



# { FOOD SURVEILLANCE }

AUSTRALIA NEW ZEALAND

FOOD STANDARDS AUSTRALIA NEW ZEALAND

## Food Surveillance News – Autumn 2010

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### Foodborne Disease Outbreaks, Australia, 2008, OzFoodNet

In Australia, an estimated 5.4 million cases of foodborne disease occur annually, costing an estimated \$1.2 billion dollars per year <sup>[1]</sup>. Surveillance of foodborne disease is used to monitor trends in illness, detect outbreaks, inform preventative measures and evaluate the efficacy of public health measures. OzFoodNet is Australia's enhanced foodborne disease surveillance system. It was established in 2000 by the Australian Government to improve national surveillance and conduct applied research into the causes of foodborne illness. OzFoodNet aggregates and analyses national-level information on the incidence of diseases caused by pathogens commonly transmitted by food, as well as conducting outbreak investigation and surveillance <sup>[2]</sup>.

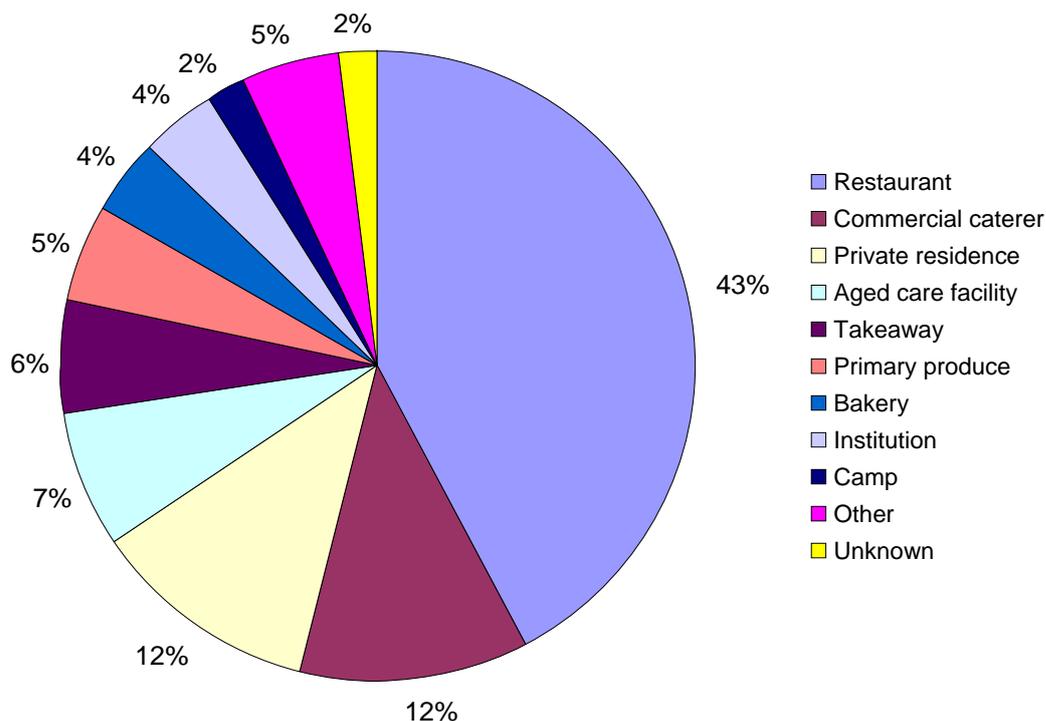
#### *Outbreaks reported in 2008*

During 2008, OzFoodNet sites reported 1,545 outbreaks of gastrointestinal illness; the majority of these were spread person-to-person but include those transmitted by contaminated food. In total, these outbreaks affected 25,555 people, resulting in 691 people being admitted to hospital, and 99 deaths <sup>[2]</sup>.

#### *Foodborne outbreaks in 2008*

Food was suspected or confirmed as the mode of transmission for 104 of these outbreaks, which affected 1,454 people, resulting in 96 hospitalisations and 11 deaths. *Salmonella* continues to be the leading cause of reported outbreaks of foodborne illness and, in 2008, 34% (35/104) of outbreaks were attributed to the pathogen, of which 89% were *S. Typhimurium* (31/35). The most common settings where food was prepared in the outbreaks were restaurants (43%, 45/104), commercial caterers (12%, 12/104) or in private residences (12%. 12/104) (Figure 1) <sup>[2]</sup>.

**Figure 1 – Food preparation settings implicated in disease outbreaks, Australia 2008**



A wide variety of food vehicles were implicated in outbreaks of foodborne disease in 2008 (Table 1). Eggs and egg-containing dishes were identified as the most common outbreak food vehicle in 2008 and were responsible for 19% (20/104) of all foodborne outbreaks. The dishes responsible included desserts containing raw egg (such as mousse and tiramisu), egg-based sauces or dressing (such as aioli or hollandaise sauce) or consuming under/lightly cooked eggs or dishes that contained egg (Table 1). Egg related outbreaks affected a total of 289 people and hospitalised 36 people. Mixed dishes, which include buffets where a variety of dishes were served, was the second most common food vehicle identified in foodborne outbreaks (15% 16/104). In 2008, the only implicated foods that were contaminated in primary produce environments were fish involved in ciguatera fish poisoning outbreaks <sup>[2]</sup>.

**Table 1 – Categories of food vehicles implicated in foodborne disease outbreaks, Australia, 2008.**

Vehicle Category	Number of outbreaks	Number affected	Mean size (persons)	Hospitalised
Mixed dishes	17	300	6	8
Egg-containing desserts	9	98	9	10
Chicken and chicken-containing dishes	9	104	12	7
Meat and meat-containing dishes	7	90	13	2
Fish	6	22	4	2
Salads and/or sandwiches	6	68	11	6
Molluscs	4	19	5	0
Egg-based sauces and dressings	5	133	27	12
Eggs	3	26	9	8
Pasta dish	3	43	14	3
Vitamised foods	2	45	23	7
Egg-containing dish	1	3	3	1
Rice based dish	1	3	3	0

Sauces and gravies	1	31	31	0
Suspected chicken and/or eggs	1	14	14	2
Unknown	29	455	16	28
<b>Total</b>	<b>104</b>	<b>1454</b>	<b>14</b>	<b>96</b>

Source: OzFoodNet Working Group. Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: Annual report of the OzFoodNet Network, 2008. Communicable Diseases Intelligence 2009; 33(4):389-413

## Discussion

In recent years a substantial number of foodborne outbreaks have been associated with eggs. Twenty outbreaks were associated with eggs or egg-based dishes in 2008, 24 outbreaks in 2007 and 16 outbreaks in 2007 compared with five outbreaks in 2005 and three in 2004<sup>[3,4,5,6]</sup>. It is important that egg safety continues to be improved in Australia. During 2009, FSANZ continued developing a primary production and processing standard for eggs and egg products that is considering safety of the whole production chain from farm through to retail<sup>[7]</sup>.

Foodborne disease surveillance provides information to assist in not only immediate public health action and the prevention of these diseases, but also to the assessment of food safety policies and campaigns. A national program of surveillance for foodborne diseases and outbreak investigation has many benefits including identifying foods that cause human illness by identifying outbreaks that occur across state and territory borders. Continuing efforts to strengthen the quality of these data will ensure their use by agencies to develop food safety policy and thereby help prevent foodborne illness<sup>[2]</sup>.

It is important to note some of the limitations of the data presented here. There is potential for variation in the way that the features of an outbreak are categorised, depending on investigator interpretation and circumstances. Differences in the ease of outbreak detection in some settings (e.g. restaurants) can influence surveillance data.

OzFoodNet is funded by the Australian Government Department of Health and Ageing. The data presented in this summary were collected by the OzFoodNet Working Group.

For questions about this summary or for more information on OzFoodNet, please contact Katrina Knope, Acting Coordinating Epidemiologist, on (02) 6289 2751 or at [katrina.knope@health.gov.au](mailto:katrina.knope@health.gov.au).

## Microbiological quality of spices; A coordinated survey conducted by food regulatory agencies in Australia

In 2007, a survey of the microbiological status of spices sold in Australia was conducted as part of the Implementation Sub Committee (ISC) Coordinated Food Survey Plan, which reports to the Food Regulation Standing Committee. This was a coordinated food survey involving food regulatory agencies in Australia. The results of the survey indicate that, while microbes were found at low levels in some spices, the microbiological risk to public health associated with consumption of spices in Australia is low as most of the products they are used in are cooked which will destroy the microbes.

### Introduction

Spices are dried aromatic plants used primarily to season and flavour foods. Spices are sourced from roots, stems and seeds of plants and can be whole, ground or blended together. They are usually incorporated into processed foods or added as an ingredient to prepared foods. Spices may have high incidences of microbial contamination, however in most cases the food will be subjected to further processing, usually involving heat, which will inactivate the microbial hazards present. However, in circumstances where the microbes are not inactivated or in the presence of microbial spores, survival and growth in food may be potentially hazardous and cause illness. The survival of microbes is also dependant on the moisture content, storage and temperature conditions of foods.

Spices can become contaminated with pathogenic microorganisms during growth, harvesting and post harvest processing. The drying process is the most critical, as drying prevents the growth of microbes, especially mycotoxin producing mould. The most popular and cheapest method of drying is to dry naturally under the sun. This may lead to cross contamination from environmental sources such as faecal contamination from birds and rodents or non potable water sources.

In this study, a range of spices including whole, ground and mixed products were assessed for water activity, *Salmonella* spp., *Bacillus cereus* and *Clostridium perfringens*. Samples were collected from a range of retail outlets by officers in each Australian State and Territory jurisdiction. Five primary samples of each product of the same batch were collected to form composite samples. Overall, 217 samples were collected for analysis. *B.cereus* and *C.perfringens* were analysed using the Most Probable Number (MPN) method.

Of the 217 samples analysed, there were no positive detections for *Salmonella* spp. Although the survey showed that 149 (69%) were positive for *B. cereus* and 71 (33%) contained *C. perfringens*, the majority of these positive samples detected levels between 3 MPN/g and 100 MPN/g. A small number of samples were found to have higher levels of *B. cereus*. The level of detection of these pathogens varied depending on the spice analysed.

## Results

### Whole spices

For *B. cereus*, 40% of samples had levels below the limit of detection and 60% had positive detections. It should be noted that most of these samples had fewer than 100 MPN/g. In particular, 71% of fennel seeds had levels between 10 and 100 MPN/g and 67% of caraway seeds had levels of between 10 and 1000 MPN/g. For *C. perfringens*, 80% of whole spice samples tested had levels below the limit of detection (<3 MPN/g). The remainder of these samples tested positive although had fewer than 100 MPN/g.

### Ground spices

One third of the ground spices tested (n=102) had levels below the limit of detection for *B. cereus* (<3 MPN/g). In this group, there were four ground spice products that had noticeably higher levels of *B. cereus* (cumin, fennel, ginger and nutmeg). Of these samples, about 80% were found to have *B. cereus* levels <100 MPN/g and 88% had levels of *B. cereus* >100 MPN/g. For *C. perfringens*, 70% of samples had levels below the limit of detection (<3 MPN/g), with all positive samples below <100 MPN/g.

### Mixes spices

For mixed spice samples (n=55), 20% had *B. cereus* levels below the detection limit (<3 MPN/g). While most of the positive samples had levels below 100 MPN/g, 15% were positive in the range of 100-10,000 MPN/g and only 2% had detected levels between 10,000-1,000,000 MPN/g. In addition, 45% of the spice mixes samples had *C. perfringens* levels lower than the detection limit (<3 MPN/g), while most positive samples had fewer than 100 MPN/g.

### Water activity (Aw)

The water activity of the spices assessed indicates that bacterial growth on the dry spice is inhibited, as microbial proliferation is not believed to occur at an Aw of less than 0.60. In this study, the Aw of the spices analysed ranged from  $0.39 \pm 0.01$  (tandoori spice mix) to  $0.66 \pm 0.11$  (whole cloves).

## Discussion

The objective of this survey was to provide information regarding the level of microbiological contamination of spices available in Australia and thus inform any potential further risk assessment. While spices have been implicated in large scale outbreaks of food borne illness<sup>[8,9]</sup>, the impact of contaminated spices on the incidence of foodborne illness in Australia is unclear.

Although *Salmonella* spp. have been detected in spices in other studies conducted<sup>[10,12]</sup>, these organisms are generally detected in very few samples, as was the case in this study. Stankovic<sup>[13]</sup> did not detect *Salmonella* spp. in 101 samples tested, while Banerjee<sup>[10]</sup> and Hara-Kudo<sup>[11]</sup> both found only two positive samples. The results of this analysis are consistent with other reported data and we can report that the incidence of *Salmonella* spp. in imported spices is low.

The survey has demonstrated that spices available to the Australian public may contain *B. cereus* and *C. perfringens*, potentially causing illness depending on the use of the spice. However, the level of *C. perfringens* reported in this survey was generally very low. The survey is comparable with the findings from other studies that have been conducted by Bates<sup>[15]</sup> and Garcia<sup>[16]</sup>. All of these studies indicate that although the incidence of *C. perfringens* in spices is relatively high, the numbers per gram detected are relatively low (<100 MPN/g)<sup>[14]</sup>. As the infectious dose for *C. perfringens* is very high (~ 1,000,000 cells/g)<sup>[15]</sup>, the spices analysed here would present a very small risk to public health.

The levels detected for *B. cereus* in this survey varied, with levels of some spices at <1000 MPN/g (fennel and caraway seeds) and < 10,000 MPN/g for other spices. This distribution was also noted in studies conducted by Banerjee<sup>[10]</sup>, Garcia<sup>[16]</sup> and Stankovic<sup>[13]</sup>. The average water activity of the spices is not conducive to the growth of *C. perfringens* and *B. cereus*; however bacterial spores can survive and grow in foods that have been temperature abused through inappropriate cooling and heating conditions. End product disinfection of spices may be used to reduce the incidence and total bacterial load of the product. Some of the methods used can include irradiation, heat treatments (e.g. steam) or ozone. For spices that are not decontaminated, temperature control of the cooked food is the most effective means of reducing the risk of foodborne illness.

The results presented here indicate that the microbiological risk to public health associated with consumption of spices in Australia is low.

The full report on the 2007 national survey of spices for the presence of pathogens can be found on the department's website: <http://www.health.vic.gov.au/foodsafety/research/microbiological.htm>

## Trans Fatty Acids

### Why are Trans Fatty Acids an issue?

Trans Fatty Acids (TFA) are unsaturated fats. However, unlike the 'good' unsaturated fatty acids found in fish and some vegetable oils, TFA act in the body like saturated fats. There is evidence that TFA can increase low-density lipoprotein ('bad') cholesterol and decrease high-density lipoprotein ('good') cholesterol. Increases in bad cholesterol and decreases in good cholesterol are strongly associated with an increased risk for coronary heart disease<sup>[17,18]</sup>.

### What foods contain Trans Fatty Acids?

TFA can be found naturally in meat and milk from certain animals and as a product of fats and oils altered by industrial processes, such as hydrogenation. Hydrogenation, adding hydrogen to oils, has been widely used to solidify liquid vegetable oils and is used in products such as: margarines, shortenings, cakes, biscuits, processed foods and takeaway meals. TFA can also be formed during heating and frying of oils at extreme temperatures<sup>[17,18,19]</sup>.

### What is the current situation in Australia and New Zealand?

In 2007, Food Standards Australia New Zealand (FSANZ) conducted a review of TFA in the food supply, estimating dietary intakes and considering potential risks of TFA. The review found that the contributions of TFA to energy intakes of Australians and New Zealanders was below the goal of 1% proposed by the World Health Organization, and was comparable to or lower than intake estimates from some countries overseas.

The Australia and New Zealand Food Regulation Ministerial Council endorsed the findings of this review and agreed that immediate regulatory intervention was not required and that non-regulatory measures (in the form of the voluntary action of industry such as reformulation) to further reduce the levels of TFA in the Australian and New Zealand food supply would continue to be the most appropriate action.

### Labelling of TFA

Under the current Australia New Zealand Food Standards Code (the Code), manufacturers are not required to label TFA unless a nutrient content claim is made on the packaging about cholesterol, saturated (SFA), monounsaturated (MUFA), polyunsaturated (PUFA), TFA, or omega-3, omega-6 or omega-9 fatty acids. Voluntary labelling of TFA is permitted and many margarine and edible oil spread manufacturers in Australia and New Zealand do voluntarily label their products.

## 2009 Survey post non-regulatory measures

In 2009, a survey on TFA was conducted under the ISC Coordinated Food Survey Plan to determine the proportion of TFA in a representative range of Australian and New Zealand processed and takeaway foods after non regulatory measures were introduced. Ratios of TFA to other fatty acids, particularly saturated fatty acids, and changes to these ratios were also assessed.

### Results

A total of 456 samples from six different food categories were collected from NSW, SA, WA and New Zealand and analysed for total fat, saturated fat, monounsaturated fat, polyunsaturated fat and TFA. The range of food categories tested included: takeaway foods, fats and oils, snack foods, meat products, and bakery products.

The results showed overall that the ratio of TFA in the range of processed and takeaway foods was relatively low with 82.3% of the samples surveyed having TFA levels equal to or less than the Danish limit of 2 grams of TFA per 100 grams of fat.

Samples likely to contain ruminant TFA were excluded from this calculation as the Danish legislation excludes these foods from the 2% limit.

Of the 456 samples tested, one brand of popcorn had the highest ratio of TFA (compared to total fat) at 35.2%. A breakfast bar, another popcorn sample and one sample of potato crisps also had a very high TFA ratio at 30.6, 27.8, and 22.2% respectively.

Forty two samples tested were also tested in previous surveys conducted by the NSW Food Authority and twenty six (61.9%) of these showed a decrease in the TFA content over time.

The results from the 2009 survey were provided to FSANZ for review of TFA intake in the Australian and New Zealand populations; [‘Review Report: Intakes of trans fatty acids in New Zealand and Australia \(2009\)’](#)

## Microbiological survey of fresh horticultural produce in Australia, 2005 – 2007

Outbreaks of human foodborne illness have previously been reported in Australia and overseas and have been linked to consumption of contaminated fresh horticultural produce. Pathogenic bacteria can survive for extended periods on fresh produce and some products support bacterial growth<sup>[20]</sup>. As fresh produce is generally not cooked prior to consumption, contaminated produce presents a potential food safety risk to consumers.

In 2005 – 2007, a survey was conducted under the ISC Coordinated Food Survey Plan to determine the prevalence of microbiological contamination in fresh horticultural produce in Australia. Participating jurisdictions included ACT, NSW, NT, Queensland, SA and Tasmania.

A total of 369 samples were analysed, including lettuce, seed sprouts, strawberries, parsley and basil. The survey collected samples from three points in the horticultural produce supply chain: from the field, at the farm gate and at retail; with the exception of seed sprouts which were collected prior to germination, at the end of the production line and at retail.

Samples were analysed for the presence of *Escherichia coli* (including verocytotoxin producing *E. coli* (VTEC) or *E. coli* O157:H7), *Listeria* spp. and/or *L. monocytogenes*, *Salmonella* spp.

## Microbiological status of sampled Australian fresh horticultural produce

Produce	VTEC	<i>E. coli</i> O157:H7	<i>Listeria</i> spp.	<i>L. monocytogenes</i>	<i>Salmonella</i> spp.
Lettuce	0 (n=18)	0 (n=107)	0 (n=113)	0 (n=134)	0 (n=134)
Seed sprouts	1 (n=27)	0 (n=66)	2 (n=88)	0 (n=104)	0 (n=104)
Strawberries	0 (n=9)	0 (n=96)	4 (n=94)	4 (n=105)	1 (n=105)
Parsley	1 (n=9)	0 (n=3)	0 (n=12)	0 (n=15)	0 (n=15)
Basil	NT	0 (n=1)	0 (n=2)	0 (n=2)	0 (n=2)

NT (not tested)

Results are provided as number of positive samples (n=number of samples tested)

VTEC was detected in one seed sprout sample (broccoli sprouts) collected at the end of production and one sample of parsley collected from the field. *Listeria* spp. was detected at retail for seed sprouts, while *L. monocytogenes* was detected in strawberry samples collected from the farm gate and retail. *Salmonella* spp. was detected in one strawberry sample collected from the field.

Follow-up action was conducted by the relevant jurisdictions for those samples in which microbiological contamination was detected. The follow-up action included contacting the producer involved (where possible) and reviewing production and handling practices.

While limited by the sample size, this survey provides a snap shot of the microbiological contamination of selected fresh horticultural produce at the time of sampling (2005 – 2007). It confirms that infrequent contamination of fresh produce with potentially harmful bacteria can occur, reiterating the importance for industry and consumers to follow general advice on the safe production, preparation and handling (e.g. washing and refrigeration) of these products.

Since this survey was undertaken, a number of measures have been put in place by the fresh produce industry and jurisdictions to enhance the microbiological safety of these products. More recent surveys of particular sectors of this industry have found even lower levels of microbiological contamination.

The full report on this survey can be found on the FSANZ website:

<http://www.foodstandards.gov.au/scienceandeducation/monitoringandsurveillance/foodsurveillance/microbiologicalsurve4782.cfm>

## Microbiological Quality of Cooked Prawns in the ACT

### Background

Cooked prawns are a popular ready-to-eat food that is widely available in retail establishments across the ACT. It has been recognised that cooked prawns may present a microbiological risk to the community due to the amount consumed and the lack of data about the safety of this product in the ACT.

FSANZ sets out the microbiological limits for this food in Standard 1.6.1 of the Code. The Standard 1.6.1 lists maximum allowable levels of foodborne micro-organisms for different classes of foods. The Standard is used to determine the level of microbiological contamination that is considered to be of significant risk to public health.

### Survey Scope and Findings

The survey was conducted between 18 February 2008 and 31 March 2008. ACT Health officers randomly sampled seven batches of prawns from five different retail outlets across the ACT. The samples were tested against Standard 1.6.1 of the Code. The tests consisted of a Standard Plate Count (SPC) and coagulase-positive *Staphylococci* analyses to assess the samples for overall hygiene quality. In addition, a *Salmonella* spp. test was used to determine the presence or absence of this bacterial pathogen. SPC counts ranged from  $6 \times 10^2$  to  $4.1 \times 10^6$ . Three (43%) of the batches of prawns from two (40%) of the five establishments sampled exceeded the maximum allowable limits for SPC. Twenty five of the thirty

five samples were tested for coagulase-positive *Staphylococci* and all tested samples reported counts of less than fifty bacteria per gram. No *Salmonella* spp. was detected in any of the thirty five samples tested. ACT Health investigated the two retail establishments that produced SPC results which exceeded the Standard. The outcome of the investigations revealed that there were no deficiencies in the retailers' equipment and correct food handling procedures were followed. The results therefore suggest that some batches of prawns may already have had a high level of SPC micro-organisms when received by the retailer. The survey indicates that the microbial quality of cooked prawns sold in the ACT is satisfactory, as all of the samples tested contained no pathogenic bacteria and would not pose a risk to public health.

Continued monitoring in the future of more retailers may provide a broader insight of the quality of prawns and food handling practices of prawn retailers in the ACT.

## Microbiological Quality of Savoury Pastries

A diverse range of filled savoury pastries are sold in Australia including meat pies, sausage rolls, pasties and quiches. They are usually made from pastry with meat, vegetable, egg-based and/or other fillings (e.g. fish) and can also contain ingredients such as thickeners, vegetable proteins and spices. Spices, in particular, and vegetables can carry a high microbial spore load. The diversity of products and ingredients is matched by diversity in methods of preparation. The typical process used for making pies and pasties involves pre-cooking the fillings to about 85°C before placing the filling (either hot or cold) into the prepared raw pastry shell, glazing the pastry and baking the complete product. The alternative method involves filling the raw pastry with the uncooked filling mix, sealing with the pastry lid and then baking to an internal temperature of 85°C. This can then be followed by injection of gelatine/agar solution into the pie headspace after partial cooling <sup>[21]</sup>.

These products are defined as 'potentially hazardous foods' as they may contain microbial pathogens and can support growth of pathogens at certain temperatures. Therefore, the safety of filled savoury pastry products relies largely on bakeries using adequate food handling and hygiene practices. Savoury pastries must be prepared using good manufacturing practices and stored at temperatures that minimise the potential growth of pathogenic microorganisms or formation of microbial toxins in the food.

From March to June 2009, a total of 172 ready-to-eat filled savoury pastries were purchased from 45 bakeries across NSW by Environmental Health Officers from local councils and NSW Food Authority officers. Samples collected included pies, sausage rolls, quiches and pasties. These products fall into a large category of ready-to-eat foods for which there are no microbiological standards in the Australian New Zealand Food Standards Code. Therefore, the results were assessed against the NSW Food Authority microbiological quality guideline for ready to-eat foods <sup>[22]</sup>. Results are outlined in Table 1. During collection of samples, a questionnaire was also completed to assess the food handling practices in the bakeries. Information such as where and how the products were prepared, reheated and displayed was collected.

**Table 1: Test results**

Products	Number of samples	Microbiological quality (%)			
		Good	Acceptable	Unsatisfactory	Potentially hazardous
Pies	101	100 (99%)	1 (1%)	-	-
Sausage rolls	38	38 (100%)	-	-	-
Quiches	11	11 (100%)	-	-	-
Others	22	22 (100%)	-	-	-

Overall, the results from the questionnaire demonstrated that respondents had a good awareness of the potential hazards associated with these products and implemented good manufacturing practices. It was found that a few businesses could improve practices by more effectively cooling the pie filling and/or reheating the final product prior to display. The positive observational results were supported by the microbiological results, which indicated that all samples tested were either categorised as microbiologically good or acceptable.

The NSW Food Authority would like to acknowledge and thank the following councils who assisted with this survey: Griffith City Council; Holroyd City Council; The Council of the Shire of Hornsby; Penrith City Council; City of Ryde and Sutherland Shire Council.

## Raw Chicken Meat Microbiological Survey

### Introduction

FSANZ was the coordinating agency for a baseline survey to obtain information on the likelihood of live chickens being contaminated on-farm with *Salmonella* and *Campylobacter* and also the likelihood of the chicken being contaminated after it has been slaughtered. *Salmonella* and *Campylobacter* are the two main bacteria that can be present on raw chicken and cause illness if the chicken isn't cooked or handled correctly.

*Salmonella* and *Campylobacter* are killed by cooking. To handle chicken safely:

- cook it thoroughly, until there is no pink visible and juices run clear
- after handling raw chicken, wash and dry hands thoroughly
- ensure all utensils that have been in contact with the raw chicken are also washed and dried thoroughly before being reused.

As this survey was testing live chickens and raw chicken carcasses, we expected to find *Salmonella* and *Campylobacter*. As in most poultry producing countries, *Campylobacter* and, to a lesser extent *Salmonella*, were frequently found in samples tested. The European Food Safety Authority (EFSA) has recently reported findings from a baseline survey undertaken by European Union Member States (published 17 March 2010) <sup>[23]</sup>. No poultry producing country has been able to eliminate *Salmonella* and *Campylobacter* from raw poultry. However, some countries have successfully reduced the amount of *Salmonella* and *Campylobacter* in raw chicken to some degree by improving practices and procedures on-farm and at the slaughtering facilities. These countries have found that this results in less illness in people.

As part of its through-chain approach to food regulation, FSANZ has developed a Primary Production and Processing Standard for Poultry Meat, which will be considered at a meeting of the Australia and New Zealand Food Regulation Ministerial Council<sup>1</sup> in May 2010. When implemented, this standard will require poultry farmers and processors to ensure their practices and procedures are effective at lowering the likelihood of poultry being contaminated with *Salmonella* and *Campylobacter*.

### Background

During the development of the Standard for Poultry Meat, the need to obtain baseline data on the prevalence and levels of *Salmonella* and *Campylobacter* along the poultry meat supply chain was identified.

Baseline data had been collected at the retail level in 2005/06, but not at the primary production or primary processing stages.

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<sup>1</sup> The Australia and New Zealand Food Regulation Ministerial Council develops domestic food regulation policy and comprises Health Ministers from most Australian States and Territories, the Australian Government and New Zealand as well as other Ministers from related portfolios (Primary Industries, Consumer Affairs etc).

This survey was agreed to as an ISC Coordinated Food Survey in 2006, with FSANZ nominated as the lead agency. The jurisdictions that participated were WA, SA, NSW, Queensland and Tasmania. The South Australian Research and Development Institute (SARDI) and the Australian Government Department of Health and Ageing were also part of the project team. SARDI compiled and analysed the results from the survey.

## Results

This study measured both the prevalence and where appropriate, concentration, of *Salmonella* and *Campylobacter* at three points along the chicken meat supply chain, on-farm, just prior to processing and at the end of primary processing (the slaughtering process). The percentage results for *Salmonella* indicate the percentage of samples that were positive for *all* types of *Salmonella* as well as the percentage that were positive for pathogenic (disease causing) types.

### *On-farm*

- To test chickens on-farm, chicken faeces were collected from 39 farms in WA. The results showed that 64% of the flocks/sheds were positive for *Campylobacter* and 47% were positive for *Salmonella* (~47% with pathogenic types).

### *Prior to processing*

- To test the degree to which chickens are contaminated that are being slaughtered, the caecal contents of chickens (part of the digestive system containing waste) were collected for testing in WA and SA. A total of 636 samples were tested. The results showed that 84% of the samples were positive for *Campylobacter* and 13% for *Salmonella* (7.5% positive for pathogenic types).

### *Post primary processing*

- To test the likelihood of chickens being contaminated after they have been slaughtered, 1112 carcasses were sampled in WA, SA, NSW and Queensland. The results showed that 84% were positive for *Campylobacter* and 37% for *Salmonella* (22% positive for pathogenic types). The numbers of bacteria present on the carcass was also tested. *Campylobacter* was present in reasonably high numbers (~500 per 100cm<sup>2</sup>) and *Salmonella* in low numbers (~1 per 100cm<sup>2</sup>).

## Discussion

Overall, the results indicate that a large percentage of the live chickens entering the processing plants are infected with *Campylobacter* (84%) and to a much lesser extent, *Salmonella* (13% with 7.5% positive for pathogenic types). Chicken carcass samples taken at the end of the slaughtering process gave a similar prevalence for *Campylobacter* (84%). However, the samples tested were higher for the prevalence of *Salmonella* (37% with 22% positive for pathogenic types). The levels of *Campylobacter* on the carcass were reasonably high and for *Salmonella*, low.

These results are similar to the results from a retail baseline microbiological survey carried out in 2005/2006 in South Australia and New South Wales, which looked at contamination levels in raw poultry, when it is purchased from a supermarket, butcher or speciality chicken shop. The study found that raw poultry is likely to be contaminated with *Campylobacter* (90%) and to a lesser extent *Salmonella* (43% with 13% positive for pathogenic types).

## Conclusion

This survey has provided baseline data on the prevalence and levels of *Salmonella* and *Campylobacter* on raw chicken meat at both the primary production, and primary processing stages of the chicken meat supply chain, prior to the introduction of a new standard for poultry meat. These results are not dissimilar to those found in many other poultry producing countries.

FSANZ will undertake another poultry survey, after the new requirements, if approved, for poultry farmers and poultry processors are implemented, to determine whether the requirements have been successful in lowering the amount of *Salmonella* and *Campylobacter* in raw chicken. It is anticipated that the new Standard for poultry will be implemented over the next two years.

## Keeping an eye on food recalls

Food identified as a risk to public health and safety is recalled. Recalls are normally triggered by consumer complaints, company testing or government testing. FSANZ is the coordinating agency for all food recalls in Australia and the NZFSA is the responsible authority in New Zealand.

Australian recalls over the months of October 2009 to January 2010 included:

- Dong Nam Trading initiated a voluntary recall of Bravo White Vanilla Ice cream, Bravo Pistachio Revolution Ice cream and Bravo Choco Chunk Ice cream (150g packets cardboard wrapped ice cream cones, all Best Before Dates) as the product contains milk and traces of peanuts that are not declared on the label. Consumers who suffer from milk and/or peanut allergy or intolerance are asked not to consume the product. The products are distributed in NSW only and sold through Asian retail outlets. Customers who have the affected product were asked to return it to the place of purchase for a full refund.
- Mani Fold Food Trading Pty Ltd conducted a voluntary recall on YAFANG Red Bean Jelly Popsicle (paper wrap – 5 popsicles per packet, 75g each with Best Before Date: 06.07.2011) as the product contains milk powder which is not declared on the label. Consumers who suffer from milk allergy or intolerance were advised not to consume this product. Customers who have the affected product were asked to return the product to the point of purchase for a full refund.
- Spiral Foods Pty Ltd initiated a voluntary recall of Bonsoy Soy Milk (1 Lt Tetra pack, all Best Before Dates) as the product has been found to contain unusually high levels of iodine. Consuming this product may constitute a health risk. Customers who have the affected product were asked to return it to the place of purchase for a full refund. No other Spiral Foods products were affected by this recall.
- B.-d Farm Paris Creek conducted a voluntary recall of Paris Creek Cheese Com'n Bear French Style Camembert (200g, Best Before Date: 27.01.2010 and 28.01.2010) and Paris Creek Cheese Brie French Style Brie (200g, Best Before Date: 22.01.2010) as the products may contain *E. coli*. Consuming these products may constitute a health risk. This was a national recall for Com'n Bear French Style Camembert and affected SA only for the Brie French Style Brie. Customers who have the affected products were asked to return them to the point of purchase for a full refund.
- Don® initiated a voluntary recall of Don® Pre Packaged Kabana (375g, Use By Date: 08.02.2010, LOT 380) as the product may potentially contain *Listeria monocytogenes*. *Listeria* may cause illness in pregnant women, the very young, the elderly and people with low immune systems. The affected product has been sold through supermarkets and other food retail outlets in all States and Territories except WA. Consumers who have the affected product were asked to contact Don® directly for a full refund.
- National Foods and Woolworths Ltd conducted a voluntary recall of Woolworths Fresh Milk Lite (2L, Use By Date: 06.12.2009) as there was possible *E.coli* contamination. The product recall affects all Woolworths stores in Victoria and some stores in NSW and ACT. Customers who have the affected product were asked to return it to their nearest Woolworths or Food For Less Supermarket for a full refund. The recall affects only this product with nominated size and Use By Date.
- Wah Lien Trading Pty Ltd conducted a voluntary recall of Shui Kou Preserved Bean Curd (Chilli) (400g glass jar, all Best Before dates up to and including: 30.08.2011) as the product may contain *Bacillus cereus*. Consumers were advised not to consume the product. The affected product is sold through Asian retail outlets in Victoria only. Customers were asked to return the product to the point of purchase for a full refund.

- Pronasindo Australia Pty Ltd trading as Simply The Best Smallgoods initiated a voluntary recall on Leg Ham Portion – Simply The Best and Leg Ham Portion – Harris Farm (Cryovac pouch of random weights, Use By Date: 18.12.2009) as the products may contain *Listeria monocytogenes*. *Listeria* may cause illness in pregnant women, the very young, the elderly and people with low immune systems. The affected product was sold in retail outlets in NSW only. Customers who have the affected products were asked to return them to the place of purchase for a full refund.
- Harvest Freshcuts Pty Ltd and Woolworths Ltd conducted a voluntary recall on Woolworths Carbonara Salad (Pre packaged 350g plastic tub, Use By Date: 24.11.2009) as the product contains fish and egg which is not declared on the label. Consumers who are allergic to egg and/or fish were asked not to consume the product. The product recall affected Queensland Woolworths stores only and only applies to product with the nominated size and Use By Date. Customers who have the affected product were asked to return it to their nearest Woolworths, Safeway or Food For Less Supermarket for a full refund.
- New World Trading Comp Pty Ltd conducted a voluntary recall of Preserved Bean Curd – Sakura (350g glass jar, Best Before Date: 10.04.2012) Fermented Bean Curd – in dressing with Chili (170g glass jar, Best Before Date: 09.04.2011) and Liu Ma Bao Kee – Preserved Bean Sauce (350g glass jar, Best Before Date: 10.04.2012) as the product may contain *Bacillus cereus* and consumers were advised not to consume the product. The products are sold through Asian retail outlets in SA, VIC, WA, Queensland and Tasmania. Customers who have the affected product were asked to return them to the point of purchase for a full refund.
- Coles Supermarkets conducted a voluntary recall of Coles Smart Buy Frozen 20 Hamburger Patties (1kg, Best Before Date: 22.04.2010) as the product may contain metal fragments. Consumers were advised not to consume the product. The affected product was sold in Coles, Bi Lo, Pick'n'Pay Stores and Coles Online nationally. Customers who have the affected product were asked to return it to their nearest Coles, Bi Lo or Pick'n'Pay store for a full refund.
- Ettason Pty Ltd conducted a voluntary recall of Punchun Sesame Sauce (290g glass jar, all Best Before Dates up to and including: 30.08.2011) as the product contains traces of peanuts which is not declared on the label. Consumers who have a peanut allergy were asked not to consume the product. The affected product is imported from Hong Kong and sold through Asian retail outlets in NSW, ACT, SA, WA and Victoria. Customers who have the affected product were asked to return the product to the point of purchase for a full refund.
- GT 1 Trading Pty Ltd conducted a voluntary recall on Original Sesame Jam (369g glass jar, all Best Before Dates) as the product contains traces of peanuts which is not declared on the label. Consumers who are allergic to peanuts were asked not to consume the product. The affected product is imported from Taiwan and sold through Asian retail outlets in NSW only. Customers who have the affected product were asked to return it to the point of purchase for a full refund.
- Vastrade Pty Ltd conducted a voluntary recall of Sesame Sauce (300g glass jar, Best Before Date: 25.04.2010) as the product contains traces of peanuts which are not declared on the label. Consumers who are allergic to peanuts were asked not to consume the product. The affected product is Imported from China and sold through Asian retail outlets in NSW and ACT. Customers who have the affected product were asked to return it to the point of purchase for a full refund.
- Win Kwong Pty Ltd conducted a voluntary recall of Punchun Sesame Sauce (290g glass jar, all dates up to and including Best Before Date: 20.06.2011) as the product contains traces of peanuts which is not declared on the label. Consumers who have a peanut allergy are asked not to consume the product. The affected product is imported from Hong Kong and sold through Asian retail outlets in NSW only. Customers who have the affected product were asked to return the product to the point of purchase for a full refund.

- Hung's Trading Company Pty Ltd conducted a voluntary recall of Sesame Sauce (450g glass jar, all dates up to and including Best Before Date: 30.08.2011) as the product contains traces of peanuts which is not declared on the label. Consumers who have a peanut allergy were asked not to consume the product. The affected product is imported from China and sold through Asian retail outlets in NSW, WA, SA and Queensland. Customers who have the affected product were asked to return the product to the point of purchase for a full refund.
- TFK Trading Pty Ltd conducted a voluntary recall of Dimko Smoked Cheese (400g vacuum sealed plastic bag, Best Before Date: 31.03.2010) as the product may be contaminated with *E. coli*. Consumers were advised not to eat the affected product. The affected product is sold in Victoria and WA. Customers with the affected product were asked to return it to the place of purchase for a full refund.

There were 2 recalls in New Zealand over the same period:

- Spice Hutt Ltd initiated a recall of whole frozen fish (warm water ocean fin fish) including, Ulavi, Brim, Savaseva, Red Snapper, Nuqa, Unicorn Fish, Surgeon, Sabatu, Kawakawa, Donu, Kacika and Saqa purchased after 20.11.2009 (various weight range wild fish) due to Ciguatera fish poisoning. Consumers were asked not to consume this product. Distribution in New Zealand is limited to Spice Hutt, Seafood City and India Shop in Lower Hutt and Wainuiomata. Customers with the affected product were advised to return the product to their local retailer for a full refund. This recall did not affect New Zealand caught fish at these outlets.
- Sealord Group Ltd initiated a nationwide recall of Sealord Deli Menu Italian Pasta & Tuna (200g, Best Before Date: November 2010, Batch Code: VT2011PLI5251) as the product may contain Deli Menu Satay Rice & Tuna, which contain peanuts. The product is safe to consume but incorrectly labelled and contains an undeclared allergen (peanuts). There have been no reports of injury; however any person concerned about their health was advised to seek medical assistance. The product is sold in supermarkets throughout New Zealand. Customers with the affected product were asked to return the product to the retailer they purchased it from for a full refund. This recall did not affect any other Sealord Group product.

## **References**

[1]HallG, Kirk MD, Becker N, Gregory JE, Unicomb L, Millard, G, *et al.* Estimating Foodborne gastroenteritis, Australia. *Emerg Infect Dis* 2005;11:1257-1264.

[2]OzFoodNet Working Group. Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: Annual report of the OzFoodNet Network, 2008. *Communicable Diseases Intelligence* 2009;33(4):389-419.

[3]Fullerton K, OzFoodNet Working Group. Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: annual report of the OzFoodNet Network, 2006. *Commun Dis Intell* 2008;32:400-424.

[4]OzFoodNet Working Group. Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: annual report of the OzFoodNet Network, 2006. *Commun Dis Intell* 2007;31:345-365.

[5]OzFoodNet Working Group. Burden and causes of Foodborne disease in Australia: Annual report of the OzFoodNet network, 2005. *Commun Dis Intell* 2006;30(3):278-300.

[6]OzFoodNet Working Group. Reported Foodborne illnesses and gastroenteritis in Australia: Annual report of the OzFoodNet network, 2004. *Commun Dis Intell* 2005;29(2):164-190.

[7]FSANZ Egg Standard. Accessed on 27 November, 2009 from:

<http://www.foodstandards.gov.au/thecode/primaryproductionprocessingstandards/eggstandard/index.cfm>.

- [8]Lehmaker, A., J.Bockemühl, and S. Aleksic, Nationwide outbreak of salmonellosis in Germany due to contaminated paprika and paprika-powdered potato chips. *Epidemiology and Infection* 1995. **115** (3): p. 501-511.
- [9]Gustavsen, S. and O. Breen, Investigation of an outbreak of Salmonella Oranienburg infections in Norway, caused by contaminated black pepper. *American journal of Epidemiology*, 1984. **119** (5): p. 806-812.
- [10]Banerjee, M. and P.K. Sarkar, Microbiological quality of some retail spices in India. *Food Research International*, 2003. **36**: p. 469-474.
- [11]Hara-Kudo, Y., et al., Salmonella prevalence and total microbial and spore populations in spices imported to Japan. *Journal of food Protection*, 2006. **69** (10): p.2519-2523.
- [12]Vij, V., et al., Recalls of spices due to bacterial contamination monitored by the US Food and Drug Administration: the predominance of Salmonellae. *Journal of Food Protection*, 2006. **69** (1): p. 233-237.
- [13]Stankovic, N., L. Comic, and B. Kocic, Microbiological correctness of spices on sale in health food stores and supermarkets. *ACTA Fac Med Naiss*, 2006. **23** (2): p. 79-84.
- [14]International Commission on Microbiological Specifications for foods, spices, dry soups and oriental flavourings, in *Micro-organisms in Foods 6-Microbial Ecology of food*. 2000, Aspen Publishers, Inc.: Maryland, USA. P. 274-312.
- [15]Bates, J.R. and P.W. Bodnaruk, clostridium perfringens, in *Foodborne Microorganisms of Public Health Significance*, A.D. Hocking, Editor. 2003, Australian Institute of food Science and Technology, Inc.: Sydney, NSW. p. 479-504.
- [16]Garcia, S., et al., Microbiological survey of retail herbs and spices from Mexican markets. *Journal of food Protection*, 2001. **64** (1): p. 99-103.
- [17]European Food Safety Authority. (2004). *Trans fatty acids: EFSA panel reviews dietary intakes and health effects*. Retrieved November 25, 2005 from: [http://www.efsa.eu.int/press\\_room/press\\_release/593\\_en.html](http://www.efsa.eu.int/press_room/press_release/593_en.html)
- [18]Stender, S. & Dyerberg, J. (2003). *The influence of trans fatty acids on health* (4<sup>th</sup> Ed.) The Danish Nutrition Council.
- [19]Institute of Food Science and Technology Trust Fund. (2007). *Trans Fatty Acids (TFA)*. Retrieved March 10, 2008 from: <http://www.ifst.org/uploadedfiles/cms/store/ATTACHMENTS/tfas.pdf>
- [20]NACMCF (1999) Microbiological safety evaluations and recommendations on fresh produce. *Food Control* 10:117-143.
- [21]Grau, F.H. (2001). Meat and meat products. In: C. Moir, Editor in Chief, *Spoilage of Processed Foods: Causes and Diagnosis*. Australian Institute of Food Science and Technology (NSW Branch) Food Microbiology Group, Sydney, Australia.
- [22]NSW Food Authority (2009). Microbiological quality guide for ready-to-eat foods available at: [http://www.foodauthority.nsw.gov.au/Documents/science/microbiological\\_quality\\_guide\\_for RTE food.pdf](http://www.foodauthority.nsw.gov.au/Documents/science/microbiological_quality_guide_for RTE food.pdf)
- [23]From: <http://www.efsa.europa.eu/en/scdocs/scdoc/1503.htm>