NSW Food Authority

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Microbiological Quality of High Risk Bakery Products

A survey to determine the microbiological quality of bakery products sold in NSW

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Contents

Executive summary

From April to November 2007 New South Wales Food Authority Officers or Environment Health Officers from local councils visited 125 randomly selected bakeries across the state to collect samples and complete a food handling questionnaire.

This survey of bakery products was undertaken for three main reasons:

- Bakery products are consumed at high levels
- Food poisoning outbreaks have been attributed to bakery products
- Poor food handling practices were identified in outbreak investigations and in previous surveys of bakeries

There were 696 samples analysed for a variety of microorganisms including *Escherichia coli*, *Bacillus cereus*, coagulase positive staphylococci and *Salmonella*. The results were compared to the guidelines for microbiological examination of ready-to-eat (RTE) foods (Food Standards Australia New Zealand [FSANZ], 2001).

When compared to these guidelines, the samples collected from 112 of the 125 of bakeries were within acceptable microbiological levels. Overall, 97.8% of samples were microbiologically acceptable. The unacceptable results were mainly due to samples having low levels of *E. coli*, *B. cereus* and coagulase positive Staphylococci that, while unlikely to cause human illness, may indicate poor handling and hygiene practices and/or poor temperature control during storage.

The food handling questionnaire identified some food hygiene and handling practices that might lead to food safety problems. This included inadequate temperature control, the improper use of equipment and the use of raw egg mayonnaise, a known risk factor associated with human illness.

Only one sample tested was considered to be potentially hazardous due to the level of *Bacillus cereus* detected. For this sample and for all unacceptable results, follow-up action was undertaken commensurate with the level of risk posed.

Communication and education with business is planned to help improve overall food hygiene and handling practices in bakeries.

Introduction

Australians consume a lot of mixed bakery products each year. For example, in 1996-1997 Australians consumed around 51.3 kg of bread per person (Australian Bureau of Statistics, 1998), contributing to a $2.5 billion industry (Ligerakis, 2004). Bakery products, as defined by the Australian Bureau of Statistics, include breads (leavened and unleavened), cakes, biscuits, gingerbread, pastries, pies and crumpets (Australian Bureau of Statistics, 1996).

Bakery products can be classified according to their ingredients, chemical profile or production method. Each of these parameters provides information on the inherent microbiological risks potentially associated with a product.

Smith, Daifas, El-Khoury, Koukoutsis, & El-Khoury (2004), for example, classified bakery products based on their chemical profile using pH, water activity (a_w) and moisture content, and cited water activity as the most important factor influencing the microbiological quality of these products. They classified products as high acid (pH less than 4.6), low acid (pH between 4.6 and 7), and alkaline (pH greater than 7) with a water activity that was either low (a_w less than 0.6), intermediate (a_w between 0.6 and 0.85), or high (a_w greater than 0.85, generally between 0.95 and 0.99).

High moisture products, those with a high water activity, are most likely to present food safety concerns as they support the growth of a wide range of bacteria, yeasts and moulds. Some high moisture/low acid components of bakery products provide an environment that is highly conducive to the growth of pathogenic bacteria (Table 1). Intermediate moisture products generally only support the growth of spoilage organisms such as osmophilic yeasts and moulds (Smith et al, 2004).

There are a number of inherent factors and practices in bakeries that increase the potential for these products to be considered as potentially hazardous. These include frequent handling of food, use of perishable ingredients, use of raw foods which might contain pathogens and the potential of cross contamination through the re-use of equipment such as piping bags.

Finally, there are many small independent operators involved in the bakery industry and knowledge of hygienic practices may not always be adequate. This was demonstrated in recent surveys and investigations of foodborne illness outbreaks linked to these products. (FSANZ 2002, Tribe, Hart, Ferrall & Givney, 2003., NSW Food Authority, 2007a)

Table 1: Ideal environment for growth of pathogenic bacteria (ICMSF, 1996)

Bacteria		pH			Temperature			a_w
		Min	Optimum	Max	Min	Optimum	Max	Min
E. coli[1]		4.4	6-7	9	7-8°C	35-40°C	44-46°C	0.95
B. cereus		5	6.0-7.0	8.8	4°C	30-40°C	55°C	0.93
Listeria Monocytogenes		4.39	7	9.4	-0.4°C	37°C	45°C	0.92
Salmonella		3.8	7-7.5	9.5	5.2°C[2]	35-43°C	46.2°C	0.94
Coagulase +ve Staphylococci[3]	Growth	4	6-7	10	7°C	37°C	48°C	0.83[4]
	Toxin production	4.5[5]	7-8	9.6	10°C	40-45°C	48°C	0.87[6]

[1] Intestinally pathogenic strains
[2] Most serotypes fail to grow <7°C
[3] *Staphylococcus aureus*
[4] Anaerobic conditions 0.90
[5] Anaerobic conditions 5.0
[6] Anaerobic conditions 0.92

Guidelines and Regulations

All food sold in Australia must comply with *the Australia New Zealand Food Standards Code* (the Code) irrespective of where that food was produced and the size of the business producing the food. Some of the requirements relevant to bakeries include the proper use of eggs, food safety practices, premises and equipment. Of particular importance are the requirements for temperature control of potentially hazardous foods. Standard 3.2.2 requires potentially hazardous foods such as high risk bakery products to be stored under temperature control at:

a) 5°C or below if this is necessary to minimise the growth of infectious or toxigenic microorganisms in the food so that the microbiological safety of the food will not be adversely affected for the time the food is at that temperature, or

b) 60°C or above, or

c) another temperature if the food business demonstrates that maintenance of the food at this temperature, for the period of time for which it will be at that temperature, will not adversely affect the microbiological safety of the food.

The code also allows for an alternative compliance as long as the business can demonstrate the product's safety as qualified in Standard 3.2.2 clause 25,

> Without limiting the ways in which a food business can demonstrate that the temperature and any heating or cooling process it uses will not adversely affect the microbiological safety of food, a food business satisfies this requirement by complying with:
>
> a) A food safety program that meets the requirements for food safety programs in the Act, regulations under the Act, or a food safety standard other than this Standard;
>
> b) If no such requirements apply to the food business, a 'food safety program' as defined in this Standard;
>
> c) A process that according to documented sound scientific evidence is a process that will not adversely affect the microbiological safety of the food; or
>
> d) A process set out in written guidelines based on sound scientific evidence that are recognised by the relevant food industry .

Potentially hazardous food such as high risk bakery products can be held out of temperature control for a limited time and remain safe. If these foods are out of temperature control for too long the risk of the food becoming unsafe increases.

Outbreaks

There have been numerous outbreaks associated with bakery and similar products in Australia and worldwide (Appendix 1). *Salmonella* has been implicated for the vast majority of these documented outbreaks.

Between 2001 and 2007 OzFoodNet (various references) reported 21 outbreaks associated with bakery and similar products. These outbreaks affected 783 people with over 130 people hospitalised and one fatality. Most outbreaks in Australia were caused by *Salmonella* Typhimurium (71.4%), 4.8% were caused by *Staphylococcus aureus* and for 23.8% of outbreaks the cause was undetermined.

The largest *Salmonella* outbreak in Australia of approximately 319 cases was linked to the consumption of Vietnamese style pork rolls containing raw egg mayonnaise. While a definitive source for this outbreak was not specifically identified, it is likely that environmental and human factors potentiated the outbreak. (New South Wales Food Authority [NSW Food Authority], 2007a).

The second largest outbreak (107 cases) occurred in Tasmania and was attributed to poor hygiene practices in two bakeries (OZFoodNet, 2006b). An outbreak of *Salmonella* Typhimurium phage type 99 in a bakery in South Australia resulted in 22 cases, seven hospitalisations and one death. This outbreak was traced back to a bakery using non-disposable and inadequately sanitised piping bags for both cream and raw meat (Tribe et al 2003).

Previous surveys

There have been several surveys on the microbiological quality of bakery products conducted in Australia and overseas (Appendix 2). These surveys found that there were issues with cross contamination, poor handling and inappropriate storage conditions across the industry, resulting in a number of indicator and/or pathogenic organisms detected in samples.

Survey objectives

This survey was undertaken because of the high level of consumption of bakery products, and the number of outbreaks and problems with food handling practices reported in previous surveys. The survey's objectives were to:

- determine the microbiological quality of high risk bakery products (products with intrinsic properties permitting the potential growth of pathogenic bacteria) retailed in NSW, and
- observe food handling practices across this industry.

Foods sampled included custard filled products, fresh cream filled products, non-dairy based products, meat topped breads, Vietnamese style rolls and miscellaneous products such as cheesecake and quiche.

Methods

Sample collection

125 randomly selected bakeries across the state were visited by Food Authority Officers or local council Environmental Health Officers (EHO) from April to November 2007. The number of premises visited per LGA was in proportion to the total number of notified bakeries in that LGA. Bakeries in supermarkets were excluded from this survey.

Each bakery completed a handling questionnaire and provided one product per product category where possible. If the bakery did not sell a product from each category then it was left to the discretion of each EHO to make up the six samples from other products on site. EHO instructions and blank questionnaire are in Appendix 3.

Samples were secured inside a sterile plastic bag and transported under temperature control to the laboratory. Analysis usually commenced within four hours of receipt. Due to the distance between some LGAs and the laboratory some samples were couriered overnight and analysed one day after purchase.

Sample analysis

Samples were tested for the presence of:

- *Salmonella* species using AS 1766.2.5,
- *Bacillus cereus* using AS 1766.2.6,
- coagulase positive staphylococci (CPS) using AS 1766.2.4, and
- faecal coliforms (thermotolerant coliforms) and *Escherichia coli* using AS 1766.2.3.

Sample preparation: 10g of sample were homogenised with 90mL of 0.1% peptone diluent. Serial dilutions were prepared for use in enumerating *B. cereus*, coagulase positive staphylococci, faecal coliforms and *E. coli*.

Salmonella detection: 25g of sample was weighed out aseptically and homogenised with 225mL buffered peptone water (non-selective enrichment) and incubated at 37°C/16-20h. Aliquots were then transferred into selective enrichment broths, mannitol selenite cystine and Rappaport-Vassiliadis, and incubated for 18-24h at 37°C and 42°C respectively. A loopful of each selective broth was then streaked onto xylose lysine desoxycholate and bismuth sulphite agar plates and incubated at 37°C for 24h and 48h respectively. Typical colonies were sub-cultured onto cystine lactose electrolyte deficient (CLED) agar for purity. Suspect *salmonellae* colonies were confirmed biochemically as per AS1766.2.5 by testing for lysine decarboxylase and beta-D-galactosidase reactions (*salmonellae* are typically lysine decarboxylase positive and beta-D-galactosidase negative). Isolates giving reactions typical of *salmonellae* in one or both of the biochemical tests were then confirmed serologically using polyvalent “O” and polyvalent “H” antisera.

B. cereus enumeration: Spread plates (using a 100µl of each dilution) of polymixin egg yolk mannitol bromothymol blue agar were prepared in duplicate and incubated at 37°C/24h and a further 24h at room temperature. Typical blue colonies with and without lecithinase production were counted and a proportion of the colonies confirmed by spore staining and microscopic examination as described in AS 1766.2.6 (*B.cereus* are typically rods 4 to 5µm long and stain red; they contain black-stained lipid globules; spores stain green, are ellipsoidal in shape, central to sub-central and do not swell the sporangium).

CPS enumeration: Spread plates (using a 100µl of each dilution) of Baird Parker medium were prepared in duplicate and incubated at 37°C/48h. Typical black colonies, with and without an egg yolk reaction surrounding the colony, were counted and a proportion confirmed by performing a tube coagulase test with rabbit coagulase plasma-EDTA(BBL).

Faecal coliforms and *E. coli* enumeration: Serial dilutions of 10^{-1} to 10^{-4} were dispensed in triplicate into test tubes of lauryl tryptose (LT) broth containing an inverted Durham tube and incubated at 37ºC/48h. A loopful from each of the LT broths producing gas was inoculated into EC broth containing an inverted Durham tube and incubated at 44.5ºC for up to 48h. EC broths producing gas were streaked onto eosin methylene blue (EMB) agar and incubated at 37ºC/18-24h. EMB plates were examined for typical colonies (dark purple centred colonies with or without a metallic sheen). Positive EMB plates were used to determine a most probable number (MPN) count for faecal coliforms. Colonies typical on EMB were subcultured into tryptone water and incubated at 44.0 to 44.5ºC/24h. Tubes indicating the presence of indole (by addition of Kovacs reagent) were used to determine an MPN count for *E. coli*.

Statistical analysis

Samples were divided into categories based on ingredients. Results were compared to the guidelines for microbiological examination of RTE foods (the guidelines) (Appendix 4) (Food Standards Australia New Zealand [FSANZ], 2001).

Statistics (mean, medium, frequency distribution as well as maximum and minimum) for levels of bacteria were calculated using Microsoft Office Excel 2003.

Results

Microbiology

The microbiological quality of 696 bakery products from 125 bakeries across NSW was assessed. If bakeries did not sell products from all categories, a total of six samples were purchased from the categories that they did sell. Samples were grouped into six categories (custard filled products, fresh cream filled products etc) according to their product type and ingredients. Raw results are presented in Appendix 5. A summary of the mean, median, minimum and maximum levels of bacteria present are in Appendix 6.

The results were compared to the guidelines for microbiological examination of RTE foods (FSANZ, 2001) and the outcomes are presented in Table 2. The FSANZ guidelines cover *Enterobacteriaceae* but not faecal coliforms. As faecal coliforms are a member of the *Enterobacteriaceae* family that guideline has some relevance. A number of faecal coliform results were classified as 'unsatisfactory' because they exceeded the *Enterobacteriaceae* guideline. This affected a small number of products when faecal coliform counts did not confirm as *E. coli*.

Table 3 shows the bacteria detected in samples from each bakery category. Frequency distributions of the counts of faecal coliforms, *E. coli*, *B. cereus* and coagulase positive staphylococci (CPS) are presented in Figures 1 and 2. Only three samples contained CPS at the level of 2, 2.18 and 3.11 log CFU/g.

Table 2: Overall results compared to FSANZ Guidelines

	Microbiologically acceptable		Microbiologically unacceptable	Potentially Hazardous	
Category	Satisfactory	Marginal	Unsatisfactory	Potentially Hazardous	Total
Custard filled products	199 (90.9%)	16 (7.3%)	3 (1.4%)	1 (0.4%)	219 (100%)
Fresh cream filled products	101 (87.8%)	7 (6.1%)	7 (6.1%)	0 (0.0%)	115 (100%)
Non dairy based products	69 (95.8%)	3 (4.2%)	0 (0.0%)	0 (0.0%)	72 (100%)
Meat topped bread	125 (98.4%)	1 (0.8%)	1 (0.8%)	0 (0.0%)	127 (100%)
Vietnamese style rolls	42 (75.0%)	11 (19.6%)	3 (5.4%)	0 (0.0%)	56 (100%)
Miscellaneous bakery products	98 (91.6%)	9 (8.4%)	0 (0.0%)	0 (0.0%)	107 (100%)
Total	634 (91.1%)	47 (6.7%)	14 (2.0%)	1 (0.1%)	696 (100%)

Table 3: Bacteria detected in samples according to product category

Category	Faecal Coliforms	*E. coli*	*B. cereus*	CPS	*Salmonella*
Custard filled product	27 (12.3%)	7 (3.2%)	12 (5.5%)	1 (0.5%)	0 (0.0%)
Fresh cream filled product	29 (25.2%)	6 (5.2%)	5 (4.3%)	0 (0.0%)	0 (0.0%)
Non dairy based product	3 (4.2%)	1 (1.4%)	2 (2.8%)	0 (0.0%)	0 (0.0%)
Meat topped bread	3 (2.4%)	1 (0.8%)	1 (0.8%)	0 (0.0%)	0 (0.0%)
Vietnamese style rolls	N/A[1]	5 (8.93%)	7 (12.50%)	2 (3.57%)	0 (0.00%)
Miscellaneous high risk products	18 (16.8%)	2 (1.9%)	6 (5.6%)	0 (0.0%)	0 (0.0%)
Total	80 (11.5%)	22 (3.2%)	33 (4.7%)	3 (0.4%)	0 (0.00%)

Note [1] Due to the presence of salad vegetables in Vietnamese rolls *Enterobacteriaceae* guidelines do not apply.

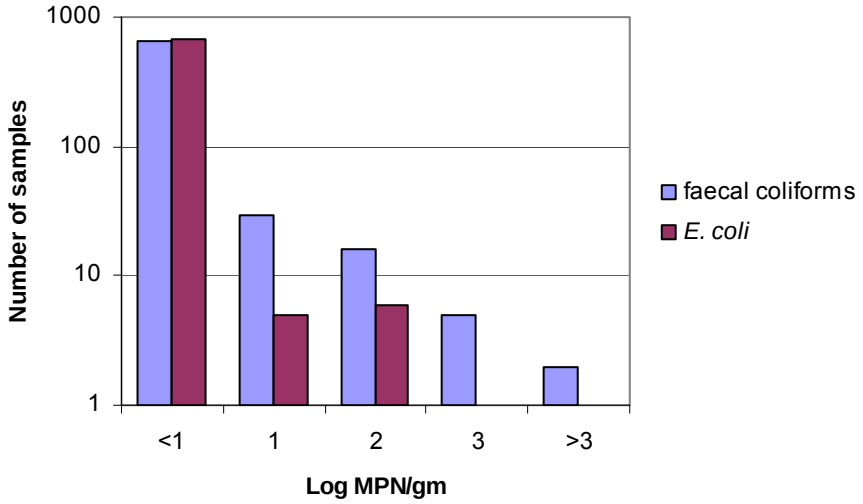

Figure 1: Frequency of faecal coliforms and *E. coli* in all samples[1]

[1] Log 1 = 10-99 MPN/gm; Log 2 = 100-999 MPN/gm; Log 3 = 1000-9999 MPN/gm

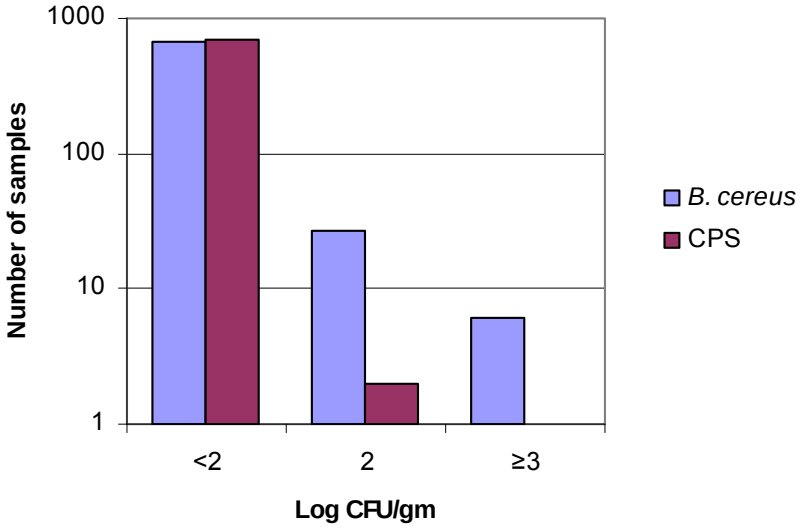

Figure 2: Frequency of *B. cereus* and CPS

Bakeries

The number of bakeries surveyed with either none, one, or two or more samples classified microbiologically unsatisfactory or potentially hazardous was calculated. No bakeries had more than two acceptable results for the products sampled. Of the bakeries included in this survey 89.6% of bakeries had acceptable microbiological results for all of the products tested. For the remaining bakeries, 11 bakeries had only one unacceptable product with two bakeries having two unacceptable products.

Handling practices

Questionnaires on handling and manufacturing procedures were received from 123 bakeries. Results are presented in Tables 4-8.

Most businesses made the products on site and stored the product under refrigeration, the exception being meat topped bread products. Overall, around 60% of refrigeration units were operating at 5°C or less and approximately 70% discarded product at the end of a day's trading.

Table 4: Production source of high risk bakery products

Where do you get the following products?	made on site	bought pre-made	do not sell
Custard filled products	102 (81.6%)	23 (18.4%)	2 (1.6%)
Fresh cream filled products	81 (66.4%)	11 (9.0%)	30 (24.6%)
Non dairy based products	96 (78.0%)	12 (9.8%)	10 (9.6%)
Meat topped bread	104 (86.0%)	11 (9.1%)	8 (6.6%)
Vietnamese style rolls	42 (37.8%)	3 (2.7%)	66 (59.5%)
Miscellaneous bakery products	84 (80.0%)	11 (10.6%)	10 (9.6%)

Table 5: Display of high risk bakery products

How are the products displayed?	chilled cabinet	room temperature	hot display
Custard filled products	95 (79.2%)	25 (20.8%)	0 (0.0%)
Fresh cream filled products	83 (91.2%)	8 (8.8%)	0 (0.0%)
Non dairy based products	35 (35.0%)	65 (65.0%)	0 (0.0%)
Meat topped bread	6 (5.5%)	97 (89.0%)	6 (5.5%)
Vietnamese style rolls	40 (100%)	0 (0.0%)	0 (0.0%)
Miscellaneous bakery products	48 (71.6%)	4 (6.0%)	15 (22.4%)

Table 6: Temperature of chilled cabinets

What is the temperature of the chilled products?[1]	0-2°C	2.1-5°C	5.1-9.0°C	9.1-14.0°C	>14.0°C
Custard filled products	3 (4.84%)	32 (51.6%)	16 (25.8%)	9 (14.5%)	2 (3.2%)
Fresh cream filled products	3 (5.7%)	28 (52.8%)	14 (26.4%)	8 (15.1%)	0 (0.0%)
Non dairy based products	2 (9.1%)	8 (36.4%)	7 (31.8%)	4 (18.2%	1 (4.5%)
Meat topped bread	0 (0.0%)	3 (50.0%)	0 (0.0%)	1 (16.7%)	2 (33.3%)
Vietnamese style rolls	2 (10.5%)	12 (63.2%)	3 (15.8%)	1 (5.3%)	1 (5.3%)
Miscellaneous bakery products	2 (6.7%)	15 (50.0%)	8 (26.7%)	5 (16.7%)	0 (0.0%)

Table 7: Use of piping bags

	Yes	No	Not sure
Do you use disposable piping bags?	43 (37.7%)	68 (59.6%)	3 (2.6%)
Do you use separate piping bags for each product?	93 (83.0%)	13 (11.6%)	6 (5.4%)

[1] In general non dairy based products and meat topped bread do not contain potentially hazardous components (eg. cream and custard) and therefore would not be expected to be stored at chilled temperatures.

Table 8: Product outcome at the end of day

What happens to products at closing time?	discarded	stored for next day	used in other products	given away
Custard filled products	77 (64.2%)	34 (28.3%)	0 (0.0%)	13 (10.8%)
Fresh cream filled products	59 (62.8%)	30 (31.9%)	0 (0.0%)	8 (8.5%)
Non dairy based products	44 (41.5%)	65 (61.3%)	0 (0.0%)	5 (4.7%)
Meat topped bread	92 (85.2%)	7 (6.5%)	0 (0.0%)	11 (10.2%)
Vietnamese style rolls	28 (63.6%)	16 (36.4%)	0 (0.0%)	2 (4.7%)
Miscellaneous bakery products	47 (61.8%)	26 (42.2%)	0 (0.0%)	5 (6.6%)

Discussion

Microbiology

This survey showed that 97.8% of the high risk bakery products sampled had acceptable microbiological limits.

Only 2.1% (15 samples) of samples tested had unacceptable results and one of the samples was considered potentially hazardous due to elevated *B. cereus* levels. The samples predominantly belonged to the fresh cream filled and Vietnamese style roll product categories.

The unacceptable microbiological results reported here are lower compared to the South Australian sweet baked goods survey (Department of Health, Government of South Australia [DoHSA], 2007), which found that 25% of custard samples and 21% of cream samples were classified as unacceptable on the basis of their total bacterial count (standard plate count). The present survey did not evaluate products against a standard plate count as some of the products sampled contained raw (fresh fruit and vegetables) and fermented ingredients for which standard plate count is not applicable. The results of our survey are similar to the results from the 2001 first quarter national survey in Ireland (Food Safety Authority of Ireland [FSAI], 2001) where only 0.19% of samples were classified as potentially hazardous when analysed for *E. coli* and *S. aureus* and 1.71% were unsatisfactory for *S. aureus*, and 2.1% were unsatisfactory for *E. coli*.

Potentially hazardous vanilla slice

A vanilla slice (belonging to the custard filled product category) was regarded as potentially hazardous due to elevated levels of *B. cereus* (5.04 log CFU/g). Levels over 4 log CFU/g might result in foodborne illness and can be indicative of growth. Although this product was stored in a chilled cabinet the slice had a temperature of 10.4°C. A second vanilla slice sample purchased from the same batch at the same time had a pH of 4.6 and water activity of 0.92. This business claimed that the product was discarded at the end of the day. The high *B. cereus* levels indicated that temperature abuse might have occurred. Of the 66 vanilla slices surveyed this was the only sample that was not within acceptable microbiological limits. Follow up and enforcement action was carried out by the local council for this sample.

Vanilla slices have previously been reported with microbiologically unacceptable results. A survey undertaken in the Lancaster & Preston area in the UK in 1995 found that 30% of 124 vanilla slices surveyed were microbiologically unacceptable. A follow up survey in 2000 found that 29.5% of 389 samples were unacceptable or potentially hazardous with 34% of these sourced from independent bakers (Williamson, Allen, Bolton, 2000).

Microbiologically unacceptable samples

Samples were regarded as microbiologically unacceptable because of:

- *B.cereus* (5 samples) ranging from 3.0 to 3.6 log CFU/g;
- *E.coli* (6 samples) ranging from 2.4 to 3.7 log MPN/g;
- Faecal coliforms (1 sample) in excess of 5.0 log MPN/g;
- CPS (1 sample) at 3.1 log CFU/g; and
- *E.coli* & Faecal coliforms (1 sample) at 2.4 log MPN/g and greater than 5.0 MPN/g respectively.

Unacceptable levels of *B.cereus* (2 – 3 log CFU/g or 100-1000 CFU/g) can result from inadequate temperature control of the product thus permitting bacterial growth or because of the presence of the organism in an ingredient (such as cream). The heating step associated with the manufacture of bakery products can serve to trigger the germination of spores naturally present

in some ingredients. If the product is then stored outside of temperature control and its intrinsic properties are conducive to *B.cereus* growth, this pathogen might grow to potentially hazardous levels. The five samples containing unacceptable levels of *B.cereus* were fresh cream and custard products. Cream and custard provide the ideal environment for growth of *B.cereus*, and as such these should be stored under temperature control.

The presence of unacceptable levels of *E.coli* can indicate poor food handling and practices. Levels greater than 2 log MPN/g (or 100 MPN/g) indicate that either improper washing of raw ingredients (ie salads), poor cleaning and sanitising or inadequate processing has occurred. The six samples containing unacceptable levels of *E.coli* were from all bakery categories, irrespective of their ingredients. This may indicate that *E.coli* contamination is not dependant on the ingredients, but rather on the handling and hygienic practices of the various bakeries.

Faecal coliforms, part of the *Enterobacteriaceae* family, are generally found in the intestinal tract of humans and animals. Only one sample, a profilerole, was found to contain unacceptable levels of faecal coliforms. Unacceptable levels indicate poor hygienic practices. While faecal coliforms are not a cause of foodborne illness, very high levels are a clear indication of poor hygiene and of post-process contamination.

CPS is also usually a result from poor hygienic practices. One Vietnamese style roll contained unacceptable levels of CPS which might indicate poor handling followed by temperature abuse. Levels greater than 4 log CFU/g might cause foodborne illness.

For all unacceptable results, information and an interpretation of the results where provided to the relevant EHO for further follow up.

Bakeries

The majority of bakeries (89.6%) included in this survey had products that were microbiologically acceptable. No bakery had more than two unacceptable results. This and the fact only one bakery had two unacceptable results would indicate that overall there are no systemic problems occurring at bakeries included in this survey.

Handling practices

Unacceptable levels of bacteria might result from temperature abuse and poor hygienic practices. The handling practices questionnaire conducted with this survey identified three mains areas of concern; temperature control, proper use of equipment and the use of raw eggs in mayonnaise. Some of the main findings of the handling practices questionnaire include:

- 8.8% of bakeries store fresh cream filled products at room temperature,
- 20.8% of bakeries store custard products at room temperature,
- 41.5% of bakeries store fresh cream filled products in chilled cabinets that are above 5°C,
- 31.9% of bakeries retained left over fresh cream filled products for the next day,
- 59.6% of bakeries surveyed did not use disposable piping bags,
- 11.6% did not use separate piping bags for each product, and
- 45% of bakeries producing Vietnamese style rolls used raw-egg mayonnaise.

Similar observations were made in a 2002 snapshot study by FSANZ and QLD Health. The study found that bakeries weren't replacing reusable piping bags after their recommended replacement period (approx 15 washes). This study also found that 9 out of 10 piping bags contained *B.cereus* and 4 out of 10 piping bags contained CPS (FSANZ, 2002).

Forty of the bakeries in the present survey produced Vietnamese style rolls. Eighteen indicated during sampling that they used raw egg mayonnaise. This mayonnaise was either made on or

off-site. Results indicate that the raw egg mayonnaise rolls contained similar or higher amounts of bacteria compared to rolls that did not use raw egg mayonnaise. Whether this result is from the direct use of raw egg mayonnaise or from food handling and hygiene in these bakeries, cannot be ascertained from this survey.

Conclusion

Overall, the microbiological status of surveyed bakery products was good with 97.85% samples yielding acceptable results. Of the 125 bakeries surveyed, 89.8% had acceptable microbiological results.

The food handling questionnaire component of the survey did identity some food hygiene and handling practices which could lead to food safety problems. Some areas of concern include temperature control, the use of equipment and the use of raw egg in mayonnaise. Although *Salmonella* was not detected in any samples, previous outbreaks have shown that the use of raw eggs in mayonnaise does present an increased risk and businesses are recommended to use a commercial non-raw egg mayonnaise as an alternative. Further communication and education with businesses will occur to assist in improving food hygiene and handling practices in bakeries.

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Appendix 1

Table 1: Foodborne outbreaks in Australia involving bakery and raw egg products (OzFoodNet 2002, 2003, 2004, 2005, 2006a, 2006b, 2006c, 2006d, 2007a, 2007b, 2007c)

Date	Vehicle	Etiology		Ill.	Hosp.	State
2001	Custard tart with strawberries & jelly glaze	*Salmonella typhimurium*	126	16	3	SA
2002	Cream filled cakes	*Salmonella typhimurium* 135a		29	4	NSW
2002	Cream and custard filled cakes and buns	*Salmonella typhimurium*	99	22	7 1 death	SA
2002	Cream filled cakes	*Salmonella typhimurium* U290		10	1	VIC
2003	Cheesecake	*Salmonella typhimurium*	4	6	1	SA
2004	Custard fruit tart	*Salmonella typhimurium* 135a		5		QLD
2004	Cream filled cakes	*Salmonella typhimurium*	108	13		SA
2005	Cream filled/iced cakes	*Salmonella typhimurium* 135a		70		TAS
2005 Feb	Suspected pork rolls	unknown		6		VIC
2005 Apr	Custard filled dumplings	*Staphylococcus aureus*		2		QLD
2005 May	Vietnamese pork rolls	unknown		5		NT
2005 May	Egg based bakery products	*Salmonella typhimurium*	197	13	7	QLD
2005 Jul	Suspected raw egg dishes	*Salmonella typhimurium*		16		NSW
2005 Oct	Bakery products	*Salmonella typhimurium*	135	107	6	TAS
2005 Dec	Mayonnaise/tartare sauce	*Salmonella typhimurium*	135	77	2	TAS
2006 Feb	Birthday cake	unknown		10		ACT
2006 Jun	Birthday cake	unknown		21		NSW
2007 Mar	Vietnamese rolls – raw egg mayonnaise	*Salmonella typhimurium*	9	319	>100	NSW
2007	Fruit/meringue/custard tart	unknown		9		NSW
2007	Cheesecake	*Salmonella typhimurium* 135a		7		QLD
2007	Pork rolls	*Salmonella typhimurium*	44	45		VIC

Table 2: Foodborne outbreaks worldwide involving bakery and raw egg products (CDC, 1990, n.d.a, n.d.b, n.d.c, n.d.d, n.d.e, n.d.f, n.d.g, n.d.h, n.d.i, n.d.j), (Stewart, Cole, & Schafferner, 2003)

Date	Vehicle	Etiology	Ill.	Hosp.	Country
1983	Cream filled pastry	*Staphylococcus aureus*	215		Caribbean Cruise Ship
1989 July	Pasta dish using raw egg. SE was traced back to the egg farm where SE was isolated from several flocks.	*Salmonella* enteritidis	21	18 (including 38 week pregnant women who subsequently delivered while ill, the infant developing septicaemia & requiring hospitalisation	NY, USA
1989 August	Custard pies (held for 21 hours without refrigeration	*Salmonella* enteritidis	14	3 (1 death of previously healthy 40 year old male)	PA, USA
1989 April	Hollandaise/ Béarnaise sauce using raw egg	*Salmonella* enteritidis	27	11	TE, USA
1990	Éclairs	*Staphylococcus aureus*	485		Thailand
1994 May	Tiramisu	*Salmonella enteritdis*	9	unknown	PA, USA
1994 Jul	Coconut cream pie	*Salmonella enteritdis*	28	unknown	PA, USA
1994 Oct	Sugar free pie	*Salmonella heidelberg*	10		OK, USA
1994 Oct	Homemade mayonnaise with raw egg	*Salmonella enteritdis*	21	unknown	CA, USA
1994 Oct	Birthday cake	*Salmonella enteritdis*	11	unknown	NY, USA
1994 Dec	Coconut cream pie	*Staphylococcus aureus*	50		IN, USA
1994 Dec	Torte	unknown	55		WI, USA
1994	Cream filled cake	*Staphylococcus aureus*	12		Brazil
1995 Jul	Coconut cream pie	*Staphylococcus aureus*	3		USA
1995 Aug	Cake	*Salmonella enteritdis*	16		CA, USA
1995	Cheesecake	*Salmonella enteritdis*	18		PA, USA
1997 Mar	Italian pastries	*Salmonella enteritdis*	17		CT, USA
1997 Mar	Béarnaise sauce with raw eggs	*Salmonella enteritdis*	30		NJ, USA
1997 Aug	Cheesecake	*Salmonella enteritdis*	13		CA, USA
1997 Aug	Meringue torte	*Salmonella enteritdis*	13		USA
1997 Nov	Coconut cream pie	*Salmonella enteritdis*	13		OH, USA
1998 Mar	Cream pies – shell eggs used	*Salmonella enteritdis* 8	19	5	VA, USA
1998 Aug	Cannelloni/cream puff	*Salmonella enteritdis*	16	2	MD, USA
1998 Sep	Mexican cake – shell eggs used	*Salmonella enteritdis*	50	7	MD, USA
1999 May	Meringue pies – shell eggs	*Salmonella enteritdis* 13a	39	2	MO, USA
1999 Jul	Pastries – shell eggs used	*Salmonella enteritdis* 4	6	2	CA, USA
2001 May	Cake with icing	*Salmonella enteritdis*	12		TX, USA
2001 Jun	Coconut cream pie	*Salmonella enteritdis*	2	3	PA, USA

Date	Vehicle	Etiology	Ill.	Hosp.	Country
2001	Meringue pie - Shell eggs	*Salmonella enteritdis* 8	3		MD, USA
2001	Pastries – shell eggs	*Salmonella enteritdis*	26		NY, USA
2001	Cakes with icing	*Salmonella enteritdis*	18		NY, USA
2002 Feb	Cannelloni – shell eggs	*Salmonella enteritdis* 8	2	8	MI, USA
2005 Mar	Custard filled cake	*Bacillus cereus*	6		NC, USA
2005 Apr	Éclair	*Salmonella enteritdis*	25		MI, USA
2006 Apr	Raw egg mayonnaise	*Salmonella heidelberg*	22	5	CA, USA
2006 Apr	Meringue pie	*Salmonella heidelberg*	13	6	USA
2005 Nov	Vanilla cake	*Salmonella enteritdis*	75		MI, USA
2005 Oct	Cake, cream cheese	*Salmonella newport*	14		NC, USA
2005	Cake	*Salmonella typhimurium*	57		CA, USA
2005	Cake, Tiramisu	*Salmonella*	12		CA, USA
2005	Homemade mayonnaise	*Salmonella enteritdis*	23		ML, USA

Appendix 2

South Australia Dept Health – Sweet Baked Goods (DoHSA, 2007)

A survey to benchmark the prevalence of pathogens and hygiene indicators in sweet baked goods was conducted by the South Australian Department of Health in 2006. 98 bakeries were visited and 290 samples were taken in total, covering a range of sweet pastries containing fresh cream, mock cream or custard, and cold set cheesecakes. Samples were tested for the presence of *Salmonella*, Standard Plate Count (SPC), CPS and *E. coli*.

The result showed that 41 products had unacceptable SPC and two samples contained unacceptable *E. coli* counts. No *Salmonella* was detected in any samples and there were no unsatisfactory levels of CPS in any sample (Table 1). Most significantly 25% of soft custard products were considered unacceptable as were 21% of cream only products. DoHSA also noted that in the 82% of bakeries where one cream product had an unacceptable SPC other cream products from the same bakery had an unacceptable SPC in other cream products.

This survey also noted several factors that may contribute to the risk of contamination of bakery products. These are:

- Products are handled following cooking ie to ice or fill
- Products use ingredients that allow growth of bacteria, such as cream and custard;
- Re-use of piping bags
- Products are often left unrefrigerated for long periods of time
- Products are made in premises where *Salmonella* contaminated meat and eggs are not properly separated from ready-to-eat products
- Use of non purpose built premises

Lastly, it was concluded that there is a need for a targeted inspection and education program to address the potential food safety risk due to the lack of hygienic practices.

Table 1 Summary of results from sweet baked goods survey

Product type	No samples	Unacceptable SPC	Unacceptable *E. coli*	Total unacceptable
Baked custard tarts	51	0	0	0
Cont. vanilla slice	22	3 (14%)	0	3 (14%)
Soft custard only	12	3 (25%)	0	3 (25%)
Soft custard & fruit	22	3 (14%)	0	3 (14%)
Soft custard & cream	9	1 (11%)	0	1 (11%)
Cream & fruit	26	4 (15%)	1 (4%)	5 (19%)
Cream filling only	128	26 (20%)	1 (1%)	27 (21%)
Cheesecake only	12	0	0	0
Cheesecake & fruit	8	1 (13%)	0	1 (13%)
Total	290	41 (14%)	2(1%)	43 (15%)

ACT Health - Microbial quality of unrefrigerated desserts [ACT Health, 1997, ACT Health 1999]

In 1997, ACT Health conducted a survey of unrefrigerated desserts for the presence of *E. coli*, CPS, *B. cereus* and *Salmonella* (ACT Health, 1997). The results indicated that there were issues with inadequate storing facilities and improper handling of sampled products. A follow up survey in 1999 identified that while the microbial quality of unrefrigerated desserts had improved, there was still potential to be a risk to public health due to the presence of coagulase positive *Staphylococcus* and *B. cereus* (ACT Health, 1999)

NSW Food Authority – Vietnamese rolls snapshot (NSWFA, 2005)

In 2005 NSW Food Authority conducted a pilot survey to gain a snapshot of the overall quality of Vietnamese style pork rolls produced in NSW. Ten randomly selected hot bread shops in the Sydney metropolitan area were visited with a total of 83 food samples and 36 environmental swabs collected. Samples were tested for faecal coliforms, *E. coli*, coagulase positive staphylococci and *Salmonella*. It was found that while cooking procedures were generally satisfactory, there was enough evidence to suggest cross contamination was a concern during the preparation of Vietnamese pork rolls.

Issues were also identified with hand washing and poor temperature control, resulting in the potential for pathogens to grow to potentially hazardous levels. The environmental swabs taken at each bakery indicated that the predominant form of contamination appeared to be from inadequate cleaning of equipment and utensils. No *Salmonella* was found in any of the samples despite eight premises using raw eggs as part of their ingredients for mayonnaise.

Microbiological quality of RTE foods in Wales (Meldrum, Smith, Ellis, & Garside, 2005)

Surveillance data of 15,228 ready-to-eat foods surveyed in Wales from 1995 to 2004 identified cakes made without dairy cream (exclusively custard slices) as one of the food types with the poorest overall results of all foods. Of 808 custard slice samples, 29 samples (3.6%) contained unsatisfactory level of *E. coli* (equal to or greater than 100 cfu/g), which suggest particularly poor hygiene during preparation of these products. In addition, samples also found to contain unsatisfactory levels of *L. monocytogenes, B. cereus* and *S. aureus* (at the level of 15%, 2.9%, 0.1% and 0.4% respectively) and unsatisfactory aerobic plate counts. Unsatisfactory limits were set at >100 cfu/g for *Listeria spp* and 10^4 < 10^5 cfu/g for *B. cereus*. Unsatisfactory limits were set at *Salmonella* detected at 25g, >100 cfu/g for *L. monocytogenes* and > 10^5 cfu/g for *B. cereus*.

Surveillance data also included quiche and cakes with dairy cream. Over nine years 415 quiche were sampled. Of these 17% contained high aerobic plate counts and only one sample contained *E. coli* at unsatisfactory levels. There were 862 cakes with dairy cream sampled with 16 samples containing unsatisfactory levels of *E. coli*, two samples containing unsatisfactory levels of *B. cereus* and *Clostridium perfringens* and one sample contained unsatisfactory levels of *Staphylococcus aureus.* Of cakes with dairy cream, 35% (301 samples) had an unsatisfactory aerobic plate count. Guidelines set by PHLS Advisory Committee for Food and Dairy Products UK (Gilbert et al 2000) set aerobic plate count unsatisfactory limit for desserts without cream and quiche at >10^5 MPN/g and an unsatisfactory limit for desserts with cream at >10^6 MPN/g.

Food Safety Authority of Ireland - 1st Quarter National Survey 2001v (NS1)– Cakes and Pastries with Perishable Fillings and Toppings (FSAI, 2001)

Food Safety Authority of Ireland conducted a survey of 527 cakes and pastries with perishable fillings and toppings in 2001 for the presence of *S. aureus* and *E.coli*. One sample (0.19%) was found to be potentially hazardous while nine samples (1.71%) were found to be unsatisfactory for *S. aureus* and 11 samples (2.09%) were unsatisfactory for *E. coli*. The findings highlighted the need for continued emphasis on good food handling practices at all stages during the processing and storage of these commodities. Unsatisfactory results for *E. coli* and *Staphylococcus* were >100 MPN/g and 10^2-<10^4 cfu/g respectively. Unsatisfactory results for *Staphylococcus* was >10^4 cfu/g. The FSAI did not define an unsatisfactory limit for *E.coli* (FSAI 2001a).

Dunn Son & Stone for Department of Human Services Victoria - A Challenge testing study of custard and cream products with *Bacillus cereus*, coagulase positive staphylococci and *Escherichia coli* at ambient temperatures. [Dunn, Son & Stone, n.d.]

In 2001, Department of Human Services Victoria contracted Dunn Son & Stone to conduct a challenge test of custard and cream products stored at ambient temperatures for *B. cereus*, coagulase positive *Staphylococcus* and *E. coli* growth and to test the applicability of the 2hr / 4 hr rule for alternative compliance to Standard 3.2.2 of the Food Standard Code (Dunn et al. n.d). The study found that 13% and 34.8% of samples sustained the growth of either *B. cereus*, coagulase positive *Staphylococcus* and *E. coli* over a four hour and eight hour time period respectively. The study also concluded that safety of products is affected by various intrinsic factors such as water activity and pH, and products may become potentially hazardous due to poor manufacturing practices and their ability to support the growth of pathogenic organisms.

Of five mock cream samples that were analysed one sample was found to support the growth of *B. cereus* with a tenfold increase over eight hours. This sample had an initial pH of seven compared to the other mock cream samples which had ph 4.32 – 5.42 and showed no significant growth.

Eighteen custard samples were analysed with six samples supporting growth of the challenge organisms. 4 samples supported the growth of *E. coli*. Three samples supported growth of *E.coli* with a tenfold increase at 8 hours and a fourth sample had a tenfold increase at 4 hours but a decrease at eight hours. These four samples had a pH between 6.22 and 7.20. One custard sample supported the growth of CPS with a tenfold increase at eight hours. Three custard samples supported growth of *B. cereus* with a tenfold increase at eight hours. Again these samples had a pH of between 6.22 and 6.68 with water activity equal to or over 0.92. A custard tart with ph 5.49 and water activity of 0.92 showed no significant growth over eight hours.

A profiterole sample with a pH of 4.19 and water activity of 0.93 showed no significant change over eight hours for any of the challenge organisms

A mock cream filled sponge with a pH of 5.42 and water activity of 0.92 and other samples with higher more neutral pH showed no significant change over an eight hour period. These samples may have had other intrinsic factors such as composition and preservative levels that inhibited the growth of bacteria in the product. This survey did not take into account the different ingredients and preservatives that are used in commercial products and also acknowledge the difficulty in inoculation of these products. The results of this survey indicate that pH and water activity can have a substantial influence on growth of pathogenic bacteria.

Appendix 3

Guidelines for sampling officer

Samples should be taken from retail bakeries randomly selected from your region, including chain stores, independent retailers and supermarket bakeries. Bread manufacturers and wholesalers are excluded from this survey.

Table 1: Product Range

Group	Samples required	Laboratory testing
Custard filled products, including pastries, tarts or bread	2 pieces/slices	Microbiology & Chemistry
Fresh cream filled products	2 pieces/slices	Microbiology & Chemistry
Meat topped bread, including ham and bacon	2 pieces/slices	Microbiology & Chemistry
Vietnamese style rolls e.g. pork roll and chicken roll (as a whole)	2 rolls	Microbiology
Non dairy based products such as products containing mock cream	2 pieces/slices	Microbiology & Chemistry
Other product type such as cheesecake, vanilla slice	2 pieces/slices	Microbiology & Chemistry
	12 samples	

- From each bakery, take two samples of each of the high-risk bakery product groups shown above – total 12 samples
- If samples from one group are not available, make up sample numbers from the other groups ensuring two samples of each product type is obtained
- Each sample is to be placed in a separate bag – six for chemistry and six for microbiology
- The questionnaire is to be conducted for each outlet

Sampling Method

Temperature reporting

1) Prior to taking the samples, the temperature of each product type is determined using an infra red (IR) thermometer
2) Record the temperature on the laboratory submission form
3) **When the temperature reading on IR thermometer is between 5 and 8°C, purchase an extra sample and take the temperature of this sample using a probe thermometer, and then discard the sample**

Sampling

1) Samples are to be taken aseptically, avoiding contamination
2) Please ask the employee to place the products inside the sterile plastic bags provided, using gloved hand or tongs (as they normally serve customer)
3) Samples should be taken in their original condition (with or without outer packaging)
4) Please photocopy the submission form and send/fax it to Victoria Stitt (details on next page)

Labelling and forms

1) Label each bag with a unique number (your initial followed by a number, for example: VS1), sample description, date and signature - NSWFA will provide label.
2) Sample submission form is required for all the samples. Please note that there are two separate forms, one for Microbiology and one for Chemistry Laboratory.

Sample transportation

1) Samples should be transported to the lab as soon as possible under cold conditions (in an esky with ice bricks or refrigeration).
2) To avoid freeze burn, make sure that ice bricks do not touch the samples.
3) It is recommended to place a line of newspaper in between the samples and ice bricks and make sure that the products are loosely packed inside the esky.
4) Place the laboratory submission inside a zip lock bag and in the esky.
5) Samples to be sent to the Divisional of Analytical Laboratories

Attachment 1. Bakery survey questionnaire - Retail

Food Officer details

Name:			
Local council represented:			
Date of survey:		Time:	

Food business surveyed:

Trading name of business:	
Address:	
Suburb:	
Describe location (eg inside shopping centre, outside etc)	
Contact person:	
Identification number	

Questions to businesses-- Please tick/circle the appropriate answer

Q1 Where do you get the following products from?

	made on site	bought pre-made	do not sell product
custard filled products			
fresh cream filled products			
meat topped bread			
pork roll (Vietnamese style)			
Non-dairy based filled products			
Other high risk products			

Q2 Where do you get the following ingredients from?

	cooked / prepared on site	cooked / prepared off site	bought pre-cooked/ pre-made	do not use ingredients
cooked chicken				
cooked meat				
deli products (ham, salami)				
raw vegetables (shredded/cut vegetables eg lettuce, carrot)				
mayonnaise				
pate				
cream				
custard				
Other high risk ingredients:				

Q3 Do you have approved suppliers program for your ingredients?

Yes	No	Not sure

Q4 Eggs:

	Yes	No
Do you use unpasteurised egg pulp?		
Name products in which unpasteurised egg pulp used:		
Do you ever receive cracked eggs?		
Do you use cracked eggs?		
Name products in which cracked eggs used:		

Q5 Mayonnaise

	Yes	No
Do you use raw egg in your mayonnaise?		
Do you put mayonnaise in the fridge at all times?		

Q6 How many of the following products do you produce each day?

	The number of products	Do not make products
custard filled products		
fresh cream filled products		
meat topped bread		
pork roll (Vietnamese style)		
Non-dairy based filled products		
Other high risk products		

Q7 Do you use disposable piping bags?

Yes	No	Not sure

Do use separate piping bags for each product?

Yes	No	Not sure

Q8 How are products displayed?

	chilled cabinet	room temperature	hot display	Temp of cabinet (°C)
custard filled products				
fresh cream filled products				
meat topped bread				
pork roll (Vietnamese style)				
Non-dairy based filled products				
Other high risk products				

Q9 Do you know how long products have been displayed for?

Yes	No	Not sure

Q10 What happen to products at closing time?

	discarded	stored for next day	use in other products	given away
custard filled products				
fresh cream filled products				
meat topped bread				
pork roll (Vietnamese style)				
Non-dairy based filled products				
Other high risk products				

Appendix 4

Guidelines for the microbiological examination of RTE foods last revised December 2001 (FSANZ, 2001)

Microbiological Quality (CFU per gram)

	Acceptable		Unacceptable	
Test	**Satisfactory**	**Marginal**	**Unsatisfactory**	**Potentially Hazardous**
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 *Enterobacteriaceae**	. $< 10^2$	. 10^2-10^4	. Greater than or equal to 10^4	. .
Escherichia coli	< 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 10^4SET +ve
Clostridium perfringens	$<10^2$	10^2-10^3	10^3-10^4	Greater than or equal to 10^4
Bacillus cereus and other pathogenic *Bacillus* spp	$<10^2$	10^2-10^3	10^3-10^4	Greater than or equal to 10^4
Vibrio parahaemolyticus[#]	<3	<3 -10^2	10^2 -10^4	Greater than or equal to 10^4
Campylobacter spp	not detected in 25g	-	-	detected
Salmonella spp	not detected in 25g	-	-	detected
Listeria monocytogenes	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.

Appendix 5

Cu = Custard filled products
Cr = Fresh cream filled products
N-D = Non dairy based products
M-B = Meat topped bread
V = Vietnamese style rolls
Misc = Miscellaneous bakery products

S = Satisfactory
M = Marginal
U = Unsatisfactory
PH = Potentially hazardous
BN = Batch number

Table 1 Raw microbiological results

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
1	Cu	Custard scroll	22.1	18.7	<3	<3	<100	<100	ND	S
1	Cu	Custard and almond scroll	21.6	18.1	9	<3	<100	<100	ND	S
1	M-B	Cheese and Bacon Roll	23.4	18.7	<3	<3	<100	<100	ND	S
1	M-B	Danish square - ham and cheese	22.8	18.7	<3	<3	<100	<100	ND	S
1	M-B	Pizza slice - ham and cheese	21.4	18.7	<3	<3	<100	<100	ND	S
1	M-B	Pizza slice - supreme	21.4	18.7	<3	<3	<100	<100	ND	S
2	Cu	Custard tart	15.0	15.9	<3	<3	<100	<100	ND	S
2	Cu	Vanilla slice	10.1	15.9	23	<3	<100	<100	ND	S
2	Cr	Apple Turnover w/ Fresh Cream	10.9	15.9	<3	<3	<100	<100	ND	S
2	N-D	Apple pie w/ mock cream	11.1	15.9	<3	<3	<100	<100	ND	S
2	N-D	Neenish Tart w/ mock cream	10.4	15.9	<3	<3	<100	<100	ND	S
2	Misc	Cheesecake slice	8.9	15.9	<3	<3	<100	<100	ND	S
3	Cu	Custard bun	24.4	19.3	<3	<3	<100	<100	ND	S
3	M-B	Cheese and Bacon Roll	24.8	19.3	<3	<3	<100	<100	ND	S
3	N-D	Jelly Cake w/ mock cream	9.2	19.3	<3	<3	<100	<100	ND	S
3	Misc	Egg tart	26.1	15.4	<3	<3	<100	<100	ND	S
3	Misc	Red bean bun	25.6	19.3	<3	<3	<100	<100	ND	S
3	Misc	Tuna Roll w/mayonnaise	26.4	19.3	<3	<3	<100	<100	ND	S
4	Cu	Vanilla slice	11.6	15.4	<3	<3	<100	<100	ND	S
4	Cr	Apple Turnover w/ Fresh Cream	10.4	15.4	<3	<3	<100	<100	ND	S
4	N-D	Neenish Tart w/ mock cream	10.1	15.4	<3	<3	<100	<100	ND	S
4	Misc	Cheesecake slice	9.4	15.4	<3	<3	<100	<100	ND	S
4	Cu	Custard tart	9.1	15.4	43	15	<100	<100	ND	M
4	Cr	Chocolate Éclair w/ fresh cream	11.2	15.4	230	230	100	<100	ND	U
5	Cu	Custard tart	21.0	22.0	<3	<3	<100	<100	ND	S
5	Cr	Fresh Cream bun	22.1	22.0	<3	<3	<100	<100	ND	S
5	Cr	Chocolate Éclair w/ fresh cream	9.6	15.9	<3	<3	<100	<100	ND	S
5	M-B	Cheese and Bacon Roll	31.3	22.0	<3	<3	<100	<100	ND	S
5	N-D	Neenish Tart w/ mock cream	22.9	22.0	<3	<3	<100	<100	ND	S
5	Misc	Unbaked cheesecake	8.8	15.9	<3	<3	<100	<100	ND	S
6	Cu	Vanilla slice	8.2	15.9	<3	<3	<100	<100	ND	S
6	Cr	Apple turnover	9.6	15.9	4	<3	<100	<100	ND	S
6	M-B	Cheese and Bacon Roll	21.5	22.0	<3	<3	<100	<100	ND	S
6	M-B	Savoury roll	21.0	22.0	<3	<3	<100	<100	ND	S
6	N-D	Neenish tart	20.4	22.0	<3	<3	<100	<100	ND	S
6	Misc	Cheese slice	10.6	15.9	<3	<3	100	<100	ND	M
7	Cu	Vanilla slice	-	13.0	<3	<3	<100	<100	ND	S
7	Cr	Cream bun	-	13.0	<3	<3	<100	<100	ND	S
7	M-B	Cheese and Bacon Roll	-	21.8	<3	<3	<100	<100	ND	S
7	N-D	Cream Slice (mock cream)	-	13.0	<3	<3	<100	<100	ND	S
7	V	Pork roll	-	21.8	<3	<3	<100	<100	ND	S
7	V	Chicken roll	-	21.8	<3	<3	<100	<100	ND	S
8	Cu	Custard tart	10.5	13.0	<3	<3	<100	<100	ND	S
8	Cr	Chocolate éclair	15.0	13.0	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
8	M-B	Cheese & bacon roll	25.5	21.8	<3	<3	<100	<100	ND	S
8	M-B	Pizza roll	25.0	21.8	<3	<3	<100	<100	ND	S
8	V	Pork roll	13.5	21.8	4	<3	<100	<100	ND	S
8	V	Chicken roll	14.5	21.8	4	<3	<100	<100	ND	S
9	Cu	Vanilla slice	8.5	12.0	<3	<3	<100	<100	ND	S
9	Cu	Custard pie	12.5	12.0	<3	<3	<100	<100	ND	S
9	M-B	Cheese & bacon roll	25.0	19.4	<3	<3	<100	<100	ND	S
9	Misc	Cheesecake slice	15.0	15.0	<3	<3	<100	<100	ND	S
9	V	Chicken roll	9.5	19.4	<3	<3	<100	<100	ND	S
9	V	Pork roll	15.5	19.4	4	<3	100	<100	ND	M
10	Cu	Custard tart	10.5	13.9	<3	<3	<100	<100	ND	S
10	Cr	Apple Turnover (Real cream)	13.0	17.2	<3	<3	<100	<100	ND	S
10	M-B	Cheese & bacon roll	23.0	20.5	<3	<3	<100	<100	ND	S
10	N-D	Jam Roll (mock cream)	14.0	17.2	<3	<3	<100	<100	ND	S
10	V	Pork roll	17.0	20.5	430	<3	<100	<100	ND	S
10	V	Chicken roll	17.0	20.5	230	<3	100	<100	ND	M
11	Cu	Custard tart	5.0	12.4	<3	<3	<100	<100	ND	S
11	Cu	Custard tart	6.5	12.4	<3	<3	<100	<100	ND	S
11	Cu	Passion fruit tart	12.0	16.8	<3	<3	<100	<100	ND	S
11	N-D	Neenish tart	10.0	16.8	<3	<3	<100	<100	ND	S
11	Misc	Vanilla cheesecake	12.0	16.8	<3	<3	<100	<100	ND	S
11	Misc	Vanilla cheesecake	10.0	16.8	<3	<3	<100	<100	ND	S
11	V	Chicken roll	20.0	20.5	<3	<3	<100	<100	ND	S
11	Cr	Cream bun	10.0	12.4	75	4	<100	<100	ND	M
11	Cr	Cream bun	10.0	12.4	210	<3	<100	<100	ND	M
11	V	Pork Roll w/ pate	13.5	20.5	9	<3	100	<100	ND	M
12	Cu	Custard tart	8.5	15.0	<3	<3	<100	<100	ND	S
12	Cu	Vanilla slice	10.0	19.4	3	<3	<100	<100	ND	S
12	M-B	Cheese & bacon roll	22.0	20.5	<3	<3	<100	<100	ND	S
12	N-D	Neenish tart	23.5	17.0	<3	<3	<100	<100	ND	S
12	Misc	Cheesecake slice	7.5	15.0	<3	<3	<100	<100	ND	S
13	Cu	Custard tart	7.5	13.4	<3	<3	<100	<100	ND	S
13	Cr	Cream bun passionfruit	11.5	13.4	<3	<3	<100	<100	ND	S
13	M-B	Ham and Cheese Roll	28.0	14.6	<3	<3	<100	<100	ND	S
13	N-D	Neenish tart	28.5	14.6	<3	<3	<100	<100	ND	S
13	Misc	Cheesecake Slice (passionfruit)	10.5	13.4	93	<3	<100	<100	ND	S
13	V	Pork roll	12.0	14.6	<3	<3	<100	<100	ND	S
14	Cu	Vanilla slice	6.0	12.0	4	<3	<100	<100	ND	S
14	Cu	Custard tart	4.0	12.0	<3	<3	<100	<100	ND	S
14	Misc	Mixed bun	5.0	12.0	<3	<3	<100	<100	ND	S
14	Misc	Lemon tart	3.5	12.0	<3	<3	<100	<100	ND	S
14	Cr	Cream roll	3.0	12.0	<3	<3	3900	<100	ND	U
15	Cu	Custard tart	3.0	6.5	<3	<3	<100	<100	ND	S
15	Cr	Cream bun	3.5	15.3	<3	<3	<100	<100	ND	S
15	M-B	Cheese & bacon roll	18.5	20.5	<3	<3	<100	<100	ND	S
15	N-D	Neenish tart	20.0	15.3	<3	<3	<100	<100	ND	S
15	V	Chicken & salad roll	2.5	18.3	<3	<3	<100	<100	ND	S
16	Cu	Custard tart	-	19.3	<3	<3	<100	<100	ND	S
16	Cu	Apple & custard tea cake	-	11.9	<3	<3	<100	<100	ND	S
16	Cu	Vanilla slice	-	18.3	<3	<3	<100	<100	ND	S
16	Cu	Cherry & custard tart	-	12.7	<3	<3	<100	<100	ND	S
16	Cr	Cream bun	-	15.8	<3	<3	<100	<100	ND	S
16	Misc	Quiche - ham & tomato	-	19.3	<3	<3	<100	<100	ND	S
17	Cu	Custard tart	14.0	8.9	<3	<3	<100	<100	ND	S
17	Cr	Apple turnover	12.6	14.4	<3	<3	<100	<100	ND	S
17	M-B	Meat topped bread	25.0	13.5	<3	<3	<100	<100	ND	S
17	N-D	Mock cream doughnut	25.6	17.1	<3	<3	<100	<100	ND	S
17	Misc	Caramel tart	27.0	8.9	<3	<3	<100	<100	ND	S
18	Cr	Chocolate Éclair w/ fresh cream	4.4	8.9	<3	<3	<100	<100	ND	S
18	M-B	Meat topped bread	23.0	13.4	<3	<3	<100	<100	ND	S
18	N-D	Mock cream tart	25.0	8.9	<3	<3	<100	<100	ND	S
18	Misc	Cheesecake	8.0	8.9	<3	<3	<100	<100	ND	S
18	Cu	Apple custard tart	4.4	8.9	<3	<3	1400	<100	ND	U
19	Cu	Custard tart	7.9	11.2	<3	<3	<100	<100	ND	S
19	N-D	Neenish tart	23.0	11.2	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
19	Misc	Quiche	21.6	17.4	<3	<3	<100	<100	ND	S
19	Cr	Fresh cream éclair	8.0	11.2	93	<3	200	<100	ND	M
19	Misc	Cheese cake	3.1	17.4	9	<3	450	<100	ND	M
20	Cu	Vanilla slice	6.0	11.2	<3	<3	<100	<100	ND	S
20	M-B	Pizza roll	21.0	14.6	<3	<3	<100	<100	ND	S
20	M-B	Bacon & cheese roll	20.6	14.6	<3	<3	<100	<100	ND	S
20	Misc	Cheesecake	5.0	14.6	<3	<3	<100	<100	ND	S
20	Misc	Finger bun	22.0	13.2	<3	<3	<100	<100	ND	S
21	Cu	Custard tart	4.0	15.8	<3	<3	<100	<100	ND	S
21	Cr	Chocolate éclair	5.6	15.8	21	<3	<100	<100	ND	S
21	M-B	Cheese & bacon roll	22.0	15.8	<3	<3	<100	<100	ND	S
21	N-D	Niniche tart	7.0	15.8	<3	<3	<100	<100	ND	S
21	Misc	Cheesecake	6.0	15.8	<3	<3	<100	<100	ND	S
21	V	Vietnamese pork	8.0	15.8	<3	<3	<100	<100	ND	S
21	Misc	Spinach quiche	17.0	15.8	<3	<3	400	<100	ND	M
22	Cr	Almond cream	32.0	15.8	<3	<3	<100	<100	ND	S
22	Misc	Quiche	5.0	15.8	<3	<3	<100	<100	ND	S
22	Misc	Cheesecake	6.5	15.8	9	<3	<100	<100	ND	S
22	Cr	Profiterole	20.0	15.8	>11000	<3	<100	<100	ND	U
23	Cu	Custard croissant	-	15.0	<3	<3	<100	<100	ND	S
23	Cu	Apple danish	-	15.0	<3	<3	<100	<100	ND	S
23	M-B	Ham and Cheese Roll	-	15.0	<3	<3	<100	<100	ND	S
23	Misc	Coconut bun	-	15.0	<3	<3	<100	<100	ND	S
23	V	Chicken roll	-	15.0	230	230	<100	<100	ND	U
23	V	Pork roll	-	15.0	4600	4600	<100	<100	ND	U
24	Cu	Custard scroll	-	15.0	<3	<3	<100	<100	ND	S
24	M-B	Cheese and Bacon Roll	-	15.0	<3	<3	<100	<100	ND	S
24	M-B	Cheese and Bacon Roll w/ egg	-	15.0	<3	<3	<100	<100	ND	S
24	Misc	Coconut scroll	-	15.0	<3	<3	<100	<100	ND	S
24	V	Pork roll	-	15.0	23	<3	<100	<100	ND	S
24	V	Chicken roll	-	15.0	9	<3	<100	<100	ND	S
25	Cu	Vanilla Slice w/ Cream	-	5.5	<3	<3	<100	<100	ND	S
25	Cu	Profiterole	-	5.5	<3	<3	<100	<100	ND	S
25	Cu	Tart	-	5.5	<3	<3	<100	<100	ND	S
25	Cu	Fruit flan	-	5.5	4	<3	<100	<100	ND	S
25	Misc	Cheesecake	-	5.5	<3	<3	<100	<100	ND	S
26	Cu	Custard tart	-	5.5	<3	<3	<100	<100	ND	S
26	Cu	Vanilla Slice w/ cream	-	5.5	<3	<3	<100	<100	ND	S
26	Cu	Vanilla slice - plain	-	5.5	<3	<3	<100	<100	ND	S
26	M-B	Cheese & ham roll	-	5.5	<3	<3	<100	<100	ND	S
26	Misc	Bity cakes	-	5.5	<3	<3	<100	<100	ND	S
26	Misc	Cheesecake	-	5.5	150	<3	<100	<100	ND	M
27	Cu	Custard slice	4.4	7.0	4	<3	<100	<100	ND	S
27	Cu	Custard tart	3.2	6.6	<3	<3	<100	<100	ND	S
27	Cr	Apple turnover	7.0	7.0	<3	<3	<100	<100	ND	S
27	M-B	Cheese & bacon roll	23.2	7.0	<3	<3	<100	<100	ND	S
27	N-D	Neenish tart	23.2	7.0	75	<3	<100	<100	ND	S
27	Misc	Caramel tart	2.8	7.0	9	<3	<100	<100	ND	S
28	Cu	Custard tart	10.0	6.6	<3	<3	<100	<100	ND	S
28	Cu	Apple & custard crumble	9.6	7.0	<3	<3	<100	<100	ND	S
28	Cr	Apple turnover	8.7	6.6	4	<3	<100	<100	ND	S
28	Cr	Cream horn	22.0	6.6	9	<3	<100	<100	ND	S
28	M-B	Bacon & cheese roll	22.0	6.6	<3	<3	<100	<100	ND	S
28	Cu	Bee sting	8.7	6.6	1500	430	<100	<100	ND	U
29	Cu	Apricot danish	21.1	16.5	<3	<3	<100	<100	ND	S
29	Cu	Custard tart	18.1	3.6	<3	<3	<100	<100	ND	S
29	Cu	Custard croissant	22.4	3.6	<3	<3	<100	<100	ND	S
29	Cr	Cream bun	18.8	3.6	<3	<3	<100	<100	ND	S
29	M-B	Cheese & bacon roll	24.4	13.4	<3	<3	<100	<100	ND	S
30	Cu	Custard bun	20.1	16.5	<3	<3	<100	<100	ND	S
30	Cr	Cream bun	20.8	16.5	9	<3	<100	<100	ND	S
30	M-B	Chicken bun	20.8	13.4	<3	<3	<100	<100	ND	S
30	M-B	Frankfurt bun	23.6	16.5	<3	<3	<100	<100	ND	S
30	Misc	Lemon cake	18.2	13.4	<3	<3	<100	<100	ND	S
30	V	Pork roll	4.6	16.5	<3	<3	<100	<100	ND	S
31	Cu	Custard tart	-	7.4	<3	<3	<100	<100	ND	S
31	Cr	Apple turnover	-	7.4	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
31	Cr	Chocolate éclair	-	7.4	<3	<3	<100	<100	ND	S
31	M-B	Cheese and Bacon Roll	-	13.6	3	<3	<100	<100	ND	S
31	Misc	Lamington cake	-	7.4	<3	<3	<100	<100	ND	S
31	V	Chicken roll	-	13.6	<3	<3	<100	<100	ND	S
32	Cu	Custard danish	-	7.4	<3	<3	<100	<100	ND	S
32	Cu	Custard tart	-	7.4	<3	<3	<100	<100	ND	S
32	M-B	Cheese and bacon roll	-	7.4	<3	<3	<100	<100	ND	S
32	Misc	Jam roll	-	7.4	<3	<3	<100	<100	ND	S
32	Misc	Cheesecake	-	7.4	23	<3	<100	<100	ND	S
32	V	Pork roll	-	13.6	43	<3	<100	<100	ND	S
33	Cu	Custard tart	-	13.9	<3	<3	<100	<100	ND	S
33	Cu	Custard scoll	-	13.9	<3	<3	<100	<100	ND	S
33	Cr	Apple turnover	-	13.9	<3	<3	<100	<100	ND	S
33	Cr	Cream bun	-	13.9	<3	<3	<100	<100	ND	S
33	M-B	Cheese and Bacon Roll	-	13.9	<3	<3	<100	<100	ND	S
33	V	Chicken roll	-	13.9	23	<3	<100	1300	ND	U
34	Cu	Custard tart	-	15.1	<3	<3	<100	<100	ND	S
34	M-B	Cheese and Bacon Roll	-	15.1	<3	<3	<100	<100	ND	S
34	Misc	Coconut tart	-	15.1	<3	<3	<100	<100	ND	S
34	Misc	Sultana scroll	-	15.1	<3	<3	<100	<100	ND	S
34	V	Pork roll	-	15.1	<3	<3	<100	<100	ND	S
34	V	Chicken roll	-	15.1	3	<3	<100	<100	ND	S
35	Cu	Custard tart	12.2	9.6	<3	<3	<100	<100	ND	S
35	M-B	Cheese & bacon roll	23.1	9.6	<3	<3	<100	<100	ND	S
35	V	Chicken roll	17.0	9.6	930	<3	<100	<100	ND	S
35	Cr	Chocolate éclair	3.5	9.6	39	39	<100	<100	ND	M
35	N-D	Neenish tarts	10.0	9.6	9	9	<100	<100	ND	M
35	Misc	Cheesecake	5.9	9.6	4	4	<100	<100	ND	M
36	Cr	Chocolate éclair	2.9	9.6	<3	<3	<100	<100	ND	S
36	Cr	Apple rollover	1.2	9.6	<3	<3	<100	<100	ND	S
36	M-B	Meat topped bread	16.1	9.6	<3	<3	<100	<100	ND	S
36	N-D	Neenish tarts	16.9	9.6	<3	<3	<100	<100	ND	S
36	Misc	Cheesecake	2.8	9.6	<3	<3	<100	<100	ND	S
36	Cu	Custard tart	1.1	9.6	<3	<3	400	<100	ND	M
37	N-D	Mock cream match	14.0	11.3	<3	<3	<100	<100	ND	S
37	Misc	Mushroom topped bread	21.5	11.3	<3	<3	<100	<100	ND	S
37	V	Chicken roll	7.0	11.3	230	93	<100	<100	ND	M
38	Cu	Vanilla slice	9.0	11.3	<3	<3	<100	<100	ND	S
38	Cu	Custard tart	13.0	11.3	<3	<3	<100	<100	ND	S
38	Cr	Apple Pie w/cream	6.0	11.3	<3	<3	<100	<100	ND	S
39	Cu	Vanilla slice	5.0	3.5	4	<3	<100	<100	ND	S
39	Cu	Custard tart	6.0	3.5	<3	<3	<100	<100	ND	S
39	M-B	Cheese & bacon roll	19.0	3.5	<3	<3	<100	<100	ND	S
39	Misc	Carrot cake	5.0	3.5	<3	<3	<100	<100	ND	S
39	Misc	Apple slice	6.0	3.5	<3	<3	<100	<100	ND	S
40	Cu	Custard tart	10.0	3.5	<3	<3	<100	<100	ND	S
40	Cr	Apple turnover	10.0	3.5	<3	<3	<100	<100	ND	S
40	M-B	Cheese & bacon roll	19.0	3.5	<3	<3	<100	<100	ND	S
40	N-D	Neenish tart	20.0	3.5	<3	<3	<100	<100	ND	S
40	Misc	Cheesecake	10.0	3.5	<3	<3	<100	<100	ND	S
40	Cu	Vanilla slice	10.0	3.5	<3	<3	200	<100	ND	M
41	Cu	Custard tart	9.0	7.5	<3	<3	<100	<100	ND	S
41	Cr	Chocolate éclair	-	7.5	<3	<3	<100	<100	ND	S
41	M-B	Meat topped bread	15.0	7.5	<3	<3	<100	<100	ND	S
41	Misc	Coconut slice	9.0	7.5	<3	<3	<100	<100	ND	S
41	Misc	Quiche	15.0	7.5	<3	<3	<100	<100	ND	S
41	Cu	Vanilla slice	9.0	7.5	<3	<3	600	<100	ND	M
42	Cu	Custard tart	1.8	4.3	<3	<3	<100	<100	ND	S
42	Cr	Chocolate Éclair	-1.6	4.3	<3	<3	<100	<100	ND	S
42	Cr	Apple turnover	-2.8	4.3	<3	<3	<100	<100	ND	S
42	M-B	Cheese & Bacon roll	14.0	4.3	<3	<3	<100	<100	ND	S
42	N-D	Neenish tart	14.8	4.3	<3	<3	<100	<100	ND	S
42	Misc	Cheesecake	12.8	4.3	<3	<3	<100	<100	ND	S
43	Cu	Danish - blueberry	-	16.1	<3	<3	<100	<100	ND	S
43	Cu	Danish - apple	-	16.1	<3	<3	<100	<100	ND	S
43	Cu	Custard tart	-	16.1	<3	<3	<100	<100	ND	S
43	M-B	Cheese & bacon roll	-	16.1	<3	<3	<100	<100	ND	S
43	Misc	Carrot cake	-	16.1	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
43	Cu	Vanilla slice	-	16.1	20	4	<100	<100	ND	M
44	Cu	Danish lattice - apple/custard	-	16.1	<3	<3	<100	<100	ND	S
44	Cu	Danish square - blueberry	-	16.1	<3	<3	<100	<100	ND	S
44	Cu	Walnut scroll - apple	-	16.1	<3	<3	<100	<100	ND	S
44	Cu	Custard almond scroll	-	16.1	<3	<3	<100	<100	ND	S
44	M-B	Ham & Pineapple slice	-	16.1	<3	<3	<100	<100	ND	S
44	M-B	Pizza slice - mediteran.	-	16.1	<3	<3	<100	<100	ND	S
45	Cu	Custard Scroll	-	8.3	<3	<3	<100	<100	ND	S
45	M-B	Cheese & Bacon roll	-	8.3	<3	<3	<100	<100	ND	S
45	M-B	Savoury bite	-	10.7	<3	<3	<100	<100	ND	S
45	Misc	Spinach & fetta roll	-	10.7	<3	<3	<100	<100	ND	S
45	Misc	Apple scroll	-	8.3	<3	<3	<100	<100	ND	S
46	Cu	Danish pastry	-	13.5	<3	<3	<100	<100	ND	S
46	Cu	Vanilla slice	-	13.5	<3	<3	<100	<100	ND	S
46	Misc	Cheesecake	-	11.0	9	<3	<100	<100	ND	S
47	Misc	Apple pastry	-	15.0	<3	<3	<100	<100	ND	S
47	Misc	Apple pie	-	15.0	<3	<3	<100	<100	ND	S
48	M-B	Cheese & bacon	-	15.0	<3	<3	<100	<100	ND	S
48	Misc	Cup cake	-	15.0	<3	<3	<100	<100	ND	S
48	V	Vitnamese chicken roll	-	15.0	3	<3	<100	<100	ND	S
48	V	Vietnamese pork roll	-	15.0	93	93	<100	<100	ND	M
49	Cu	French vanilla slice	0.4	2.8	<3	<3	<100	<100	ND	S
49	Cr	Cream Apple turnover	0.4	2.8	<3	<3	<100	<100	ND	S
49	M-B	Pizzett (cheese & meat)	34.0	2.8	<3	<3	<100	<100	ND	S
49	N-D	Neenish tarts	0.4	2.8	<3	<3	<100	<100	ND	S
49	Cu	Custard tart	0.3	2.8	11	11	<100	<100	ND	M
50	Cu	Custard tart	3.1	2.8	<3	<3	<100	<100	ND	S
50	Cr	Cream cake	3.1	2.8	<3	<3	<100	<100	ND	S
50	M-B	Ham roll	2.4	2.8	930	930	<100	<100	ND	U
51	Cu	Custard tart	8.6	7.4	<3	<3	<100	<100	ND	S
51	Cu	Vanilla slice	8.0	7.4	<3	<3	<100	<100	ND	S
51	Cr	Cream Filled bun	10.0	7.4	<3	<3	<100	<100	ND	S
51	M-B	Meat topped Bread	14.6	7.4	<3	<3	<100	<100	ND	S
51	N-D	Cream bun - Mock Cream	16.0	7.4	<3	<3	<100	<100	ND	S
51	Misc	Cheesecake	8.0	7.4	4	<3	<100	<100	ND	S
52	Cu	Custard filled tart	5.0	7.4	<3	<3	<100	<100	ND	S
52	Cr	Cream filled pie	3.0	7.4	<3	<3	<100	<100	ND	S
52	M-B	Meat topped Bread	18.0	7.4	<3	<3	<100	<100	ND	S
52	N-D	Neenish tart	15.0	7.4	<3	<3	<100	<100	ND	S
52	Misc	Cheesecake	2.5	7.4	<3	<3	<100	<100	ND	S
52	Cu	Vanilla slice	2.3	7.4	4	<3	<100	100	ND	M
53	Cu	Custard tart	4.6	8.6	<3	<3	<100	<100	ND	S
53	Cu	Custard tart	4.4	8.6	<3	<3	<100	<100	ND	S
53	Cu	Vanilla slice	4.9	8.6	<3	<3	<100	<100	ND	S
53	M-B	Meat topped Bread	18.8	8.6	<3	<3	<100	<100	ND	S
53	M-B	Meat topped Bread	18.2	8.6	<3	<3	<100	<100	ND	S
53	N-D	Mock cream bun	20.4	8.6	<3	<3	<100	<100	ND	S
54	Cu	Custard tart	6.4	8.6	<3	<3	<100	<100	ND	S
54	Cu	Vanilla slice	6.5	8.6	<3	<3	<100	<100	ND	S
54	Cr	Cream filled apple pie	7.6	8.6	<3	<3	<100	<100	ND	S
54	M-B	Meat topped bread	20.1	8.6	<3	<3	<100	<100	ND	S
54	N-D	Neenish tart	10.5	8.6	<3	<3	<100	<100	ND	S
55	Cu	Custard tart	4.0	7.8	<3	<3	<100	<100	ND	S
55	Cr	Apple turnover	4.0	7.8	<3	<3	<100	<100	ND	S
55	Cr	Cream bun	21.0	7.8	<3	<3	<100	<100	ND	S
55	M-B	Ham and Cheese Roll	21.0	7.8	<3	<3	<100	<100	ND	S
55	N-D	Neenish tart	4.0	7.8	<3	<3	<100	<100	ND	S
55	Misc	Mud cake	21.0	7.8	<3	<3	<100	<100	ND	S
56	Cu	Custard tart	9.0	7.8	<3	<3	<100	<100	ND	S
56	Cr	Apple turnover	9.0	7.8	<3	<3	<100	<100	ND	S
56	M-B	Foccacia	19.0	7.8	<3	<3	<100	<100	ND	S
56	M-B	Pizza slice	19.0	7.8	<3	<3	<100	<100	ND	S
56	N-D	Mock cream bun	19.0	7.8	<3	<3	<100	<100	ND	S
56	Misc	Mud cake cups	9.0	7.8	<3	<3	<100	<100	ND	S
57	Cu	French Vanilla Slice w/ mock cream	-	6.3	<3	<3	<100	<100	ND	S
57	Cr	Cheesecake w/fresh cream	-	6.3	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
57	M-B	Bacon, egg & cheese roll	-	6.3	<3	<3	<100	<100	ND	S
57	M-B	Cheese and Bacon Roll	-	6.3	<3	<3	<100	<100	ND	S
57	N-D	Cream bun w/ mock cream	-	6.3	<3	<3	<100	<100	ND	S
57	Cu	Custard Slice w/fresh cream	-	6.3	<3	<3	400	<100	ND	M
58	Cu	Vanilla slice	-	10.0	<3	<3	<100	<100	ND	S
58	Cr	Apple turnover	-	10.0	<3	<3	<100	<100	ND	S
58	M-B	Cheese & bacon roll	-	10.0	<3	<3	<100	<100	ND	S
58	N-D	Neenish tart	-	10.0	<3	<3	<100	<100	ND	S
58	Misc	Cheesecake	-	10.0	4	<3	<100	<100	ND	S
58	Cu	Custard tart	-	10.0	<3	<3	100	<100	ND	M
59	Cu	Apricot and Custard Danish	-	8.7	<3	<3	<100	<100	ND	S
59	Cu	Vanilla slice	-	8.7	<3	<3	<100	<100	ND	S
59	Cr	Apple Turnover w/ fresh cream	-	8.7	<3	<3	<100	<100	ND	S
59	M-B	Ham & bacon roll	-	8.7	<3	<3	<100	<100	ND	S
59	N-D	Neenish tart	-	8.7	<3	<3	<100	<100	ND	S
59	V	Pork roll	-	8.7	43	<3	100	<100	ND	M
60	Cu	Custard tart	-	8.7	<3	<3	<100	<100	ND	S
60	Cu	Vanilla slice	-	8.7	<3	<3	<100	<100	ND	S
60	M-B	Cheese and Ham Roll	-	8.7	<3	<3	<100	<100	ND	S
60	N-D	Chocolate éclair with mock cream	-	8.7	<3	<3	<100	<100	ND	S
60	V	Pork roll	-	8.7	<3	<3	<100	<100	ND	S
60	V	Chicken roll	-	8.7	<3	<3	<100	<100	ND	S
61	Cu	Custard Tart	8.9	7.4	<3	<3	<100	<100	ND	S
61	M-B	Cheese & Bacon topped roll	21.0	7.4	<3	<3	<100	<100	ND	S
61	N-D	Cream horn	22.0	7.4	<3	<3	<100	<100	ND	S
61	Misc	Carrot cake	9.0	7.4	<3	<3	<100	<100	ND	S
61	V	Pork roll	1.5	7.4	<3	<3	<100	<100	ND	S
62	Cu	Custard tart	3.0	7.4	<3	<3	<100	<100	ND	S
62	Cr	Apple Turnover with Cream	3.5	7.4	<3	<3	<100	<100	ND	S
62	M-B	Bacon & cheese roll	15.5	7.4	<3	<3	<100	<100	ND	S
62	V	Pork roll	1.0	7.4	<3	<3	<100	<100	ND	S
62	V	Chicken roll	4.0	7.4	<3	<3	<100	<100	ND	S
63	Cu	Custard tart	5.5	8.7	<3	<3	<100	<100	ND	S
63	M-B	Cheese & bacon roll	20.0	8.7	<3	<3	<100	<100	ND	S
63	N-D	Apple Turnover w/ mock cream	17.5	8.7	<3	<3	<100	<100	ND	S
63	Misc	Lamington	1.5	8.7	<3	<3	<100	<100	ND	S
63	V	Pork roll	5.0	8.7	<3	<3	<100	<100	ND	S
64	Cu	Custard tart	10.0	9.1	<3	<3	<100	<100	ND	S
64	Cu	Vanilla slice	8.7	9.1	<3	<3	<100	<100	ND	S
64	Cr	Apple Turnover w/ Cream	11.0	9.1	<3	<3	<100	<100	ND	S
64	M-B	Cheese & Ham roll	24.0	11.9	<3	<3	<100	<100	ND	S
64	N-D	Caramel & mock cream tart	10.0	9.1	<3	<3	<100	<100	ND	S
64	V	Pork roll	5.8	9.1	<3	<3	<100	<100	ND	S
65	Cu	Custard tart	6.0	10.5	<3	<3	<100	<100	ND	S
65	Cu	Vanilla slice	6.0	10.5	<3	<3	<100	<100	ND	S
65	M-B	Ham & cheese roll	2.1	13.5	<3	<3	<100	<100	ND	S
65	N-D	Apple Turnover w/ mock cream	17.0	10.5	<3	<3	<100	<100	ND	S
65	Misc	Cheesecake	6.0	10.5	<3	<3	<100	<100	ND	S
65	V	Pork roll	6.0	13.5	<3	<3	<100	<100	ND	S
66	Cu	Match stick w/ mock cream	20.0	18.2	<3	<3	<100	<100	ND	S
66	Cu	Custard tart	17.0	18.2	<3	<3	<100	<100	ND	S
66	M-B	Meat pizza roll	20.0	24.8	<3	<3	<100	<100	ND	S
66	Misc	Apple strudle	17.0	18.2	<3	<3	<100	<100	ND	S
66	V	Pork roll	2.5	18.2	<3	<3	<100	<100	ND	S
67	Cu	Custard tarts	19.0	15.2	<3	<3	<100	<100	ND	S
67	Cr	Apple turnover w/fresh cream	19.0	15.2	<3	<3	<100	<100	ND	S
67	N-D	Chocolate cake with mock cream	21.5	15.2	<3	<3	<100	<100	ND	S
67	V	Pork & salad roll	2.5	17.6	4	<3	100	<100	ND	M
68	Cu	Custard tart	13.5	11.6	<3	<3	<100	<100	ND	S
68	M-B	Cheese and Bacon Roll	15.0	12.5	<3	<3	<100	<100	ND	S
68	N-D	Apple Turnover w/ mock cream	13.5	11.6	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
68	Misc	Coconut bun	16.5	12.5	<3	<3	<100	<100	ND	S
68	V	Pork roll	7.5	12.5	<3	<3	<100	<100	ND	S
69	Cu	Custard snail	13.5	18.0	<3	<3	<100	<100	ND	S
69	M-B	Ham & cheese roll	35.0	18.0	<3	<3	<100	<100	ND	S
69	V	Pork roll	5.5	18.0	430	<3	<100	<100	ND	S
69	V	Chicken roll	6.0	18.0	75	<3	<100	<100	ND	S
70	Cu	Custard tart	4.5	7.4	<3	<3	<100	<100	ND	S
70	M-B	Cheese and Bacon Roll	21.5	14.1	<3	<3	<100	<100	ND	S
70	N-D	Cream bun w/ mock cream	4.9	9.6	<3	<3	<100	<100	ND	S
70	Misc	Coconut bun	9.5	14.1	<3	<3	100	<100	ND	M
70	V	Pork roll	4.5	14.1	<3	<3	150	<100	ND	M
70	V	Chicken roll	5.7	14.1	<3	<3	350	<100	ND	M
71	Cu	Custard tart	-	12.9	<3	<3	<100	<100	ND	S
71	Cu	Vanilla slice	-	15.8	<3	<3	<100	<100	ND	S
71	Cr	Caramel cream puff	-	12.9	<3	<3	<100	<100	ND	S
71	Cr	Chocolate éclair	-	12.9	4	<3	<100	<100	ND	S
71	M-B	Cheese & Bacon pizza	-	15.8	<3	<3	<100	<100	ND	S
71	Misc	Lemon cheesecake	-	15.8	43	<3	<100	<100	ND	S
72	Cu	Custard tart	-	12.9	<3	<3	<100	<100	ND	S
72	Cu	Vanilla slice	-	12.9	<3	<3	<100	<100	ND	S
72	Cr	Cream bun	-	12.9	<3	<3	<100	<100	ND	S
72	Cr	Sponge cake w/ fresh cream	-	12.9	43	<3	<100	<100	ND	S
72	M-B	Cheese & bacon roll	-	15.8	<3	<3	<100	<100	ND	S
72	Misc	Butterfly cake	-	12.9	230	<3	100	<100	ND	M
73	Cu	Fruit custard danish	-	4.5	<3	<3	<100	<100	ND	S
73	Cu	Vanilla slice	-	4.5	4	<3	<100	<100	ND	S
73	Cr	Apple Turnover w/ Cream	-	4.5	<3	<3	<100	<100	ND	S
73	M-B	Cheese & bacon roll	-	4.5	<3	<3	<100	<100	ND	S
73	N-D	Pineapple Tart w/ mock Cream	-	4.5	<3	<3	<100	<100	ND	S
74	Cu	Vanilla slice	1.0	4.5	<3	<3	<100	<100	ND	S
74	Cu	Custard tart	11.0	4.5	<3	<3	<100	<100	ND	S
74	Cr	Fresh cream turnover	1.0	4.5	<3	<3	<100	<100	ND	S
74	M-B	Meat topped bread	15.0	4.5	<3	<3	<100	<100	ND	S
74	M-B	Meat topped bread	15.0	4.5	<3	<3	<100	<100	ND	S
74	N-D	Mock cream	1.0	4.5	<3	<3	<100	<100	ND	S
75	Cu	Custard tart	7.8	13.2	<3	<3	<100	<100	ND	S
75	Cu	Vanilla slice	10.8	14.4	7	<3	<100	<100	ND	S
75	Cr	Chocolate éclair	11.1	13.2	<3	<3	<100	<100	ND	S
75	Cr	Apple Turnover w/ Cream	8.9	13.2	<3	<3	<100	<100	ND	S
75	M-B	Ham & cheese roll	22.9	14.4	<3	<3	<100	<100	ND	S
75	M-B	Ham & cheese roll	22.9	14.4	<3	<3	<100	<100	ND	S
76	Cu	Custard tart	20.1	13.2	<3	<3	<100	<100	ND	S
76	Cu	Custard tart	20.1	13.2	<3	<3	<100	<100	ND	S
76	Cr	Fresh cream roll	11.6	13.2	<3	<3	<100	<100	ND	S
76	Cr	Fresh cream roll	11.6	13.2	<3	<3	<100	<100	ND	S
76	M-B	Ham & cheese roll	22.4	14.4	<3	<3	<100	<100	ND	S
76	M-B	Ham & cheese roll	22.4	14.4	4	<3	<100	<100	ND	S
77	Cu	Vanilla slice	24.8	3.7	<3	<3	<100	<100	ND	S
77	Cu	Match Stick w/ mock cream	24.8	3.7	<3	<3	<100	<100	ND	S
77	Cu	Custard tart	21.4	3.7	<3	<3	<100	<100	ND	S
77	Cr	Apple turnover	9.8	3.7	<3	<3	<100	<100	ND	S
77	M-B	Cheese & bacon roll	24.4	3.7	<3	<3	<100	<100	ND	S
77	Misc	Cheesecake	5.8	3.7	<3	<3	<100	<100	ND	S
78	Cu	Custard tart	3.0	3.6	4	<3	<100	<100	ND	S
78	Cu	Vanilla slice	3.0	3.6	<3	<3	<100	<100	ND	S
78	Cu	Match Stick w/ mock cream	25.0	3.6	<3	<3	<100	<100	ND	S
78	Cr	Apple Turnover w/ fresh cream	2.0	3.6	<3	<3	<100	<100	ND	S
78	Cr	Cream bun	0.0	3.6	4	<3	<100	<100	ND	S
78	M-B	Bacon & cheese roll	22.0	3.6	<3	<3	<100	<100	ND	S
79	Cu	Custard tart	24.0	-	<3	<3	<100	<100	ND	S
79	Cu	Vanilla slice	10.0	21.7	<3	<3	<100	<100	ND	S
79	M-B	Cheese & bacon roll	57.0	-	<3	<3	<100	<100	ND	S
79	Misc	Cheesecake	11.0	21.7	<3	<3	<100	<100	ND	S
79	Misc	Cheese & Bacon quiche	56.0	21.7	<3	<3	<100	<100	ND	S
79	V	Vietnamese pork roll	8.1	-	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
80	Cu	Custard tart	2.0	14.5	<3	<3	<100	<100	ND	S
80	Cr	Chocolate Éclair	2.0	10.3	<3	<3	<100	<100	ND	S
80	Cr	Cream bun	21.0	14.7	<3	<3	<100	<100	ND	S
80	M-B	Cheese & bacon roll	21.0	16.3	<3	<3	<100	<100	ND	S
80	V	Pork roll	5.0	15.3	<3	<3	<100	<100	ND	S
80	V	Chicken roll	5.0	15.8	4	<3	<100	<100	ND	S
81	M-B	Cheese & bacon slice	24.0	12.0	<3	<3	<100	<100	ND	S
81	N-D	Neenish tart	24.0	12.0	<3	<3	<100	<100	ND	S
81	Misc	Apple strudle	18.0	20.0	<3	<3	<100	<100	ND	S
81	Misc	Cheesecake	15.0	12.0	<3	<3	<100	<100	ND	S
81	Cu	Custard tart	6.0	12.0	<3	<3	100	<100	ND	M
82	Cu	Vanilla slice	12.5	7.1	<3	<3	<100	<100	ND	S
82	Cu	Custard tart	13.3	7.1	<3	<3	<100	<100	ND	S
82	Cr	Chocolate Éclair	11.6	7.1	<3	<3	<100	<100	ND	S
82	M-B	Cheese & Bacon Roll	22.0	7.1	<3	<3	<100	<100	ND	S
82	Misc	Cheesecake	6.8	7.1	4	<3	<100	<100	ND	S
82	Cr	Cream bun w/ fresh cream	16.0	7.1	15	9	<100	<100	ND	M
83	Cu	Custard tart	6.7	13.4	<3	<3	<100	<100	ND	S
83	Cu	Custard bun	4.4	15.6	<3	<3	<100	<100	ND	S
83	Cr	Cream bun	5.6	15.6	4	<3	<100	<100	ND	S
83	M-B	Cheese & bacon roll	7.9	15.6	<3	<3	<100	<100	ND	S
83	V	Chicken roll	3.2	15.6	2400	<3	<100	<100	ND	S
83	V	Pork roll	2.0	15.6	430	<3	<100	<100	ND	S
84	Cu	Custard tart	4.0	9.6	<3	<3	<100	<100	ND	S
84	Cu	Match stick	12.0	15.2	<3	<3	<100	<100	ND	S
84	Cr	Apple turnover	5.0	9.6	<3	<3	<100	<100	ND	S
84	Cr	Chocolate Éclair	5.0	9.6	<3	<3	<100	<100	ND	S
84	M-B	Cheese & Bacon roll	11.0	15.2	<3	<3	<100	<100	ND	S
84	M-B	Cheese & bacon roll	12.0	15.2	<3	<3	<100	<100	ND	S
85	Cu	Custard roll	4.0	9.6	<3	<3	<100	<100	ND	S
85	Cu	Vanilla slice	6.0	9.6	<3	<3	<100	<100	ND	S
85	Cr	Apple turnover	4.0	9.6	<3	<3	<100	<100	ND	S
85	M-B	Cheese & bacon roll	9.0	15.2	<3	<3	<100	<100	ND	S
85	M-B	Pizza slice	9.0	15.2	<3	<3	<100	<100	ND	S
85	Misc	Musk stick	11.0	15.2	<3	<3	<100	<100	ND	S
86	Cu	Custard tart	6.0	18.8	<3	<3	<100	<100	ND	S
86	Cr	Cream bun	6.0	18.8	<3	<3	<100	<100	ND	S
86	Cr	Chocolate Éclair	4.0	18.8	<3	<3	<100	<100	ND	S
86	M-B	Cheese & bacon roll	8.0	18.8	<3	<3	<100	<100	ND	S
86	M-B	Cheese bacon roll	6.0	18.8	<3	<3	<100	<100	ND	S
86	Misc	Jam bun	6.0	18.8	<3	<3	100	<100	ND	M
87	Cu	Custard tart	8.1	10.2	<3	<3	<100	<100	ND	S
87	M-B	Cheese & bacon roll	29.8	15.4	<3	<3	<100	<100	ND	S
87	N-D	Apple Turnover w/ mock cream	8.1	15.4	<3	<3	<100	<100	ND	S
87	Misc	Cheesecake slice	8.7	10.2	<3	<3	<100	<100	ND	S
87	V	Pork roll	9.0	15.4	<3	<3	<100	<100	ND	S
87	Cu	Vanilla slice	10.4	10.2	<3	<3	110000	<100	ND	PH
88	Cu	Custard tart	7.1	10.2	<3	<3	<100	<100	ND	S
88	Cr	Apple turnover	4.1	15.4	<3	<3	<100	<100	ND	S
88	M-B	Cheese and Bacon Roll	24.0	15.4	<3	<3	<100	<100	ND	S
88	N-D	Neenish tart	8.4	15.4	<3	<3	<100	<100	ND	S
88	Misc	Cheesecake tart	8.1	15.4	<3	<3	<100	<100	ND	S
88	V	Pork roll	8.7	15.4	<3	<3	<100	<100	ND	S
89	Cu	Custard tart	-	8.8	<3	<3	<100	<100	ND	S
89	Cu	Vanilla slice	-	8.8	<3	<3	<100	<100	ND	S
89	M-B	Cheese & bacon roll	-	8.8	<3	<3	<100	<100	ND	S
89	N-D	Chocolate éclair w/ mock cream	-	8.8	<3	<3	<100	<100	ND	S
89	N-D	Swiss roll w/ mock cream	-	8.8	<3	<3	<100	<100	ND	S
89	V	Pork roll	-	8.8	<3	<3	<100	<100	ND	S
90	Cr	Cream bun	-	12.3	<3	<3	<100	<100	ND	S
90	M-B	Cheese & bacon roll	-	22.8	<3	<3	<100	<100	ND	S
90	V	Pork roll	-	12.2	<3	<3	<100	<100	ND	S
90	V	Chicken roll	-	12.2	<3	<3	<100	<100	ND	S
90	N-D	Neenish tart	-	12.2	<3	<3	200	<100	ND	M
91	Cu	Custard tart	5.1	4.2	<3	<3	<100	<100	ND	S
91	Cu	Vanilla slice	5.7	4.2	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
91	Cu	Match stick	4.0	4.2	4	<3	<100	<100	ND	S
91	Cr	Cream bun	18.9	4.2	<3	<3	<100	<100	ND	S
91	M-B	Cheese & bacon scroll	22.3	4.2	<3	<3	<100	<100	ND	S
91	N-D	Neenish tart	5.3	4.2	<3	<3	<100	<100	ND	S
92	Cu	Custard tart	6.4	4.2	<3	<3	<100	<100	ND	S
92	Cu	Vanilla slice	7.4	4.2	<3	<3	<100	<100	ND	S
92	M-B	Cheese & bacon roll	18.9	4.2	<3	<3	<100	<100	ND	S
92	N-D	Pineapple Tart w/ mock Cream	16.0	4.2	<3	<3	<100	<100	ND	S
92	Misc	Cheesecake tart	8.0	4.2	3	3	<100	<100	ND	M
92	V	Pork roll	4.4	4.2	<3	<3	<100	150	ND	M
94	Cu	Custard cream sponge	-	17.1	<3	<3	<100	<100	ND	S
94	Cu	Vanilla slice	-	17.1	<3	<3	<100	<100	ND	S
94	Cr	Apple turnover	-	17.1	<3	<3	<100	<100	ND	S
94	M-B	Meat topped Bread	-	17.1	<3	<3	<100	<100	ND	S
94	Misc	Quiche	-	17.1	<3	<3	<100	<100	ND	S
94	Misc	Banana cake	-	17.1	<3	<3	<100	<100	ND	S
95	Cu	Custard scroll	-	17.3	<3	<3	<100	<100	ND	S
95	M-B	Cheese & bacon roll	-	17.3	<3	<3	<100	<100	ND	S
95	M-B	Cheese & bacon roll	-	17.3	<3	<3	<100	<100	ND	S
95	M-B	Ham & cheese danish	-	17.3	<3	<3	<100	<100	ND	S
95	Misc	Spinach & feta	-	17.3	<3	<3	<100	<100	ND	S
95	Misc	Spinac & feta	-	17.3	<3	<3	<100	<100	ND	S
96	Cu	Custard bun	-	31.0	<3	<3	<100	<100	ND	S
96	Cu	Custard tart	-	31.1	<3	<3	<100	<100	ND	S
96	M-B	Ham & cheese	-	31.0	<3	<3	<100	<100	ND	S
96	Misc	Coconut Cream	-	31.0	4	<3	<100	<100	ND	S
97	Cu	Custard tart	-	12.1	<3	<3	<100	<100	ND	S
97	Cr	Chocolate éclair	-	14.6	4	<3	<100	<100	ND	S
97	Cr	Apple turnover	-	14.6	7	<3	<100	<100	ND	S
97	M-B	Cheese & Bacon bun	-	14.6	<3	<3	<100	<100	ND	S
97	M-B	Pizza	-	14.6	<3	<3	<100	<100	ND	S
97	Misc	Lamington	-	14.6	<3	<3	<100	<100	ND	S
98	Cu	Custard tart	18.0	13.2	<3	<3	<100	<100	ND	S
98	Cu	Custard tart	3.5	14.6	<3	<3	<100	<100	ND	S
98	Cr	Cream bun	4.5	13.2	<3	<3	<100	<100	ND	S
98	Cr	Cannaloni	4.0	14.6	<3	<3	<100	<100	ND	S
98	N-D	Neenish tart	19.0	14.6	<3	<3	<100	<100	ND	S
98	Misc	Quiche	4.0	14.6	<3	<3	<100	<100	ND	S
99	Cu	Vanilla slice	4.5	14.4	<3	<3	<100	<100	ND	S
99	Misc	Baked cheesecake	4.5	16.3	<3	<3	<100	<100	ND	S
99	Misc	Carrot cake	4.5	16.3	<3	<3	<100	<100	ND	S
99	Misc	Banana slice	4.5	14.4	<3	<3	<100	<100	ND	S
100	Misc	Carrot cake	4.2	16.3	<3	<3	<100	<100	ND	S
100	Misc	Jam & coconut slice	4.2	16.3	<3	<3	<100	<100	ND	S
101	Cu	Custard tart	-	8.0	<3	<3	<100	<100	ND	S
101	Cr	Cream filled lamington	-	8.0	<3	<3	<100	<100	ND	S
101	M-B	Cheese & bacon roll	-	8.0	<3	<3	<100	<100	ND	S
101	N-D	Neenish tart	-	8.0	<3	<3	<100	<100	ND	S
101	Misc	Jaffa cheesecake	-	8.0	9	<3	<100	<100	ND	S
102	Cu	Custard tart	-	8.0	<3	<3	<100	<100	ND	S
102	Cu	Vanilla slice	-	8.0	<3	<3	<100	<100	ND	S
102	M-B	Cheese & bacon roll	-	8.0	<3	<3	<100	<100	ND	S
102	N-D	Mock cream doughnut	-	8.0	<3	<3	<100	<100	ND	S
102	N-D	Apple turnover w/mock cream	-	8.0	<3	<3	<100	<100	ND	S
102	Cr	Cream filled chocolate éclair	-	8.0	4	<3	1400	<100	ND	U
103	Cu	Custard tart	-	11.5	4	<3	<100	<100	ND	S
103	Cu	Vanilla slice	-	11.5	<3	<3	<100	<100	ND	S
103	Cr	Chocolate eclair w/ fresh cream	-	11.5	<3	<3	<100	<100	ND	S
103	M-B	Cheese & bacon roll	-	11.5	<3	<3	<100	<100	ND	S
103	N-D	Neenish tart	-	11.5	<3	<3	<100	<100	ND	S
104	Cu	Custard tart	-	11.5	<3	<3	<100	<100	ND	S
104	Cu	Vanilla slice	-	11.5	<3	<3	<100	<100	ND	S
104	Cr	Chocolate éclair	-	11.5	43	<3	<100	<100	ND	S
104	M-B	Cheese & bacon roll	-	11.5	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
104	N-D	Neenish tart	-	11.5	<3	<3	<100	<100	ND	S
104	Misc	Vegetable quiche	-	11.5	<3	<3	<100	<100	ND	S
105	Cu	Custard tart	4.0	12.5	<3	<3	<100	<100	ND	S
105	M-B	Cheese & bacon roll	22.0	12.5	<3	<3	<100	<100	ND	S
105	N-D	Neenish tart	22.0	12.5	<3	<3	<100	<100	ND	S
105	Misc	Cheesecake slice	5.0	12.5	<3	<3	<100	<100	ND	S
105	V	Pork roll	5.0	12.5	<3	<3	<100	<100	ND	S
105	Cr	Chocolate éclair	4.0	12.5	<3	<3	1000	<100	ND	U
106	Cu	Custard Tart	-	15.9	<3	<3	<100	<100	ND	S
106	Cr	Chocolate éclair fresh cream	-	15.9	<3	<3	<100	<100	ND	S
106	M-B	Meat topped Bread	-	15.9	<3	<3	<100	<100	ND	S
106	N-D	Butterfly cake w/ mock cream	-	15.9	<3	<3	<100	<100	ND	S
106	Misc	Cheesecake	-	15.9	<3	<3	<100	<100	ND	S
107	Cu	Custard tart	4.5	-	<3	<3	<100	<100	ND	S
107	Cu	Matchstick	27.0	-	<3	<3	<100	<100	ND	S
107	Cu	Vanilla slice	4.5	-	<3	<3	<100	<100	ND	S
107	Cr	Apple turnover	4.5	-	<3	<3	<100	<100	ND	S
107	M-B	Cheese and bacon roll	23.0	-	<3	<3	<100	<100	ND	S
107	Misc	Cheesecake	11.5	-	<3	<3	<100	<100	ND	S
108	Cu	Custard tart	4.5	-	<3	<3	<100	<100	ND	S
108	Cu	French vanilla slice	2.5	-	<3	<3	<100	<100	ND	S
108	N-D	Neenish tart	4.0	-	<3	<3	<100	<100	ND	S
108	Misc	Cheesecake slice	3.7	-	<3	<3	<100	<100	ND	S
108	Cu	Banana & custard tart	2.0	-	4	4	<100	<100	ND	M
109	Cu	French vanilla slice	4.7	6.7	<3	<3	<100	<100	ND	S
109	Cr	Chocolate éclair fresh cream	8.5	6.7	<3	<3	<100	<100	ND	S
109	Cr	Caramel/cream	8.8	6.7	<3	<3	<100	<100	ND	S
109	M-B	Ham and cheese pizza	21.5	6.7	<3	<3	<100	<100	ND	S
109	N-D	Caramel tart w/ mock cream	24.0	6.7	<3	<3	100	<100	ND	M
109	Cu	Custard tart	5.0	6.7	<3	<3	1200	<100	ND	U
110	Cu	Vanilla slice	5.0	6.7	<3	<3	<100	<100	ND	S
110	Cr	Apple turnover	5.0	6.7	<3	<3	<100	<100	ND	S
110	M-B	Ham and cheese scroll	25.0	6.7	<3	<3	<100	<100	ND	S
110	N-D	Passion fruit tart w/ mock cream	26.0	6.7	<3	<3	<100	<100	ND	S
110	Misc	Cupcake	4.5	6.7	<3	<3	<100	<100	ND	S
110	Cu	Custard tart	5.2	6.7	<3	<3	100	<100	ND	M
111	Cu	Custard tart	-	12.7	<3	<3	<100	<100	ND	S
111	Cu	Trifle	-	12.7	<3	<3	<100	<100	ND	S
111	N-D	Mock cream donut	-	12.7	<3	<3	<100	<100	ND	S
111	Misc	Cheesecake	-	12.7	<3	<3	<100	<100	ND	S
111	M-B	Cheese & bacon roll	-	12.7	<3	<3	100	<100	ND	M
112	Cu	Custard tart	10.0	14.3	<3	<3	<100	<100	ND	S
112	Cu	Custard & cream slice	10.0	14.3	43	<3	<100	<100	ND	S
112	Cr	Cup cake & cream	10.0	14.3	23	<3	<100	<100	ND	S
112	M-B	Ham & cheese roll	10.0	14.3	<3	<3	<100	<100	ND	S
112	N-D	Neenish tart	10.0	14.3	<3	<3	<100	<100	ND	S
112	V	Pork & chicken Vietnamese roll	10.0	14.3	230	9	<100	<100	ND	M
114	Cu	Custard tart	1.0	16.5	<3	<3	<100	<100	ND	S
114	Cu	Vanilla slice	0.0	16.5	<3	<3	<100	<100	ND	S
114	Cr	Apple cream	4.0	16.5	<3	<3	<100	<100	ND	S
114	Cr	Chocolate éclair	3.0	16.5	<3	<3	<100	<100	ND	S
114	M-B	Cheese & bacon roll	18.0	16.5	<3	<3	<100	<100	ND	S
114	N-D	Neenish tart	18.0	16.5	<3	<3	<100	<100	ND	S
115	Cu	Vanilla slice	11.8	15.4	4	<3	<100	<100	ND	S
115	Cu	Custard tart	6.3	15.4	<3	<3	<100	<100	ND	S
115	Cr	Cream horn	10.0	15.4	<3	<3	<100	<100	ND	S
115	Cr	Apple turnover	7.5	15.4	9	<3	<100	<100	ND	S
115	M-B	Meat topped Bread	23.6	15.4	<3	<3	<100	<100	ND	S
115	N-D	Neenish tart	13.0	15.4	<3	<3	<100	<100	ND	S
116	Cu	Vanilla slice	8.5	15.4	43	<3	<100	<100	ND	S
116	Cu	Match stick	8.8	15.4	93	<3	<100	<100	ND	S
116	Cu	Custard tart	7.9	15.4	<3	<3	<100	<100	ND	S
116	M-B	Meat topped Bread	26.0	15.4	<3	<3	<100	<100	ND	S

BN	Sample Type	Sample Name	Temp at purchase C°	Temp at lab C°	faecal coliform	*E. coli*	*B. cereus*	CPS	*Salmonella*	Assessment
116	Misc	Lamington	7.7	15.4	43	<3	<100	<100	ND	S
116	Cr	Apple turnover	9.0	15.4	750	<3	<100	<100	ND	M
117	Cu	Custard tart	22.8	20.9	<3	<3	<100	<100	ND	S
117	Cu	Vanilla slice	22.0	20.9	<3	<3	<100	<100	ND	S
117	Cr	Chocolate éclair	8.0	20.9	<3	<3	<100	<100	ND	S
117	Cr	Apple turnover	8.0	20.9	43	<3	<100	<100	ND	S
117	M-B	Meat topped Bread	21.8	20.9	<3	<3	<100	<100	ND	S
117	Misc	Cheesecake tart	12.0	20.9	<3	<3	<100	<100	ND	S
118	Cu	Custard tart	23.2	20.9	<3	<3	<100	<100	ND	S
118	Cu	Vanilla slice	26.5	20.9	23	<3	<100	<100	ND	S
118	Cu	Matchstick	9.5	20.9	<3	<3	<100	<100	ND	S
118	Cr	Chocolate éclair	10.0	20.9	<3	<3	<100	<100	ND	S
118	Cr	Apple pie	10.3	20.9	<3	<3	<100	<100	ND	S
118	N-D	Neenish tart	23.6	20.9	<3	<3	<100	<100	ND	S
119	Cu	Custard tart	23.6	19.5	<3	<3	<100	<100	ND	S
119	Cr	Apple turnover	9.7	19.5	<3	<3	<100	<100	ND	S
119	Cr	Chocolate éclair	8.8	19.5	<3	<3	<100	<100	ND	S
119	N-D	Neenish tart	13.5	19.5	<3	<3	<100	<100	ND	S
119	Misc	Caramel tart	11.0	19.5	<3	<3	<100	<100	ND	S
119	Misc	Cheesecake slice	11.5	19.5	<3	<3	<100	<100	ND	S
120	Cu	Vanilla slice	10.0	19.5	<3	<3	<100	<100	ND	S
120	Cu	Custard tart	10.0	19.5	<3	<3	<100	<100	ND	S
120	Cr	Cream bun	9.0	19.5	<3	<3	<100	<100	ND	S
120	M-B	Meat topped bread	25.0	19.5	<3	<3	<100	<100	ND	S
120	Misc	Butterfly cake	9.0	19.5	4	<3	<100	<100	ND	S
120	Misc	Sponge slice	23.7	19.5	<3	<3	<100	<100	ND	S
121	Cu	Custard tart	7.5	13.6	<3	<3	<100	<100	ND	S
121	Cu	Vanilla slice	22.2	18.1	<3	<3	<100	<100	ND	S
121	Cr	Apple turnover	6	18.1	<3	<3	<100	<100	ND	S
121	Cr	Cream lamington	6.5	18.1	4	<3	<100	<100	ND	S
121	M-B	Meat topped bread	19.5	18.1	<3	<3	<100	<100	ND	S
121	Misc	Butterfly cake	5.2	18.1	<3	<3	<100	<100	ND	S
122	Cu	French vanilla slice	4.6	13.6	<3	<3	<100	<100	ND	S
122	Cu	Match stick	6.3	18.1	<3	<3	<100	<100	ND	S
122	Cr	Chocolate éclair	4.4	13.6	<3	<3	<100	<100	ND	S
122	M-B	Meat topped bread	26.0	18.1	<3	<3	<100	<100	ND	S
122	N-D	Pineapple tart	3.0	18.1	<3	<3	<100	<100	ND	S
122	Misc	Cheesecake	3.8	13.6	<3	<3	<100	<100	ND	S
123	Cu	Custard tart	6.0	11.5	43	<3	<100	<100	ND	S
123	M-B	Meat topped bread	27.5	11.5	<3	<3	<100	<100	ND	S
123	N-D	Neenish tart	30.0	11.5	4	<3	<100	<100	ND	S
123	Cu	Match stick	5.2	11.5	230	4	<100	<100	ND	M
123	Cu	Vanilla slice	5.3	11.5	230	4	<100	<100	ND	M
123	Cr	Chocolate éclair	5.3	11.5	4600	<3	<100	<100	ND	M
124	Cu	Custard tart	12.0	18.3	3	<3	<100	<100	ND	S
124	Cu	Match stick	32.0	18.3	<3	<3	<100	<100	ND	S
124	Cr	Chocolate éclair	13.5	18.3	<3	<3	<100	<100	ND	S
124	Cr	Cream horn	13.6	18.3	<3	<3	<100	<100	ND	S
124	M-B	Meat topped bread	31.3	18.3	<3	<3	<100	<100	ND	S
124	N-D	Neenish tart	13.8	18.3	<3	<3	<100	<100	ND	S
125	Cu	Custard tart	13.0	12.7	<3	<3	<100	<100	ND	S
125	Cu	Vanilla slice	7.6	11.2	<3	<3	<100	<100	ND	S
125	Cu	Match stick	15.0	11.2	<3	<3	<100	<100	ND	S
125	Cr	Chocolate éclair	7.1	11.2	4	<3	<100	<100	ND	S
125	M-B	Meat topped bread	32.7	18.3	<3	<3	<100	<100	ND	S
125	N-D	Neenish tart	32.0	12.7	<3	<3	<100	<100	ND	S
126	Cu	Vanilla slice	-	11.5	<3	<3	<100	<100	ND	S
126	Cu	Apple Danish	-	11.5	<3	<3	<100	<100	ND	S
126	Cu	Custard tart	-	11.5	<3	<3	<100	<100	ND	S
126	Misc	Classic cheesecake	-	11.5	<3	<3	<100	<100	ND	S
126	Cr	Chocolate éclair	-	11.5	1500	390	<100	<100	ND	U
126	Cr	Profiterole	-	11.5	11000	230	<100	<100	ND	U
127	M-B	Cheese and bacon roll	-	11.5	<3	<3	<100	<100	ND	S
127	N-D	Mock cream roll	-	11.5	<3	<3	<100	<100	ND	S
127	Misc	Mixed Roll	-	11.5	<3	<3	<100	<100	ND	S
127	Cu	Custard bun	-	11.5	<3	<3	150	<100	ND	M
127	Cu	Custard boat	-	11.5	<3	<3	550	<100	ND	M

Appendix 6

LOD - Faecal coliforms & *E. coli* - <3 For calculation <3 = 1.5 = 0.18 log MPN/g
- *B. cereus* & CPS - <100 <100 = 50 = 1.70 log CFU/g.

Table 1 Summary of microbiological results for all samples

	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	1.81	0.18	0.18	4.04
E. coli (log MPN/g)	1.10	0.18	0.18	3.66
B. cereus (log CFU/g)	2.35	1.70	1.70	5.04
CPS (log CFU/g)	1.72	1.70	1.70	3.11

Table 2 Summary of microbiological results for all samples with bacterial detections

	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	2.63	0.95	0.48	4.04
E. coli (log MPN/g)	2.52	1.11	0.48	3.66
B. cereus (log CFU/g)	3.58	1.11	2.00	5.04
CPS (log CFU/g)	2.71	2.18	2.00	3.11

Table 3 Summary of microbiological results for all custard filled samples

	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	1.09	0.18	0.18	3.18
E. coli (log MPN/g)	0.56	0.18	0.18	2.63
B. cereus (log CFU/g)	2.76	1.70	1.70	5.04
CPS (log CFU/g)	1.70	1.70	1.70	2.00

Table 4 Summary of microbiological results for custard filled samples with bacterial detections

	Samples	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	27	1.94	0.85	0.48	3.18
E. coli (log MPN/g)	7	1.83	0.60	0.60	2.63
B. cereus (log CFU/g)	12	3.98	2.60	2.00	5.04
CPS (log CFU/g)	1	2.00	2.00	2.00	2.00

Table 5 Summary of microbiological results for all fresh cream filled samples

	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	2.41	0.18	0.18	4.04
E. coli (log MPN/g)	0.96	0.18	0.18	2.59
B. cereus (log CFU/g)	2.02	1.70	1.70	3.59
CPS (log CFU/g)	1.70	1.70	1.70	1.70

Table 6 Summary of microbiological results for fresh cream filled samples with bacterial detections

	Samples	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	29	3.01	1.32	0.60	4.04
E. coli (log MPN/g)	6	2.18	2.13	0.60	2.59
B. cereus (log CFU/g)	5	3.12	3.00	2.00	3.59
CPS (log CFU/g)	0	n/a	n/a	n/a	n/a

Table 7 Summary of microbiological results for all non dairy filled samples

	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	0.43	0.18	0.18	1.88
E. coli (log MPN/g)	0.21	0.18	0.18	0.95
B. cereus (log CFU/g)	1.72	1.70	1.70	2.30
CPS (log CFU/g)	1.70	1.70	1.70	1.70

Table 8 Summary of microbiological results for non dairy filled samples with bacterial detections

	Samples	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	3	1.47	0.95	0.60	1.88
E. coli (log MPN/g)	1	0.95	0.95	0.95	0.95
B. cereus (log CFU/g)	2	2.18	2.18	2.00	2.30
CPS (log CFU/g)	0	n/a	n/a	n/a	n/a

Table 9 Summary of microbiological results for all meat topped bread samples

	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	0.95	0.18	0.18	2.97
E. coli (log MPN/g)	0.95	0.18	0.18	2.97
B. cereus (log CFU/g)	1.70	1.70	1.70	2.00
CPS (log CFU/g)	1.70	1.70	1.70	1.70

Table 10 Summary of microbiological results for meat topped bread samples with bacterial detections

	Samples	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	1	2.97	2.97	2.97	2.97
E. coli (log MPN/g)	1	2.97	2.97	2.97	2.97
B. cereus (log CFU/g)	1	2.00	2.00	2.00	2.00
CPS (log CFU/g)	0	n/a	n/a	n/a	n/a

Table 11 Summary of microbiological results for all Vietnamese style rolls samples

	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	2.27	0.18	0.18	3.66
E. coli (log MPN/g)	1.96	0.18	0.18	3.66
B. cereus (log CFU/g)	1.79	1.70	1.70	2.54
CPS (log CFU/g)	1.87	1.70	1.70	3.11

Table 12 Summary of microbiological results for Vietnamese style rolls samples with bacterial detections

	Samples	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	26	2.62	1.63	0.48	3.66
E. coli (log MPN/g)	5	3.00	1.97	0.95	3.66
B. cereus (log CFU/g)	7	2.15	2.00	2.00	2.54
CPS (log CFU/g)	2	2.86	2.86	2.18	3.11

Table 13 Summary of microbiological results for all miscellaneous bakery samples

	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	0.86	0.18	0.18	2.36
E. coli (log MPN/g)	0.19	0.18	0.18	0.60
B. cereus (log CFU/g)	1.77	1.70	1.70	2.65
CPS (log CFU/g)	1.70	1.70	1.70	1.70

Table 14 Summary of microbiological results for miscellaneous bakery samples with bacterial detections

	Samples	Mean	Median	Minimum	Maximum
Faecal coliforms (log MPN/g)	18	1.56	0.95	0.48	2.36
E. coli (log MPN/g)	2	0.54	0.54	0.48	0.60
B. cereus (log CFU/g)	6	2.32	2.00	2.00	2.65
CPS (log CFU/g)	0	n/a	n/a	n/a	n/a

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