

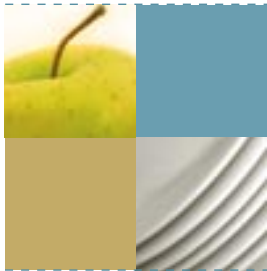


FOOD SURVEILLANCE

AUSTRALIA NEW ZEALAND

Food Standards Australia New Zealand

Spring 2003



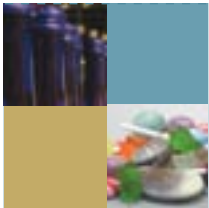
Editorial

Like the variety and complexity of surveillance and enforcement work undertaken by Public Health Units all around Australia and New Zealand, this edition is a mixed bag of both 'snapshots' and in-depth surveillance. It reports on some microbiological and chemical residues studies and also introduces a new

segment where quarterly results from the AQIS Imported Food Inspection Scheme are reported.

This edition contains a number of long-term projects that have been undertaken by FSANZ that have either just been released or are soon to be released: a report on the results of

a survey of *Listeria monocytogenes* in cooked prawns; When is organic food not organic; Weekend Produce Markets around Adelaide; the report "Food Labelling Issues Quantitative Research with Consumers"; and the finalisation and publication of a technical paper on chloropropanols in food.



Survey of *Listeria monocytogenes* in cooked prawns[#]

Introduction

In 2002, Food Standards Australia New Zealand (FSANZ) coordinated a microbiological survey of cooked prawns. The objectives of the survey were:

- to determine the frequency and level of *Listeria monocytogenes* contamination in both domestically produced and imported cooked prawns at retail; and
- to measure the standard plate count (SPC) in cooked prawns at retail (i.e. at the point of sale) as a possible indicator of shelf life.

Based on FSANZ's review of the microbiological standard for *Listeria monocytogenes* in cooked prawns, it was considered that further data on the prevalence

of *Listeria monocytogenes* in cooked crustacea were needed to assess the risk posed from the consumption of cooked crustacea. Data from the survey were used in probabilistic modelling as part of FSANZ's 'Microbiological Risk Assessment: *Listeria monocytogenes* in Cooked Crustacea' (FSANZ, 2002).

Methods

A total of 380 samples of unpackaged Australian and imported cooked prawns were collected from Brisbane, Melbourne, Sydney and Perth. A range of prawns including peeled and unpeeled, were sampled as shown in Table 1. Additional information was recorded for each sample at the time of purchase, which included the temperature of the samples.

Microbiological analyses were conducted by the Australian Government Analytical Laboratory (AGAL) and the Western Australia Centre for Pathology and Medical Research.

All cooked prawns were analysed for *Listeria monocytogenes* and SPC using standard methods. The enumeration of *Listeria monocytogenes* was conducted in tandem with the presence/absence test for *Listeria monocytogenes*. The limit of detection for enumerating *Listeria monocytogenes* was 50 colony forming units per gram (cfu/g). A dilution range of 10^{-3} – 10^{-5} was used to determine the SPC for each sample (sub-sample). This gave a minimum detection range of 10^4 – 10^7 cfu/g.

[#] The information in this article was presented as a poster to the 11th Australian Institute of Food Science and Technology Food Microbiology Conference, Noosa (March 2003) and was prepared by Narelle Marro, Sally Hasell*, Julie Boorman, Scott Crerar Food Standards Australia New Zealand, Canberra, Australia
* New Zealand Milk, Wellington, New Zealand

Table 1: Breakdown of prawns by frequency and type

	Type of prawn							
	Peeled	Unpeeled	Imported	Domestic	Frozen	Chilled	Supermarket	Seafood retailer/ fish market
No. of Samples	89	290	139	230	67	313	195	185
Total	379		369		380			380

Survey of *Listeria monocytogenes* in cooked prawns continued

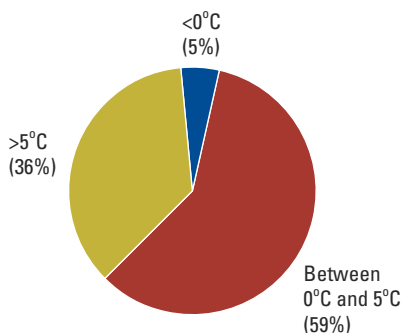
Results

Temperature

Cooked prawns were sampled either as 'frozen' or 'chilled' under retail conditions.

The average temperatures recorded for chilled cooked prawn samples at retail varied from -5.5°C to 12.8°C. The majority (59%) of chilled samples had average temperatures between 0°C and 5°C (Figure 1). 113 chilled samples (36%) had average temperatures exceeding 5°C. There was no apparent difference between the temperatures of cooked prawns sampled from supermarkets compared to the temperatures of cooked prawns sampled at fish market/specialist fish retailers.

Figure 1: Average Temperature of Cooked Prawn Samples at Retail (excluding samples recorded as 'frozen')



Standard Plate Count

Standard plate counts were undertaken to determine levels of microbiological contamination. The SPCs ranged from less than 10³ to greater than 10⁷ cfu/g. Figure 2 shows the range of SPCs obtained for both frozen and chilled cooked prawns.

Frozen cooked prawns generally had lower SPCs than chilled product and there was no apparent association between high SPCs and whether the prawns were peeled or unpeeled, imported or domestic, or the different types of retail outlets. There was also no apparent association between the high SPCs and higher temperatures recorded at retail.

Although the best-before date was recorded when available, there was insufficient information to associate the high SPCs with best-before dates.

Figure 2: Frequency histogram showing the range of mean SPC for cooked prawns.

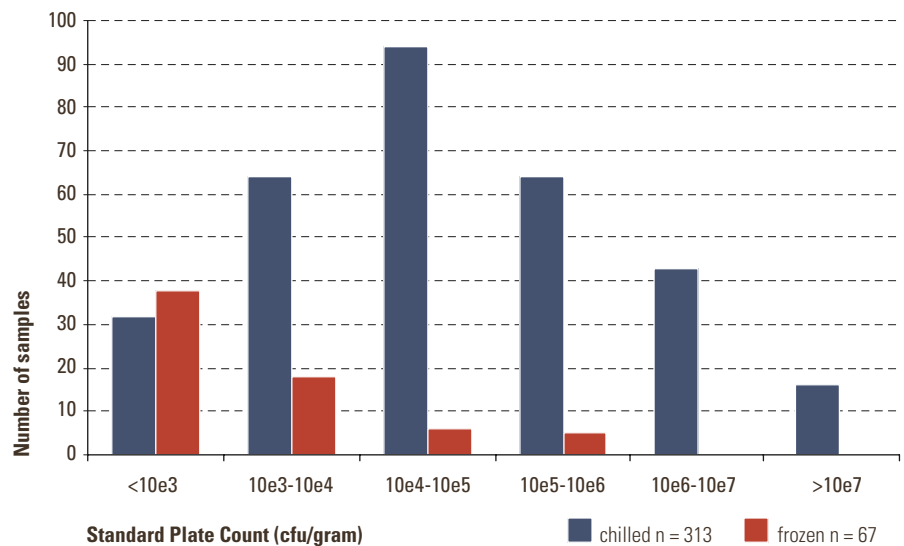


Table 2: Comparison Between Number of Samples Positive for *Listeria monocytogenes* and the Total Number of Samples

Type of Prawn	Number Positive for <i>Listeria monocytogenes</i>			Total No.
	Imported	Domestic	Unknown	
Peeled	6/77(8%)	0/8	1/4	7/89(8%)
Unpeeled	1/62(2%)	4/221 (2%)	0/7	5/290(2%)
Unknown		0/1		0/1
Total	7/139 (5%)	4/230(2%)	1/11(9%)	12/380(3.2%)

Listeria monocytogenes

The 380 samples were tested for *Listeria monocytogenes* and twelve (3%) were found to be positive. There were no counts of *Listeria monocytogenes* greater than 50cfu/g. Table 2 provides a breakdown of the total number of samples positive for *Listeria monocytogenes* according to origin (imported or domestic product) and type (peeled or unpeeled).

Peeled prawns had a higher contamination rate than unpeeled prawns (8% and 2% respectively). This difference was statistically significant (Fishers Exact Test, p=0.009).

Contamination rates for unpeeled prawns were similar for both imported and domestic products. Imported prawns had a higher contamination rate than domestic prawns but this result was not statistically significant.

low (3%) and are comparable with surveys published in the international literature where rates are frequently below 10% for retail samples (Adesiyun, 1993; Gecan et al, 1994; Hartemink et al, 1991; Hofer et al, 1990; McLauchlin and Nichols, 1994). As a comparison *Listeria monocytogenes* contamination rates reported in smoked salmon are generally much higher and range from 10 to 20% at retail, with contamination rates of up to 40% recorded (FSANZ, 2002).

The data from the survey were used in probabilistic modelling to assess the risk posed from the consumption of cooked crustacea contaminated with *Listeria monocytogenes*. The FSANZ 'Microbiological Risk Assessment: *Listeria monocytogenes* in Cooked Crustacea' concluded that *Listeria monocytogenes* in cooked crustacea poses a low risk to the Australian population (FSANZ, 2002). However, the significant difference reported in this survey between contamination rates of cooked peeled and unpeeled prawns (8% and 2%) indicates that there may be a higher exposure to individuals consuming cooked peeled product versus other forms of crustacea to *Listeria monocytogenes*.

Discussion and Conclusions:

Results from this survey indicate that the contamination rate of cooked prawns in Australia with *Listeria monocytogenes* is

Survey of *Listeria monocytogenes* in cooked prawns continued

Standard 1.6.1 - *Microbiological Limits for Food - of the Australia New Zealand Food Standards Code* (the Code) requires cooked crustacea to have a SPC below 10^6 cfu/g. All of the cooked prawns sampled as 'frozen' had average SPCs less than 10^6 cfu/g and met the requirements of the Code. 19% of chilled cooked prawn samples had average SPCs greater than 10^6 cfu/g and exceeded the limit set in the the Code. High SPCs can be indicative of poor process control or may result from inadequate cooking and/or cross-contamination, and/or inappropriate temperature control during storage and display. In addition the high SPCs could also have indicated the prawns to be near the end of or past their shelf-life.

Standard 3.2.2 - *Food Safety Practices and General Requirements* - the Code requires food businesses to store potentially

hazardous foods under temperature control, which is defined as maintaining food at a temperature of 5°C or below. The majority (64%) of cooked prawn samples (excluding 'frozen' product) met the temperature control requirements of Standard 3.2.2. The samples (36%) with recorded temperatures above 5°C clearly did not meet temperature controls and indicated that a number of retail outlets need to improve temperature control for these products.

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When is organic food not organic?

The organic food industry is a small market industry, which has a growth rate exceeding 20% per annum in Australia. There is evidence to suggest that more people are consuming organic foods as an alternative from traditionally processed foods. Because of the increased popularity of the organic market and the rapid increase in market growth, the Food Surveillance Advisory Committee (Queensland Health) commissioned a survey to sample food represented as 'organic' so as to increase the understanding of the organic food industry.

The organic certification process was reviewed and information regarding the processes of the industry and regulatory services was gathered. 96 samples of foods represented as 'organic' were sampled for analysis.

All samples were forwarded to Queensland Health Scientific Services where they were analysed for a broad screen of organochlorine, organophosphorus and synthetic pyrethroid pesticides.

Analysis results were as follows:

- Pesticide residues were found in 14 (14.6%) of samples represented as 'organic'. Of these samples about 78% of these products were certified 'organic' (certified in country of origin).
- One product (Toasted Sesame Oil, manufactured in USA) contained a residue level that was the same as the maximum residue limit (MRL) stated in the Food Standards Code. All other residues found were below the stated MRL.
- Six (6.25%) of the products analysed contained residues that have no MRL in the Food Standards Code and therefore should not be detected in any foods.

Consumers may believe that food labelled, represented or sold as 'organic' or described by words of similar meaning will be 'free' of pesticides. The Food Standards Code does not include any specific labelling requirements or restrictions for foods advertised as 'organic'. However, based upon typical consumers' expectations, legal opinion may

provide that the sale of food represented as 'organic' and which contained pesticide residues may be a breach of the Food Act, 1981.

The recommendations of the survey were that:

- further surveys should be conducted on foods represented as 'organic' to continue to monitor the levels of pesticide residues found in these foods; and
- future surveys should include the sampling of foods where data exists on the residues found in conventional food. This will allow comparisons to be made regarding the levels of pesticide residues on 'organic' vs. conventional foods.

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Weekend Produce Markets around Adelaide

A Survey of Horticultural Produce for Chemical Residues

Background to the Survey

The Food Section of the South Australian Department of Human Services (DHS) participated in a program that tested a large number of fresh fruits and vegetables that are sold from supermarkets and greengrocers for residues of agricultural chemicals such as pesticides and fungicides. The results show that most fresh produce from conventional retail outlets is free of residues or has low levels well within safe limits. Results of recent testing can be found by searching for 'Pooraka Food-Care Project' at www.safoodonline.com

Weekend produce markets, which appear to be growing in popularity near Adelaide, provide an opportunity for small-scale farmers and backyard growers to sell their produce direct to consumers. These growers may not have previously been subject to a testing program. The Food Section accordingly took a 'snapshot' of 80 samples from weekend markets to obtain a picture of how well the produce complies with legal requirements for chemical residues. If the survey indicated the presence of residues above approved levels, the Food Section would consider more comprehensive testing.

Standards

A variety of chemicals are approved for use on fruit and vegetable crops to prevent or control a range of pests and fungal diseases. There are maximum residue limits set for each type of chemical that is approved for use on specific crops. The chemicals approved for use are listed in Standard 1.4.2 of the *Australia New Zealand Food Standards Code* (the Code), and can be viewed at www.foodstandards.gov.au

Which markets?

A total of 80 samples were purchased from the following markets in and around Adelaide.

- Torrens Island Market
- Gepps Cross Drive-in Market
- Willunga Farmers Market
- Pooraka weekend Market
- Junction Market

What fruit and vegetables were tested?

Samples included: carrots, beans, snow peas, apples, tomatoes, pears, leeks, peaches, onions, coriander, cucumber, corn, plums, silverbeet, spinach, lettuce, cherries, parsley and grapes.

What chemicals did we test for?

Each sample was screened for 85 chemicals, including pesticides, herbicides, and fungicides. A total of 6,800 food and chemical combinations were examined.

Results

72 of the 80 samples (90%) were free of any residues.

All residues detected were well within the limits listed in the Code:

Sample	Chemical (type)	Max Residue Limit (MRL)	Level detected
carrots	endosulphan (pesticide)	2.0 mg/kg	0.17 mg/kg
apples	Iprodione (fungicide)	3.0 mg/kg	0.84 mg/kg
apples	Iprodione (fungicide)	3.0 mg/kg	0.24 mg/kg
pears	Iprodione (fungicide)	3.0 mg/kg	0.48 mg/kg
grapes	Iprodione (fungicide)	3.0 mg/kg	0.57 mg/kg
peaches	Iprodione (fungicide)	3.0 mg/kg	1.21 mg/kg
cherries	Iprodione (fungicide)	3.0 mg/kg	2.81 mg/kg
	Procymidone (fungicide)	10.0 mg/kg	0.21 mg/kg
cherries	Procymidone (fungicide)	10.0 mg/kg	0.17 mg/kg
	Iprodione (fungicide)	3.0 mg/kg	1.21 mg/kg



The 'Snapshot Survey' found no evidence to indicate that fresh horticultural produce sold from weekend markets poses a risk to consumers from the presence of agricultural chemicals. Growers and stallholders should remain diligent to ensure that proper agricultural practices continue to be observed. Further testing will be undertaken by the Food Section to confirm the safety of these foods.

For further information

Department of Human Services (DHS)
– Food Section
Email: food@dhs.sa.gov.au
Phone: (08) 82267100



In the pipeline...

Future surveys are planned or underway for a number of food additives, contaminants and hygiene practices including:

21st Australian Total Diet Survey - Update

The 21st ATDS is focussing on sulphites, sorbates, benzoates and nitrites, with a limited number of samples being examined for nitrates. Sample collection was conducted in all Australian States and Territories during April and May with analysis of over 700 composite samples of 60 different foods being completed by mid July 2003. As for past

total diet surveys, composite samples were prepared to a 'ready-to-eat' stage to allow an accurate estimate of dietary exposure to be made, taking into account losses due to food processing and preparation.

Dietary exposure estimates and the subsequent ATDS report should be completed by early 2004.



Quantitative Consumer Research on Labelling Issues

Providing adequate information on food labels to enable consumers to make an informed choice is one of the objectives of the *Australian New Zealand Food Standards Code* (the Code). In the recently revised Code, several labelling changes have been introduced, such as date marking, mandatory nutrition information panels (NIPs), percentage ingredient labelling and allergen declarations (FSANZ 2002). To assess the impact of these labelling changes, FSANZ recently completed baseline research on food labelling issues for consumers and other stakeholders (ANZFA 2001, FSANZ 2002¹, FSANZ 2003).

The aim of the quantitative consumer research on labelling issues was to benchmark baseline indicators on consumer attitudes towards and knowledge and use of food labels, including consumer awareness and use of different label elements, beliefs about the clarity and trustworthiness of different label elements, and the elements that were difficult to interpret.

The quantitative survey results confirmed the preliminary qualitative findings that different consumers used food labels for different reasons and in different ways, and some used more label elements than others (ANZFA 2001). For example, date marks were used more regularly for perishable foods, such as dairy foods, and allergen declarations were mostly used for baked products, such as biscuits.

Consumers reported that ingredient lists, NIPs, date marks, country of origin, percentage labels and nutrient claims were more *'top of mind'* label elements than weight, price or brand (unprompted awareness). However, unprompted awareness on health claims, novel foods and irradiation was low. New Zealanders reported a higher prompted awareness and use of most label elements. For example, ingredient lists, NIPs, advisory statements, warning statements, GMO declarations, preparation and storage instructions, and novel food declarations. However, Australian consumers reported a higher awareness of nutrient claims, and a greater proportion reported using the country of origin label element than New Zealanders, reflecting different regulations in New Zealand for country of origin labelling.

On average, consumers reported using at least five label elements (range of 1 to 14) out of the 15 assessed. The most widely used label elements were date marking, ingredient lists and NIPs with over two thirds of consumers reporting their use. The least used elements were the genetically modified organism (GMO) declarations, health claims,

allergen declarations, and novel and irradiated food declarations. With the exception of health claims, the other elements are only mandatory on labels where the food contains allergens, GMOs, novel and irradiated foods as ingredients. These mandatory declarations are new provisions in the Code and their awareness and use was expected to be lower compared to other label elements. There were two key reasons reported for label non-use: disinterest, habit or previous positive experiences with foods, and thus considering their use as being unnecessary.

The results also demonstrated that most consumers did not have difficulties in reading and interpreting the nutrient information contained in NIPs on single products. However, when comparing two similar products using the NIPs, consumers did not consider the overall nutritional value of the foods. When comparing two similar products, consumers focussed on one nutrient only, and fat levels dominated their evaluative thinking. Given the choice, many consumers opted for a product slightly lower in fat over a product where the difference in another nutrient e.g. sodium, was greater in magnitude and significance. These results suggested that consumers might have difficulties assessing the overall nutrient composition of a food and, in particular, in judging the relative differences between nutrients. More consumers used the 'per serve' column than the 'per 100g' column when selecting the 'healthy choice' between two NIPs for similar products. In cases where the serve size was not the same, this may have led to unintended choices as the 'per 100g' column should be used for product comparison.

One quarter of all consumers were aware, when shown an example of an ingredients list, that ingredients were presented in descending order of quantity. The qualitative research previously undertaken with consumers indicated that once made aware, many consumers found this information useful (ANZFA 2001). Similarly, the quantitative results indicated that once aware, most consumers (71%) could correctly interpret percentage ingredient labelling.

Approximately half the consumers misunderstood the meaning of nutrient claims, such as '94% fat free'. Therefore many consumers may be making poor food choices because of their misinterpretation of such claims. Overall, approximately 50% of all consumers considered 'may contain nuts' allergen statements as very useful. In contrast, consumers who purchased foods for

allergy sufferers considered these statements as least useful.

Although nearly all consumers (93%) were aware of date marks, almost half did not understand the actual information it represented. For example, the 'use by' date mark was considered as *only a guide* and that it was quite safe to eat food products after this date whereas, in fact food must not be sold past its 'use by' date.

The survey findings indicate that for consumers to benefit fully from the recent labelling requirements of the Code, they need to be able to understand and interpret food labelling information. The research findings also support FSANZ's previous decision to produce a poster on food labels, and to include an additional section on food label use and interpretation in 'The official shopper's guide to food additives and labels - know what you are eating at a glance' booklet for consumers (FSANZ 2002²).

The summary and methodology reports together with an interactive presentation of results in PowerPoint format are available on the following website: <http://www.foodstandards.gov.au/mediareleasespublications/publications/index.cfm>. A limited number of hard copy reports are also available on request from FSANZ (contact either judy.cunningham@foodstandards.gov.au or shareen.lata@foodstandards.gov.au).

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AQIS Imported Food Inspection Scheme - 1st quarter 2003 results

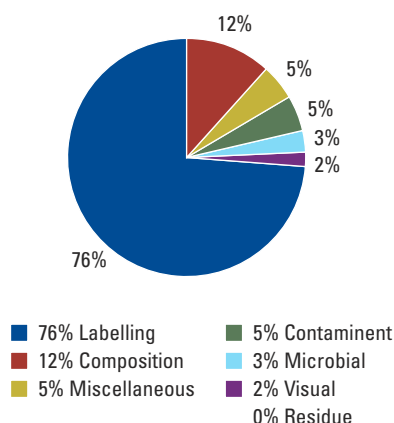
The Australian Quarantine and Inspection Service (AQIS) produces a summary report every three months on the results of inspection and testing of imported foods under the *Imported Food Control Act 1992*. The reports are compiled some time after the quarter is finished to allow time for all results and confirmatory testing to be completed. Outlined below are the outcomes of AQIS testing from 1 January 2003 to 31 March 2003.

How Much Imported Food is tested?

AQIS inspects approximately 5% - 10% of all foods coming into the country, although some foods are inspected at a higher rate. The percentage varies as the frequency of inspection is determined by the risk rating assigned to the food and the compliance history of that type of food from that source.

In the January – March quarter, 18,767 tests, which included labelling and visual inspection, were conducted on selected imported foods. Of these tests only 527 failed tests (2.8%) were recorded. Putting it another way, 97.2% of the tests conducted on inspected foods complied with the testing criteria.

Figure 1. Summary of failed foods (failure by element type)

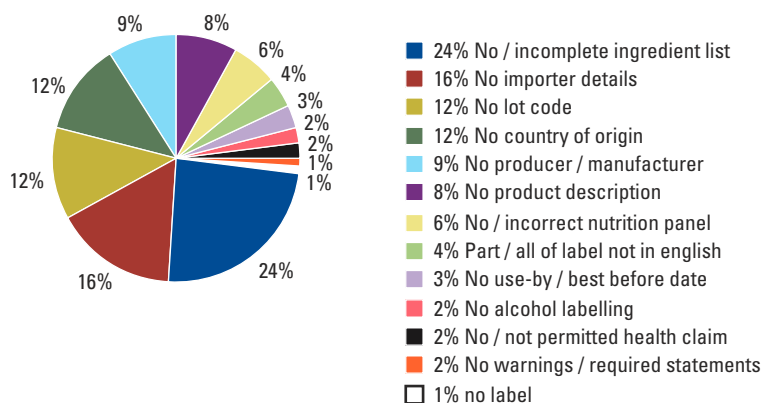


Types of testing

Where an imported food is selected for inspection, it is subjected to a visual/label inspection and where relevant analytical tests may also be applied. More than one test may be assigned to a particular food within a consignment, and several lots may also be tested. The number of tests does not therefore reflect the number of foods tested.

The breakdown of test failures for the quarter is illustrated in Figure 1. In the small number of situations where inspected foods were found not to comply, it was found that the majority of non-compliance was for labelling failures (76%). This is not unusual as the labelling requirements in the *Australia New Zealand Food Standards Code* (the Code) are relatively new and other countries do not have the same labelling requirements as Australia and New Zealand. It is expected that labelling non-compliance will be lower in future reports because importers will have the option of relabelling imported food to bring labels into line with the Code before an AQIS inspection is carried out. AQIS is looking at conducting a survey to ascertain how labelling compliance can be further improved to ensure imported products meet Australian requirements.

Figure 2. Summary of failed foods for labelling (by labelling element)



The specific labelling requirements that have not been met for the January – March quarter are shown in Figure 2. It can be seen that labelling failures would decrease by 64% if a valid ingredients list, the importer details, the lot code and the country of origin were correctly declared.

After labelling, the next area of non-compliance was 'composition' failure. Of the many compositional tests applied, there were only 38 failed tests across a wide range of products. These test failures included non-permitted colours in products such as confectionery and non-permitted amino acids in sports drinks. In addition, some preserved vegetable products contained prohibited plant species, for example, betel nut.

In the tests for 'contaminants' there were only 14 failed tests. The main failures were: 3-MCPD in soy and oyster sauce (5 failed tests); aflatoxin, mainly in peanuts (4 failed tests); and mercury in shark (3 failed tests).

In the microbiological testing, there were only ten failures for exceeding microbiological limits, seven of these were fish products. Four failures related to excessive Standard Plate Counts and the remaining six related to failures for *Listeria monocytogenes*, *Salmonella species*, *Vibrio species*, *Escherichia coli* and *coliforms*.

AQIS advises State and Territory authorities as well as the New Zealand Food Safety Authority on a weekly basis, as to what foods were failed under the imported food inspection scheme. This is done to provide enforcement agencies with up to date information on potential problem areas in their jurisdictions and to facilitate consistent testing of domestically produced foods. The three-month summaries are produced and analysed

by AQIS so that long-term trends can be monitored. They can also help gauge the effectiveness of any new measures introduced to improve imported food compliance.

For more information

Browse the AQIS webpage:

<http://www.aqis.gov.au>

or

ask about imported food matters:

(02) 6272 5445



Chloropropanol levels in foods – found to be safe

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Food Standards Australia New Zealand (FSANZ) has completed a survey of chloropropanols in general foods in Australia and has found that a wide range of foods are safe. The overall conclusion of this report is that, in relation to exposure to chloropropanols from food, adequate regulatory measures are in place to protect consumers, and any risk associated with the levels of chloropropanols remaining in food is considered to be very low.

In recent years there has been increasing scientific interest in a class of chemicals known as chloropropanols. How chloropropanols are formed in foods is not fully understood, although they are known to be formed during the production of hydrolysed vegetable protein in the presence of hydrochloric acid. The World Health Organisation (WHO) has identified potentially adverse health effects resulting from exposure to high levels chloropropanols.

In 2001 FSANZ tested a number of soy and oyster sauces and they were subsequently removed from the shelves when found to have high levels of chloropropanols. Maximum levels for chloropropanols in soy and oyster sauces were then set in the Code. At the time FSANZ undertook to survey, as a precaution, other foods for chloropropanols.

The samples were taken from all Australian states and territories during different seasons of the year. They were then prepared to a ready-to-eat form. For example, minced beef was dry-fried before analysis.

The survey found that there were no chloropropanols detected in baked beans, mixed and single grain breakfast cereal, processed and cheddar cheeses, instant

coffee, dim sims, doughnuts, boiled eggs, infant cereal, infant dinners, infant formula, instant noodles, peanut butter, potato crisps, and canned tuna.

There were very small levels of chloropropanols found in bacon, margarine, minced beef, savoury and sweet biscuits, white and multigrain bread, battered and fried fish fillets, crumbed fish portions, hamburgers, lamingtons, leg ham. sausages and certain meats. In all these cases, FSANZ considers the levels of chloropropanols safe for example, for 1,3-DCP the highest estimated dietary exposure is 200,000 times lower than the level at which tumours were found in some rats. FSANZ's advice to consumers is that the very small levels of chloropropanols found are not a health risk and that Australians should continue to eat a balanced diet. FSANZ is in discussion with other government agencies and the food industry to identify the source of these very low levels of chloropropanols to ensure that they are as low as possible.

A number of overseas agencies are also gathering data on levels of chloropropanols in food. FSANZ is working closely with these agencies on reducing the level of chloropropanols in the food supply.

The full report can be viewed at www.foodstandards.gov.au