking regulations in other countries in the Organisation for Economic Development and Cooperation (OECD) on packaged foods, including those in hermetically sealed containers, are not harmonised. Overall, the joint Australia and New Zealand date marking standard is more stringent compared to the United States (US) and the Canadian regulations, but less stringent when compared to the Codex and the European Union (EU) regulations. For example, packaged foods with a shelf-life of 18 months are exempted from date marking in Canada but the EU and Codex requires all packaged food to be date marked, in the form of year (Codex) or month/year (EU) with some commodity specific exemptions.

The key purpose of date marking canned foods in EU and Codex standards is to provide a guide to consumers on the shelf-life of the product, i.e. quality. On the other hand, the purpose of date marking as required by the Code is to protect public health in Australia and New Zealand and provide adequate information to consumers to make informed food choices.

Consumer Issues

Consumer research[1] commissioned by FSANZ in 2002 (during the transition period to the new Code), indicated that date marks were used more regularly for perishable foods e.g. dairy. Over two thirds of consumers reported using date marks, but this was primarily for dairy products; oils, butter, margarine, dairy spreads and other fats and breads.

Of note, canned foods were included as a food category in this survey. This research indicated that date marking is not widely used by consumers in making food selection choices for this category. However, many canned foods are exempt from date marking, although in some instances manufacturers provide this information voluntarily.

Food Industry Considerations

Currently, Standard 1.2.2 - Food Identification Requirements requires lot identification to be included on the food label in order to be able to identify the food in question. This information, although not useful for consumers, assists in traceability and food recalls.

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[1] *Food Standards Australia New Zealand (FSANZ).* 2003, Food Labelling Issues: Quantitative Research with Consumers, NFO Donovan Research Report, FSANZ, Canberra.

Chapter 3 – Food Safety Standards aims to ensure that only safe and suitable food is sold in Australia. It requires manufacturers to produce food that is microbiologically safe and packaged using 'fit-to-use' materials that will not allow contamination of the product. New Zealand also has similar requirements.

Standard 1.2.5 was developed following the Inquiry Report on Proposal P139 in 1999 and was adopted by the Ministerial Council in November 2000. The date marking standard became fully enforceable in December 2004 following a two-year stock-in-trade period for long shelf life foods.

Previously New Zealand manufacturers, under the *Food Regulations 1984,* were exempted from providing date marking on packaged foods with a shelf life of 90 days or more. Under the Code, these manufacturers have had to change their systems to comply with Standard 1.2.5. Any further changes may cause pecuniary disadvantages to these manufacturers.

Regulatory Options

Under Standard 1.2.5, all packaged foods with a shelf life of less than two years require date marking, including those in hermetically sealed containers. Therefore, the regulatory options considered by FSANZ include:

1. Amend Standard 1.2.5 and remove the current exemption from date marking for all packaged foods with a shelf-life of two years or more. The date marking format for food with a shelf-life of two years or more, should the standard be varied, would be 'best-before date'. This is because date marking of packaged foods over two years is related to quality parameters and not food safety; or

2. Retain the current exemption from date marking for all packaged foods with a shelf-life of two years or more, thereby maintain the Standard as it is.

Based on the scientific evidence and consumer research findings, FSANZ proposes to maintain the *status quo*. That is, food in hermetically sealed containers with a shelf life of two years or more remain exempt from providing 'best-before dates'.

However, to assist consumers select, inspect contents and safely handle and prepare foods in hermetically sealed containers, FSANZ will develop a consumer Information Sheet.

Conclusion

Canning or hermetic sealing is a traditional process for preserving food. The application of a thermal process to food packed in hermetically sealed containers results in a commercially sterile food. Commercial sterility implies that there is no pathogenic micro-organism present that could grow in correctly handled and stored containers. Improper packaging or processing of foods may result in incidents of food-borne illness, but this is extremely rare. No epidemiological evidence or case reporting is available to suggest any significant public health risk associated with commercial hermetically sealed foods in Australia and New Zealand. Date marking of food in hermetically sealed containers will not distinguish whether food is properly processed, and therefore would not contribute to the increased detection and removal of foods that are improperly processed.

This Initial Assessment Report is an appraisal of whether the Application warrants further consideration according to the criteria in the FSANZ Act. FSANZ has come to the conclusion that the Application does not warrant further consideration as there is no evidence of public health and safety risk to be addressed by date marking food in hermetically sealed containers with a shelf life of two years or more. Any perceived risk could be better addressed via consumer education on selecting, storage and handling of foods in hermetically sealed containers.

1. Introduction

1.1 Nature of Application

An Application (A511) received by FSANZ on 2 September 2003, requested that all canned foods contain 'use-by dates', to address a perceived public health and safety risk of food-borne illness. Currently, the Code exempts foods with a shelf-life of more than two years from date marking.

Application A511 – Date-marking of Canned Foods, has reached Initial Assessment under the operation of the *Food Standards Australia New Zealand Act 1991* (FSANZ Act), and will be finalised in accordance with the provisions of the FSANZ Act.

In reviewing Application A511, FSANZ intends to consider:

1. the need for either a 'use-by date' or a 'best-before date' on all 'canned foods' with a shelf-life of two years or more. FSANZ will therefore, refer to the current definitions for these terms in Standard 1.2.5 (Attachment 1); and

2. whether 'canned foods' should include all foods preserved in hermetically sealed containers, such as metal containers, glass jars and flexible packages (e.g. TetraPaks, retort pouches).

While the Application was only in relation to canned foods, FSANZ broadened the scope because a wide variety of packaging systems other than metal containers can be utilised to produce a heat processed hermetically sealed product. These include aseptic packaging - papers (coated and impregnated), plastic film (plain and coated), paper, plastic, foil laminates, glass where the packaging is sterilised separately, retort pouches and packages with a combination of nylon, polyesters, polyolefins and aluminium foil.

1.1.1 Background to the Application

On 24 August 2003, according to the Applicant, the Applicant's spouse consumed canned vegetable and lamb condensed soup and within ten minutes felt nauseated. An hour later, after developing black discoloration to tongue and teeth, the spouse was taken to hospital where oxygen was administered for approximately half an hour.

On close inspection of the can containing the condensed soup several days after the event, black stains were noticed that the applicant deemed to be consistent with tin leaching. The can was not retained by the Applicant and no further examination of the can or its contents was conducted.

1.1.2 Follow-up action by Applicant

The Applicant contacted the Australian manufacturer of the canned condensed soup and was promised product samples. The Applicant did not receive any further correspondence from the manufacturer. The date of manufacture for this product was not obtained from the manufacturer.

2. Regulatory Problem

2.1 Current Standard

Standard 1.2.5 – Date Marking of Packaged Foods (Attachment 1) was gazetted in 2000 and became fully enforceable in Australia and New Zealand following a two year transition period. The Standard prescribes a date marking system for packaged foods and the form in which those foods must be date marked. It requires packaged foods, with some exceptions, to be date marked either with a 'use-by' or a 'best-before' date. The Standard stipulates that the label on a packaged food must include date marking information unless the 'best-before date' is two years or more. Labels must also include a statement on conditions of storage where it is necessary to ensure that food will keep for the specified period indicated by date marking. The two date marking formats in relation to a packaged food are defined in the Code as:

- 'best-before date' is the date which signifies the end of the period during which intact package of food, if stored in accordance with any stated storage conditions, will remain fully marketable and will retain any specific qualities for which express or implied claims have been made'; and

- 'use-by date' is the date which signifies the end of the estimated period, if stored in accordance with any stated storage conditions, after which the intact package of food should not be consumed because of health and safety reasons

Most foods in hermetically sealed metal containers are considered to have a shelf-life of more than two years if transported and stored properly and are therefore, exempted from date marking.

However some hermetically sealed foods, such as ready-to-eat chilled foods or ultra heat treated milk may have a shorter shelf-life, and are required to provide date marking.

3. Objective

The objective of Application A511 is to amend Standard 1.2.5 of the Code and require foods in hermetically sealed containers with a shelf life of two years or more to provide date marking for public health and safety reasons.

In developing or varying a food standard, FSANZ is required by section 10 of the FSANZ Act to meet three primary objectives. 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 Ministerial Council.

4. Background

4.1 Historical Background

The National Health and Medical Research Council (NHMRC) released a draft Standard A2 – Date Marking of Packed Food for comment in 1974. This Standard was further developed into a form that closely represents the current Standard 1.2.5 (Attachment 1). Date marking exemption for foods with a shelf-life of two years or longer was specifically recommended by the NHMRC's Food Standards Committee in 1980. This was in recognition that manufacturers have difficulties in accurately assessing the shelf-life of long-life foods.

In 1996, the then National Food Authority (now FSANZ) raised Proposal P139 to review date marking of packed foods for both Australia and New Zealand. The Proposal made a number of recommendations on which extensive public comments were sought. A Full Assessment report, released in 1998 for public comment, addressed the issues raised in the original submissions and included a draft standard on date marking. The Inquiry Report, published in 1999, included a joint date marking standard for Australia and New Zealand that was developed and further revised taking into consideration issues raised during the public consultations.

The Ministerial Council approved Standard 1.2.5 – Date Marking of Packaged Foods in November 2000. It was gazetted in December 2000 in Australia and in February 2001 in New Zealand, and was implemented by the food industry over a two-year transition period, ending in December 2002. However, long shelf-life foods had a two year stock-in-trade exemption until the standard became fully enforceable in December 2004.

5. Relevant Issues

5.1 Purpose of date marking

Date marking provides a guide to consumers on the shelf-life of a food regarding its safety ('use-by date') or quality ('best-before date'). That is, the length of time a food should keep before it begins to deteriorate, or the duration a food can be expected to remain safe. Foods that are date marked with a 'best-before' date can continue to be sold after this date provided that the food is not damaged, deteriorated or perished. However, foods with a 'use-by date' cannot be sold in Australia or New Zealand past this date.

Foods in hermetically sealed containers are commercially sterile. Exposure to environmental conditions during domestic and/or international transportation (to the warehouse, shipping, to household), and storage (in warehouses, transport vehicles, retail outlets, and households) impact the quality of such foods. These conditions are diverse and only some are within the control of the manufacturer. However, it is likely that signs of deterioration of foods in hermetically sealed containers would be visibly evident. For example, swollen containers, rusted cans/lids, leaking, or unusual colour or odour of contents. Date marking will not prevent these deteriorations, which result from breakdowns during processing and/or handling of the finished products.

5.2 Format of date marking

In reviewing the issues raised by the Applicant, especially that date marking foods in hermetically sealed containers would prevent food-borne illnesses, FSANZ has considered the scientific and/or technical risks, and the current definitions of 'use-by date' or 'best-before date' in the Code. FSANZ has also taken into consideration section 10 of the FSANZ Act (see Chapter 3), i.e. protection of public health and safety, and the provision of adequate information relating to food to enable consumers to make informed choices.

Currently, Standard 1.2.5 requires all packaged foods with a shelf-life of less than two years to provide date marking information on the label. The format of the date marking, i.e. 'use-by date' or 'best-before date', is dependent on the nature of the food and the processing conditions of the packaged food.

For example, some packaged foods, such as chilled ready-to-eat foods, have to be consumed within a certain period to ensure public health and safety and in these circumstances, a 'use-by date' must be provided on the food label. Most packaged foods with a shelf-life life of less than two years are date marked with a 'best-before date'.

Therefore, FSANZ concludes that within the scope of this Application the 'best-before date' would be more appropriate. This date would indicate that in the absence of any visible signs of deterioration of the container or its contents, the packaged product can still be marketed.

5.3 Other Code requirements

There are other standards in the Code that apply to foods in hermetically sealed containers for public health and safety purposes.

Standard 1.2.2 - Food Identification Requirements requires that certain information, such as lot identification or where and when the food was made, must be included on the food label in order to be able to identify the food in question. The label on foods in hermetically sealed containers must include its lot identification. This information, while not important for consumers, enables foods to be traced and recalled should the need arise.

Chapter 3 – Food Safety Standards requires all food businesses to comply with standards 3.1.1 (Food Safety Programs), 3.2.2 (Food Safety Practices and General Requirements) and 3.2.3 (Food Premises and Equipment). Clause 7 of Standard 3.2.2 requires that hermetic sealing process achieve microbiological safety of the food, and clause 9 requires that packaging, such as cans, to be made of material that is not likely to cause food contamination and be 'fit for use', i.e. enable the hermetically sealed food to be kept safely under normal storage conditions.

The *New Zealand Food Act 1981* section 9(4)(c) requires that packaging, when used, must not cause food to be unsafe or tainted. Therefore, it is the responsibility of food manufacturers and sellers to ensure their products are safe and that they comply with relevant legislation. In practise, packaging suppliers will need to ensure their products are suitable for the intended use.

5.4 Consumer use of date marking

Quantitative research[2] conducted in 2002, at the time of transition to the current Code, provided baseline indicators on consumer attitudes towards labelling, awareness and use of different labelling elements, beliefs about the clarity and trustworthiness of labels, and which label elements consumers found difficult to interpret. One thousand nine hundred and forty door-to-door interviews in metropolitan cities in Australia (1259 interviews) and New Zealand (681 interviews) were conducted.

The results of this research confirmed that different consumers use labels for different reasons and in different ways, and that some use more label elements than others. For example, date marks were used more regularly for perishable foods (e.g. dairy) and allergen declarations were relied upon more for baked products such as biscuits, and dairy foods.

The consumers reported unprompted awareness of six label elements (ingredients, list, nutrition information panel or NIP, date mark, country of origin, percentage labels and nutrient claims) to be more 'top of the mind' than weight, brand and/or price. The most used label elements were date marks, ingredients lists and NIPs with over two thirds or more consumers reporting their use.

Details of the research results specific to date marking are provided below:

- of the 1940 respondents, 25% (unprompted) were aware of date marking and when prompted, 93 % reported awareness of this label element;
- date marking was the most used label element and of the 1940 respondents, 85% had used this label information and 68% reported using it 'most' frequently;
- 67% (n = 1639) of respondents reported using date marking ' every time they bought a product';
- approximately half the respondents trusted the date marking information; and
- food categories for which date marking was mostly used (n = 1656):

    - dairy products (85%);
    - oils, butter, margarine, dairy spreads and other fats (54%); and
    - breads (51%).

Of note, canned food was included as a food category in this research but, ingredients list was reported as 'most used' element for this category.

5.5 Codex and Other International Standards

The international regulations on date marking of packaged foods are not uniform and a summary is provided at Attachment 5. For example, the United States (US) only requires date marking to be provided on infant formula and dietary supplements. Manufacturers can voluntarily provide this information on other products, such as foods in hermetically sealed containers, for quality purposes.

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[2] *Food Standards Australia New Zealand (FSANZ).* 2003, Food Labelling Issues: Quantitative Research with Consumers, NFO Donovan Research Report, FSANZ, Canberra.

Codex requires date marking to be provided on all packaged foods, but provides commodity specific exemptions, such as peeled fruits and vegetables.

Overall, the Australia and New Zealand date marking standard is more stringent compared to the US and Canadian regulations, but less stringent when compared to the Codex and European Union standards.

6. Regulatory Options

Under Standard 1.2.5, all packaged foods with a shelf life of less than two years require date marking, including those in hermetically sealed containers. Therefore, the regulatory options considered by FSANZ were:

1. Amend Standard 1.2.5 and remove the current exemption from date marking for all packaged foods with a shelf-life of two years or more. The date marking format for food with a shelf-life of two years or more, should the standard be varied, would be 'best-before date'. This is because date marking of packaged foods over two years is related to quality parameters and not food safety; or

2. Retain the current exemption from date marking for all packaged foods with a shelf-life of two years or more, thereby maintain the Standard as it is.

7. Impact Analysis

7.1 Affected Parties

The following groups will be impacted should Standard 1.2.5 be amended as per A511:

1. food manufacturers;
2. food importers;
3. consumers; and
4. Government(s).

7.2 Data Collection

The following are the summaries of the technical and/or scientific assessments undertaken as part of A511:

7.2.1 Microbiological Risk Assessment

Canning, a traditional food preservation method, involves heat processing of foods packed in hermetically sealed containers. This results in a product that is commercially sterile. Commercial sterility is achieved by the application of heat either alone or in combination with other treatments, such as irradiation or ingredients. Food in hermetically sealed containers is free of microorganisms including spores, that are capable of growing at the temperature at which the specific food is to be held during distribution and storage.

Food is graded, washed, peeled, blanched and sometimes pre-cooked to remove contamination from its surface, inactivate enzymes and ensure that food is ready for filling.

The containers are then filled to the correct weight allowing for adequate head space above the food. The head space significantly influences the rate of heat penetration into the food. Exhausting removes air from the container forming a vacuum when the container is cooled. Hermetic sealing of containers further isolates the possibility of external contamination, and thermal processing allows for the required level of microbial inactivation. Rapid cooling of containers prevent over-cooking of the food, thereby maximising the organoleptic and nutritive properties of the food, and prevents surviving thermophilic microorganisms from growing.

In addition to inactivating and reducing the number of viable microorganisms in food, hermetic sealing also removes oxygen through steam exhaustion, high fill temperature and/or closure under vacuum. Exposure to oxygen would further deteriorate the quality of food and allow microorganisms to grow.

As hermetically sealed containers create a barrier between the food and the external environment, these foods are microbiologically stable and can be stored without refrigeration for an extended period of time. This is one of the key objectives of the hermetic sealing process.

Problems with foods in hermetically sealed containers may occur due to breakdowns in the packaging and/or processing stages. These include:

- under-processing. It allows the survival of microorganisms with exceptional heat resistance, or does not fully inactivate initial levels of microbial contamination in the raw ingredient. Faulty retort operation, and/or under-heating may lead to under-processing;
- defective seams. This results in leakage of cooling water into the container, and/or leakage of contents from the container; and
- inadequate preparation of food prior to sealing. This may result in growth of microorganisms in food, and/or delays between food preparation and thermal processing stages.

A detailed microbiological risk assessment report is at Attachment 2.

7.2.2 Food Technology Assessment

Hermetically sealed foods refer to airtight containers, usually made of tin-coated iron, in which foods or beverages are preserved. The containers may also include aluminium, steel, thermoformed plastic and glass. Canning produces a shelf-stable product that can be stored at ambient temperatures for long periods of time, e.g. four years[3], as the food remains commercially sterile in the intact containers. Spoilage of contents in the container does not occur if the product is processed correctly. However, slow chemical changes do proceed in these foods[4].

In Australia and New Zealand, a range of foods is preserved using the hermetic sealing technology, including fruits, vegetables, fish, meats and baby foods.

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[3] *Food Science Australia.* 2000, Storage life of Foods – Fact Sheet. [online]. Available at: http://www.foodscience.afsic.csiro.au/storagelife2.htm. Accessed on January 17, 2005.

[4] *Food Science Australia.* 2000, Storage life of Foods – Fact Sheet. [online]. Available at: http://www.foodscience.afsic.csiro.au/storagelife2.htm. Accessed on January 17, 2005.

Most metal containers used by the Australian canning industry are made from tinplated steel but aluminium cans, often with easy-opening ends are used for beer and other carbonated beverages. The advantages of using metal containers are that they:

- can be heated for sterilisation and quickly cooled;
- have reasonable physical strength;
- are impervious to light, air and water;
- do not interact with food if properly treated;
- are impervious to insects and rodents; and
- can be recycled.

In manufacturing metal containers, tin (coating) is deposited by electrolysis onto the surface of steel plates. The coating, used on either surface of the container, can be of same or different material. A heavy coating is used if the metal container is lacquered on the inside and the food to be stored in this container is moderately corrosive. There are a number of reasons containers are lacquered: to prevent tin from interacting with its contents; to remove contents easily; to improve its appearance; and to protect against exposure to environment.

Sulphur resistant lacquers are used to prevent the staining of tinplate surfaces by sulphur compounds that are released from foods, such as meat, fish and vegetables, during processing and storage. General purpose lacquers are often used for more acidic products, such as beetroot and red berry fruits. Special lacquers containing additives, such as aluminium powder, assist the release of the food from the metal container.

A wide variety of packaging systems other than metal containers can be utilised to produce a heat processed hermetically sealed product. These include aseptic packaging - papers (coated and impregnated), plastic film (plain and coated), paper, plastic, foil laminates, glass where the packaging is sterilised separately, retort pouches and packages with a combination of nylon, polyesters, polyolefins and aluminium foil.

All containers are sterilised by heating during manufacture. These packaging types also provide a number of barriers, such as microbiological, gas, moisture and light, thereby maintaining the safety and quality of foods.

Due to processing procedures involved, foods in hermetically sealed containers can be stored for extended periods. However, the storage life is also dependent on the nature of food and temperature during transportation and storage. Damage that affects the intactness of the container, such as piercing, results in leakage shortly after the event. As a general rule, the Australian Canned Food Industry Association and Food Science Australia recommend that foods in hermetically sealed containers should be consumed within a year of purchase to enjoy the peak flavour and quality.

A detailed food technology report is at Attachment 3.

7.2.3 Chemical Risk Assessment

The levels of tin in most foods are very low; less than one part per million (ppm). Foods, such as those in hermetically sealed metal containers, are the major source of tin exposure by humans.

Current Australia and New Zealand population data indicate that the levels of tin in the adult population, as a result of consuming canned foods, are low. There is no evidence of cumulative adverse effects due to exposure to low levels of tin in the diet of humans.

The uptake of tin by foods in metal containers is dependent on lacquering. Lacquer significantly reduces the risk of contamination of food. However, there are no data available on the levels of tin following prolonged storage, e.g. more than two years, in hermetically sealed foods in metal containers.

Acute exposure to high levels of tin in humans occurs mainly through ingestion. Current data indicate that tin toxicity causes an acute gastric irritation but the number of reported cases of food poisoning is small, and there are no new reported cases of tin poisoning in humans in Australia.

The dietary exposure to tin for Australia and New Zealand adults is low when compared to the Provisional Tolerable Weekly Intake[5] of 14 milligrams per kilogram body weight per day established by Joint Expert Committee on Food Additives.

Thus, based on the available toxicological data the dietary exposure to tin for mean and high consumers in Australia and New Zealand is considered to be within the safe range of tin intake. In terms of public health and safety, there are no public health and safety concerns regarding exposure to tin from diets in both these countries.

A detailed chemical safety report is at Attachment 4.

7.3 Impact Analysis

7.3.1 Food Industry

Based on the scientific reports (Attachments 2-4), date marking foods in hermetically sealed containers with a shelf-life of two years or more would only indicate the quality of food.

New Zealand manufacturers, under the *Food Regulations 1984* were exempted from date marking information for packaged foods with a shelf-life of 90 days or more. Under the Code, these manufacturers have had to comply with the new date marking standard. Where a business is predominantly manufacturing long shelf-life hermetically sealed foods, there would be equipment setup costs incurred should date marking be required on these products.

In addition, the cost for stock rotation and disposal of products past its date mark will be significant for manufacturers and importers should date marking be required for the foods currently exempted.

7.3.2 Consumers

[5] Provisional Tolerable Daily Intakes (PTDI) are upper limits that are set for substances that do not accumulate in animals and humans.

Quantitative research[6] of Australian and New Zealand consumers indicate that date marking information is not frequently used by consumers in making purchase decisions for foods in hermetically sealed containers.
The industry costs to comply will date marking of hermetically sealed foods with a shelf-life of two year or more may be passed on to consumers. The benefits of this cost to consumers could not be justified as date marking of such foods is not used to make purchase decisions, nor for protection of public health.

7.3.3 Impact on government

International regulations on date marking for packaged foods vary (see Attachment 5), and changing the existing Australia New Zealand regulations on date marking may create further technical trade barriers with some countries. It should be noted that the overarching principles for date marking standards in Codex and US is so that foods are consumed at their peak quality. However, the deterioration of foods in hermetically sealed containers is a very slow process[7].

7.3.4 Impact on regulatory agencies

The States/Territories and New Zealand have surveillance and inspection systems in place and priorities for these systems are established within each jurisdiction. Labelling of packaged foods may be subject to investigations only if consumer complaints are made regarding specific labelling issues.

When food is imported into Australia, it is placed into one of three inspection categories. These categories determine the frequency with which the food will be inspected. The categories are: risk, active surveillance and random surveillance. FSANZ advises the Australian Quarantine and Inspection Service (AQIS), based on a risk assessment process, which food belongs into which category. These food inspection categories are regularly reviewed by FSANZ.

All risk categorised foods are inspected and tested against a pre-determined list of potential hazards, such as microbial risks, contaminants, pesticide residues etc. Food is risk categorised if it has the potential to pose a high or medium risk to public health. One hundred percent of risk categorised foods are referred to AQIS, by the Australian Customs Service, for inspection.

As the scientific evidence does not link date marking of foods in hermetically sealed containers to public health and safety, inspection at the border for these foods may not be a priority for the enforcement agencies.

8. Consultation

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[6] *Food Standards Australia New Zealand (FSANZ).* 2003, Food Labelling Issues: Quantitative Research with Consumers, NFO Donovan Research Report, FSANZ, Canberra.
[7] *Food Science Australia.* 2000, Storage life of Foods – Fact Sheet. [online]. Available at: http://www.foodscience.afsic.csiro.au/storagelife2.htm. Accessed on January 17, 2005.

FSANZ made its decision under section 36 because it was satisfied that omitting to invite public submissions prior to making an Initial Assessment would not have an adverse effect on anyone's interests.

Section 63 of the FSANZ Act provides that, subject to the *Administrative Appeals Tribunal Act 1975*, an application for review of FSANZ's decision to omit to invite public submissions prior to making an Initial Assessment, may be made to the Administrative Appeals Tribunal.

9. Conclusion and Recommendation

Hermetic sealing is a traditional process for preserving food. Thermally processing food packed in hermetically sealed containers result in commercially sterile foods. Commercial sterility implies that there is no pathogenic micro-organism present that could grow in correctly handled and stored containers. Improper packaging or processing of foods in hermetically sealed containers may result in incidents of food-borne illnesses, but this is extremely rare.

To date, there is no evidence available to suggest that any significant public health risk is associated with commercially produced foods in hermetically sealed containers. Date marking of food in hermetically sealed containers will not distinguish whether food is properly processed, and therefore would not contribute to the increased detection and removal of foods that are improperly processed. Faulty processing of foods in hermetically sealed containers would be evident shortly after manufacture. Furthermore, date marking foods in hermetically sealed containers with a shelf-life of two years or more will not indicate a faulty process nor will it prevent food-borne illnesses resulting from consumption of such foods. The latter is the function of good manufacturing practices employed by the food industry, and handling of these products post-manufacture by retailers and consumers. Handling of products by retailers and consumers cannot be regulated by the Code.

Having considered the current scientific data, consumer use of food labelling information, and international regulations, FSANZ is of the opinion that varying the current standard date mark foods in hermetically sealed containers, such as metal cans, glass jars and flexible packages, with a shelf-life of two years or more would not further protect public health and safety. Therefore, on public health and safety grounds there is only minimal risk to be addressed, and no change to the current standard is warranted.

The minimal risk that exists is sufficiently managed by other standards of the Code, such as Standards 1.2.2 and 1.2.6 and Chapter 3 standards and the *New Zealand Food Act 1981*. Therefore, FSANZ is of the view that a further variation to the standard will not reduce the risk any further.

FSANZ notes that any low-level risk to public health and safety arising from not providing date marking on foods in hermetically sealed containers with a shelf-life of two years or more can be better addressed via consumer education on selecting, storing and handling of foods in hermetically sealed containers. On this basis, A511 would also be rejected.

9.1 Analysis against Section 13 of FSANZ Act

To accept or reject an application, there must be sufficient evidence to support a decision based on the criteria (a-e) provide below. FSANZ findings in regard to the criteria leading to the recommendation, based on matters listed in section 13 of the FSANZ Act, are:

(a) whether the application relates to a matter that may be developed as a food regulatory measure, or that warrants a variation of a food regulatory measure;

Application A511 is for a variation to Standard 1.2.5 to provide date marking on foods in hermetically sealed containers with a shelf life of two years or more. By varying the standard, the Applicant asserts that food-borne illnesses from such foods will be prevented.

FSANZ has concluded that the Application does not warrant further consideration as there is no evidence of a public health and safety risk to be addressed by date marking food in hermetically sealed containers with a shelf life of two years or more. Any perceived risk could be better addressed via consumer education on selecting, storage and handling of foods in hermetically sealed containers.

(b) whether the application is so similar to a previous application that it should not be accepted;

Not applicable.

(c) whether the costs that would arise from a food regulatory measure would outweigh the direct and indirect benefits to the community, Government or industry;

There is no link to support that date marking foods in hermetically sealed containers with a shelf-life of two years or more would prevent food-borne illness. If the standard is varied, there would be initial equipment set up costs for the food industry and maybe an on-going cost per stock keeping unit.

FSANZ also notes that some manufacturers may already have the equipment if they produce hermetically sealed foods with a shelf life of less than two years. There will also be considerable costs associated with stock rotation and disposal of products past its date mark that cannot be justified on public health and safety reasons.

New Zealand manufacturers, under the *Food Regulations 1984* were exempted from providing date marking information for packaged foods with a shelf-life of 90 days or more. Under the Code, these manufacturers now comply with the new requirements. Another variation to the standard may result in pecuniary disadvantages to the long-life product manufacturers in a very short period as Standard 1.2.5 became fully enforceable in December 2004.

A consumer survey, commissioned by FSANZ, has indicated that generally consumers do not use date marking information to make purchase choices for foods in hermetically sealed containers.

FSANZ is of the view that the risk of food-borne illness from foods in hermetically sealed containers is minimal and therefore, costs incurred by industry should the standard be amended cannot be justified.

(d) whether other measures (available to FSANZ or not) would be more cost-effective than a food regulatory measure;

The risk to public health and safety resulting from foods in hermetically sealed containers with a shelf life of two years or more not being date marked is considered to be minimal. Manufacturing practices, product storage and traceability are already covered in the Code. One approach to optimise appropriate selection and handling of hermetically sealed foods, including canned foods, is to educate the consumers. This cannot be regulated by the Code. However, an Information Sheet (printed and electronic) on selection, storage and handling of these products pre- and post-purchase developed by FSANZ would be appropriate.

(e) any other relevant matters

No other matter has been identified as applicable to this Application.

ATTACHMENTS

1. Standard 1.2.5 Date Marking of packaged foods
2. Microbiological Risk Assessment Report
3. Food Technology Report
4. Chemical Safety Report
5. Comparison of International Standards on Date Marking
6. Draft Information Sheet

Attachment 1

Standard 1.2.5 – Date Marking of Packaged Food

Purpose

This Standard prescribes a date marking system for packaged food and the form in which those foods must be date marked. The Standard requires packaged food, with some exceptions, to be date marked, and prohibits the sale of packaged food after the expiration of the use-by date, where such a date mark is required. In particular, clause 2 of this Standard sets out the circumstances in which a use-by date must be used instead of a best-before date.

Table of Provisions

Clauses

1 Interpretation

In this Standard –

baked-for date, in relation to bread, means a date not later than 12 hours after the time the bread was baked.

baked-on date, in relation to bread, means the date on which the bread was baked.

best-before date, in relation to a package of food, means the date which signifies the end of the period during which the intact package of food, if stored in accordance with any stated storage conditions, will remain fully marketable and will retain any specific qualities for which express or implied claims have been made.

use-by date, in relation to a package of food, means the date which signifies the end of the estimated period if stored in accordance with any stated storage conditions, after which the intact package of food should not be consumed because of health and safety reasons.

2 Food must be date marked

(1) Unless otherwise expressly prescribed in this Code, the label on a package of food must include –

(a) its use-by date, where the food should be consumed before a certain date because of health or safety reasons; or
(b) where paragraph 2(1)(a) does not apply, its best-before date;

unless -

(c) the best-before date of the food is two years or more; or
(d) the food is -

(i) an individual portion of ice cream or ice confection; or
(ii) in a small package, except where the food should be consumed before a certain date because of health or safety reasons.

Editorial note:

ANZFA's *Guide to the Use of 'Use-by' and 'Best-Before' Dates for Food Manufacturers* provides guidance on paragraphs 2(1)(a) and (b).

Standard 1.2.1 sets out the exemptions to the general labelling requirements in this Code, and provides a definition of 'small package'.

(2) The label on a package of bread with a shelf life less than 7 days, may include instead of a best-before date -

(a) its baked-on date; or
(b) its baked-for date.

3 Prohibition on sale of food after the use-by date

Food must not be sold past its use-by date.

4 Prescribed form of date mark

(1) A best-before date must use the words -

'Best Before'

accompanied by the date or a reference to where the date is located in the label.

(2) A use-by date must use the words -

'Use By'

accompanied by the date or a reference to where the date is located in the label.

(3) A baked-for date must use either the words -

'Baked For'; or
'Bkd For'

accompanied by the date or a reference to where the date is located in the label.

Editorial note:

The 'baked-for date' indicates the date the bread is being baked for, and has been included to overcome problems associated with bread that is baked later in the day for sale the following day. This date cannot be later than 12 hours after the time the bread was baked. Hence, bread that is baked after 12:00pm (midday) can include a 'baked-for date' that specifies the following day. However, bread baked before 12:00pm (midday) cannot.

(4) A baked-on date must use either the words -

'Baked On'; or
'Bkd On'

accompanied by the date or a reference to where the date is located in the label.

5 Prescribed form of date

(1) The best-before date and use-by date must consist at least of -

(a) the day and the month for products with a best-before date or use-by date of not more than 3 months; or
(b) the month and the year for products with a best-before date or use-by date of more than 3 months.

(2) The best-before date and use-by date must be expressed in uncoded numerical and chronological form, other than the month, which may be expressed in letters.

(3) The day, month and year so expressed within the best-before or used-by date must be distinguishable.

Examples:

For paragraph 5(1)(a) -

3 Dec or 3 12
3 12 99 or 3 Dec 99

For paragraph 5(1)(b) -

Dec 99 or 12 99
3 12 99 or 3 Dec 99

6. Statement of storage conditions

(1) The label on a package of food must include a statement of any specific storage conditions required to ensure that the food will keep for the specified period indicated in the -

(a) use-by date; or

(b) best-before date.

(2) Subclause 6(1) does not apply to liquid milk and milk products and cream and cream products sold in glass bottles with no label other than that on the foil cap.

7 Exclusive date marking system to be used

(1) Subject to subclause (2), the label on a package of food must not include a date marking system other than that prescribed by this Standard.

(2) Subclause (1) does not preclude the addition of a manufacturer's or packer's code on the label on a package of food.

Attachment 2

Microbiological Risk Assessment

Introduction

Canning represents a food preservation technology that extends the shelf life of food packaged in hermetically sealed container. Developed some two hundred years ago, the canning process aims to prevent food spoilage and preserve the quality of the foods, so that food can be kept for an extended period of time without refrigeration and without the loss of nutrition values (Blementhal, 1990)

To assist in the evaluation of Application A511 – Date marking on canned foods, the microbiological safety risks associated with canned foods are assessed in this report. Food technology and chemical food safety risks associated with canned foods are covered elsewhere in the assessment report (Attachments 3 and 4).

Definition of specific canning terms

D value: D value refers to decimal reduction time, which is the time required to destroy 90% (1 $\log_{10}$ reduction) of the micro-organism in a specific substrate at a specific temperature (Forsythe, 2000). D-values are specific according to the intrinsic characteristics of the micro-organism. For example, the D value for *Clostridium botulinum* type A and B spores is approximately 0.21 minute at 121.1°C, and the D value for the thermophilic organism *Bacillus stearothermophilus* is approximately 5 minutes at 121.1°C (Hersom and Hulland, 1980).

12-D: 12-D refers to the minimum heat process during canning where the probability of survival of the most heat resistant *C. botulinum* spores is reduced to 10^{-12}. 12-D is measured in canning industry only for foods with a pH above 4.6 because *C. botulinum* spores do not germinate below this pH (Forsythe, 2000). Since the D value for *C. botulinum* type A and B spores is approximately 0.21 minute at 121.1°C, a 12-D process is achieved by approximately 2.52 minutes heating at 121.1°C.

Commercial sterility: Commercial sterility refers to the condition achieved by application of heat, irradiation, high-pressure, or other processes, alone or in combination with other ingredients or treatments, to render the product (canned food) free of microorganisms capable of growing in the product at non-refrigerated conditions (over 10°C) at which the product will be held during distribution and storage (Uhler, 2001).

Canned foods of commercial sterility are not invariably sterile. Instead, commercial sterility refers to the bacteriological condition of unsterile but marketable canned foods, where those microorganisms and spores surviving the canning process are incapable of development under normal conditions of storage (Hersom and Hulland, 1980).

Conventional canning process

Conventional canning operation involves the following steps:

1) Preparation of the food
2) Filling of the container

3) Exhausting
4) Sealing of container
5) Thermal processing
6) Cooling of the container and contents.

Preparation of the food includes grading, washing, peeling, blanching and sometimes pre-cooking of the food material. The preparation step largely removes external contamination, inactivates enzymes in the food and ensures the food is ready for filling.

Filling the container to the correct weight to allow adequate head space above the food in the can has a significant influence on the rate of heat penetration. The role of exhausting is to remove air from the container to enable vacuum formation when the container is cooled.

Sealing of the can isolates the food from external contamination, and thermal processing delivers the required level of microbial inactivation. Rapid cooling of the container prevents overcooking of the foods, maximises the organoleptic and nutritive properties of the food, and prevents surviving thermophilic microorganisms from growing. Because of the possibility that cooling water may be sucked into the can through the seams due to pressure changes during cooling, only microbiologically sound cooling water should be used for cooling of cans. The cooling water is usually chlorinated at 4-5 ppm total residual chlorine.

Other than the inactivation and reduction of viable microorganisms, the process of canning removes oxygen from food through steam exhaustion, high fill temperature and/or closure under vacuum.

Variation of canning process in achieving commercial sterility

Food spoilage results from the growth of microorganisms (bacteria, yeasts or moulds) in food. With conventional canning, food in hermetically sealed cans is heated for a period of specific time/temperature in order to kill all those microorganisms in the food capable of growth under normal conditions of canned food storage. Viable microorganisms may remain, but are incapable of growth under the conditions that prevail in the can. Under these circumstances, the food in the container is said to have achieved commercial sterility.

With the availability of various types of packaging material, food-canning technology nowadays includes not only heat treatment, but also irradiation, sterile filtration and aseptic packaging, adjustment of pH and water activity and others, either alone or in combinations (Hersom and Hulland, 1980). The common objective of the various types of canning approach is the same, i.e. to ensure the canned food is microbiologically stable under normal storage conditions. To narrow the discussion, the following section focuses on conventional canning process, i.e. heat treatment.

With heat treatment, the combination of temperature and time used in canning varies considerably according to the characteristics of the food including texture and consistency, water activity, presence of microbiological inhibitors or preservatives, and pH of the food.

For example:

- For food products with low water activity, mild heat treatment may suffice to render the food shelf-stable. For example, the keeping properties of sweetened condensed milk in cans are largely determined by the high sugar content in which microorganisms cannot grow.

- For cured or pickled meats in cans, little heat treatment is needed to achieve commercial sterility because of the preservative action of the curing salts such as nitrites and nitrates.

- Food physical consistency influences temperature and time combinations in canning due to differences in heat penetration. Heat penetration of liquid food is by convection whereas heat penetration of solid food is by conduction. Unlike liquid food, there is no transfer of the food material from the hot parts to the cooler parts of the can in the case of solid food. Heat penetration by convection is faster than by conduction. This is a part of the consideration in determining temperature and time combinations of a food in canning.

- Microorganisms in high acid environment are more vulnerable to the destruction of heat than those in low acid environment. For example, at 58°C, the D-value of *Escherichia coli* O157:H7 is 1 minute at pH 3.6, but 2.5 minutes at pH 4.5. As such, food pH plays a critical role in the determination of the appropriate time and temperature in a canning process.

High acid foods are those with a pH less than 4.5. Canned fruit juice, fruits and pickled vegetables are usually considered high acid foods. Vegetative cells of *C. botulinum* are killed in a few minutes at 60°C in high acid foods and germination of *C. botulinum* spores is suppressed because of the low pH. To achieve commercial sterility, treatment at temperatures of 65-70°C for a period of time may suffice for high acid foods, unless the removal of spoilage mesophiles such as *B. polymyxa* and *B. macerans* from the food is necessary. For the latter case, a 3.3-D reduction may be adequate (Hersom and Hulland, 1980).

Red meat, poultry, seafood and many vegetables have pH values above 4.5 and are classified as low acid foods. For low acid food, other than those containing curing salts or preservatives, heat treatment in a retort (pressurised cooker) is necessary to deliver a minimum of 12-D reduction to ensure commercial sterility is achieved (Hersom and Hulland, 1980). More rigorous heat treatment may need to apply if it is necessary to reduce the load of thermophilic spoilage organisms such as *B. stearothermophilus*.

Acidity of commonly available canned foods is shown in Table 1.

Table 1: Acidity of some common foods*

High acid foods (pH ≤ 3.7)	**Acid food (pH 3.7-4.5)**	**Medium acid food (pH 4.5-5.0)**	**Low acid foods (pH ≥ 5.0)**
Rhubarb	Tomatoes	Meat/vegetable mixtures	Meat
Grapefruit	Pears	Soups	Milk
Citrus juices	Figs	Sauces	Seafood
Pickled vegetables	Pineapple	Spaghetti	Vegetables: - Mushrooms, peas, peppers, corn, etc

• From Hersom and Hulland (1980) and a fact sheet published by the Australian Food Safety Centre

Micro-organisms of food safety concern in canned foods

Reported incidents of food-borne outbreaks as a result of consumption of canned food are almost always associated with improper application of the canning process, and improperly home-canned food is responsible for the majority of incidents. For example, more than 90% of food-borne botulism outbreaks between 1976 and 1985 in the US was due to home-canned foods that had not been properly made (Vangelova, 1995).

Improperly canned food refers to:

1) Under processing - contamination by an organism with exceptional heat resistance; and/or excessive levels of microbial contamination in raw ingredients; and/or faulty retort operation, and/or under-heating.
2) Seam leakage - defective seams and/or contamination by cooling water.
3) Inadequacy in the preparation of foods before canning – excessive contamination and/or growth of microorganisms and excessive delay between food preparation and thermal processing.

The principal pathogenic microorganisms associated with canned foods are *C. botulinum*, *Salmonella* and enterotoxin producing *Staphylococcus aureus*. Among them, staphylococci rank first in terms of frequency followed by *C. botulinum* and *Salmonella* (Hersom and Hulland, 1980). However *C. botulinum* is the major concern because of the severity of its impact on consumers.

C. botulinum is a rod-shaped, Gram-positive anaerobe producing heat-resistant spores and has seven toxicologically distinct types (A, B, C, D, E, F and G). *C. botulinum* is widely distributed in nature and has been isolated from soil in every part of Australia (Hocking, 2003). *C. botulinum* is known for production of a potent neurotoxin that causes the syndrome botulism characterised by paralysis of muscle leading to respiratory failure and death. In the US, commercially canned tuna fish was responsible for an outbreak of *C. botulinum* type E botulism in 1963. In this case, the contamination occurred as a result of leakage through defective seams, *i.e*. improperly canned food.

Between 1971 and 1974, a number of botulism outbreaks occurred in US with commercially canned foods largely due to under-processing (Hersom and Hulland, 1980). As a result, the Food and Drug Administration (FDA) issued "Good manufacturing practice regulations for thermally processed low-acid canned foods in hermetically sealed containers". The regulations set the benchmark for food safety and food safety control in the canning industry. The regulations have since been revised several times and the latest revision is part of volume 21 of the Code of Federal Regulations published in 2002 (21 CFR 113 - Thermally processed low-acid foods packaged in hermetically sealed containers). To assist the integration of the good manufacturing practice into the HACCP plans or programs, the Food Surveillance and Inspection Service of the US Department of Agriculture published a "Generic HACCP model for thermally processed, commercially sterile meat and poultry products" in 2001.

No food-borne botulism in Australia due to canned food has been reported in recent years. Between 1942 and 1984, five outbreaks of food-borne botulism were reported in Australia. Foods implicated include canned vegetables (mushrooms and asparagus) and canned tuna (Hocking, 1997). The latest reported food-borne botulism was in 1991 when a couple became ill after consuming home-preserved, unacidified asparagus.

More awareness and improved knowledge about food-borne botulism in the community may have been the reason for the decline of incidents of food-borne botulism.

Salmonella organisms are Gram-negative, non-spore forming rods with low heat-resistance. Their presence in canned foods is largely due to contamination post-heat process. A major outbreak of illness due to *Salmonella typhi* (resulting in 504 cases of typhoid fever) occurred in Aberdeen (Scotland) in 1964 and was traced to contaminated canned corned beef. Investigation of the outbreak found that the cooling water used during canning was unchlorinated water drawn from a river point downstream of a sewage outfall (Hersom and Hulland, 1980). Seam leakage resulted in the organism contaminating the canned corned beef.

Staphylococcus aureus is a Gram-positive, non-spore forming, facultative anaerobe bacteria that is relatively susceptible to heat destruction. Enterotoxins produced by *S. aureus* cause food-borne illness, and are highly heat-stable. Improperly prepared canned mushrooms were responsible for food-borne outbreaks caused by staphylococcal enterotoxins in 1989 in the states of Mississippi, New York and Pennsylvania. Investigation of the outbreaks determined that *S. aureus* grew and produced enterotoxin in mushroom either before heat processing or after the completion of the canning process. Excessive delays before canning would allow the organism to produce enterotoxin, which would not be destroyed by the heat process. Alternatively, the organism may have entered the cans after heat processing and produced toxin. Avoidance of handling warm wet cans immediately after processing is a critical measure in avoiding the possibility that *S. aureus* may enter the can via seam leakage.

Incidents of food-borne illness due to commercially canned food have largely diminished since 1991, and no data is available of recent outbreaks. Considering all the evidence available and having regard to the efficiency of modern caning processing conditions, commercially canned foods are of minor significance as vehicles of food-borne illness (Hersom and Hulland, 1980).

Improper handling of opened canned food also contributes to the food-borne illness. For example, a fatal case of staphylococcal poisoning reported in 1942 was due to canned soup, which had been opened and held for one week before consumption (Hersom and Hulland, 1980).

Conclusion

Canning is a traditional process for preserving food. The application of a thermal process to food packed in hermetically sealed containers results in a commercially sterile food. Because of their isolation from external contamination, canned foods are microbiologically stable and can be stored without refrigeration for an extended time. Commercial sterility implies that there is no pathogenic microorganisms present that could grow in correctly handled and stored cans. It must be noted that extended period of storage does not mean these foods should be infinitely.

Improper packaging or processing of canned foods may result in incidents of food-borne illness, but this is extremely rare, and reflects the level of process control employed by the commercial canning industry.

No epidemiological evidence is available to suggest any significant public health risk associated with commercially canned food in Australia and New Zealand.

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Attachment 3

Food Technology Report – Canned Foods

Introduction

Food canning is a long established and well-understood method of food preservation that has served consumers well for over 200 years. The term 'canned', in terms of food regulation, refers to hermetically sealed food containers processed by heat to prevent spoilage and includes steel, tin plated and aluminium cans as well as glass jars, plastic thermoformed and heat sealed containers.

During World War II the Australian canned food industry expanded rapidly and new products such as cauliflower, Brussels sprouts and whole tomatoes were canned. Today some 30 canning companies operate throughout Australia and produce over 1000 different types of canned foods for the Australian market and for export. The different types of products canned today include fruits (e.g. pineapple, peaches, cherries), vegetables (e.g. asparagus, peas, beans, corn), meats (e.g. spam, stews, sausage mixes) and soups (e.g. condensed meat and vegetable varieties and more recently ready to serve types), as well as traditional baked beans and spaghettis. Products which have a pH of less than 4.5 such as tomatoes are called "acid" foods and can be thermally processed at temperatures less than 100^{o}C. Those with a pH above 4.5 must be thermally processed at temperatures between 110 and 125^{o}C. The Australian Canned Food Industry Association (CFIA) estimated retail value is around one billion dollars each year

Source: CFIA website (http://www.cannedfood.org)

Canning produces a shelf stable product that can be stored at ambient temperatures for long periods of time (e.g. many canned foods have a storage shelf life greater than 2 years if stored correctly at room temperature). Because foods stay sealed in the traditional steel can, outside contamination is prevented until the can is opened.

Steel Cans used in Australia

Most cans used by the Australian canning industry are made from tinplated steel but aluminium cans, often with easy opening ends are popular for beer and other carbonated beverages.

The advantages of using metal cans are:

- can be heated for sterilisation and quickly cooled;
- physical strength;

- impervious to light, air and water;
- no harmful interaction with food if properly treated;
- impervious to insects and rodents; and
- recyclable.

Manufacture of Tin-Plated Cans

Most tin cans are comprised of 3 major components: the two ends and the body which may be cylindrical, rectangular or tapered.

The body of the three-piece cans has a side seam which until recently was formed by soldering a lock joint or a lap. This has now been replaced in the Australian industry by seams that are made by electric welding of the edges of the body plate, the edges lapping to only a negligible extent. Cans must comply with several dimensional and structural specifications if they are to be accepted as being hermetic (Buckle 1985).

Some cans are comprised of only two components; the top end, and a body which is made from one piece of metal through a pressing operation. These cans have no side seam or bottom double seam so the areas of potential leakage are eliminated. Tin plate may be used to make two piece cans but they are usually more shallow and used for such products as fish. Some tall aluminium cans are also made by this method and are popular for beer and soft drinks.

The tin coating is applied by continuous electro-deposition of tin onto a thin steel strip, after which the tinplate is either sold in coil form or cut into sheets for the can manufacturer. The plate is slit into rectangular "body blanks" which are then rolled into a cylindrical shape and the contacting edges welded together at very high speeds. The ends of the cylinder are flanged, ready to receive the can ends. Corrugations known as 'beads' are often rolled into the cylinder walls for added strength.

The end of the can is often seamed by the can manufacturer and the other end by the food canner using double seaming rollers.

The can end is applied forming the "open top can" which is then supplied to the food canning company.

(CFIA Website – Steel Can Manufacture)

Tinplating cans

Tinplate is made in Australia by electro-depositing controlled masses of tin onto the surface of steel strip as it moves continuously through two electroplating baths. It is possible to produce tinplate with the same coating mass (equally coated) or different coating masses (differently coated) on each surface to suit particular applications.

The tin is added to resist rusting and corrosion. The tin coating is measured in terms of grams per square metre (Buckle 1985). Tinplate having heavy tin coating masses is commonly used if the can is not to be lacquered and if the food product is only moderately corrosive. If the food product is especially corrosive or if contact with tin or iron will adversely affect the product, the tinplate should be lacquered. Three types of lacquers are generally used as follows:

1. SR Sulfur Resistant – are used to prevent staining of tinplate surfaces by sulfur compounds released from foods such as meat, fish and vegetables during processing and storage.

2. GP General Purpose – are epoxy resins and often used for the more acidic products such as beetroot and red berry fruits which are especially corrosive.

3. Special Lacquers - contain additives to assist the easy removal of contents from the can or lacquer pigments with aluminium powder or other materials.

The purpose of the lacquers is:

- prevention of interaction between can and contents;
- easy removal of contents;
- improved can appearance; and
- protection against the environment.

Food Safety

Canned foods have been assessed as having a storage life of many years. As a general rule, the lower the storage temperature, the longer the storage life will be. Food Science Australia advises that once cans are opened some foods, especially fruit, fruit juices, and tomato products, should be placed in a clean plastic or glass container, covered and stored in the refrigerator. When these foods are stored in the opened metal can, tin and iron will dissolve from the can walls and the food may develop a metallic taste. However, repackaging food once a can is opened is a good practice to adopt for all foods packaged in metal cans.

The CFIA recommends that consumers check canned foods before purchasing them. Badly dented cans or bulging cans should be rejected. Cans that have stained labels might indicate poor storage practices or a possible leak and should also be rejected. The CFIA also recommend to store cans of food in a cool dry place and to use them within 12 months of purchase to enjoy peak flavour and nutrition.

The canning industry was one of the first to adopt the HACCP principles of food safety, a preventative approach identifying potential food safety hazards at various stages of food production.

<u>Non-microbial Spoilage</u>

There are four basic aspects that must be considered regarding undesirable physical and chemical changes that may occur in canned foods; the container, the food being canned, the processing conditions and the storage conditions.

Chemical changes can lead to product discoloration due to a variety of reasons including: formation of coloured complexes, metal contamination, Maillard reactions (non-enzymic) and unintentional inclusion of natural, coloured matter in association with the canned products.

For example, black complexes have been reported in canned green asparagus (Lueck 1970). The natural occurring flavonol glycoside, rutin (quercitin-3-rutinoside) can be extracted from asparagus during retorting. This chemical forms complexes with both tin and iron. The tin complex is yellow, whereas the ferrous complex is colourless. On opening the can, the ferrous component is rapidly oxidised to the ferric state, which develops a black discolouration that can appear within minutes of opening. Metal contamination, principally iron, is responsible for a variety of dark colours e.g. iron-tannin reaction products in pickles. Non-microbial spoilage is rarely of public health significance, and yet unless correctly diagnosed initially, may result in considerable adverse consumer reaction until the significance of the spoilage is determined.

Products containing proteins and associated amino acids can produce sulfur compounds during heating, including mercaptans, sulfide ions and hydrosulfide ions (Marsal 1977) which readily react with tin to cover the metal surface with thin layers of tin sulfides. Mannheim and Passy (1982) indicate that this formation follows a two-step process; oxidation of tin and then deposition of insoluble precipitates. The 'stain' consists of tin (II) sulfide (SnS) with some iron (II) sulphide (FeS), tin (IV) disulfide (SnS_2) and iron-tin complex (iron stannide $FeSn_2$). The stain colour can be quite variable, including blue, blue-grey, purple to blue black and sometimes brown. Tin sulfide staining is usually widespread throughout the can, and adheres firmly to the metal surface. Iron sulfide stains are characteristically black, usually on isolated points on the can, mainly in the head space and are poorly adherent to the metal surface. These reactions can occur if damage has been done to the lacquer film on the can in some way such as scratching or if the film adhesion is discontinuous (Buckle 1985).

Non-Metal Alternatives for Hermetically Sealed Packaging

With advances in technology there is also available a wide variety of alternative packaging systems other than metal cans which can be utilised to produce a heat processed hermetically sealed product. These include aseptic packaging - papers (coated and impregnated), plastic film (plain and coated) - paper /plastic /foil laminates, glass where the packaging is sterilised separately, retort pouches and packages (combination of nylon, polyesters, polyolefins and aluminium foil).

In the selection of glass packaging there are 4 principal properties that have been identified as being significant, mechanical strength, thermal strength, optical properties and chemical properties (Paine and Paine, 1983; Moody, 1963).

All are sterilised by heating during manufacture. These packaging types also provide a microbiological barrier, a gas and moisture barrier, as well as the advantages of a light barrier with structural strength. Packaging also prevents contamination during storage and transport.

Food Regulations

Under Proposal P139, Standard 1.2.5 – Date Marking of Packaged Food was reviewed in 2000, with particular reference to food with an extended shelf life.

The preferred option was that foods with a minimum durable life of two years or longer should be exempt from the date marking requirements.

The exemption from date marking for foods with a shelf life of two years or longer was specifically recommend by the National Health and Medical Research Council's Food Standards Committee in 1980. Manufacturers have difficulty accurately assessing the shelf life of food that has a long shelf life. Canned foods can be voluntary date-marked by manufacturers, if there is consumer demand. For example Heinz-Wattie voluntarily date mark canned baby food.

Conclusion

- Canned foods have been around for a long time as a convenient and durable form of food preservation.
- Because foods stay sealed in the traditional steel can, outside contamination is prevented.
- Safety is mainly due to the barrier properties of the can.
- Other hermetically sealed containers have come onto the market such as glass which provides an almost inert transparent container with excellent barrier properties.

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Attachment 4

Chemical Risk Assessment

Dietary exposure to tin

Food, especially canned food, represents the major route of human exposure to tin. Tin occurs in most foods, however, levels are generally less than 1 ppm in unprocessed foods (Schroeder *et al*, 1964; Schafer and Fembert, 1984). In Australia a maximum limit of 100 ppm stannous chloride is permitted in Standard 1.3.1-Food Additives of the *Australia New Zealand Food Standards Code* (the Code) for use on asparagus not in direct contact with tin. Stannous chloride[8] is generally recognized as safe (GRAS) as a food ingredient in the USA

Higher concentrations of tin are found in canned foods from dissolution of the tinplate to form inorganic tin compounds or complexes (Schafer and Fembert, 1984). The concentration of tin in canned foods depends on a number of factors, including the type and acidity of the food, time and temperature of storage and the presence of air in the can headspace. Foods packed in cans that are totally coated with lacquer have been reported as containing less than 4 ppm tin; whereas specific foods such as pineapple, grapefruit, orange juice, apple sauce and tomato sauce that may be packed in cans that are not coated with lacquer have been found to contain 40-150 ppm tin (Greger, 1987). Several foods that were stored in the refrigerator in cans that were opened have been reported as having levels in excess of 250 ppm (Gregor, 1987). Oxidising agents such as nitrates, iron and copper salts accelerate dissolution of tin, while sugars and colloids such as gelatin retard detinning.

Previous surveys in the United Kingdom have found tin concentrations for a range of canned foods were generally below 200 ppm, with only 2% exceeding a concentration of 200 ppm (Meah, et al, 1991). The 1994 Australian Market Basket Survey (AMBS) conducted analysis on 72 composite samples of canned foods showed tin levels below 120 ppm.

A more recent survey carried out by the UK Food Standards Agency (UK FSA, 2002) was undertaken to provide up-to-date information on the levels of tin in canned foods and identify whether measures introduced to reduce tin levels, such as fully lacquering the inside of the cans to contain acidic foods, were working. Four hundred samples of tomato-based products and of other canned fruit and vegetables were analysed for tin.

The conclusions of the survey were that:

- The results do not raise any general food safety concerns.
- Tin concentrations in 99.5 % of samples were below the UK regulatory limit of 200 ppm. One sample of spaghetti in tomato sauce and one sample of gooseberries were above this limit.
- Tin concentrations were similar, or lower, than those reported in previous surveys.
- Estimated dietary intakes of tin for average and high level consumers of canned fruit and vegetables (mean = 1.7 mg/person/day; 97.5 % level = 5.6 mg/person/day) are well within the Provisional Tolerable Weekly Intake (PTWI) of 120 mg/person/day (based on a daily limit for a 60 kg adult) set by the Joint Expert Committee on Food Additives (JECFA).

[8] Stannous chloride is a specific chemical form of tin.

Safety assessments by Joint Expert Committee on Food Additives (JECFA)

The tolerable intake of tin for humans was evaluated by JECFA at its 26th meeting and a Provisional Maximum Tolerable Daily Intake (PMTDI) was established for inorganic tin of 2 mg/kg bw (WHO, 1982). At the 33rd JECFA meeting the committee reaffirmed the PMTDI but converted it to a PTWI of 14 mg/kg bw (WHO, 1989) and indicated that this value was applicable to chronic exposure.

At the 55th JECFA meeting the acute toxicity of tin was assessed, however, it was considered that the data were insufficient to establish an acute reference dose (ArfD). The Committee concluded that tin concentrations as low as 150 ppm in canned beverages and 250 ppm in other canned foods might produce acute manifestations of gastric irritation in certain individuals (WHO, 2000).

At the 64th JECFA meeting in February 2005 the Committee reconsidered studies of the acute effects observed after humans consume high concentrations of inorganic compounds of tin, and also considered a new study (www.who.int/ipcs/food/jecfa/summaries/en/summary_report_64_final.pdf). JECFA concluded that the data available indicated that it was inappropriate to establish an ArfD for inorganic tin, since whether or not irritation of the gastro-intestinal tract occurs after ingestion of food containing tin depends on the concentration and nature of tin in the product, rather than on the dose ingested on a body-weight basis. JECFA concluded that the available data for humans suggested that tin at concentrations >150 ppm in canned beverages or 250 ppm in canned foods might produce acute manifestations of gastric irritation in certain individuals, thus confirming the findings of the 55th JECFA meeting.

Safety assessments by FSANZ

FSANZ reviewed the toxicology of tin in food as part of **Proposal P 157**-Review of Metals and Contaminants in foods as part of the review of the *Australia New Zealand Food Standards Code* in 1999.

The conclusions from that review were as follows:

- Levels of tin in foods (other than canned food products) are very low with most foods surveyed containing less than 1 ppm.

- Canned foods represent the major route of exposure to tin for humans.

- The levels of tin in foods depends on whether the cans are lacquered or not, the risk of contamination of food by tin being significantly reduced by lacquering. The lacquer protects the surface and tin dissolution occurs only around a scratch or through a pore. The contact area is small therefore corrosion is slow. Problems arise when the lacquer film lifts from the metal surface.

- The toxicological effects of oral ingestion of inorganic tin compounds have been studied in animals and humans. However, the toxicological evaluation of these studies was complicated by the fact that only limited data are available on the chemical forms present in food following dissolution of the tin coating from cans, and that the toxicological data base for compounds other than stannous chloride is poor.

- The main hazard from ingestion of tin would appear to be from an acute exposure to high levels. Available human poisoning cases suggested a threshold dose of 200 ppm but some individuals could tolerate up to 700 ppm. However, the chemical form of tin is unknown from these case reports, and toxicity and threshold would vary depending on the specific chemical form.

- Dietary exposure from tin is low compared to the PMTDI established by JECFA for adults in both Australia and New Zealand. Therefore, there is no concern about the dietary exposure to tin for high consumers of specific food commodity groups included in the dietary exposure evaluation.

- In conclusion, from analysis of the available toxicological data, it is considered that the dietary exposure to tin for Australian and New Zealand consumers is considered to be within the safe range of intake for both mean and high consumers, and supports the conclusion that there is limited cause for concern in terms of public health and safety from dietary exposure to tin.

Review of more recent data by FSANZ

FSANZ assessed a recent study (Boogard et al, 2003), which examined the following situations:

- Study 1 assessed the tolerability of 20 human volunteers, where tin (in the form of tin (II) chloride[9]) was added at a range of concentrations (<0.5, 161, 264 and 529 ppm) to tomato juice[10], before administration to subjects; and

- Study 2, assessed the tolerability of 24 human volunteers, following the migration of tin from canned foods[11] administered to subjects at concentrations of <0.5, 201 and 267 ppm in tomato soup.

Only 1/18 subjects in study 1 experienced a mild gastro-intestinal effect at a concentration of tin of 161 ppm. At the next highest concentration of 264 ppm, 7/18 subjects had adverse gastro-intestinal effects rated as mild to moderate in intensity. At the highest concentration treatment was discontinued in the majority of subjects due to the frequency of adverse effects observed with 4/5 remaining subjects having moderate and frequent gastro-intestinal effects.

In study 1, tin (II) chloride was added to the juice shortly before dosing and the chemical distribution analyses undertaken indicated that the tin speciation consisted of low molecular weight tin (II) chloride complexes which may not be representative of normal canned food. In addition, spiked Tin (II) chloride juice samples (study 1) were consumed without intake of other liquid or solid food by subjects fasted for 6h, conditions that may favour gastro-intestinal tract irritant effects, compared to subjects in study 2 who were permitted to consume a snack and fluids 2h post administration[12].

[9] Common name stannous chloride dihydrate

[10] Tin (II) chloride spiked juice samples

[11] Specific and deliberate alterations in the cans were used to simulate poor canning practices and produce higher levels of tin

[12] There is no mention in the methods section of study 1 that subjects were permitted any other foods or fluids post administration.

In study 2, 4/18 subjects reported mild to moderate gastro-intestinal disturbances at concentrations of 267 ppm with no adverse effects reported at 201 ppm.

This new study in humans suggests that tin concentrations up to 267 ppm in canned foods are well tolerated in healthy adults. This conclusion is based on the results of study 2, which studied migration of tin into food following a simulation of poor canning practices. However, both studies suggested that gastro-intestinal irritation effects are dependent on both chemical speciation and total concentration of tin. Study 1 focused specifically on one species of tin, and consisted of administration of tin (II) chloride spiked juice samples only to humans which may be atypical of the normal situation when compared to migration of other chemical species of tin or whole tin complexes following dissolution of the tinplate. Tin in acidic foods has been reported as being transformed to many different chemical forms (Winship, 1988). In addition, the conduct of study 1 appeared to favour a reduced tolerability to tin in subjects by virtue of the conditions that the study was conducted under.

Potential adverse health effects from tin

The toxicological effects of oral ingestion of inorganic tin compounds have been studied in animals and humans. However, a complete toxicological evaluation of tin could not be made as these studies were complicated by the fact that only limited data are available on the chemical forms present in food following dissolution of the tin coating from cans, and that the toxicological data base for compounds other than stannous chloride is poor. Available survey data suggest that concentration levels of tin in food are generally low and well below the levels reported to cause adverse effects in humans.

The main hazard from ingestion of tin for humans would appear to be from an acute exposure to high levels; however, some individuals can tolerate up to 700 ppm. The chemical form of tin is unknown from these case reports, and as such toxicity would vary depending on the specific chemical form and the concentration in food.

The toxicity of tin was reviewed internationally by JECFA on numerous occasions, which allowed the setting of a PTWI of 14 mg/kg bw/day. JECFA recommended that efforts be made to keep tin levels in canned foods as low as practicable and consistent with GMP. More recently JECFA concluded that it was inappropriate to establish an ArfD with the toxicity of tin in food being determined by the concentration and nature of tin in the product, rather than on the dose ingested on a body-weight basis. JECFA considered that the available data for humans suggested that tin at concentrations >150 ppm in canned beverages or 250 ppm in canned food might produce acute manifestations of gastric irritation in certain individuals based on a new study in humans.

Conclusions

No data are available on levels of tin in food following prolonged storage (e.g. greater than 2 years on the shelf). Under normal conditions of use and storage tin levels in canned foods are very low and do not cause any safety concerns.

From an assessment of the available data, FSANZ concludes the following:

- From the available data, the toxicity of tin is restricted to acute gastric irritation and the number of reported cases of acute tin poisoning is small. FSANZ is not aware of any new reported cases of tin poisoning in humans.

- The risk assessment undertaken by FSANZ as part of Proposal P 157 concluded that dietary exposure to tin for Australian and New Zealand consumers from the normal food supply was within the safe range of intake for both mean and high consumers, and supports the conclusion that there are no public health and safety concerns in relation to dietary exposure to tin.

- There is no evidence of cumulative adverse effects due to exposure to low levels of tin in the diet of humans reported in the scientific literature.

- FSANZ reviewed a recent study on the tolerability of humans to tin following consumption of canned food products containing high-levels of tin and concluded that the concentration that caused adverse gastro-intestinal effects was >267 ppm.

- A recent international survey of tin in food in the UK in 2002 found high compliance rates with their regulatory limit of 200 mg/kg.

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Attachment 5

International Standards on Date Marking

Countries / Shelf Life Duration	Australia and New Zealand[13]	Codex [14]	European Union[15]	Canada[16]	United States
Less than 3 months	required (day/month)	required (day/month)	required (day/month)	required (year/month/day)	not mandated
More than 3 months but less than 18 months	required (month/year)	required (month/year)	required (month/year)	required	not mandated
More than 18 months	required (month/year)	required (month/year)	required (year)	exempted	not mandated
More than 2 years (24 months)	exempted	required (month/year)	required (year)	exempted	not mandated
Exemptions	- individual portions of ice-cream and ice confection; and - small package foods.	- unpeeled and uncut fruits and vegetables; - wines, liqueur wines, sparkling wines, aromatised wines, fruit wines and sparkling fruit wines; - beverages containing 10% or more by volume of alcohol;	- unpeeled and uncut fruits and vegetables; - wines, liqueur wines and other similar products for fruits; - beverages with 10% or more by volume of alcohol; - soft drinks, fruit juices and alcoholic	- pre-packaged fresh fruit and vegetables; - pre-packaged individual portions of foods served by restaurants, airlines etc, with meals or snacks; - or pre-packaged foods sold by a commissary, vending machines or	- dates marks are related to quality of product. *Note:* - 'use-by' date must be provided on infant formula and dietary supplements; - 'expiration dates' are not required on most

[13] Australia New Zealand Food Standards Code (up to and including Amendment 75), 2000. Anstat PTY Ltd, Melbourne.

[14] Codex Alimentarius Commission, *Codex General Standard for the labeling of prepackaged foods (Codex Stan 1 – 1985 Rev. 1-1991)*

[15] Official Journal of the European Communities, Directive 2000/13/EC of the European Parliament and of the Council of 20 March 2000 (L 109/29)

[16] Canadian Food Inspection Agency. Guide Food Labelling and Advertising (sections 2.1 –2.15). [Online] Available at: www.inspection.gc.ca/english/bureay/labeti/guide/2-0-0e.shtml. Accessed on September 9, 2004.

[17] Codex Alimentarius Commission, *Codex General Standard for Corned beef (Codex Stan 88 – 1981(Rev. 1-1991))*

[18] Codex Alimentarius Commission, *Codex General Standard for lemon juice preserved exclusively by physical means (Codex Stan 47 – 1981)*

		- bakers and pastry cooks wares (which are consumed within 24 hours of manufacture); - vinegar; - food grade salt; - solid sugars - confectionary products consisting of flavoured and/or coloured sugars; and - chewing gum. *Note:* - has commodity specific exemptions, such as canned corned beef minimum durability can be indicated by year[17] only , and lemon juice with shelf life of more than 18 months needs to provide the minimum durability information of year[18] on.	beverages in individual mass catering containers of more than 5 litre; - bakers and pastry cooks wares (which are consumed within 24 hours of manufacture); - vinegar; - cooking salt; - confectionery products consisting almost solely of flavoured and/or coloured sugars - chewing gums and other chewing products; - individual portions of ice-cream.	mobile canteens; and - pre-packaged donuts.	products, and selling past expirations dates is not prohibited; - 'sell-by' and 'best-if-used-by' dates are used on some products but it is not mandated.

FOOD STANDARDS Australia New Zealand
Te Mana Kounga Kai – Ahitereiria me Aotearoa

Attachment 6

INFORMATION SHEET (draft)

CORRECT STORAGE AND USE OF CANNED FOODS

Commonly, foods in hermetically sealed metal containers (such as aluminium and tinplate) are called **canned foods.**

Hermetically sealing foods in containers is a method of food preservation. Foods such as fruit, vegetables, meat, fish, or a combination of these foods (e.g. meat and vegetable condensed soup, sauces and fruit salad) are preserved this way. Hermetically sealed containers are also made from glass jars, plastic tubs, flexible pouches and UHT cartons.

How are these foods made commercially?
Foods are washed, prepared and filled into containers and sealed. The food is heat treated producing a commercially sterile shelf-stable product in air tight containers. Heat treatment kills organisms that may spoil the food or cause food-borne illnesses. Contents remain commercially sterile until the container is opened.

Are the containers safe?
Most containers used to hermetically seal foods do not affect the quality or safety of its contents. If the container is damaged during or after manufacture, the safety of its contents can be affected.

How long can I keep these foods?
Foods in hermetically sealed containers have a long, but not an indefinite shelf life. The storage life depends on a number of factors, including conditions of storage and the nature of food. As a general rule, the lower the storage temperature, the longer the storage life will be.

The sealed containers prevent contamination of food, by organisms that can spoil the contents or cause illness to people, during transportation and storage.

While foods in sealed containers do not change suddenly, slow changes do occur in the container. This may affect the quality of food.

How do I select these foods?
When buying foods, always check the label. In Australia and New Zealand, foods in hermetically sealed containers that have a shelf-life of less than two years require a 'best-before date' (date mark) on the label. However, where a food needs to be consumed within a certain time for safety reasons, a 'use-by date' is provided. Those that have a shelf life of longer than two years do not need this information.

The label must also include storage conditions required to ensure that the food will keep until the date marked period. Manufacturers also have to provide directions for storage on labels for health and safety reasons.

- Do not purchase any food past its 'use-by date'. If it has a 'best-before date', you could purchase and consume the product after that date, though the food may not be at its peak quality.

- If the label has storage instructions, ensure that the food is stored accordingly at the point-of-purchase.

In addition to the above, food containers should be inspected for:

- swelling and/or leakage
- rust and scratches
- broken tamper seals
- dented or damaged containers
- damaged seams
- abrasions, blisters, wrinkles (pouches)

Do not purchase the food if you see any signs of the above defects.

How do I store these foods at home?
Foods in hermetically sealed containers must be stored according to the storage instructions on the label. If instructions are not provided, then store in a cool dry place. Handle containers carefully to avoid denting or damaging it.

Rotate food in your pantry by using older stock first. Food in hermetically sealed containers is best used within 12 months of purchase to enjoy peak flavour and nutrition.

Before opening
Inspect the container as outlined in 'How do I select these foods?' before use. If there are signs of damage, do not use or even taste the food.

Wipe or wash the top of the container before opening. Always use a sharp clean can opener and wash the opener after every use.

Practice good hygiene as if you were handling fresh food – keep all food preparation surfaces and implements clean, and wash hands in warm soapy water before preparing food.

After opening
If the contents have an unusual odour or colour, or if you notice that the inside of a metal container (or lid) is rusted, throw out the contents. Do not taste.

If not used immediately, the contents of the opened container should be emptied into clean plastic or glass container, covered and stored in a refrigerator.

What should I do if I suspect problems with these foods.
You should report any doubtful product to the manufacturer. If you have any concerns about a particular food, you could alert the health department in your state, territory or region.

Further information
Food Science Australia. Storage life of Foods – Fact Sheet 2000. Available at: http://www.foodscience.afsic.csiro.au/storagelife2.htm.
Canned Food Industry Association. Website: www.cannedfood.org or email: info@cannedfood.org
For general food safety information, http://www.safefood.net.au/content.cfm

This document is intended as a guide only: legal requirements are contained in the *Australia New Zealand Food Standards Code,* other relevant food legislation and other applicable laws. This information in this document should not be relied upon as legal advice or used as a substitute for legal advice. You should exercise your own skill, care and judgement before relying on this information in any important matter.