



Government of Western Australia
Department of Health
Public Health

Survey of Egg Based Sauces and Salmonella

**In Small to Medium Food Businesses
April – August 2010**



Summary

The consumption of improperly handled uncooked or lightly cooked products containing eggs was linked to a significant number of cases of *Salmonella* infection in Western Australia since October 2009². OzFoodNet WA reported since 2009 that nine out of 19 outbreaks of foodborne or suspected foodborne disease were caused by *Salmonella* species, with eggs being the suspected cause of two of these outbreaks³. The outbreak investigations highlighted the need to conduct further research to evaluate whether products containing raw eggs present an increased risk of *Salmonella* contamination and if so, whether the preparation practices contribute to the cause of contamination.

A state-wide survey was co-ordinated by WA Health, Food Unit's Western Australian Food Monitoring Program and conducted by local government from April to August 2010. A total of 25 local government authorities assisted with the survey by collecting samples of egg based sauces and spreads made on-site from a range of food businesses. A questionnaire was also completed at each premises to collect information regarding food safety management, hygiene practices and details of the eggs being used, including quality, storage and source.

A total of 120 samples of egg based sauces including mayonnaise, aioli, hollandaise sauce and caesar dressing were collected from 81 food businesses which included restaurants, cafes, burger outlets, take-away outlets and lunch bars. The samples were submitted for Standard Plate Count (aerobic plate count), *E. coli*, Coagulase Positive Staphylococcus, *Salmonella*, *L. monocytogenes* and *Campylobacter* microbiological testing. In the absence of microbiological standards, the Food Standards Australia New Zealand (FSANZ) *Guidelines for the microbiological examination of ready-to-eat foods* were used to interpret the significance of the types and levels of micro-organisms.

The microbiological test results did not identify any pathogens, including *Salmonella* species, and the vast majority of results were satisfactory. Of the 720 test results 98.20% (n=707) were within the satisfactory category of the guidelines, indicating good microbiological quality. Of the remaining test results 0.97% (n=7) were within the marginal category indicating possible hygiene problems in the preparation of the food and 0.83% (n=6) were categorised as unsatisfactory, indicative of poor hygiene or food handling practices.

Of the completed questionnaires it was found that 84.0% of food businesses provided food safety and hygiene training to their staff, with over half (63.6%) the respondents providing training that included egg safety awareness and evidence that risks were being handled at the food receipt stage (63.0%). On the day of sampling the majority of food businesses did not have cracked or dirty eggs on the premises (85.2%) and excluding the questionnaires with an 'unknown' response, 84.3% of food businesses stored their eggs under refrigeration.

The findings of this survey did not provide sufficient evidence to indicate that the production by small to medium food businesses of products containing raw eggs are a significant source of *Salmonella* contamination. However, it may be considered that *Salmonella* species are more prevalent during the warmer months of the year. Further investigation is recommended to assess whether the increase in ambient temperature and manufacturing activity associated with the period December to April, will have an effect on the level of *Salmonella* contamination of egg based sauces prepared on-site by food businesses.

It is recommended that:

1. This survey is repeated during March to early April 2011.
2. The Food Industry and Enforcement Officers continue to refer to the *Food Unit Notice 10.01* for advice pertaining to the safe handling of eggs and products containing eggs.



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- City of Stirling
- City of Subiaco
- City of Swan
- Shire of Broome
- Shire of Busselton
- Shire of Derby/West Kimberley
- Shire of Irwin
- Shire of Kalamunda
- Shire of Mundaring
- Shire of Roebourne
- Town of Claremont
- Town of Cottesloe
- Town of East Fremantle
- Town of Port Hedland
- Town of Victoria Park
- Town of Vincent

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1. Introduction

The latest national annual report by OzFoodNet stated that during 2008 foodborne outbreaks affected 1,454 persons including 96 hospitalisations and 11 deaths reported during these outbreaks¹. It was also reported that for these foodborne outbreaks, *Salmonella* was the most common aetiological agent, with 20 of these foodborne outbreaks related to the consumption of eggs, the majority (n=18) of these outbreaks due to various phage types of *Salmonella* Typhimurium¹.

In 2009, OzFoodNet WA reported there were two significantly large foodborne outbreaks in Western Australia caused by *S. Typhimurium*³. Investigations by WA Health Food Unit in conjunction with OzFoodNet WA and local government determined that a significant number of cases of *Salmonella* infection in Western Australia since October 2009, could be linked to the consumption of improperly handled uncooked or lightly cooked products containing eggs².

The outbreak investigations highlighted the need for accurate information about the practices and prevalence of on-site production of egg based sauces by food businesses to facilitate a greater understanding of the food safety risk. This survey aims to produce robust data on the microbiological quality of egg based sauces and spreads containing pasteurised and unpasteurised eggs. The information and data collected will be used to evaluate whether products containing raw eggs are a significant source of *Salmonella* contamination and whether preparation practices increase the risk for the sale of unsafe food.

2. Method

Sauces and spreads made on-site with egg as an ingredient were collected from various small to medium food businesses including restaurants, cafes, burger bars, take-away outlets and lunch bars throughout Western Australia by participating local government Environmental Health Officers. The sauces and spreads included mayonnaise, aioli, hollandaise sauce and caesar dressing. A questionnaire (see appendix 1) was also conducted at each food business to gather information pertaining to food safety management, hygiene practices, details of the eggs being used including quality, storage and source.

A minimum of 100mL/100g of the sauce or spread was submitted to PathWest Laboratory for Standard Plate Count (Aerobic Plate Count), *E. coli*, Coagulase Positive Staphylococcus, *Salmonella*, *L. monocytogenes* and *Campylobacter* microbiological testing.

3. Results

Microbiological Results

A total of 120 samples of egg based sauces were collected from 81 food businesses, with 720 microbiological test results assessed against levels provided in Table 1 of the FSANZ Guidelines for the microbiological examination of ready-to-eat foods⁴. These guidelines provide assistance in the interpretation of microbiological analyses of foods where no other microbiological criteria exist, and provide follow-up actions appropriate to each category of microbiological quality (see appendix 2 for a complete copy of Table 1 of FSANZ guidelines and appendix 4 for a complete list of the microbiological test results). Table 1 below lists the tests and guidelines applicable to this survey.

Table 1: FSANZ ‘Guidelines for the microbiological examination of ready-to-eat foods’

| Test | Satisfactory | Marginal | Unsatisfactory | Potentially Hazardous |
|--------------------------------|---------------------|-----------------------------------|-----------------------------------|--|
| Standard Plate Count (Level 2) | < 10 ⁶ | < 10 ⁷ | ≥ 10 ⁷ | - |
| Indicators | | | | |
| <i>E. coli</i> | < 3 | 3 - 100 | ≥ 100 | Pathogenic strains of <i>E. coli</i> should be absent. |
| Pathogens | | | | |
| Coagulase +ve staph | < 10 ² | 10 ² - 10 ³ | 10 ³ - 10 ⁴ | ≥ 10 ⁴ SET +ve |
| <i>Campylobacter</i> spp | Not detected in 25g | - | - | Detected |
| Salmonella spp | Not detected in 25g | - | - | Detected |
| <i>L. monocytogenes</i> | Not detected in 25g | Detected but < 10 ² | - | ≥ 10 ² |

Chart 1 provides a summary of outcomes of the 720 test results showing 98.20% (n=707) were within the satisfactory category, indicating good microbiological quality. Of the remaining test results 0.97% (n=7) were within the marginal category indicating possible hygiene problems in the preparation of the food and 0.83% (n=6) were categorised as unsatisfactory, indicative of poor hygiene or food handling practices.



Chart 1: Summary of 720 microbiological test results

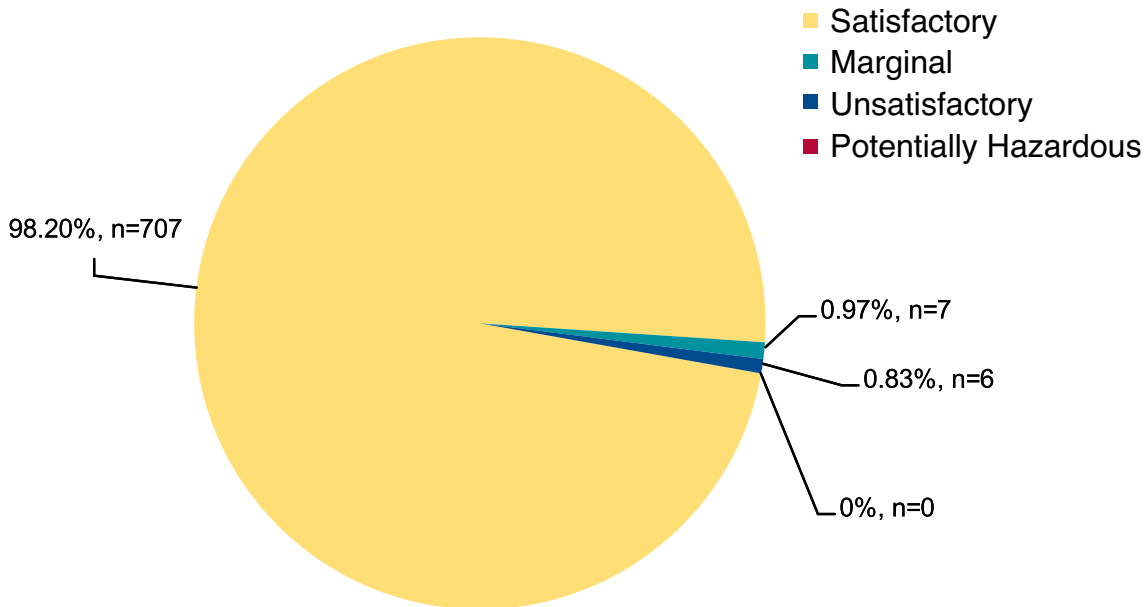


Table 2 below and Chart 2 provides a summary of outcomes of the 120 samples of egg based sauces. Overall, pathogens Coagulase positive staphylococcus, *Campylobacter*, *Salmonella* and *L. monocytogenes* were not detected. Results for the indicator organism *E. coli* identified five samples (4.2%) with marginal results and the remaining 115 samples (95.8%) as satisfactory. Test results for Standard plate counts identified six samples (5%) with unsatisfactory levels, two samples (1.7%) with marginal levels and the remaining 112 samples (93.3%) as satisfactory.

Table 2: Summary of microbiological test results of 120 samples of egg based sauces

| Test | Satisfactory | Marginal | Unsatisfactory | Potentially Hazardous |
|--------------------------------|---------------|------------|----------------|-----------------------|
| Standard Plate Count (Level 2) | 93.3% (n=112) | 1.7% (n=2) | 5% (n=6) | - |
| <i>E. coli</i> | 95.8% (n=115) | 4.2% (n=5) | - | - |
| Coagulase +ve staph | 100% | - | - | - |
| <i>Campylobacter</i> spp | 100% | - | - | - |
| <i>Salmonella</i> spp | 100% | - | - | - |
| <i>L. monocytogenes</i> | 100% | - | - | - |

Chart 2: Summary of microbiological test results of 120 samples of egg based sauces

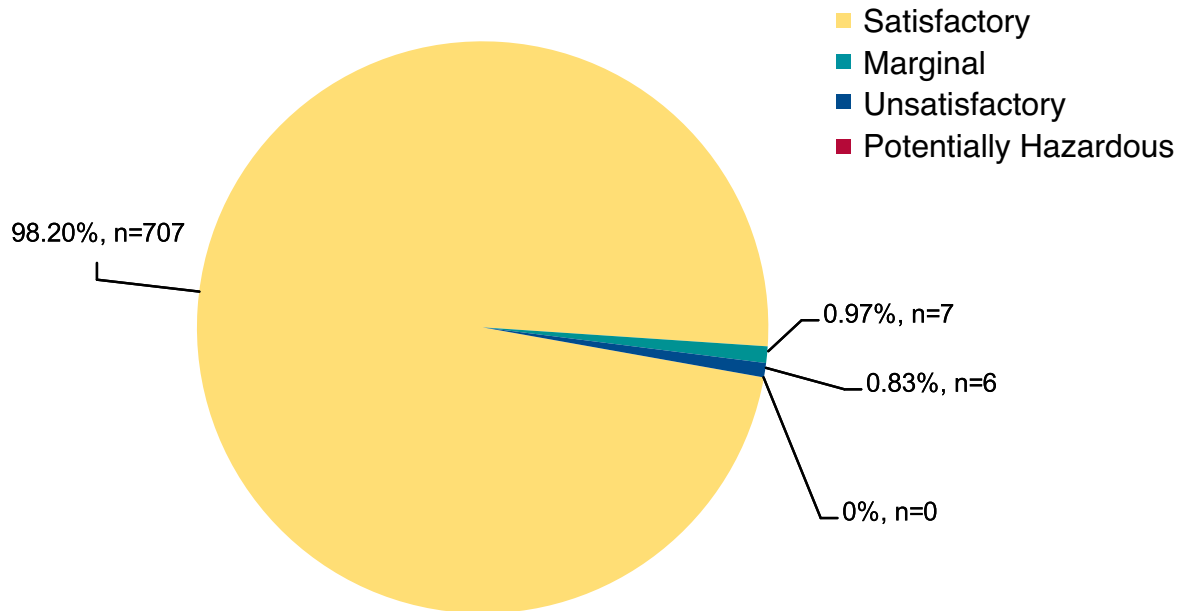


Table 3 lists the samples with test results exceeding the satisfactory category and the number of micro-organisms detected in each sample. Of the samples with test results falling outside the satisfactory category, there was no apparent correlation between the premises food safety management and hygiene practices and the test results.

Table 3: List of samples exceeding the satisfactory category

| Test | Marginal | Sample | CFU/g | Unsatifactory | Sample | CFU/g |
|--------------------------------|------------|-----------------------|-----------|---------------|-----------------|-------------|
| Standard Plate Count (Level 2) | 1.7% (n=2) | Caesar dressing | 2,400,000 | 5% (n=6) | Aioli | > 3,000,000 |
| | | Tuna dressing | 2,100,000 | | Caesar dressing | > 3,000,000 |
| | | | | | Tartare sauce | > 3,000,000 |
| | | | | | Aioli | > 3,000,000 |
| | | | | | Aioli | > 3,000,000 |
| | | | | | Caesar dressing | > 3,000,000 |
| <i>E. coli</i> | 4.2% (n=5) | Caesar dressing | 64 | | | |
| | | Hollandaise | 17 | | | |
| | | Caesar dressing | 7 | | | |
| | | White chocolate mouse | 7 | | | |
| | | Aioli | 4 | | | |

Questionnaire Results

Table 4 below provides the summary of answers documented at 81 food businesses. Over half the establishments (69.1%, n=56) did not have a written food safety management system however, a significant number of food businesses (84.0%, n=68) provided training for staff to learn food safety and hygiene procedures. Of the questionnaires with a response 63.6% of food businesses provided training that included egg safety awareness. Answers pertaining to hygiene practices and egg safety revealed a significant number of food businesses were able to provide evidence of good hygiene practices and egg safety awareness. Of the food businesses that were able to be assessed at the time of visit (n=61) a total of 91.8% (n=56) of food handlers washed and dried hands after handling potentially hazardous foods, 92.5% (n=74) had appropriate hand washing facilities and 97.0% (n=66) had appropriate cleaning and sanitising practices. Of the food businesses that were able to be assessed at the time of visit 92.0% (n=69) did not have cracked or dirty eggs on the premises, 84.3% (n=43) refrigerated their eggs and for the questionnaires with a response (n=90), 96.7% of food businesses (n=87) rotated their stored eggs.

Table 4: Questionnaire answers from 81 food businesses

| Food Safety Management | Yes | No | Other | No Answer |
|---|---------------------|---------------------|---|------------|
| 1. Is there a written food safety management system | 30.9% (25) | 69.1% (56) | - | - |
| 2. Is training provided for staff to learn food safety procedures/hygienic practices? | 84.0% (68) | 12.3% (10) | 3.7% (3) | - |
| 2a. Does it include egg safety awareness? (Including all questionnaires) (Excluding questionnaires with no answer) | 51.5% (35) 63.6% | 29.4% (20) 36.4% | - | 19.1% (13) |
| 3. Is there a documented procedure in place that assists managing the risks of potentially hazardous foods? | 28.4% (23) | 67.9% (55) | 3.7% (3) | - |
| 4. Is there evidence that demonstrates risks are being managed at the food receipt stage? ie. delivery records, documented procedure in place to accept or reject goods.(Including all questionnaires) (Excluding questionnaires with other/no answer) | 56.8% (46) 63.0% | 33.3% (27) 37.0% | 7.4% (6) | 2.5% (2) |
| Hygiene Practices | Yes | No | Not possible to assess at time of visit | |
| 5. Is there evidence that staff wash and dry hands after handling potentially hazardous foods? (Including all questionnaires) (Excluding responses not possible to assess) | 69.1% (56) 91.8% | 6.2% (5) 8.2% | 24.7% (20) | |
| 6. On the day of sampling were appropriate hand washing facilities available & accessible for use? (Including all questionnaires) (Excluding questionnaires with other/no answer) | 91.4% (74) 92.5% | 7.4% (6) 7.5% | 1.2% (1) | |
| 7. Is there evidence that appropriate cleaning and sanitising practices are being performed? (Including all questionnaires) (Excluding responses not possible to assess) | 81.5% (66) 97.0% | 2.5% (2) 2.9% | 16.0% (13) | |
| 8. Are there appropriate food preparation areas for the safe production of potentially hazardous foods? (ie. sufficient space/designated areas) (Including all questionnaires) (Excluding responses not possible to assess) | 95.1% (77) 97.5% | 2.5% (2) 2.5% | 2.4% (2) | |


| | | | | | | |
|--|---------------------|----------------------|------------------|------------------|------------------|------------|
| 9. Is there evidence of cracked or dirty eggs on the premises? (Including all questionnaires) (Excluding responses not possible to assess) | 7.4% (6) 8.0% | 85.2% (69) 92.0% | 7.4% (6) | | | |
| Egg Details (from 120 samples) | Pasteurised | Unpasteurised | Unknown | | | |
| 15. The eggs used to make the product are – (Including all questionnaires) (Excluding questionnaires with answer unknown) | 10.8% (13) 15.9% | 57.5% (69) 84.1% | 31.7% (38) | | | |
| | Room Temp. | Refrigerated | Unknown | | | |
| 21. The eggs are stored – (Including all questionnaires) (Excluding questionnaires with answer unknown) | 6.7% (8) 15.7% | 68.3% (43) 84.3% | 25.0% (30) | | | |
| | Daily | Weekly | Fortnightly | Monthly | No Rotation | No Answer |
| 22. The stored eggs are rotated – (Including all questionnaires) (Excluding questionnaires with answer unknown) | 21.7% (26) 28.9% | 43.3% (52) 57.8% | 4.2% (5) 5.6% | 3.3% (4) 4.4% | 2.5% (3) 3.3% | 25.0% (30) |

4. Discussion

The microbiological test results of this survey did not reveal significant concerns for *Salmonella* contamination of egg based sauces using raw eggs as an ingredient. Over 90% of the test results were within satisfactory guidelines provided by the FSANZ *Guidelines for the microbiological examination of ready-to-eat foods*. Overall, information gathered from the questionnaire answers did not reveal significant concerns for Salmonella contamination of egg based products produced on-site by small to medium food businesses, as a result of poor food hygiene and handling practices. Over 80% of food businesses provided food safety training to staff and did not have evidence of cracked or dirty eggs on the premises. Of the samples with test results exceeding the satisfactory category, there was no apparent correlation between the premises food safety management and hygiene practices and the test results.

The information gathered for this survey provides an indication of the level of food safety awareness of food businesses including egg safety. It was found that 69.1% of food businesses did not have a written food safety management system however, it should be noted that it is only a legislative requirement for certain high risk food businesses. A significant 84.0% of food businesses provided training for staff to learn food safety procedures and hygiene practices and, for the questionnaires with a response, 63.6% of food businesses provided training that included egg safety awareness and 63.0% were able to provide evidence or demonstrate that risks are being managed at the food receipt stage.

Following the outbreaks that were linked to the consumption of eggs in late 2009, WA Health Food Unit released a *Food Unit Notice 10.01* (see appendix 3) to provide advice to the food industry and enforcement agencies about the safe handling of eggs and products containing eggs. This notice recommended that food businesses use commercially prepared mayonnaise or pasteurised egg to manufacture their egg product. It was also advised that if a food business wished to manufacture products that contain unpasteurised eggs, then the associated risks must be properly identified and



managed with a suitable processing treatment implemented. This advice follows the requirements of Chapter 3 of the Australia New Zealand Food Standards Code which places responsibility on food businesses to manage their food safety risks, with *Standard 3.2.2 – Food Safety Practices and General Requirements* setting out specific requirements for food businesses and food handlers to ensure that food does not become unsafe or unsuitable.

This survey revealed that 57.5% of samples contained unpasteurised eggs, 10.8% (n=13) contained pasteurised eggs and 31.7% (n=38) were unknown. Of the questionnaires with a yes or no response 92.0% of food businesses did not have cracked or dirty eggs, 96.7% rotated their eggs and 84.3% (n=43) refrigerated their eggs.

Although the findings of this survey did not provide sufficient evidence to indicate that products containing raw eggs pose a greater risk of *Salmonella* contamination, the outbreaks of late 2009 prompt a need to further investigate whether some strains of *Salmonella* species are more prevalent during the warmer months of the year (December to April).

Foods generally consumed during the warmer months can include salads, burgers and fish and chips, which are often accompanied with an egg based sauce or mayonnaise. In addition increased production rates and higher ambient temperatures at this time of year could increase the risk for temperature control management issues during food production in small to medium food businesses.

5. Conclusion

A total of 120 samples of egg based sauces were collected from 81 food businesses, with 720 microbiological test results assessed against guideline levels provided in Table 1 of FSANZ Guidelines for the microbiological examination of ready-to-eat foods. The information and data collected did not provide sufficient evidence to indicate that the production by small to medium food businesses of products containing raw eggs are a significant source of *Salmonella* contamination.

6. Recommendations

This report recommends that:

1. This survey is repeated during March to early April 2011.
2. The food industry and enforcement officers continue to refer to *Food Unit Notice 10.01* for advice pertaining to the safe handling of eggs and products containing eggs.

7. References

1. Communicable Diseases Intelligence Vol 33 No 4, 2009. *Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: Annual report of the OzFoodNet Network, 2008*. Retrieved 8 February 2011 from <http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi3204c.htm>
2. Department of Health Western Australia, 2010. *Food Unit Notice 10.01*.
3. WA Health Communicable Disease Control Directorate, 2010. *OzFoodNet – Enhancing foodborne disease surveillance across Australia Annual Report 2009 Western Australia*. Retrieved 8 February 2011 from <http://www.public.health.wa.gov.au/cproot/3562/2/WA%20OzFoodNet%20Annual%20Report%202009%20Final%20Dec%202010.pdf>
4. Food Standards Australia New Zealand, 2001. Guidelines for microbiological examination of ready-to-eat foods. Retrieved 10 January 2011 from <http://www.foodstandards.gov.au/scienceandeducation/publications/guidelinesformicrobi1306.cfm>

Appendix 1 – Western Australian Food Monitoring Program

Survey Questionnaire 2010

TITLE: Survey of Egg Based Sauces and Salmonella

| | | | | |
|------------------|---------------|-------|----------------|-------------------|
| Local Authority: | Officer Name: | Date: | Premises Name: | Premises Address: |
|------------------|---------------|-------|----------------|-------------------|

| | |
|---|---|
| <p>Food Safety Management:</p> <p>1. Is there a written food safety management system? <input type="checkbox"/> Yes (specify) _____ <input type="checkbox"/> No</p> <p>2. Is training provided for staff to learn food safety procedures/hygienic practices? <input type="checkbox"/> Yes - Does it include egg safety awareness? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> Other (specify) _____</p> <p>3. Is there a documented procedure in place that assists managing the risks of potentially hazardous foods? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other (specify) _____</p> <p>4. Is there evidence that demonstrates risks are being managed at the food receipt stage? (ie. delivery records, documented procedure in place to accept or reject goods) <input type="checkbox"/> Yes (specify) _____ <input type="checkbox"/> No <input type="checkbox"/> Other (specify) _____</p> | <p>Hygiene Practices:</p> <p>5. Is there evidence that staff wash & dry hands after handling potentially hazardous foods? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not possible to assess at time of visit</p> <p>6. On the day of sampling were appropriate hand washing facilities available & accessible for use? (ie. does it comply with standard 3.2.2, clause 17 of the Food Standards Code1) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not possible to assess at time of visit</p> <p>7. Is there evidence that appropriate cleaning & sanitising practices are being performed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not possible to assess at time of visit</p> <p>8. Are there appropriate food preparation areas for the safe production of potentially hazardous foods? (ie. sufficient space / designated areas) Yes No Not possible to assess at time of visit <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not possible to assess at time of visit</p> <p>9. Is there evidence of cracked or dirty eggs on the premises? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not possible to assess at time of visit</p> |
|---|---|

¹ See page 2 for copy of Standard 3.2.2 Clause 17 – Hygiene of food handlers — duties of food businesses

| | | |
|--|--|--|
| <p>Sample No:</p> <div style="border: 1px solid black; width: 100px; height: 40px; margin: 5px 0;"></div> | <p>Product Details:</p> <p>10. Product name _____</p> <p>11. Production date _____</p> <p>12. Volume of production date _____</p> <p>13. The final product contains eggs that are - <input type="checkbox"/> Raw <input type="checkbox"/> Lightly cooked <input type="checkbox"/> Other (specify) _____</p> <p>14. The product is - <input type="checkbox"/> Served immediately (at room temperature) <input type="checkbox"/> Stored for later use (refrigerated) <input type="checkbox"/> Other (specify) _____</p> | <p>Egg Details:</p> <p>15. The eggs used to make the product are <input type="checkbox"/> Pasteurised <input type="checkbox"/> Unpasteurised</p> <p>16. Batch no(s) _____ Use-by date(s) _____</p> <p>17. Eggs are purchased <input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Other (specify) _____</p> <p>18. Volume of egg purchase _____</p> <p>19. Eggs are purchased <input type="checkbox"/> Direct <input type="checkbox"/> Delivered</p> <p>20. Name of egg supplier(s) _____</p> <p>21. The eggs are stored <input type="checkbox"/> Room temperature <input type="checkbox"/> Refrigerated</p> <p>22. The stored eggs are rotated - <input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> No stock rotation <input type="checkbox"/> Other (specify) _____</p> |
|--|--|--|

¹ Food Standards Code: Standard 3.2.2 Clause 17 – Hygiene of food handlers — duties of food businesses

- (1) Subject to subclause (2), a food business must, for each food premises –
 - (a) maintain easily accessible hand washing facilities;
 - (b) maintain, at or near each hand washing facility, a supply of –
 - (i) warm running water; and
 - (ii) soap; or
 - (iii) other items that may be used to thoroughly clean hands;
 - (c) ensure hand washing facilities are only used for the washing of hands, arms and face; and
 - (d) provide, at or near each hand washing facility –
 - (i) single use towels or other means of effectively drying hands that are not likely to transfer pathogenic micro-organisms to the hands; and
 - (ii) a container for used towels, if needed.
- (2) Paragraph (1)(c) does not apply in relation to hand washing facilities at food premises that are used principally as a private dwelling if the proprietor of the food business has the approval in writing of the appropriate enforcement agency.
- (3) With the approval in writing of the appropriate enforcement agency, a food business that operates from temporary food premises does not have to comply with any of the requirements of paragraphs (1)(b)(i) or (1)(d) that are specified in the written approval.



Appendix 2 – Guidelines for the microbiological examination of ready-to-eat foods (December 2001)

Introduction

Samples collected for surveillance and monitoring purposes are often multi-component products for which there are no microbiological standards or guidelines. Interpreting the significance of the types and levels of microorganisms reported when these foods are tested may therefore be difficult. The purpose of this document is to provide assistance in the interpretation of microbiological analyses of foods where no other microbiological criteria exist.

These guidelines identify four categories of microbiological quality for ready-to-eat foods ranging from satisfactory to potentially hazardous. This reflects both the high level of microbiological quality that is achievable for ready-to-eat foods in Australia and New Zealand and indicates the level of contamination that is considered to present a significant risk to public health. Follow-up actions appropriate to each category of microbiological quality are also recommended.

The guidelines for the microbiological examination of ready-to-eat foods apply to foods sampled at the point of sale or distribution to consumers.

Ready-to-eat foods

Ready-to-eat food is food that is ordinarily consumed in the same state as that in which it is sold or distributed and does not include nuts in the shell and whole, raw fruits and vegetables that are intended for hulling, peeling or washing by the consumer.

Sampling

These guidelines provide quantitative levels of microbiological quality but do not provide sampling plans for the acceptance/rejection of sample lots.

Food samples may be submitted for laboratory analysis for a number of reasons and may be limited in size and number. While these guidelines will allow an assessment of the microbiological quality of a single sample of ready-to-eat food to be made, the results may not be representative of the lot from which it is derived, unless the sample has been individually prepared. Further samples may be required if an assessment as to the microbiological status of the lot is needed.

The statistical validity of a microbiological examination increases with the number of field samples analysed. For regulatory purposes, a minimum of 5 sample units from a lot is generally specified for examination. The size of the samples taken should also be adequate to enable appropriate microbiological analyses to be undertaken. A minimum sample size of 100g or ml is commonly required.

A lot is defined as a quantity of food or food units produced and handled under uniform conditions. This may be restricted to a food item produced from a particular production line or piece of equipment within a certain time period (not exceeding 24 hours).

Food examination

The microbiological testing of ready-to-eat foods should be appropriate to the type of food sample being examined and to the processing it has received. Not all the organisms listed in Table 1 are equally applicable to all food groups, nor should all the organisms listed be tested for routinely. Interpretation of results should also be based on knowledge of the product components and the production process. The significance of the microbiological tests that may be conducted is discussed below.

Standard Plate Count

The standard plate count (SPC), also referred to as the aerobic plate count or the total viable count, is one of the most common tests applied to indicate the microbiological quality of food. The significance of SPCs, however, varies markedly according to the type of food product and the processing it has received. When SPC testing is applied on a regular basis it can be a useful means of observing trends by comparing SPC results over time. Three levels of SPC are listed in Table 1 based on food type and the processing/handling the food has undergone.

Level 1 applies to ready-to-eat foods in which all components of the food have been cooked in the manufacturing process/preparation of the final food product and, as such, microbial counts should be low.

Level 2 applies to ready-to-eat foods which contain some components that have been cooked and then further handled (stored, sliced or mixed) prior to preparation of the final food or where no cooking process has been used.

Level 3 SPCs not applicable. This applies to foods such as fresh fruits and vegetables (including salad vegetables), fermented foods and foods incorporating these (such as sandwiches and filled rolls). It would be expected that these foods would have an inherent high plate count because of the normal microbial flora present. Note: An examination of the microbiological quality of a food should not be based on SPCs alone. The significance of high (unsatisfactory) SPCs cannot truly be made without identifying the microorganisms that predominate or without other microbiological testing.

Indicators

Enterobacteriaceae

The family *Enterobacteriaceae* includes many bacteria that are found in the human or animal intestinal tract, including human pathogens such as *Salmonella* and *Shigella*. *Enterobacteriaceae* are useful indicators of hygiene and of post-processing contamination of heat processed foods. Their presence in high numbers ($>10^4$ per gram) in ready-to-eat foods indicates that an unacceptable level of contamination has occurred or there has been underprocessing (e.g. inadequate cooking). Testing for *Enterobacteriaceae* is not applicable to fresh fruits and vegetables or foods containing these.



Escherichia coli

The presence of *E. coli* in ready-to-eat foods is undesirable because it indicates poor hygienic conditions which have led to contamination or inadequate heat treatment. Ideally *E. coli* should not be detected and as such a level of <3 per gram (the limit of the Most Probable Number test) has been given as the satisfactory criteria for this organism. Levels exceeding 100 per gram are unacceptable and indicate a level of contamination which may have introduced pathogens or that pathogens, if present in the food prior to processing, may have survived.

Pathogens

Coagulase-positive staphylococci

Contamination of ready-to-eat foods with coagulase-positive staphylococci is largely as a result of human contact. Contamination should be minimised through good food handling practices and growth of the organism prevented through adequate temperature controls. Unsatisfactory levels of coagulase-positive staphylococci indicate that time/temperature abuse of a food is likely to have occurred following improper handling during food preparation. A test for enterotoxin, SET, may be appropriate where levels of coagulase positive staphylococci exceed 10^3 cfu per gram or where poor handling practices are suspected but it is likely that viable organisms may no longer be present in significant numbers. Levels of $\geq 10^4$ cfu are considered as potentially hazardous as foods with this level of contamination may result in food borne illness if consumed.

Clostridium perfringens

Unsatisfactory levels of *C. perfringens* generally occur as a result of temperature abuse where cooked foods are held at warm temperatures (<60 °C, particularly room temperature) for extended periods of time or cooled (to 5 °C or below) too slowly. Foods associated with foodborne illness caused by *C. perfringens* include joints of meat (especially large and rolled joints) and meat and vegetable dishes such as stews and pies. The detection of high levels ($>10^3$ cfu per gram) of *C. perfringens* should result in an investigation of the food handling controls used by the food business. Levels of $\geq 10^4$ cfu per gram are considered as potentially hazardous as consumption of foods with this level of contamination may result in food borne illness.

Bacillus cereus and other Bacillus spp

An unsatisfactory level of *B. cereus* in cooked foods generally occurs as a result of inadequate temperature control. As for *C. perfringens*, cooked foods should be held at or above 60°C or at or below 5°C to prevent growth, or held outside this temperature range for a limited time. Foods associated with *B. cereus* food poisoning include cooked rice dishes, other cereal based foods such as pasta/noodles, dairy based deserts and meat or vegetable dishes incorporating spices. The detection of high levels ($>10^3$ cfu per gram) of *B. cereus* should result in an investigation of the food handling controls used by the food business. Levels of $\geq 10^4$ cfu per gram are considered potentially hazardous as consumption foods with this level of contamination may result in food borne illness. Other *Bacillus* species, such as *B. subtilis* and *B. licheniformis*, have also been associated with food borne illness and may also be tested for.

Vibrio parahaemolyticus

Testing for *V. parahaemolyticus* is relevant to seafoods only. High levels of *V. parahaemolyticus* ($>10^2$ per gram) in cooked seafoods indicates that the food has been inadequately cooked or cross-contaminated after cooking with subsequent time/ temperature abuse and should result in an investigation of the food handling controls used by the food business. Higher levels (up to 10^2 per gram) of *V. parahaemolyticus* in raw seafoods may be expected because of natural contamination from the aquatic environment, however levels from 10^3 to 10^4 per gram in raw seafoods would indicate inadequate temperature controls since harvesting and should be considered as unsatisfactory. The potentially hazardous level of *V. parahaemolyticus* relates to Kanagawa-positive strains. Levels of *V. parahaemolyticus* of $\geq 10^4$ cfu per gram are considered potentially hazardous as consumption of the food may result in food borne illness (relates to Kanagawa-positive strains).

Campylobacter

Campylobacter should not be present in ready-to-eat foods as consumption of food containing this pathogen may result in food borne illness. The detection of *Campylobacter* indicates poor food handling controls, particularly cross contamination (especially where raw poultry is handled) or inadequate cooking (e.g. raw or undercooked meat and poultry). The use of raw milk or of contaminated water may be alternative sources of *Campylobacter* that should be considered.

Salmonella

Ready-to-eat foods should be free of *Salmonella* as consumption of food containing this pathogen may result in food borne illness. The presence of this organism indicates poor food preparation and handling practices such as inadequate cooking or cross contamination. Consideration may also be given to investigating the health status of food handlers on the premises who may have been suffering from salmonellosis or asymptomatic carriers of the organism.

Listeria monocytogenes

Listeria monocytogenes is widespread in the environment and can be isolated from a wide variety of foods. Its detection in ready-to-eat foods which have not undergone a listericidal treatment, therefore, does not immediately indicate a problem with food practices within the food establishment. Higher levels of *L. monocytogenes* (10^2 cfu per gram), however, do indicate a failure with food handling controls and based on current epidemiological evidence are considered a public health risk. Foods in which all components have been cooked in the final food preparation, or have received some other listericidal treatment, should be *Listeria* free. The detection of *L. monocytogenes* in such foods indicates the food was inadequately cooked or the food was contaminated post preparation. Additionally, the detection of *L. monocytogenes* in foods which have been prepared specifically for at risk population groups such as the elderly, immunocompromised and infants should be considered as potentially hazardous.

Categories of microbiological quality

Four categories of microbiological quality have been assigned based on standard plate counts, levels of indicator organisms and the number or presence of pathogens. These are satisfactory, marginal, unsatisfactory and potentially hazardous.

Satisfactory – results indicate good microbiological quality. No action required.



Marginal – results are borderline in that they are within limits of acceptable microbiological quality but may indicate possible hygiene problems in the preparation of the food. Action: Re-sampling may be appropriate. Premises that regularly yield borderline results should have their food handling controls investigated.

Unsatisfactory – results are outside of acceptable microbiological limits and are indicative of poor hygiene or food handling practices. Action: Further sampling, including the sampling of other foods from the food premise may be required and an investigation undertaken to determine whether food handling controls and hygiene practices are adequate.

Potentially Hazardous – the levels in this range may cause food borne illness and immediate remedial action should be initiated. Action: Consideration should be given to the withdrawal of any of the food still available for sale or distribution and, if applicable, recall action may be indicated. An investigation of food production or handling practices should be instigated to determine the source/ cause of the problem so that remedial actions can commence.

Table 1. Guideline levels for determining the microbiological quality of ready-to-eat foodsSatisfactory = **S**; Marginal = **M**; Unsatisfactory = **US**; Potentially Hazardous = **PH****Microbiological Quality (CFU per gram)**

| Test | S | M | US | PH |
|---|---------------------|----------------------------------|--|--|
| Standard Plate Count | | | | |
| Level 1 | < 10 ⁴ | < 10 ⁵ | Greater than or equal to 10 ⁵ | |
| Level 2 | < 10 ⁶ | < 10 ⁷ | Greater than or equal to 10 ⁷ | |
| Level 3 | N/A | N/A | N/A | |
| Indicators | | | | |
| <i>Enterobacteriaceae</i> * | < 10 ² | 10 ² -10 ⁴ | Greater than or equal to 10 ⁴ | |
| <i>Escherichia coli</i> | < 3 | 3 - 100 | Greater than or equal to 100 | ** |
| Pathogens | | | | |
| Coagulase +ve staphylococci | <10 ² | 10 ² -10 ³ | 10 ³ -10 ⁴ | Greater than or equal to 10 ⁴ SET +ve |
| <i>Clostridium perfringens</i> | <10 ² | 10 ² -10 ³ | 10 ³ -10 ⁴ | Greater than or equal to 10 ⁴ |
| <i>Bacillus cereus</i> and other pathogenic <i>Bacillus</i> spp | <10 ² | 10 ² -10 ³ | 10 ³ -10 ⁴ | Greater than or equal to 10 ⁴ |
| <i>Vibrio parahaemolyticus</i> # | <3 | <3 -10 ² | 10 ² -10 ⁴ | Greater than or equal to 10 ⁴ |
| <i>Campylobacter</i> spp | not detected in 25g | - | - | detected |
| <i>Salmonella</i> spp | not detected in 25g | - | - | detected |
| <i>Listeria monocytogenes</i> | not detected in 25g | detected but <10 ² ++ | - | Greater than or equal to 10 ² ## |

* Enterobacteriaceae testing is not applicable to fresh fruits and vegetables or foods containing these.

** Pathogenic strains of *E. coli* should be absent.# *V. parahaemolyticus* should not be present in seafood that have been cooked. For ready-to-eat seafood that are raw, a higher satisfactory level may be applied (<10² cfu/g)The potentially hazardous level of *V. parahaemolyticus* relates to Kanagawa-positive strains.++ Foods with a long shelf life stored under refrigeration should have no *L. monocytogenes* detected in 25g.## The detection of *L. monocytogenes* in ready-to-eat foods prepared specifically for 'at risk' population groups (the elderly, immunocompromised and infants) should also be considered as potentially hazardous.

N/A - SPC testing not applicable. This applies to foods such as fresh fruits and vegetables (including salad vegetables), fermented foods and foods incorporating these (such as sandwiches and filled rolls)



Appendix 3 – Department of Health Food Unit Notice 10.01

Subject: Safe Handling of Eggs and Products Containing Eggs

Notice Number: 10.01

Date of Issue: 25/02/2010

Distribution of Notice:

Food industry and Food Act 2008 enforcement agencies.

Purpose:

To ensure food businesses are aware of the need to manage the risks involved in the production of eggs and products containing eggs.

Actions:

The Department of Health recommends that food businesses:

- Use commercially prepared mayonnaise, aioli or similar sauces that contain egg products; or
- Use pasteurised egg products to manufacture these products.

Pasteurised egg products including egg yolks, liquid egg whites and liquid whole eggs are readily available in Western Australia.

If a food business wishes to manufacture products that contain unpasteurised eggs, then the associated risks must be properly identified and managed and a suitable processing treatment implemented.

Background:

The Department of Health confirms that a number of cases of Salmonella infection in Western Australia since October 2009 have been linked to the consumption of improperly handled uncooked or lightly cooked egg products. Investigations by local government Environmental Health Officers and the Department of Health Food Unit have highlighted the need for consumers and food businesses to properly understand and manage the risks associated with the use and production of egg products.

Products containing raw or lightly cooked eggs

Several products may contain raw or lightly cooked eggs which include:

- homemade mayonnaise and dressings
- egg butter
- béarnaise and hollandaise sauces
- milkshakes/eggflips
- ice cream
- mousses, tiramisu and other desserts containing raw egg.

A food business must ensure that food products containing egg either:

- re prepared using pasteurised egg products; or
- implement procedures that ensure the microbial safety of the product.

Cross contamination considerations

WHEN STORING AND HANDLING EGGS, FOOD BUSINESSES MUST TAKE THE SAME PRECAUTIONS AS WHEN HANDLING AND PREPARING OTHER PRIMARY PRODUCTS SUCH AS RAW CHICKEN, MEAT, SEAFOOD AND SALAD INGREDIENTS.

As with other products from animal origins, eggs come into contact with faecal matter and therefore low levels of bacteria including salmonella may be present. It is estimated however, that the proportion of contaminated eggs in the food supply is low. Cracked and dirty eggs are more likely to contain bacteria associated with food borne illness.

For these reasons it is important to correctly store and handle eggs and egg products by:

- Ensuring food handlers wash hands before and after handling eggs
- Storing eggs at 5°C (and never at temperatures over 15°C)
- Only using clean and uncracked eggs which are within their date coding
- Keeping separate from ready to eat food
- Minimising contact between the internal components of an egg and it's external surfaces
- Storing eggs in their original packaging. The packaging ensures that traceability and shelf life information remains with the product.


Risk management

To minimise the risks involved, food businesses should ensure that:

- Customers are able to be informed of whether a product contains raw or lightly cooked eggs so that they can make an informed decision about whether to consume the product
- Any food product manufactured using raw egg is disposed of if it has not been used within 24 hours
- Products containing egg are stored below 5°C at all times or if this is not practical (i.e. during food preparation), use alternative control methods such as recording information detailing the length of time the product has been out of temperature control to demonstrate compliance with the 2 hour/4 hour rule.
- Sauces and dressings containing raw eggs should have a pH of 4.8 or less. The acid present in vinegar or lemon juice will lower the pH which inhibits or slows the growth of bacteria present but it will not KILL bacteria.

Information for enforcement agencies

The Food Safety Standards – Chapter 3 of the *Australia New Zealand Food Standards Code* (the Code) – places responsibility on food businesses to manage their food safety risks. The role of an authorised officer is to collect evidence from the food business to determine whether the food safety outcomes are being met and food safety is being adequately managed.



Eggs are a potentially hazardous food product. Authorised officers should be assessing whether or not food businesses are adequately managing the risks involved in the use of egg – in particular compliance with the outcomes of clause 7 of Standard 3.2.2 of the Code if the food business is producing products containing eggs.

Clause 7 of Standard 3.2.2. requires a food business to:

- (a) take all practicable measures to process only safe and suitable food; and*
- (b) when processing food:*
 - (i) take all necessary steps to prevent the likelihood of food being contaminated; and*
 - (ii) where a process step is needed to reduce to safe levels any pathogens that may be present in the food – use a process step that is reasonably known to achieve the microbiological safety of the food.*
- (2) A food business must, when processing potentially hazardous food that is not undergoing a pathogen reduction step, ensure that the time the food remains at temperatures that permit the growth of infectious or toxigenic micro-organisms in the food is minimised.*

It is also of value for authorised officers to investigate the quality of eggs received and stored by the food business. Standard 2.2.2 of the Code prohibits the sale of cracked and dirty eggs. Cracked and dirty eggs pose a serious risk to safe food production and should not be received or present in a food business.

Useful Resources and Websites

- Department of Health WA www.public.health.wa.gov.au
- Food Standards Australia New Zealand www.foodstandards.gov.au
- Australian Egg Corporation Limited www.aecl.org/resources/codes-of-practice

Contact the Food Unit

Any feedback or concerns please utilise the “Food Unit Query” form which can be downloaded from our website: www.public.health.wa.gov.au/2/786/3/food_informatio.pm

Email: FoodUnit@health.wa.gov.au

Ph: (08) 9388 4999

Fax: (08) 9382 8119

Web: www.public.health.wa.gov.au

Note: The information contained in this document covers the food legislation requirements for Western Australia. It is current on the date of publication but may change without notice. The Department of Health is not liable for any costs arising from or associated with decisions based on information here and users should obtain expert advice to satisfy all requirements of the relevant food legislation applicable.

Appendix 4 – Microbiological results

| Sender | Sample | Lab No | Use by | Mfg Date | Aerobic Plate Count | Campylobacter | Coagulase Positive Staphylococci | E_coli | Listeria monocytogenes (BAX PCR) | Salmonella (BAX PCR) |
|-------------------|--------------------|------------|------------|------------|---------------------|---------------|----------------------------------|--------|----------------------------------|----------------------|
| City of Bayswater | Balsamic Dressing | F10.002757 | | 15/04/2010 | 180 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Bayswater | Basil Mayonnaise | F10.002755 | | 15/04/2010 | 150 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Bayswater | Caesar Dressing | F10.002756 | | 15/04/2010 | >3000000 | Not detected | <100 | 64 | Not Detected | Not Detected |
| City of Belmont | Aioli | F10.005389 | | 12/07/2010 | 100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Belmont | Aioli | F10.005390 | | 5/07/2010 | 250 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Belmont | Tartare | F10.005388 | | 6/07/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Bunbury | Aioli | F10.004553 | | | 96000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Bunbury | Aioli | F10.004554 | | | 550 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Bunbury | Aoili | F10.004551 | | | 140000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Bunbury | Tartare Sauce | F10.004552 | | | 2200 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Cockburn | Raw Egg Mayonnaise | F10.005091 | 13/07/2010 | 30/06/2010 | 4500 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Cockburn | Raw Egg aioli | F10.006760 | | 19/08/2010 | 410 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Cockburn | Aoili (Raw Egg) | F10.006049 | | 4/08/2010 | 12000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Aiolo | F10.004882 | | 20/06/2010 | 1700 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Aioli | F10.004885 | | 17/06/2010 | 7400 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Cocktail Sauce | F10.004886 | | 12/06/2010 | 500 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Tartar Sauce | F10.004883 | | 11/06/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Aioli Sauce | F10.004881 | | 21/06/2010 | 640000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Mayonnaise | F10.004884 | | 14/06/2010 | 1900 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Dressing | F10.004879 | | 22/06/2010 | 130000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Caesar | F10.004890 | | 29/03/2010 | 2400000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Mayonnaise | F10.004888 | | 19/05/2010 | 230000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Tartare | F10.004889 | | 22/06/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Mayonnaise | F10.004893 | | 17/06/2010 | 1200 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Aioli | F10.004887 | | 21/06/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Hollandaise | F10.004891 | | 24/06/2010 | 200 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Mayonnaise | F10.004892 | | 24/06/2010 | 680 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Joondalup | Aioli | F10.004880 | | 23/06/2010 | 860 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Mandurah | Hollandaise | F10.003770 | | 20/05/2010 | 1300 | Not detected | <100 | 17 | Not Detected | Not Detected |
| City of Mandurah | Mayonnaise | F10.003771 | | 16/05/2010 | 150 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Melville | Tartare | F10.004183 | | 24/05/2010 | 500 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Melville | Caesar Sauce | F10.004184 | | 29/05/2010 | 320 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Melville | Aioli | F10.004180 | | 28/05/2010 | 8200 | Not detected | <100 | <1 | Not Detected | Not Detected |

| Sender | Sample | Lab No | Use by | Mfg Date | Aerobic Plate Count | Campylobacter | Coagulase Positive Staphylococci | E. coli | Listeria monocytogenes (BAX PCR) | Salmonella (BAX PCR) |
|--------------------|---------------------|------------|------------|------------|---------------------|---------------|----------------------------------|---------|----------------------------------|----------------------|
| City of Melville | Aioli | F10.004182 | | 29/05/2010 | 9400 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Melville | Aioli | F10.004181 | | 31/05/2010 | 9500 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Nedlands | Mayonnaise | F10.004965 | | 29/06/2010 | 180 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Nedlands | Mayonnaise (Aioli) | F10.004964 | | 14/06/2010 | 1100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Nedlands | Mayonnaise | F10.004922 | | | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Nedlands | Tartar Sauce | F10.004923 | | | 700 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Perth | Caesar Dressing | F10.002905 | | 10/04/2010 | 100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Perth | Aioli | F10.003022 | | | 11000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Perth | Mayonnaise | F10.002906 | | 15/04/2010 | 300 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Perth | Tartare Sauce | F10.002907 | | 19/04/2010 | 3500 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Perth | Mayonnaise | F10.003023 | | | 12000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Perth | Mayonnaise | F10.003021 | | | 4100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Perth | Aoili | F10.002904 | | 19/04/2010 | 3400 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Stirling | Aioli | F10.005610 | | 18/07/2010 | >3000000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Stirling | Aioli | F10.005794 | | 25/07/2010 | 5800 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Stirling | Ceaser | F10.005611 | | 18/07/2010 | 640 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Stirling | Ceaser | F10.005612 | | 15/07/2010 | 200 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Stirling | Ceaser | F10.005613 | | 18/07/2010 | 2600 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Stirling | Egg & Chicken Sauce | F10.005614 | | | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Stirling | Mayo | F10.005793 | | 26/07/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Stirling | Tartare | F10.005609 | | 18/07/2010 | 2800 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Subiaco | Basil Mayonnaise | F10.003099 | 5/05/2010 | 28/04/2010 | 35000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Subiaco | Garlic Aioli | F10.003097 | 5/05/2010 | 28/04/2010 | 33000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Subiaco | Tartare | F10.003098 | 5/05/2010 | 28/04/2010 | 30000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Subiaco | Aioli | F10.002832 | 21/04/2010 | 18/04/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Swan | Aoili | F10.004812 | | 17/06/2010 | 3300 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Swan | Caesar Dressing | F10.004813 | | 17/06/2010 | 2900 | Not detected | <100 | <1 | Not Detected | Not Detected |
| City of Swan | Scrambled Egg | F10.004811 | | 17/06/2010 | 7800 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Broome | Aioli | F10.003534 | | 11/05/2010 | 6300 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Broome | Aioli | F10.003535 | | 5/05/2010 | 820 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Busselton | Tartare Sauce | F10.004046 | | | 820 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Busselton | Aioli Sauce | F10.004044 | | | 1000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Busselton | Aioli Sauce | F10.004045 | | | 270 | Not detected | <100 | <1 | Not Detected | Not Detected |

| Sender | Sample | Lab No | Use by | Mfg Date | Aerobic Plate Count | Campylobacter | Coagulase Positive Staphylococci | E_coli | Listeria monocytogenes (BAX PCR) | Salmonella (BAX PCR) |
|-----------------------------------|--|------------|------------|------------|---------------------|---------------|----------------------------------|--------|----------------------------------|----------------------|
| Shire of Derby/ West Kimberley | Hollandaise Sauce | F10.005917 | 27/07/2010 | 27/07/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Derby/ West Kimberley | Aoili Sauce | F10.005916 | | 26/07/2010 | 230 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Derby/ West Kimberley | Garlic Butter Sauce | F10.005914 | | 20/07/2010 | 46000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Derby/ West Kimberley | Moroccan Lime Mayo Sauce | F10.005915 | | 27/07/2010 | 7700 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Irwin | Aoili | F10.003728 | | 17/05/2010 | 200 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Irwin | Aoili | F10.003727 | | 15/05/2010 | >3000000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Kalamunda | Mayonnaise With Black Pepper | F10.003368 | | | 2500 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Kalamunda | Tartare Sauce With Onton, Gherkin, Capers | F10.003369 | | | 10000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Mundaring | Chilli Sauce | F10.003006 | | | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Mundaring | Honey Mustard Dressing | F10.003007 | | | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Mundaring | Horse Radish Sour Cream Dressing | F10.003008 | | 22/04/2010 | 87000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Mundaring | Whole Egg Mayonnaise | F10.003005 | | | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Roebourne | Aioli | F10.003616 | | | 3800 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Roebourne | Aioli | F10.003614 | | | 340000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Shire of Roebourne | Hollandaise | F10.003615 | | | 46000 | Not detected | <100 | 1 | Not Detected | Not Detected |
| Town of Claremont | Hollandaise Sauce | F10.003123 | 9/11/2010 | | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Claremont | Caesar Salad Sauce | F10.003118 | | | 81000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Claremont | Mayonnaise | F10.003119 | | | 850 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Claremont | Tartare Sauce | F10.003120 | | | >3000000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Claremont | Caesar Salad Sauce | F10.003121 | | 27/04/2010 | 860 | Not detected | <100 | <1 | Not Detected | Not Detected |

| Sender | Sample | Lab No | Use by | Mfg Date | Aerobic Plate Count | Campylobacter | Coagulase Positive Staphylococci | E_coli | Listeria monocytogenes (BAX PCR) | Salmonella (BAX PCR) |
|------------------------|---------------------------------|------------|------------|------------|---------------------|---------------|----------------------------------|--------|----------------------------------|----------------------|
| Town of Claremont | Mayonaise | F10.003122 | | 24/04/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Claremont | Hollandaise Sauce | F10.003124 | | 25/04/2010 | 200 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Claremont | Mayonaise | F10.003125 | | 25/04/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Claremont | Sweet Chilli Mayonaise | F10.003126 | | 25/04/2010 | 3400 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Cottesloe | Aioli | F10.002707 | | 13/04/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Cottesloe | Aioli | F10.002708 | | 8/04/2010 | 860 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Cottesloe | Aioli | F10.002709 | | 10/04/2010 | 3800 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of East Fremantle | Caesar Dressing | F10.003595 | 20/05/2010 | 14/05/2010 | 270000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of East Fremantle | Tuna Dressing | F10.003596 | 20/05/2010 | 15/05/2010 | 2100000 | Not detected | <100 | 2 | Not Detected | Not Detected |
| Town of East Fremantle | Aioli | F10.003624 | 29/12/2010 | | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of East Fremantle | Mayo | F10.003627 | 18/05/2010 | 16/05/2010 | 500 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of East Fremantle | Mayo | F10.003626 | 18/05/2010 | 11/05/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of East Fremantle | Saffron Aioli | F10.003625 | 23/05/2010 | 16/05/2010 | 300 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of East Fremantle | Lime Aioli | F10.003594 | 22/05/2010 | 14/05/2010 | 2600 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of East Fremantle | Aoli | F10.003593 | 21/05/2010 | 14/05/2010 | 5500 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of East Fremantle | Mayonaise | F10.003592 | 23/05/2010 | 17/05/2010 | 100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Port Hedland | Aoli Sample 2 | F10.004190 | | 30/05/2010 | 20000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Port Hedland | Aoli Sample 1 | F10.004189 | | 1/06/2010 | <100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Port Hedland | White Chocolate Mousse Sample 3 | F10.004191 | | 1/06/2010 | 6300 | Not detected | <100 | 7 | Not Detected | Not Detected |
| Town of Victoria Park | Aioli | F10.004058 | | 24/05/2010 | 51000 | Not detected | <100 | <1 | Not Detected | Not Detected |

| Sender | Sample | Lab No | Use by | Mfg Date | Aerobic Plate Count | Campylobacter | Coagulase Positive Staphylococci | E_coli | Listeria monocytogenes (BAX PCR) | Salmonella (BAX PCR) |
|-----------------------|-----------------------|------------|------------|------------|---------------------|---------------|----------------------------------|--------|----------------------------------|----------------------|
| Town of Victoria Park | Aioli Dressing | F10.006354 | 21/08/2010 | 18/08/2010 | 2000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Victoria Park | Caesar Salad Dressing | F10.004217 | 3/06/2010 | 1/06/2010 | 6500 | Not detected | <100 | 2 | Not Detected | Not Detected |
| Town of Victoria Park | Caesar Dressing | F10.003617 | 19/05/2010 | 17/05/2010 | 4200 | Not detected | <100 | 7 | Not Detected | Not Detected |
| Town of Victoria Park | Mayonnaise | F10.003453 | | | 2900 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Vincent | Aioli Sauce | F10.002865 | | | >3000000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Vincent | Aioli Sauce | F10.002864 | | 17/04/2010 | 1400 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Vincent | Aioli | F10.002869 | | | 76000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Vincent | Aioli | F10.002868 | | 19/04/2010 | 3000 | Not detected | <100 | 4 | Not Detected | Not Detected |
| Town of Vincent | Aioli | F10.002871 | | 19/04/2010 | 4900 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Vincent | Aioli | F10.002873 | | 16/04/2010 | 240000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Vincent | Caesar Dressing | F10.002867 | | | 1100 | Not detected | <100 | 1 | Not Detected | Not Detected |
| Town of Vincent | Caesar Dressing | F10.002872 | | 15/04/2010 | >3000000 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Vincent | Hollandaise Sauce | F10.002866 | | | 1100 | Not detected | <100 | <1 | Not Detected | Not Detected |
| Town of Vincent | Mayonnaise | F10.002870 | | 18/04/2010 | 590 | Not detected | <100 | <1 | Not Detected | Not Detected |



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