NSW Food Authority

safer food, clearer choices

Survey of takeaway chicken shops

NSW/FA/CP053/1107

The NSW Food Authority conducts food surveys throughout the year. Surveys provide a snapshot of practices at the participating businesses and may not be representative of industry-wide practices. Survey results serve to highlight potential areas requiring further attention by businesses. Where necessary, follow up enforcement action is taken by the NSW Food Authority or Council officers.

More information about our survey program is available at
http://www.foodauthority.nsw.gov.au/_Documents/science/survey_program_overview.pdf

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Executive summary

According to the *Risk Profiling Framework for the Australian Food Business Sector* (Ross et al., 2009), retail food businesses in which ready-to-eat (RTE) food is prepared in advance, such as takeaways and hot hold RTE food, are categorised as high risk. This is because these food businesses prepare and serve foods that are classified "potentially hazardous food" (PHF).

For food prepared in takeaway chicken shops, employees commonly handle raw meat and poultry, so the potential for cross contamination from raw to cooked product exists as raw meat and poultry can contain pathogens such as *Salmonella* and *Campylobacter*. Cross contamination between raw and cooked products may take place via surfaces, equipment, utensils, aerosols and food handlers themselves.

Considering the risk related to these food businesses, a snapshot survey was conducted to assess the potential for cross contamination in these businesses by gathering information on:

- the hygiene status of equipment and surfaces (by using environmental swabs),
- food handling practices, and
- microbiological quality of prepared food.

In December 2009, invitations were sent to all local councils in NSW to take part in the survey and 31 councils agreed to participate. Interested councils were also asked to provide the number of takeaway chicken shops in their local government area. Of the 31 councils, 19 of them provided that information. A total of 291 shops were recorded in the 19 councils, and 31 shops were randomly selected and surveyed, which represents 10% of the total shops in those areas collectively. Another 33 shops were randomly selected from the other councils.

As information was not available on the total number of this type of business in all local government areas participating in the survey and no information is available on volume of throughput for each business surveyed, the survey provides only a snapshot of practices at the participating businesses and may not be representative of the entire sector.

From March to December 2010, 331 food samples and 305 environmental swabs were collected from 64 takeaway chicken shops across NSW. At the time of sampling, a questionnaire was also undertaken to assess food handling practices at takeaway chicken shops. A completed questionnaire was received from 60 of the businesses surveyed.

Food testing results showed that 93% of samples tested were categorised as good or acceptable. Only seven of the 331 samples tested were categorised as potentially hazardous due to the presence of pathogenic microorganisms:

- *L. monocytogenes* was detected in six samples that may support the growth of this organism and may have been stored for more than one day, and
- one product contained a high level of *B. cereus*.

A further fifteen samples were classified unsatisfactory due to either elevated levels of Standard Plate Count (SPC) and/or *E. coli*.

Where samples were found to be unsatisfactory or potentially hazardous, follow up action was undertaken by the relevant EHOs in accordance with the level of risk posed. Follow up action included detailed inspection of the premises, re-sampling of products, and education on the significance of the findings.

This survey also found that some areas of improvements are needed, especially in relation to the preparation and handling of shredded/diced chicken, gravy, and mayonnaise-based salads.

Some practices observed in the takeaway chicken shops at the time of the survey which have the potential to allow the growth of pathogenic microorganisms included:

- the display of gravy and mayonnaise-based salads (54% and 75% of businesses surveyed, respectively) within the temperature danger zone (between 5° and 60°C, respectively),
- the shredding/dicing of chicken from whole product displayed for an extended period of time outside temperature control for use the next day (40% of businesses surveyed),
- the cooling of gravy in large (>5L) containers (40% of businesses surveyed), and
- inappropriate sanitation practices for food preparation surfaces (45% of businesses surveyed).

The poor handling practices observed at the surveyed premises alone will not lead to foodborne illness. However, when foodborne illness occurs, it is normally due to a series or combination of elements converging.

The NSW Food Authority has published a number of factsheets and guidelines that can be applied to takeaway chicken businesses to help improve food handling practices. These include:

- *Potentially hazardous food guidelines*
- *Food safety guidelines on applying the 4-hour/2-hour rule for temperature control*
- *Cleaning and sanitising in food businesses*

The recently introduced Food Safety Supervisor requirement, as well as ongoing food safety education of food handlers, can assist in improving food handling practices at takeaway chicken outlets.

1. Introduction

There is an increasing consumption of takeaway food in Australia predominately due to its convenience. The Dietitians Association of Australia (DAA) reported that the average Australian family spent nearly 15% of their food budget on fast food and/or takeaway food in 2008, 27% in 2009 and approximately 42% in 2010 (DAA, 2008; DAA, 2009; DAA, 2010).

According to the *Risk Profiling Framework for Australian Food Business Sector* (Ross et al., 2009), retail food businesses in which ready-to-eat (RTE) food is prepared in advance, such as takeaways and hot hold RTE food, are categorised as high risk (level P1[1]). This is because these food businesses prepare and serve foods that are classified "potentially hazardous food" (PHF). PHF normally has high nutrient value, high water activity, and neutral pH which could allow any pathogenic microorganisms that may be present in the food to grow.

Temperature control during cooking and storage of food is considered critical when dealing with PHF. In food service operations, inadequate temperature control can provide opportunity for microbial growth and is often cited as a contributing factor in foodborne illness outbreaks. So too is cross contamination between raw and ready-to-eat food (NSW Food Authority, 2008; Ross et al., 2009).

For food prepared in takeaway chicken shops, employees commonly handle raw meat and poultry, so the potential for cross contamination from raw to cooked product is much greater as raw meat and poultry can contain pathogens such as *Salmonella* and *Campylobacter*. Cross contamination between raw and cooked products may occur via surfaces, equipment, utensils, aerosols and food handlers themselves. A range of contaminants can be introduced by food handlers including *Staphylococcus aureus* and other gastro-intestinal pathogens (bacterial or viral).

From January 1996 to March 2010, there were nineteen foodborne illness outbreaks in Australia linked to takeaway chicken shops (Appendix 4). *Salmonella* in cooked chicken were suspected as the vehicles for seven of the outbreaks. A further three outbreaks were caused by *S. aureus* in cooked chicken and gravy which was likely to be caused by cross contamination and/or temperature abuse (Food Science Australia & Minter Ellison Consulting, 2002; Kirk et al., 1999 & OzFoodNet, 2002, 2003, 2004, 2005, 2006, 2007).

A number of studies have been conducted around the world to determine the microbiological quality of food similar to those commonly sold by these businesses. Food was tested for indicator organisms such as *E. coli* and pathogens including *S. aureus, Bacillus cereus, Salmonella* and *Listeria monocytogenes*. The results from these studies are presented in Appendix 5. Indicator and/or pathogenic organisms were detected in one or more samples from each study, although the levels detected varied.

Considering the risk associated with these food businesses, a survey was conducted to assess the potential for cross contamination by gathering information on:

- the hygiene status of equipment and surfaces (by using environmental swabs),
- food handling practices, and
- microbiological quality of prepared food.

An additional objective of the survey was to assist local council officers in providing food safety education and advice to takeaway chicken outlets.

[1] Business Sector Food Safety Risk Priority Classification Framework (Version: 27 February 2007) (http://www.health.gov.au/internet/main/publishing.nsf/Content/D838A89DCEB7348ACA256F190003AFC1/$File/Risk%20Profiling.ppt accessed 1 March 2011).

2. Materials and methods

2.1 Council participation

In December 2009, invitations were sent to all local councils in NSW to take part in the survey. Participation from local councils involved collecting food and environmental samples as well as gathering information on the food handling practices at takeaway chicken shops. In addition, the interested councils were also asked to provide the number of takeaway chicken shops in their LGA.

A total of 31 local councils agreed to take part in the survey. Of the 31 councils, 19 of them provided information on the number of takeaway chicken shops in their LGA. A total of 291 shops were recorded in the 19 councils, and 31 shops were randomly selected and surveyed, which represents 10% of the total shops in those areas collectively.

As information was not available on the total number of this type of business in all local government areas participating in the survey, and no information is available on volume of throughput for each business surveyed, the survey provides only a snapshot of practices at the participating businesses rather than a statistical representation of the sector.

2.2 Method for laboratory analysis

From March to December 2010, 331 food samples and 305 environmental swabs were collected during unannounced visits to 64 takeaway chicken shops across NSW. Food samples included BBQ chicken pieces, shredded cooked chicken, cooked breaded chicken (eg chicken nuggets), stuffing, gravy, sauces, and ready-to-eat salads.

Information on the hygienic status of the premises was collected using 3M™ Enviroswab. Various surfaces were swabbed including chopping boards, benches, utensils and other surfaces such as display cabinet, walls and door handles.

Samples were analysed by the Food Microbiology Laboratory of the Division of Analytical Laboratories at Lidcombe. All samples were analysed within 24 hours of receipt at the laboratory using the appropriate Australian Standard method as detailed in Table 1.

Table 1. Australian Standard methods used in the analysis of samples

Tests undertaken	Method
Bacillus cereus – enumeration	AS 1766.2.6
Campylobacter – enumeration	AS 1766.2.13
Clostridium perfringens – enumeration	AS 1766.2.8
Coagulase positive staphylococci (CPS) – enumeration	AS 1766.2.4
Listeria – detection	AS/NZS 1766.16.1
Thermotolerant coliforms *and Escherichia coli* – enumeration	AS 1766.2.3
Salmonella spp.– detection	AS 1766.2.5
Standard Plate Counts (SPC)	AS 1766.2.1

Due to the nature of the products, different food groups were tested for different microorganisms, as outlined in Table 2.

Table 2. Food groups included in the survey and microorganisms tested for

Food category	Microorganisms to be tested for
Cooked chicken products, eg BBQ/charcoal chicken, breaded chicken products	SPC, *E. coli,* CPS, *Salmonella, Campylobacter*
Shredded/diced chicken	SPC, *E. coli,* CPS, *Listeria, Salmonella, Campylobacter*
Cooked stuffing	SPC, *E. coli,* CPS, *B. cereus, C. perfringens, Salmonella, Campylobacter*
Gravy and sauces	SPC, *E. coli,* CPS, *B. cereus, C. perfringens*
Mayonnaise-based salad	*E. coli,* CPS, *Salmonella, Campylobacter, L. monocytogenes*
Swabs from surfaces, cutting boards and utensils	*Salmonella, Campylobacter*

2.3 Method for data analysis

All food products tested in this survey fall into a large category of ready-to-eat foods for which there are no microbiological standards in the Australian New Zealand Food Standards Code (the Code). The *NSW Food Authority microbiological quality guide for ready-to-eat foods*, as shown in Table 3, was used to assess the microbiological results from this survey (2214 tests).

Table 3. Guideline levels for determining the microbiological quality of ready-to-eat foods (NSW Food Authority, 2009a)

Test	Microbiological result (CFU/g)			
	Good	**Acceptable**	**Unsatisfactory**	**Potentially hazardous**
Standard Plate Count[2]				
Category A	$<10^4$	$<10^5$	$\geq 10^5$	N/A
Category B	$<10^6$	$<10^7$	$\geq 10^7$	N/A
Indicators				
Enterobacteriaceae[3]	$<10^2$	10^2 to $<10^4$	$\geq 10^4$	N/A
E. coli	<3	3 to $<10^2$	$\geq 10^2$	N/A
Pathogens				
B. cereus	$<10^2$	10^2 to $<10^3$	10^3 to $<10^4$	$\geq 10^4$
Campylobacter spp	Not detected in 25g	-	-	Detected in 25g
C. perfringens	$<10^2$	10^2 to $<10^3$	10^3 to $<10^4$	$\geq 10^4$
Coagulase positive staphylococci (CPS)	$<10^2$	10^2 to $<10^3$	10^3 to $<10^4$	$\geq 10^4$
Listeria monocytogenes – Food Group 1[4]	Not detected in 25g	-	-	Detected in 25g
Salmonella	Not detected in 25g	-	-	Detected in 25g

[2] Standard Plate Count:
- Category A – applies to RTE foods in which all components are fully cooked for immediate sale or consumption (eg BBQ chicken, breaded chicken, cooked stuffing, gravy)
- Category B – applies to RTE foods that are fully cooked with further handling or processing before consumption (eg. shredded/diced chicken)

[3] In the absence of a guideline for thermotolerant coliform results, these were compared with the guideline for *Enterobacteriaceae* as both groups of bacteria are similar (the bacteria detected by the coliform test are members of several genera within the family *Enterobacteriaceae*).

[4] *L. monocytogenes* Food Group 1 applies to RTE that will support the growth of *L. monocytogenes* and has been stored prepared for greater than one day (eg shredded chicken and mayonnaise-based salad)

3. Food handling questionnaire

At the time of sampling, a questionnaire was also undertaken to assess food handling practices at takeaway chicken shops (see Appendix 3 – Food handling questionnaire for takeaway chicken shops).

A completed questionnaire was received from 60 of the businesses surveyed. The questionnaire collected information on product receipt, cooking and display, sanitising practices, and food handling and hand washing practices.

The survey responses were collated and a summary of results was generated by SurveyMonkey™. Statistical analysis on the responses was conducted using Microsoft® Office Excel 2003.

4. Results

4.1 Microbiological results – food samples

A summary of the microbiological results for the food samples is shown in Table 4. When compared with the NSW Food Authority's *Microbiological quality guide for ready-to-eat foods*, 93% of samples were classified good or acceptable. None of the food samples tested was positive for *Salmonella* or *Campylobacter* spp.

A total of seven samples were categorised as potentially hazardous due to the presence of pathogenic microorganisms:

- *L. monocytogenes* was detected in six samples that may support the growth of this organism and may have been stored for more than one day, and
- one product contained a high level of *B. cereus*.

A further fifteen samples were classified unsatisfactory due to an elevated level of Standard Plate Count (SPC) and/or *E. coli*.

The unsatisfactory and potentially hazardous samples (22 in total) came from sixteen businesses around NSW. In one business, seven samples were collected and four of them were deemed to be unsatisfactory or potentially hazardous.

Where samples were found to be unsatisfactory or potentially hazardous, follow up action was undertaken by the relevant EHOs in accordance with the level of risk posed. Follow up action included detailed inspection of the premises, re-sampling of products, and education on the significance of the findings. A total of 38 samples were collected as part of the follow up action due to the detection of *L. monocytogenes* in the original samples. Only four of these samples were positive for *L. monocytogenes* and they were under the limit of detection of 10 CFU/25g.

Table 4. Assessment of results for products using the microbiological criteria for ready-to-eat foods (NSW Food Authority, 2009a)

Food category	No. of samples	Microbiological quality (%)			
		Good	Acceptable	Unsatisfactory	Potentially hazardous
BBQ chicken pieces	63	61 (97%)	1 (1.5%)	1 (1.5%)	-
Shredded/diced chicken	50	34 (68%)	10 (20%)	4 (8%)	2 (4%)
Breaded chicken products	48	47 (98%)	1 (2%)	-	-
Cooked stuffing	33	29 (88%)	3 (9%)	1 (3%)	-
Roast meats	3	3 (100%)	-	-	-
Gravy and sauces	60	45 (75%)	5 (8%)	9 (15%)	1 (2%)
Green salad	5	5 (100%)	-	-	-
Mayonnaise-based salad	69	50 (72%)	15 (22%)	-	4 (6%)

Frequency distribution for Standard Plate Count (SPC), thermotolerant coliforms and *E. coli* are presented in Figure 1 and Figure 2. The graphs show that the majority of samples contained these organisms at a very low level or under the limit of detection.

Figure 1. Frequency distribution for SPC in all samples

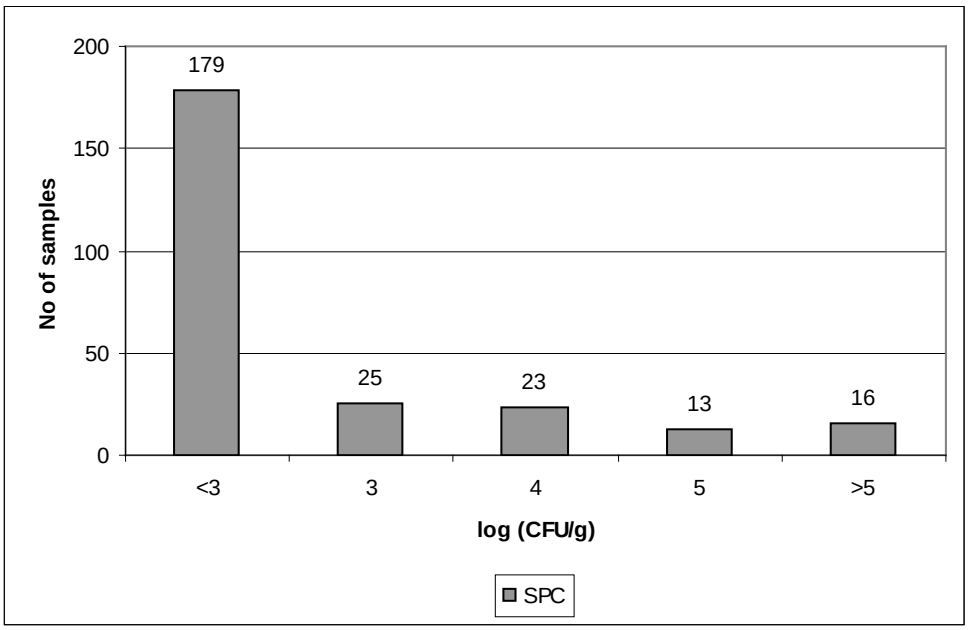
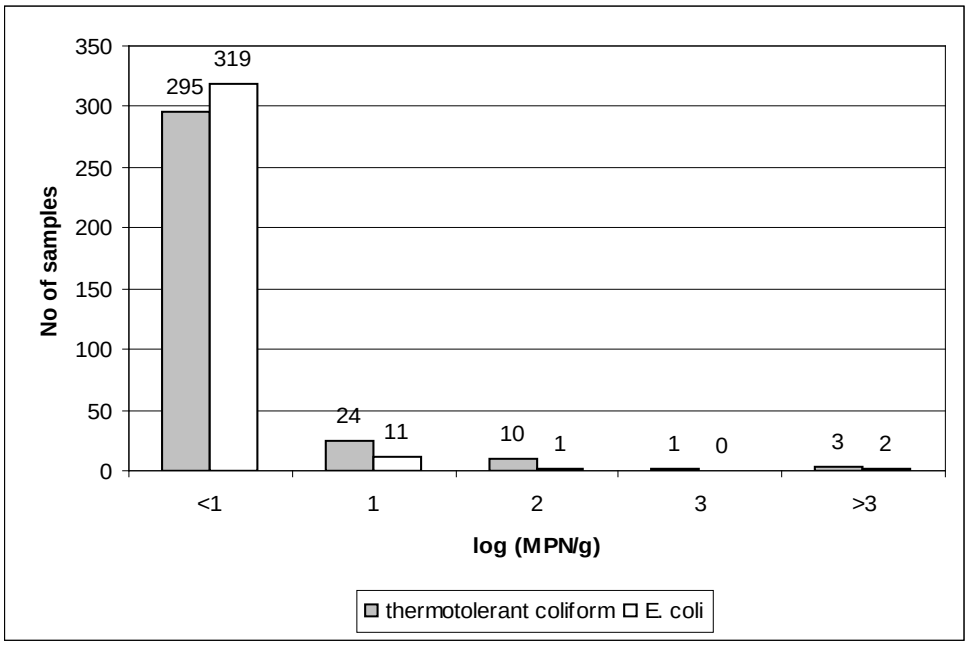


Figure 2. Frequency distribution for thermotolerant coliform and *E. coli* in all samples



4.2 Microbiological results – environmental swabs

A summary of the microbiological results for the environmental swabs is shown in Table 5. *Salmonella* was not detected from any swab, but *Campylobacter* spp was isolated from one swab.

Table 5. Microbiological results for environmental swabs collected during the survey

Surfaces being swabbed	No of swabs tested for *Salmonella* (n=305)	No of *Salmonella* positive	No of swabs tested for *Campylobacter* (n=302)	No of *Campylobacter* positive
Bench near display	81	0	81	0
Chopping board	100	0	100	1 (0.3%)
Utensils	58	0	56	0
Others, eg door handle, display cabinet	66	0	65	0

4.3 Responses to food handling questionnaire

Receipt and cooking of chicken

Responses to the questionnaire indicated that 60 businesses received raw chicken refrigerated or frozen. Of the 58 businesses (96.7%) receiving raw refrigerated chicken, only 21 (36.2%) checked the temperature of the chicken upon receipt. The remaining two respondents received raw chicken frozen. These respondents indicated that they thawed frozen chicken on the bench for 30 minutes or in refrigerator for a couple of hours.

Forty-three businesses provided information on where the chicken was placed in the rotisserie oven during cooking. Six of them (14%) placed raw chicken on the top skewer, sixteen of them (37.2%) placed chicken on bottom skewer and the rest were not sure.

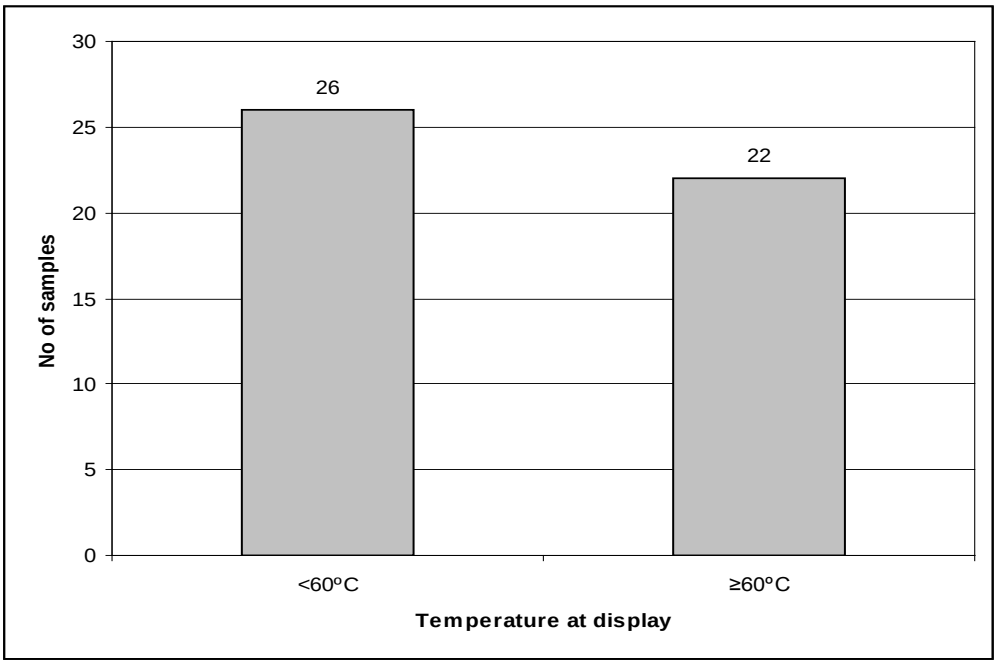
After cooking, almost all (93.3%) of the respondents displayed the cooked chicken in a bain marie that was separated from raw food (eg raw chicken).

Preparation of other food

The majority of respondents (71.7%) made stuffing in-house using pre-packaged bread crumbs. A number of them (63%) also used herbs and spices as part of the ingredients. Most of the respondents (70%) did not cook the stuffing before placing it inside the chicken and only seven (11.9%) respondents checked the stuffing temperature during cooking.

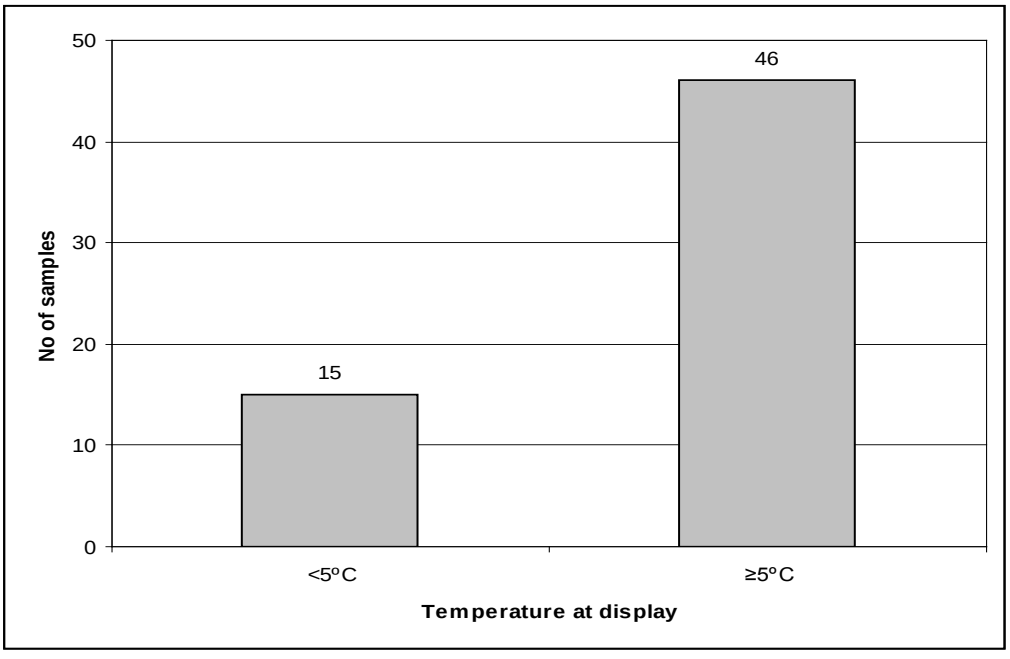
Fifty respondents (86.2%) made the gravy in-house using commercial gravy powder. Some respondents made gravy fresh in small batches, while others made one big batch to last the whole day. For those that cooled the gravy before display, different types of cooling containers were used. They varied from stainless steel bowls and saucepans to plastic containers/buckets, with sizes ranging from 1L to 30L. The time taken to cool gravy also varied from a few hours to overnight. During the survey, the temperature of gravy at display was taken from 48 (80%) businesses. The display temperature ranged from 28°C to 80°C with an average of 60°C.

Figure 3. Frequency distribution for temperature of gravy at display



A total of 49 (81.7%) respondents sold mayonnaise-based salad at their businesses. The types of salad commonly sold were pasta salad (78.7%), vegetables-based salad such as coleslaw (72.3%) and potato salad (55.3%). Some salads sold also included ingredients such as chicken, meat (eg ham) and seafood. Only four (6.7%) respondents made mayonnaise in-house, with one using raw egg mayonnaise. One respondent stated that the pH of the mayonnaise was checked before use. During the survey, the temperature of 61 mayonnaise-based salads on display was taken. The display temperature ranged from 0°C to 13°C with an average of 6.5°C.

Figure 4. Frequency distribution for temperature of mayonnaise-based salad at display



Display of food products

In regards to display, the majority of respondents indicated that they keep gravy and mayonnaise-based salads for longer than four hours, 40% and 61% respectively. In addition, 30 (50%) respondents displayed BBQ chicken for two to four hours, and a further 20% of respondents indicated that they keep cooked chicken for longer than four hours.

The majority of respondents (88.3%), indicated that leftover cooked chicken was stored to be used the next day, or used as an ingredient in other products such as pasta salad, with the remainder of respondents either discarding (10%) or giving away (1.7%) leftover cooked chicken.

Of the 56 respondents that had gravy on display, 52 (93%) stated that gravy was discarded at the end of the day. A further four respondents stored gravy to be used the next day.

Thirty-nine businesses made stuffing and the majority of them (32 businesses) indicated that stuffing was discarded at the end of the day. A further seven respondents stored it to be used the next day.

In addition, 64.7% of respondents discarded leftover or unsold mayonnaise-based salad, with the remainder either storing it to be used the next day (33.3%) or giving it away (2%).

Cooked chicken is cut on display benches (38.6%), wooden chopping boards (6.8%), plastic chopping boards (31.8%) or other surfaces such as stainless steel boards or bain maries (22.8%).

Cleaning and sanitising of utensils and chopping board

The majority of respondents (88.3%) used cleaning cloths, either separately or in combination with sponges, single-use paper towels and scourers to clean food preparation areas.

Only 33 respondents (55%) sanitised their utensils and chopping boards using commercially-available sanitisers such as bleach and/or heat treatment. Thirteen (39.4%) sanitised at the end of the day, two (6.1%) sanitised every four hours, nine (27.3%) sanitised every two hours, and the remainder (27.2%) were not sure how often the utensils and chopping boards were sanitised.

Food handler and hand washing

The majority of respondents (80%), used gloves while handling food, but the use of hair nets was not common (only 11.7%). Thirty-seven respondents (62.7%) indicated that the same person may handle both raw and cooked product. However, the majority of businesses (94.8%) had a separate area for raw and cooked food and used separate utensils for different foods.

Almost all respondents (98.3%) had a separate sink for food preparation and hand washing, as required in Standard 3.2.3 of the Code, with single-use paper towels and liquid soap available. However, only 60% of staff members were observed to wash their hands regularly with an adequate hand washing technique.

5. Discussion

The microbiological testing illustrated that food sold in takeaway chicken shops was, in general, of a good or acceptable microbiological standard, with 93% of samples tested categorised as good or acceptable.

However, the questionnaire highlighted some areas for businesses to focus on for improvement, especially in relation to the preparation and handling of shredded/diced chicken, gravy, and mayonnaise-based salads.

Chicken products

In this survey, 98.5% of BBQ chicken pieces and 100% of breaded chicken products tested were either good or acceptable, with no pathogenic microorganisms detected in any sample. This is comparable to results obtained in previous surveys (Meldrum et al., 2006; Tavakoli & Riazipour, 2008; Thompson, 2010; Willis & Greenwood, 2003).

The response from the food handling questionnaire on the cooking and display of BBQ chicken showed that most respondents have a good understanding of the safe processing and handling of these products. The temperature of the majority of samples was taken during the survey and the average display temperature for BBQ chicken and breaded chicken products was 61.3ºC and 61.9ºC respectively. Overall, 93.3% of businesses displayed the cooked chicken away from raw chicken to prevent cross contamination. However, there was a small percentage of businesses that put raw chicken on the top skewer in a rotisserie oven, which can increase the chance of cross contamination of raw chicken juices onto cooked chicken.

One sample of cooked stuffing was microbiologically unsatisfactory due to elevated SPC. There was a high degree of handling involved in the preparation of this stuffing sample and it also contained herbs and spices which may contribute to the high SPC. Three other samples collected from this business also contained very high SPC, which may indicate lack of hygienic practices and cross contamination between foods. The questionnaire also revealed that this business used vinegar and hot water to sanitise their utensils and chopping boards instead of a commercial sanitiser and it was likely that the same person handled both raw and cooked food.

A very small number of roast meats and green salads was also collected, and they were all classified microbiologically good.

Shredded/diced chicken

Of 50 shredded/diced cold chicken samples tested, four (8%) samples were found to be unsatisfactory and two (4%) samples were potentially hazardous. The temperatures of these samples were taken at the time of sampling and they ranged from 2.8°C to 7.4°C, similar to those with satisfactory results.

All of the microbiologically unsatisfactory samples had an elevated SPC which ranged from log 7.5 CFU/g to greater than log 8.4 CFU/g. The percentage of samples with elevated SPC in this survey was less than that observed in Western Australia's survey in 2003/04, which found 21% of samples with SPC greater than one million CFU (WAFMP, n.d.). High SPC may indicate that the product had been subject to temperature abuse or unhygienic processing (ie during slicing/dicing).

Furthermore, two samples were categorised as potentially hazardous due to the presence of *L. monocytogenes* and elevated level of SPC (log 5.3 CFU/g and log 7.5 CFU/g). One of them also contained thermotolerant coliforms at a level greater than log 4.0 MPN/g and *E. coli* at log 2.9 MPN/g.

Shredded/diced chicken may become contaminated with *L. monocytogenes* during the shredding/dicing process due to contact with contaminated surfaces or utensils. Previous studies have documented slicing/dicing as one of the handling activities that may contribute considerably to the contamination of products with *L. monocytogenes.* For example, in the Western Australia's survey on cold shredded/diced chicken, L. *monocytogenes* was detected in 41% of the samples (Little & de Louvois, 1998; Uyttendaele, de Troy, & Debevere, 1999; WAFMP, n.d.).

Shredded/diced chicken also provide a perfect environment for *L. monocytogenes* to grow due to the high level of nutrients and neutral pH. A study conducted by Glass & Doyle (1989) found that *L. monocytogenes* can grow rapidly on cooked chicken and turkey products stored under refrigeration. Once the shredded/diced chicken was contaminated with *L. monocytogenes*, any subsequent product using them as an ingredient will, in turn, be contaminated as well.

The responses from the food handling questionnaire indicated that shredded/diced chicken is normally used in salads or sandwiches and is prepared from leftover BBQ chicken from the day before, which may have been on display for a period of time. The method for shredding or dicing the chicken was not included in the questionnaire.

In this survey, BBQ chicken pieces were found to be displayed at an average temperature of 61.9°C (ranging from 40°C to 88°C). According to the NSW Food Authority's *Food safety guidelines on applying the 4-hour/2-hour rule for temperature control*, if businesses would like to prepare shredded/diced chicken from leftover BBQ chicken, shredding/dicing can be done at the end of the day, provided that BBQ chicken was displayed at a temperature of 60°C or above at all times.

However, this survey found that 23 of 63 businesses surveyed were displaying BBQ chicken at temperatures between 5°C and 60°C (the temperature danger zone). The time taken to shred/dice the chicken also contributes to the length of time the food is out of temperature control. Therefore, if BBQ chicken is displayed at temperature between 5°C and 60°C, a business must take care that the time for display in this zone, plus that required for shredding/dicing, does not exceed two hours (NSW Food Authority, 2011). The shredded/diced chicken will then also need to be refrigerated immediately if it is going to be used the next day, as per Clause 3, Division 3 of Standard 3.2.2 of the Code.

Gravy

Sixty gravy and sauce samples were collected and tested in this survey. Eight (13%) gravy samples were categorised as unsatisfactory and one (2%) was categorised as potentially hazardous.. The temperatures of these samples were taken at the time of sampling and they ranged from 39.6°C to 69°C, with an average of 55°C, similar to those with satisfactory results. In addition, one garlic sauce sample was categorised as unsatisfactory due to an elevated SPC (log 5.5 CFU/g).

All of the unsatisfactory gravy samples had elevated SPC, ranging from log 5.1 CFU/g to log 8.4 CFU/g. One sample also had elevated levels of *C. perfringens* (although not at a level to cause it to be potentially hazardous), thermotolerant coliforms and *E. coli*. Another sample also had a high level of *B cereus* (not at a level to cause it to be potentially hazardous) and one sample also contained both thermotolerant coliforms and *E. coli* at elevated levels. The gravy sample categorised as potentially hazardous had *B. cereus* level of 37,000 CFU/g.

An elevated level of *E. coli* may indicate inadequate heat treatment of the gravy, followed by temperature abuse. *C. perfringens* is an anaerobic organism and gravy can provide a suitable environment for the growth of this organism if the product is not kept under temperature control (Sebastian, 2002). The presence of *B. cereus* in processed foods is often associated with the ability of spores to survive heat treatment processes, or contamination from raw material. Elevated levels might also indicate time and opportunity for pathogen growth.

The prevalence of *E. coli, B. cereus*, and *C. perfringens* found in this survey was well within the prevalence found in other surveys previously conducted overseas. However, the levels of these organisms in other surveys were not known (Kubheka et al., 2001; Mosupye & von Holy, 1999; Willis & Greenwood, 2003).

Responses from the food handling questionnaire indicated that the majority of businesses (86.2%) made their gravy in-house using commercial powder and gravy was normally discarded at the end of the day. A study conducted by Kadis et al. (1971) concluded that there was little danger for foodborne illness from gravy prepared from commercial gravy bases, provided that preparation instructions were followed. However, the handling of products after cooking or rehydrating plays an important role in ensuring that the product remains safe.

The questionnaire identified that there were some practices with the potential to allow the growth of pathogenic microorganisms:

- Cooling of gravy in large containers. Twelve out of 30 (40%) business made up gravy in a 5L container or bigger
- Twenty-six businesses (54%) displayed their gravy within the temperature danger zone (between 5°C and 60°C)

Cooling of gravy in large containers will result in long cooling periods during which time microorganisms can grow. Irrespective of the food, it is usually recommended that foods be placed in shallow containers prior to cooling to decrease the time it takes to cool the foods. This should minimise the time the food is at a temperature which will support the growth of pathogenic microorganisms. Standard 3.2.2 of the Code includes provisions for the cooling of foods, that being to cool from 60°C to 21°C within two hours, following by cooling from 21°C to 5°C within a further four hours.

Displaying gravy at temperatures between 5°C and 60°C means that the gravy will be within the temperature danger zone. When food is kept within the temperature danger zone, microorganisms are able to grow. Therefore, gravy should be displayed at a temperature above 60°C. This survey found that, on average, gravy was displayed at 57°C (ranging from 28.8°C to 92°C).

To date, there have been seven reported outbreaks attributed to gravy in Australia. Six were caused by *C. perfringens* and one was due to *B. cereus*. Some of the contributing factors to these outbreaks were time/temperature abuse including slow cooling that enabled relatively low levels of *B. cereus* to increase (Food Science Australia & Minter Ellison Consulting, 2002; OzFoodNet 2003, 2004, 2005, 2008c; Roberts et al., 1996).

Mayonnaise-based salads

Of 69 samples tested, four (6%) mayonnaise-based salads were categorised as potentially hazardous due to the presence of *L. monocytogenes*. In addition, two of these also contained low levels of *E. coli*, at 4 and 7 CFU/g. The potentially hazardous samples were ham and pasta salad, creamy pasta salad, potato salad, and chicken Caesar salad. The last two salads came from one business.

Surveys overseas found similar prevalence of *L. monocytogenes* in mayonnaise-based salads collected from delicatessens and takeaway businesses, with prevalence ranging from 0 to 3.6% (Christison et al., 2008; Gombas et al. 2003; Meldrum et al., 2005).

The presence of *L. monocytogenes* in these types of products may not be unexpected due to the presence of raw vegetables. While potentially hazardous, *L. monocytogenes* is mainly of concern with at-risk groups such as pregnant woman, the elderly and immunocompromised individuals. The presence of *L. monocytogenes* in four of the samples supports the current risk management strategy of communicating to at-risk groups— that prepared cold salads should be avoided.

This survey also found some degree of temperature abuse since three of the four potentially hazardous samples were displayed at temperatures greater than 5°C at the time of sampling (ranging from 7.2°C to 17.2°C). The average temperature for mayonnaise-based salad samples in this survey was 6.5°C. The responses from the questionnaire also revealed that 33.3% of respondents normally stored unsold salads to be sold the next day. This practice is acceptable, provided that salad is displayed under 5°C at all times (NSW Food Authority, 2011).

Environmental swabs

Of 305 environmental swabs taken from a range of surfaces at the takeaway chicken shops, only one (0.3%) was positive with *Campylobacter* spp. This swab was taken from a chopping board used for raw chicken. However no food sample collected from the shop was positive for *Campylobacter* spp.

Despite the absence of *Salmonella* or *Campylobacter* spp. from swabbed surfaces around the food preparation areas, responses from the food handling questionnaire highlighted an issue with the lack of use of sanitisers. A total of 45% of respondents did not use sanitisers on their chopping boards, utensils and other food preparation surfaces. In addition, only 60% of staff was observed to wash their hands regularly with an adequate hand washing technique, despite the availability of a sink for hand washing, single-use paper towels and liquid soap.

Proper hand washing and sanitation of food preparation surfaces is critical for the control of microbial contamination of foods and in the prevention of foodborne outbreaks. Correct hand washing procedures, using antibacterial soap, hand sanitisers and paper towels for drying, are required to reduce hand contamination by 3 log CFU or more (Chen et al., 2001; Christison et al., 2008; de Boer, 2006). However, in recent years, it has been recognised that cleaning products such as cloths and sponges may play a role in the contamination of foods if strict hygiene practices are not adhered to (Christison et al., 2007).

In 2010, the Food Safety Supervisor initiative was introduced in NSW. It requires one person per food premises to undergo accredited training to improve his/her food safety knowledge and skills, and thereby reduce the incidence of foodborne illness attributed to food handling errors in the NSW hospitality industry, including takeaway chicken businesses (NSW Food Authority, 2009).

6. Conclusion

The microbiological testing illustrated that food sold in takeaway chicken shops at the time of the survey was, in general, of a good or acceptable microbiological standard, with 93% of samples tested categorised as good or acceptable.

However, this survey found that improvements are needed, especially in relation to the preparation and handling of shredded/diced chicken, gravy, and mayonnaise-based salads as revealed by the questionnaire.

Practices observed in the takeaway chicken shops at the time of the survey, which have the potential to allow the growth of pathogenic microorganisms, include:

- 54% and 75% of businesses displayed gravy and mayonnaise-based salads within the temperature danger zone (between 5°C and 60°C)
- 40% of businesses shredded or diced chicken after it had been displayed for a period of time outside temperature control, to be used the next day,
- 40% of businesses cooled gravy using large containers (>5L), and
- 45% of businesses did not use appropriate sanitisers to sanitise food preparation surfaces.

The poor handling practices observed at the surveyed premises will not lead to foodborne illness on their own. When foodborne illness occurs, it is normally due to a series or combination of events. For microbial foodborne illness to occur, four essential elements need to come together:

- a susceptible consumer,
- a microorganism in a form that is able to cause illness and is in sufficient numbers,
- the microorganism is present in a food that supports its transmission and, in some cases, amplifies it, and
- an environment (eg temperature) that supports the microorganism's transmission and, in some cases, amplifies it.

The NSW Food Authority has published a number of factsheets and guidelines that can help takeaway chicken businesses address the poor handling practices observed in this study, including:

- *Potentially hazardous food guidelines*
- *Food safety guidelines on applying the 4-hour/2-hour rule for temperature control*
- *Cleaning and sanitising in food businesses factsheet*

The recently introduced Food Safety Supervisor requirements and ongoing food safety education of food handlers can assist in improving food handling practices at takeaway chicken outlets.

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- Coffs Harbour City Council
- Council of the City of Sydney
- Fairfield City Council
- Glen Innes Severn Council
- Great Lakes Council
- Greater Taree City Council
- Gosford City Council
- Holroyd City Council
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- Ku-ring-gai Council
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- Wyong Shire Council
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8. References

Albrecht, J.A., Hamouz, F.L., Sumner, S.S. & Melch, V. Microbial evaluation of vegetable ingredients in salad bars. *Journal of Food Protection*, 58(6), 683 – 685.

Chen, Y., Jackson, K.M., Chea, F.P. & Schaffner, D.W. (2001). Quantification and variability analysis of bacterial cross contamination rates in common food service tasks. *Journal of Food Protection, 64*(1), 72 – 80.

Christison, C.A., Lindsay, D. & von Holy, A. (2007). Cleaning and handling implements as potential reservoirs for bacterial contamination of some ready-to-eat foods in retail delicatessen environments. *Journal of Food Protection, 70*(12), 2878 – 2883.

Christison, C.A., Lindsay, D. & von Holy, A. (2008). Microbiological survey of ready-to-eat foods and associated preparation surfaces in retail delicatessens, Johannesburg, South Africa. *Food Control, 19*(7), 717 – 733.

De Boer, E. (2006). *Contamination in the food industry environment*. Retrieved August 7, 2009 from http://www.iso.org/iso/contamination_in_the_food_industry_environment.pdf

Dietitians Association of Australia (DAA). (2008). *Fast food and take-away*. Retrieved August 24, 2009 from http://www.daa.asn.au/index.asp?PageID=2145834438

Dietitians Association of Australia (DAA). (2009). *Fast food and take-away*. Retrieved August 24, 2010 from http://www.healthyweightweek.com.au/index.asp?pageID=2145857400

Food Science Australia & Minter Ellison Consulting. (2002). National Risk Validation Project.

Food Standards Agency (FSA) (2009). FSA report for the UK survey of *Campylobacter* and *Salmonella* contamination of fresh chicken at retail sale. Retrieved October 9, 2009 from http://www.foodbase.org.uk/admintools/reportdocuments/351-1-676_B18025.pdf

Food Standard Australia New Zealand. (2011). Australia New Zealand Food Standards Code. Retrieved April 1, 2011 from http://www.foodstandards.gov.au/foodstandards/foodstandardscode.cfm

Glass, K.A. & Doyle, M.P. (1989). Fate of *Listeria monocytogenes* in processed meat products during refrigerated storage. *Applied and Environmental Microbiology, 55*(6), 1565 – 1569.

Gombas, D.E., Chen, Y., Clavero, R.S. & Scott, V.N. (2003). Survey of *Listeria monocytogenes* in ready-to-eat foods. *Journal of Food Protection, 66*(4), 559 – 569.

Kadis, V.W., Hill, D.A. & Pennifold, K.S. (1971). Bacterial content of gravy bases and gravies obtained in restaurants. *Canadian Institute of Food Technology Journal, 4*(3), 130 – 132.

Kaneko, K.I., Hayashidani, H., Ohtomo, Y., Kosuge, J., Kato, M., Takahashi, K., Shiraki, Y. & Ogawa, M. (1999). Bacterial contamination of ready-to-eat foods and fresh products in retail shops and food factories. *Journal of Food Protection, 62*(6), 644 – 649.

Kirk, M., Waddell, R., Dalton, C., Creaser, A. & Rose, N. (1997). A prolonged outbreak of Campylobacter infection at a training facility. *Communicable Disease Intelligence, 21*(5), 57 – 61.

Kirk, M., Carnie, J. & Tallis, G. (1999). *Surveillance of notifiable infectious diseases in Victoria 1998*. Retrieved August 10, 2009 from http://www.health.vic.gov.au/__data/assets/pdf_file/0006/19806/snid1998_complete.pdf

Kubheka, L.C., Mosupye, F.M. & von Holy, A. (2001). Microbiological survey of street-vended salad and gravy in Johannesburg city, South Africa. *Food Control, 12*(2), 127 – 131.

Little, C.L. & de Louvois, J. (1998). The microbiological examination of butchery products and butchers' premises in the United Kingdom. *Journal of Applied Microbiology* 85(1), 177 – 186.

Meldrum, R.J., Ribeiro, C.D., Smith, R.M.M., Walker, A.M., Simmons, M., Worthington, D. & Edwards, C. (2005). Microbiological quality of ready-to-eat foods: results from a long-tem surveillance program (1995 through 2003). *Journal of Food Protection, 68*(8), 1654 – 1658.

Meldrum, R.J., Smith, R.M.M., Ellis, P. & Garside, J. (2006). Microbiological quality of randomly selected ready-to-eat foods sampled between 2003 and 2005 in Wales, UK. *International Journal of Food Microbiology, 108*, 397 – 400.

Meldrum, R.J. & Wilson, I.G. (2007). *Salmonella* and *Campylobacter* in United Kingdom retail raw chicken in 2005. *Journal of Food Protection, 70*(8), 1937 – 1939.

Meldrum, R.J., Little, C.L., Sagoo, S., Mithani, V., McLauchlin, J., de Pinna, E. & the Foods, Water and Environmental Surveillance Network. (2009). *LACORS/HPA co-ordinated food liaison group studies: microbiological quality of salad vegetables and sauces from kebab take-away restaurants*. Retrieved September 17, from http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1236155255969

Moore, J.E., Wilson, T.S., Wareing, D.R.A., Humphrey, T.J. & Murphy, P.G. (2002). Prevalence of thermophilic *Campylobacter* spp. in ready-to-eat foods and raw poultry in Northern Ireland. *Journal of Food Protection, 65*(8), 1326 – 1328.

Mosupye, F.M. & von Holy, A. (1999). Microbiological quality and safety of ready-to-eat street-vended foods in Johannesburg, South Africa. *Journal of Food Protection, 61*(11), 1278 – 1284.

NSW Food Authority. (2008). Potentially hazardous foods. Retrieved February 23, 2011 from http://www.foodauthority.nsw.gov.au/_Documents/science/potentially-hazardous-foods.pdf

NSW Food Authority. (2009a). Microbiological quality guide for ready-to-eat foods. Retrieved February 23, 2011 from http://www.foodauthority.nsw.gov.au/_Documents/science/microbiological_quality_guide_for_RTE_food.pdf

NSW Food Authority. (2009b). Better Regulation Statement. Food Handler Training Initiative — Food Safety Supervisor requirement for NSW hospitality businesses. Retrieved April 1, 2011 from http://www.foodauthority.nsw.gov.au/_Documents/industry_pdf/BRS_Food_Handler_Training.pdf

NSW Food Authority. (2011). Food safety guidelines on applying the 4-hour/2-hour rule for temperature control. Retrieved June 3, 2011 from http://www.foodauthority.nsw.gov.au/_Documents/industry_pdf/4_hour_2_hour.pdf

OzFoodNet Working Group (2003). *Foodborne disease in Australia: incidence, notifications and outbreaks, annual report of the OzFoodNet network, 2002*. Retrieved August 10, 2009, from http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/cda-2003-cdi2702-pdf-cnt.htm/$FILE/cdi2702g.pdf

OzFoodNet Working Group (2004). *Foodborne disease investigation across Australia: annual report of the OzFoodNet network, 2003*. Retrieved August 10, 2009, from http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/cda-pubs-2004-cdi2803-pdf-cnt.htm/$FILE/cdi2803h.pdf

OzFoodNet Working Group (2005). *Reported foodborne illness and gastroenteritis in Australia: annual report of the OzFoodNet network, 2004*. Retrieved August 10, 2009, from http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/cda-cdi2902-pdf-cnt.htm/$FILE/cdi2902f.pdf

OzFoodNet Working Group (2006). *Burden and causes of foodborne disease in Australia: annual report of the OzFoodNet network, 2005*. Retrieved August 10, 2009, from http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/cda-cdi3003-pdf-cnt.htm/$FILE/cdi3003b.pdf

OzFoodNet Working Group (2007). *Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: Annual report of the OzFoodNet Network, 2006*. Retrieved August 10, 2009 from http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi3104-pdf-cnt.htm/$FILE/cdi3104a.pdf

OzFoodNet Working Group (2008a). *Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: Annual report of the OzFoodNet Network, 2007.* Retrieved September

28, 2009 from http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi3204-pdf-cnt.htm/$FILE/cdi3204c.pdf

OzFoodNet Working Group (2008b). *OzFoodNet quarterly report, 1 January to 31 March 2008*. Retrieved September 28, 2009 from http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi3202-pdf-cnt.htm/$FILE/cdi3202k.pdf

OzFoodNet Working Group (2008c). *OzFoodNet quarterly report, 1 April to 30 June 2008*. Retrieved September 23, 2009 from http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi3203-pdf-cnt.htm/$FILE/cdi3203f.pdf

OzFoodNet Working Group (2009). *OzFoodNet quarterly report, 1 July to 30 September 2009*. Retrieved August 20, 2010 from http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi3304-pdf-cnt.htm/$FILE/cdi3304f.pdf

OzFoodNet Working Group (2010). *OzFoodNet quarterly report, 1 October to 31 December 2009*. Retrieved August 20, 2010 from http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi3401-pdf-cnt.htm/$FILE/cdi3401j.pdf

Pepe, O., Blaiotta, G., Bucci, F., Anastasio, M., Aponte, M. & Villani, F. (2006). *Staphylococcus aureus* and Staphylococcal Enterotoxin A in breaded chicken products: detection and behaviour during the cooking process. *Applied and Environmental Microbiology, 72*(11), 7057 – 7062.

Quiñones-Ramĭrez, E.I., Vázquez-Salinas, C., Rodas-Suárez, O.R., Ramos-Flores, M.O., Rodrĭguez-Montaño, R. (2000). Frequency of isolation of *Campylobacter* from roasted chicken samples from Mexico City. *Journal of Food Protection, 63*(1), 117 – 119.

Roberts, T.A., Baird-Parker, A.C., & Tompkin, R.B. (Ed). (1996). *Microorganisms in foods – 5 – Microbiological specifications of food pathogens*. Blackie Academic & Professional, UK.

Ross, T., Mellfont, L., McQuestin, O., Haines, H., & Smith, J. for Department of Health and Ageing (2009). *Draft Risk profiling framework – example classifications*.

Sagoo, S.K., Little, C.L. & Mitchell, R.T. (2003). Microbiological quality of open ready-to-eat salad vegetables: effectiveness of food hygiene training of management. *Journal of Food Protection, 66*(9), 1581 – 1586.

Sebastian, E.K. (2002). *Clostridium perfringens* outbreak at Christmas banquet. *Public Health and Epidemiology Report Ontario, 13*(5), 93 – 96.

Smith, D.P., Berrang, M.E., Feldner, P.W., Phillips, R.W. & Meinersmann, R.J. (2004). Detection of *Bacillus cereus* on selected retail chicken products. *Journal of Food Protection, 67*(8), 1770 – 1773.

Tavakoli, H.R. & Riazipour, M. (2008). Microbial quality of cooked meat foods in Tehran University's restaurants. *Pakistan Journal of Medical Sciences, 24*(4), 595 – 599. Retrieved August 10, from http://pjms.com.pk/issues/julsep08/pdf/microbial.pdf

Thompson, T. (2010). Government of South Australia Food Act Report Year ending 30 June 2010. Appendix 2: Food safety survey report – microbiological quality of cooked chickens. Retrieved December 17, 2010 from http://www.health.sa.gov.au/pehs/publications/FoodActReport-PEHS-2010.pdf

Uyttendaele, M., de Troy, P. & Debevere, J. (1999a). Incidence *of Salmonella, Campylobacter jejuni, Campylobacter coli*, and *Listeria monocytogenes* in poultry carcasses and different types of poultry products for sale on the Belgian retail market. *Journal of Food Protection, 62*(7), 735 – 740.

West Australian Food Monitoring Program. (n.d.). *Microbiological quality of cooked chicken meat 2003 – 2004*.

Willis, C. & Greenwood, M. (2003). Wessex shopping basket survey – a structured approach to local food sampling. *International Journal of Environmental Health Research, 13*(4), 349 – 359.

Appendices

Appendix 1: Survey results for food products

Appendix 2: Survey results for environmental swabs

Appendix 3: Food handling questionnaire for takeaway hot chicken shops

Appendix 4: Foodborne illness attributed to takeaway chicken shops in Australia (2004 – 2010)

Appendix 5: Selected studies on microbiological quality of food commonly sold in takeaway chicken shops

Appendix 1: Survey results for food products[5]

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Chicken products											
1/2 BBQ chicken	<10	<3	<3	ND	<100				ND		Good
1/2 roast chicken	380	<3	<3	ND	<100				ND		Good
1/4 BBQ chicken	<10	<3	<3	ND	<100				ND		Good
1/4 BBQ chicken	<250	<3	<3	ND	<100				ND		Good
1/4 BBQ chicken	<10	<3	<3	ND	<100				ND		Good
1/4 BBQ chicken	4,300	23	23	ND	<100				ND		Acceptable
1/4 BBQ chicken hot display	<250	<3	<3	ND	<100				ND		Good
1/4 BBQ chicken in hot display	<10	<3	<3	ND	<100				ND		Good
1/4 BBQ chicken with stuffing	<10	<3	<3	ND	<100				ND		Good
1/4 chicken	<10	<3	<3	ND	<100				ND		Good
1/4 chicken	<250	<3	<3	ND	<100				ND		Good
1/4 chicken	<250	<3	<3	ND	<100				ND		Good
1/4 chicken BBQ	<250	<3	<3	ND	<100				ND		Good
1/4 cooked chicken	<250	<3	<3	ND	<100				ND		Good
1/4 roast chicken	1,100	<3	<3	ND	<100				ND		Good
BBQ chicken	<250	<3	<3	ND	<100				ND		Good
BBQ chicken	<250	<3	<3	ND	<100				ND		Good
BBQ chicken	<10	<3	<3	ND	<100				ND		Good
BBQ chicken	<250	<3	<3	ND	<100				ND		Good
BBQ chicken	<250	<3	<3	ND	<100				ND		Good
BBQ chicken	<250	<3	<3	ND	<100				ND		Good
BBQ chicken	310	7	<3	ND	<100				ND		Good

[5] Different tests were done on different type of food.
ND: Not Detected

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
BBQ chicken	220	<3	<3	ND	<100				ND		Good
BBQ chicken	<250	<3	<3	ND	<100				ND		Good
BBQ chicken	<10	<3	<3	ND	<100				ND		Good
BBQ chicken	520	<3	<3	ND	<100				ND		Good
BBQ chicken	2,700,000	<3	<3	ND	<100				ND		Unsatisfactory
BBQ chicken	<250	<3	<3	ND	<100				ND		Good
BBQ chicken	<10	<3	<3	ND	<100				ND		Good
BBQ chicken	<250	<3	<3	ND	<100				ND		Good
BBQ chicken piece	<10	<3	<3	ND	<100				ND		Good
BBQ chicken piece	<250	<3	<3	ND	<100				ND		Good
BBQ chicken piece	41,000	<3	<3	ND	<100				ND		Good
BBQ chicken piece	<10	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	1,000	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	<250	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	<10	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	<10	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	<10	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	<250	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	<250	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	<10	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	1,800	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	<10	<3	<3	ND	<100				ND		Good
BBQ chicken pieces	<10	<3	<3	ND	<100				ND		Good
BBQ cooked chicken leg thigh	<10	<3	<3	ND	<100				ND		Good
Chicken drumstick	<10	<3	<3	ND	<100				ND		Good
Chicken piece	<10	<3	<3	ND	<100				ND		Good
Chicken wing	<10	<3	<3	ND	<100				ND		Good
Chicken wing	320	<3	<3	ND	<100				ND		Good
Cooked BBQ chicken	580	<3	<3	ND	<100				ND		Good
Cooked chicken	<250	<3	<3	ND	<100				ND		Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Cooked chicken	<10	<3	<3	ND	<100						Good
Cooked chicken	<250	<3	<3	ND	<100				ND		Good
Cooked chicken	<250	<3	<3	ND	<100				ND		Good
Cooked chicken pieces	16,000	<3	<3	ND	<100				ND		Good
Hot BBQ chicken	<250	<3	<3	ND	<100				ND		Good
Hot BBQ chicken	<250	<3	<3	ND	<100				ND		Good
Hot BBQ chicken hot food bar	<250	<3	<3	ND	<100				ND		Good
Hot BBQ chicken hot food bar	<10	<3	<3	ND	<100				ND		Good
Hot chicken pieces from display	<250	<3	<3	ND	<100				ND		Good
Leg quarter charcoal chicken	<10	<3	<3	ND	<100				ND		Good
Quarter chicken	<250	<3	<3	ND	<100				ND		Good
Baiada chicken crackles	<10	<3	<3	ND	<100				ND		Good
Battered chicken	7,000	<3	<3		<100				ND		Good
Breaded chicken	<250	<3	<3	ND	<100				ND		Good
Breaded chicken piece	<250	<3	<3	ND	<100				ND		Good
Breaded chicken wing hot display	<10	<3	<3	ND	<100						Good
Breaded product	<10	<3	<3	ND	<100						Good
Chicken fingers	<10	<3	<3	ND	<100				ND		Good
Chicken goujons	<10	<3	<3	ND	<100				ND		Good
Chicken nugget	<10	<3	<3	ND	<100				ND		Good
Chicken nuggets	<10	<3	<3	ND	<100				ND		Good
Chicken nuggets	<250	<3	<3	ND	<100				ND		Good
Chicken nuggets	<10	<3	<3	ND	<100				ND		Good
Chicken nuggets	<250	<3	<3	ND	<100				ND		Good
Chicken nuggets	3,900	<3	<3	ND	<100				ND		Good
Chicken nuggets	<10	<3	<3	ND	<100				ND		Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Chicken nuggets	<250	<3	<3	ND	<100						Good
Chicken nuggets	<250	<3	<3	ND	<100				ND		Good
Chicken nuggets	<10	<3	<3	ND	<100				ND		Good
Chicken nuggets (just cooked)	<250	<3	<3	ND	<100				ND		Good
Chicken piece deep fried	590	<3	<3	ND	<100				ND		Good
Chicken schnitzel	<250	<3	<3	ND	<100				ND		Good
Chicken schnitzel	<10	<3	<3	ND	<100				ND		Good
Chicken schnitzel	<10	<3	<3	ND	<100				ND		Good
Chicken schnitzel	<250	<3	<3	ND	<100				ND		Good
Chicken schnitzel	<10	<3	<3	ND	<100				ND		Good
Chicken schnitzel	<250	<3	<3	ND	<100				ND		Good
Chicken schnitzel from display	<10	<3	<3	ND	<100				ND		Good
Chicken strip	<250	<3	<3	ND	<100				ND		Good
Chicken strips	19,000	<3	<3	ND	<100				ND		Acceptable
Chicken strips	<250	<3	<3	ND	<100				ND		Good
Chicken tenders	<10	<3	<3	ND	<100				ND		Good
Chicken wings deep fried	<10	<3	<3	ND	<100				ND		Good
Cooked breaded chicken	<10	<3	<3	ND	<100				ND		Good
Cooked breaded chicken	<250	<3	<3	ND	<100				ND		Good
Cooked breaded chicken	<10	<3	<3	ND	<100				ND		Good
Cooked breaded chicken product	5,800	<3	<3	ND	<100						Good
Cooked breaded chicken product	<250	<3	<3	ND	<100				ND		Good
Cooked chicken breast coujons/chippees	<10	<3	<3	ND	<100				ND		Good
Cooked chicken schnitzel	<250	<3	<3	ND	<100				ND		Good
Crispy chicken strip	<10	<3	<3	ND	<100				ND		Good
Crumbed chicken	<10	<3	<3	ND	<100				ND		Good
Crumbed chicken	<250	<3	<3	ND	<100				ND		Good
Crumbed chicken pieces	<10	<3	<3	ND	<100				ND		Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Crumbed chicken wings	<10	<3	<3	ND	<100				ND		Good
Fried chicken	<250	<3	<3	ND	<100				ND		Good
Fried chicken breast	<10	<3	<3	ND	<100				ND		Good
Fried crumbed chicken	<10	<3	<3	ND	<100				ND		Good
Jerra fried chicken	<10	<3	<3	ND	<100				ND		Good
Schnitzel chicken	<10	<3	<3	ND	<100				ND		Good
Spicy chicken wings	<250	<3	<3	ND	<100				ND		Good
Beef gravy	11,000	4	4		<100	<100				<100	Acceptable
Chicken gravy	240,000,000	>11,000	>11,000		<100	<100				450	Unsatisfactory
Gravy											
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	3,100	43	23		<100	<100				<100	Acceptable
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	1,600,000	<3	<3		<100	7,100				<100	Unsatisfactory
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<2,500	930	43		<100	<100				<100	Acceptable
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	680,000	<3	<3		<100	<100				<100	Unsatisfactory
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	1,200,000	2,400	<3		<100	<100				<100	Unsatisfactory
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<2,500	<3	<3		<100	<100				<100	Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	740	<3	<3		<100	<100				<100	Good
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	120,000	>11,000	>11,000		<100	<100				<100	Unsatisfactory
Gravy	4,800	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	37,000	<3	<3		<100	<100				<100	Acceptable
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	5,600,000	28	20		<100	<100				<100	Unsatisfactory
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	53,000	<3	<3		<100	37,000				<100	Potentially hazardous
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<2,500	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy	<10	<3	<3		<100	<100				<100	Good
Gravy	<250	<3	<3		<100	<100				<100	Good
Gravy (hot from display)	<10	<3	<3		<100	<100				<100	Good
Gravy from display	<10	<3	<3		<100	<100				<100	Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Gravy hot display	1,200,000	<3	<3		<100	<100				<100	Unsatisfactory
Gravy hot display	250,000	<3	<3		<100	<100				<100	Unsatisfactory
Gravy that has just been cooked	<10	<3	<3		<100	<100				<100	Good
Mayonnaise-based salad											
Caesar salad		93	<3	ND	<100		ND	ND	ND		Good
Garden salad		<3	<3	ND	<100		ND	ND	ND		Good
Green salad		<3	<3		<100		ND	ND			Good
Lettuce salad		<3	<3	ND	<100		ND	ND			Good
Mushroom, baby spinach salad		<3	<3	ND	<100		ND	ND	ND		Good
Cabbage & mayonnaise		<3	<3	ND	<100		ND	ND			Good
Caesar salad		43	<3	ND	<100		ND	ND	ND		Good
Coleslaw		<3	<3	ND	<100		ND	ND	ND		Good
Coleslaw		<3	<3	ND	<100		ND	ND	ND		Good
Coleslaw		<3	<3	ND	<100		ND	ND	ND		Good
Coleslaw		<3	<3	ND	<100		ND	ND	ND		Good
Coleslaw		<3	<3	ND	<100		ND	ND	ND		Good
Coleslaw		<3	<3	ND	<100				ND		Good
Coleslaw		<3	<3	ND	<100		ND	ND	ND		Good
Coleslaw		<3	<3	ND	<100		ND	ND	ND		Good
Creamy pasta salad		<3	<3	ND	<100		ND	ND	ND		Good
Creamy pasta salad		9	4	ND	<100		Detected	Detected	ND		Potentially hazardous
Curried egg salad		<3	<3	ND	<100		ND	ND	ND		Good
Egg mayonnaise sandwich filling		<3	<3	ND	<100		ND	ND	ND		Good
Lettuce and mayonnaise		<3	<3	ND	<100		ND	ND	ND		Good
Mayo based salad		930	<3	ND	<100		ND	ND	ND		Acceptable
Mayonnaise based salad		<3	<3	ND	<100		ND	ND	ND		Good
Mayonnaise based salad		<3	<3	ND	<100		ND	ND	ND		Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Mayonnaise based salad		930	<3	ND	<100		ND	ND	ND		Acceptable
Mayonnaise coleslaw		<3	<3	ND	<100		ND	ND	ND		Good
Mayonnaise prawn salad		23	<3	ND	<100		ND	ND	ND		Good
Mayonnaise salad		<3	<3	ND	<100		ND	ND	ND		Good
Pasta salad		93	<3	ND	<100		ND	ND	ND		Good
Pasta salad		93	43	ND	<100		ND	ND	ND		Acceptable
Pasta salad		<3	<3	ND	<100		ND	ND	ND		Good
Pasta salad		23	<3	ND	100		ND	ND	ND		Acceptable
Pasta salad		<3	<3	ND	<100		ND	ND	ND		Good
Pasta salad		<3	<3	ND	<100		ND	ND	ND		Good
Pasta salad		7	<3	ND	<100		ND	ND	ND		Good
Pasta salad		4	<3	ND	<100		ND	ND	ND		Good
Pasta salad on display		430	<3	ND	<100		ND	ND	ND		Acceptable
Pasta salad with mayonnaise		20	<3	ND	<100		Detected	ND	ND		Good
Potato salad		<3	<3	ND	<100		ND	ND	ND		Good
Potato salad		75	39	ND	<100		Detected	ND	ND		Acceptable
Potato salad		4	<3	ND	<100		ND	ND	ND		Good
Potato salad		<3	<3	ND	<100		ND		ND		Good
Potato salad		<3	<3	ND	<100		ND	ND	ND		Good
Potato salad		<3	<3	ND	<100		ND	ND	ND		Good
Potato salad		<3	<3	ND	<100		ND	ND	ND		Good
Potato salad		430	<3	ND	<100		ND	ND	ND		Acceptable
Potato salad		<3	<3	ND	<100		ND	ND			Good
Potato salad		<3	<3	ND	<100		ND	ND	ND		Good
Potato salad		<3	<3	ND	<100		Detected	Detected	ND		Potentially hazardous
Salad tub with coleslaw dressing		<3	<3	ND	<100		ND	ND	ND		Good
Seafood salad		4	<3	ND	<100		ND	ND	ND		Good
Seafood salad		230	<3	ND	<100		ND	ND	ND		Acceptable
Seafood salad		4	<3	ND	<100		ND	ND	ND		Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Seafood salad		<3	<3	ND	<100		ND	ND	ND		Good
Seafood salad on display		<3	<3	ND	<100		ND	ND	ND		Good
Tomato and sweet chilli mayo		<3	<3	ND	<100		ND	ND	ND		Good
Avocado and chicken salad		15	4	ND	<100		ND	ND	ND		Acceptable
Bacon and chicken pasta salad		<3	<3	ND	<100		ND	ND	ND		Good
Chicken and egg salad		<3	<3	ND	<100		ND	ND	ND		Good
Chicken Avocado salad		<3	<3	ND	<100		ND	ND	ND		Good
Chicken avocado salad		<3	<3	ND	<100		ND	ND	ND		Good
Chicken pasta salad		9	<3	ND	<100		ND	ND	ND		Good
Chicken salad		4	<3	ND	<100	<100	ND	ND	ND		Good
Chicken, broccoli, mayonnaise salad		23	9	ND	<100		Detected	ND	ND		Acceptable
Pasta salad with chicken		23	<3	ND	150		ND	ND	ND		Acceptable
Salad with chicken		430	<3	ND	<100		ND	ND	ND		Acceptable
Shredded chicken salad	550,000	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken with mayonnaise	29,000	15	15	ND	<100				ND		Acceptable
Caesar salad		<3	<3	ND	<100				ND		Good
Caesar salad with shredded chicken		4	<3	ND	<100		ND	ND	ND		Good
Chicken Caesar salad		20	9	ND	<100		ND	ND	ND		Acceptable
Chicken Caesar salad		430	7	ND	<100		Detected	Detected	ND		Potentially hazardous
Chicken Caesar salad with mayonnaise		9	<3	ND	200		ND	ND	ND		Acceptable
Ham and pasta salad		<3	<3	ND	<100		Detected	Detected	ND		Potentially hazardous
Pasta salad with ham		<3	<3	ND	<100		ND	ND	ND		Good
Roast meats											
Cooked beef	390	<3	<3	ND	<100						Good
Roast pork	<250	<3	<3	ND	<100				ND		Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Roast pork	<10	<3	<3	ND	<100				ND		Good
Sauces											
Garlic dip	16,000	<3	<3		<100	<100				<100	Acceptable
Garlic sauce	<250	<3	<3		<100	<100				<100	Good
Garlic sauce (raw egg)	310,000	<3	<3		<100	<100				<100	Unsatisfactory
Mayonnaise		<3	<3	ND							Good
Tartar sauce	<2,500	<3	<3		<100	<100				<100	Good
Shredded/diced chicken											
BBQ chicken pieces (cold)	720	<3	<3	ND	<100		ND	ND	ND		Good
Chicken and bacon from Caesar salad	72,000	23	<3	ND	<100				ND		Good
Chicken cold	1,500	<3	<3	ND	<100		ND	ND	ND		Good
Chicken for salads etc	850	<3	<3	ND	<100		ND	ND	ND		Good
Chicken from roll (diced)	240,000	430	<3	ND	<100		ND	ND	ND		Acceptable
Chopped chicken	780,000	<3	<3	ND	<100		ND	ND	ND		Good
Cold BBQ chicken	59,000	9	<3	ND	<100		ND	ND	ND		Good
Cold chicken	980	<3	<3	ND	<100		ND	ND	ND		Good
Cold chicken in cool room	<250	<3	<3	ND	<100				ND		Good
Cold shredded diced chicken salad bar	79,000,000	<3	<3	ND	<100		ND	ND	ND		Unsatisfactory
Cooked BBQ chicken pieces (cold)	<250	<3	<3	ND	<100				ND		Good
Cooked diced chicken pieces	4,500	<3	<3	ND	<100		ND	ND	ND		Good
Cooked shredded chicken	620,000	<3	<3	ND	<100		ND	ND	ND		Good
Cooked shredded chicken	4,800	<3	<3	ND	<100		ND		ND		Good
Cooked shredded chicken	7,700	23	<3	ND	<100		ND	ND	ND		Good
Cool diced cooked chicken	410,000	4	4	ND	<100		ND	ND			Acceptable

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Diced chicken	17,000	<3	<3	ND	<100		ND	ND	ND		Good
Diced chicken 1kg bag	1,900,000	<3	<3	ND	<100		ND	ND	ND		Acceptable
Diced chicken 1kg bag	200,000	<3	<3	ND	<100		Detected	Detected	ND		Potentially hazardous
Diced chicken cold for sandwich and rolls	11,000	<3	<3	ND	<100		ND	ND	ND		Good
Diced chicken for salad	32,000,000	9	<3	ND	<100		ND	ND	ND		Unsatisfactory
Diced chicken from cold room	30,000	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken	4,800	<3	<3	ND	<100				ND		Good
Shredded chicken	630	<3	<3	ND	<100				ND		Good
Shredded chicken	49,000	93	93	ND	<100				ND		Acceptable
Shredded chicken	310,000	<3	<3	ND	<100				ND		Good
Shredded chicken	52,000	9	<3		<100				ND		Good
Shredded chicken	33,000	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken	53,000	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken	<250	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken	6,800,000	<3	<3	ND	<100		ND	ND	ND		Acceptable
Shredded chicken	93,000	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken	<250	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken	<250	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken	>250,000,000	<3	<3	ND	<100		ND	ND	ND		Unsatisfactory
Shredded chicken				ND			ND	ND	ND		Good
Shredded chicken	40,000	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken	8,500,000	<3	<3	ND	<100		ND	ND	ND		Acceptable
Shredded chicken	660,000	230	<3	ND	<100		ND	ND			Acceptable
Shredded chicken	13,000	4	<3	ND	<100		ND	ND			Good
Shredded chicken	550,000	75	75	ND	<100		ND	ND	ND		Acceptable
Shredded chicken for roll	30,000	<3	<3	ND	<100		ND	ND	ND		Good
Shredded chicken for salad	950,000	<3	<3	ND	500				ND		Acceptable
Shredded chicken from roll	4,500	<3	<3	ND	<100		ND	ND	ND		Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Shredded chicken in cool room	400	<3	<3	ND	<100				ND		Good
Shredded cold chicken	1,600,000	43	23	ND	100				ND		Acceptable
Shredded cold chicken	3,800	<3	<3	ND	<100		ND	ND	ND		Good
Shredded cold chicken	31,000,000	>11,000	750	ND	<100		Detected	Detected	ND		Potentially hazardous
Shredded/diced chicken	<250	<3	<3	ND	<100		ND	ND	ND		Good
Shredded/diced chicken	1,900,000,000	<3	<3	ND	<100		ND	ND			Unsatisfactory
Stuffing											
BBQ chicken stuffing	300	<3	<3	ND	<100	<100			ND	<100	Good
Chicken stuffing	<2,500	<3	<3	ND	<100	<100				<100	Good
Chicken stuffing	19,000	<3	<3	ND	<100	<100			ND	<100	Acceptable
Cooked chicken stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	3,400	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	12,000	11	<3	ND	<100	<100			ND	<100	Acceptable
Cooked stuffing	<250	<3	<3	ND	<100	<100				<100	Good
Cooked stuffing	330	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	1,500	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	1,900	75	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	<10	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	<10	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	580	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	670	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	3,200,000	<3	<3	ND	<100	<100			ND	<100	Unsatisfactory
Cooked stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	9,700	<3	<3	ND	<100	<100			ND	<100	Good

Product name	Standard Plate Count (CFU/g)	Thermotolerant coliforms (CFU/g)	E.coli (CFU/g)	Salmonella (/25g)	CPS (CFU/g)	B. cereus (CFU/g)	Listeria spp (/25g)	L. monocytogenes (/25g)	Campylobacter (/25g)	C. perfringens (CFU/g)	Category
Cooked stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	<2,500	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Cooked stuffing from chicken on display	<250	<3	<3	ND	<100	<100			ND	<100	Good
Mayo/stuffing mix		<3	<3	ND	<100		ND	ND			Good
Stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Stuffing	<250	<3	<3	ND	<100	<100			ND	<100	Good
Stuffing	42,000	75	75	ND	<100	100				<100	Acceptable
Stuffing from chicken	<250	<3	<3	ND	<100	<100			ND	<100	Good
Stuffing from display chicken	840	4	<3	ND	<100	<100			ND	<100	Good
Stuffing mix	<250	<3	<3	ND	<100	<100			ND	<100	Good
Stuffing mix from inside cooked chicken	<250	<3	<3	ND	<100	<100			ND	<100	Good

Appendix 2: Survey results for environmental swabs[6]

Product name	Salmonella /25g	Campylobacter (/25g)
Bench area		
Swab: Area bench near food display	ND	ND
Swab: Area in front of cooked chicken (clean)	ND	ND
Swab: Area near food display	ND	ND
Swab: Area to cut cooked chicken	ND	ND
Swab: Area used for cutting cooked chicken	ND	ND
Swab: Area used for cutting cooked chicken (dirty)	ND	ND
Swab: Bench adjacent to hot chicken display	ND	ND
Swab: Bench area to prepare raw chicken	ND	ND
Swab: Bench food display	ND	ND
Swab: Bench food display (clean)	ND	ND
Swab: Bench for salad prep (clean)	ND	ND
Swab: Bench in front of chicken bain marie (clean)	ND	ND
Swab: Bench in front of salad bar (clean)	ND	ND
Swab: bench near display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display	ND	ND
Swab: Bench near food display (clean)	ND	ND
Swab: Bench near food display (clean)	ND	ND
Swab: Bench near food display (clean)	ND	ND
Swab: Bench near food display (clean)	ND	ND
Swab: Bench near food display (clean)	ND	ND
Swab: Bench near food display (clean)	ND	ND
Swab: Bench near food display (clean)	ND	ND

[6] ND: Not Detected
N/T: Not tested

Product name	Salmonella /25g	Campylobacter (/25g)
Swab: Bench near food display (cold)	ND	ND
Swab: Bench near food display (unclean)	ND	ND
Swab: Bench near hot food display	ND	ND
Swab: Bench near rear food display (cleaned but not sanitised)	ND	ND
Swab: Bench next to store room (clean)	ND	ND
Swab: Bench to back of hot chicken display	ND	ND
Swab: Bench top near food display (dirty)	ND	ND
Swab: Bench top next to cook top	ND	ND
Swab: Bench top raw food	ND	ND
Swab: Bench used for preparing cooked chicken (clean)	ND	ND
Swab: Bench used for preparing raw chicken (clean)	ND	ND
Swab: Bench where cooked chicken prepared (clean)	ND	ND
Swab: Bench where raw chicken is skewered	ND	ND
Swab: Chook rod and bench beside it (clean)	ND	ND
Swab: Cooked chicken preparation bench	ND	ND
Swab: Cooked chicken rotisserie trolley (unclean)	ND	ND
Swab: Cutting bench cooked chicken	ND	ND
Swab: Cutting bench for cooked chicken (dirty)	ND	ND
Swab: Cutting bench servery	ND	ND
Swab: Food display bench	ND	ND
Swab: Food display bench	ND	ND
Swab: Food display bench	ND	ND
Swab: Food display bench	ND	ND
Swab: Food display bench	ND	ND
Swab: Food display bench (clean)	ND	ND
Swab: Fresh chicken preparation bench	ND	ND
Swab: Front bench prep	ND	ND
Swab: In front of cool display (clean)	ND	ND
Swab: Main prep bench	ND	ND
Swab: Metal bench – salad preparation (clean)	ND	ND
Swab: Metal bench near food display (dirty)	ND	ND
Swab: Near food display area	ND	ND
Swab: Next to chip storage (clean)	ND	ND
Swab: Prep bench for raw chicken	ND	ND
Swab: Preparation bench for cooked food	ND	ND
Swab: Raw chicken prep bench	ND	ND
Swab: Rear preparation bench (dirty)	ND	ND
Swab: Stainless steel tray that chicken is cut on (clean)	ND	ND
Swab: Salad prep bench	ND	ND
Swab: Salad prep bench	ND	ND
Swab: Serving bench	ND	ND
Swab: Stainless steel bench in front of bain marie (clean)	ND	ND
Swab: Stainless steel preparation bench for raw chicken (dirty)	ND	ND
Swab: Stainless steel tray for cooked chicken (dirty)	ND	ND
Swab: Stainless steel work bench at rear	ND	ND

Product name	Salmonella /25g	Campylobacter (/25g)
Cutting boards		
Swab: Area cutting board cut cooked chicken	ND	ND
Swab: Area cutting board prepare raw chicken	ND	ND
Swab: Area cutting board preparing salad	ND	ND
Swab: Board for cut cooked chicken	ND	ND
Swab: Board for preparing salad	ND	ND
Swab: Board for preparing salad (clean)	ND	ND
Swab: Board to prepare raw chicken	ND	ND
Swab: Burger chopping board	ND	ND
Swab: Chicken cutting tray (dirty)	ND	ND
Swab: Chopping board	ND	ND
Swab: Chopping board	ND	ND
Swab: Chopping board	ND	ND
Swab: Chopping board for cooked chicken	ND	ND
Swab: Chopping board for cooked chicken (clean)	ND	ND
Swab: Chopping board for green vegetable	ND	ND
Swab: Chopping board for raw chicken	ND	ND
Swab: Chopping board for raw chicken	ND	ND
Swab: chopping board for raw chicken	ND	ND
Swab: Chopping board for raw chicken (clean)	ND	ND
Swab: Chopping board for raw products	ND	Detected
Swab: Chopping board for rolls	ND	ND
Swab: Chopping board for salad	ND	ND
Swab: Chopping board for salad	ND	ND
Swab: Chopping board for salad	ND	ND
Swab: Chopping board for salad (dirty)	ND	ND
Swab: Chopping board for salads	ND	ND
Swab: Chopping board for salads	ND	ND
Swab: Chopping board for salads, in use (clean)	ND	ND
Swab: Chopping board next to display	ND	ND
Swab: Chopping board to cut cooked chicken	ND	ND
Swab: Chopping board used for salad	ND	ND
Swab: Chopping board used to serve/prepare sandwiches	ND	ND
Swab: Clean chopping board	ND	ND
Swab: Cooked chicken cutting board	ND	ND
Swab: Cooked chicken cutting board	ND	ND
Swab: Cut cooked chicken board dry	ND	ND
Swab: Cutting board for cooked chicken	ND	ND
Swab: Cutting board – cooked chicken	ND	ND
Swab: Cutting board – cooked chicken (dirty)	ND	ND
Swab: Cutting board – raw chicken	ND	ND
Swab: Cutting board (chicken)	ND	ND
Swab: Cutting board cooked chicken	ND	ND
Swab: Cutting board for burger preparation	ND	ND
Swab: Cutting board for cooked chicken	ND	ND

Product name	Salmonella /25g	Campylobacter (/25g)
Swab: Cutting board for cooked chicken	ND	ND
Swab: Cutting board for cooked chicken	ND	ND
Swab: Cutting board for cooked chicken	ND	ND
Swab: Cutting board for cooked chicken	ND	ND
Swab: Cutting board for cooked chicken	ND	ND
Swab: Cutting board for cooked chicken	ND	ND
Swab: Cutting board for cooked chicken	ND	ND
Swab: cutting board for cooked chicken	ND	ND
Swab: Cutting board for cooked chicken (clean)	ND	ND
Swab: Cutting board for cooked chicken (dirty)	ND	ND
Swab: Cutting board for greens (clean)	ND	ND
Swab: Cutting board for others than cut up raw chicken	ND	ND
Swab: Cutting board for prep (clean)	ND	ND
Swab: Cutting board for preparing salad	ND	ND
Swab: Cutting board for preparing salad	ND	ND
Swab: Cutting board for preparing salad (dirty)	ND	ND
Swab: Cutting board for raw chicken	ND	ND
Swab: Cutting board for raw chicken	ND	ND
Swab: Cutting board for raw chicken (clean)	ND	ND
Swab: Cutting board for raw chicken (clean)	ND	ND
Swab: Cutting board for raw chicken (clean)	ND	ND
Swab: Cutting board for raw chicken (clean)	ND	ND
Swab: Cutting board for salad	ND	ND
Swab: Cutting board for salad	ND	ND
Swab: Cutting board for salad	ND	ND
Swab: Cutting board for salad	ND	ND
Swab: Cutting board for salad	ND	ND
Swab: Cutting board for salad	ND	ND
Swab: Cutting board for salad	ND	ND
Swab: Cutting board for salad (clean)	ND	ND
Swab: Cutting board for salad (clean)	ND	ND
Swab: Cutting board for salad prep (dirty)	ND	ND
Swab: Cutting board for salad preparation	ND	ND
Swab: cutting board for salad preparation	ND	ND
Swab: Cutting board for salads	ND	ND
Swab: Cutting board raw chicken preparation	ND	ND
Swab: Cutting board salad prep	ND	ND
Swab: Cutting board to cut cooked chicken	ND	ND
Swab: Cutting board to cut cooked chicken (unclean)	ND	ND
Swab: Cutting board to prep raw chicken (clean)	ND	ND
Swab: Cutting board used for salad (dirty)	ND	ND
Swab: Cutting mat for cooked chicken (clean)	ND	ND
Swab: Cutting tray for cooked chicken	ND	ND
Swab: Cutting tray for cooked chicken (dirty)	ND	ND
Swab: Plastic chopping board pre-clean brown	ND	ND

Product name	Salmonella /25g	Campylobacter (/25g)
Swab: Plastic chopping board pre-clean green	ND	ND
Swab: Raw chicken cutting board	ND	ND
Swab: Salad and veggie cutting board (bit dirty)	ND	ND
Swab: Salad chopping board	ND	ND
Swab: Salad cutting board	ND	ND
Swab: Salad cutting board	ND	ND
Swab: Salad cutting board	ND	ND
Swab: Salad prep board	ND	ND
Swab: Salad preparation board (clean)	ND	ND
Swab: Wooden board for sandwich (clean)	ND	ND
Swab: Wooden chopping board used to cut up cooked chicken (unclean)	ND	ND
Other area		
Swab: Area for cooling cooked chicken	ND	ND
Swab: Area for preparing raw chicken	ND	ND
Swab: Area for preparing salad	ND	ND
Swab: Area for raw and cooked chicken storage	ND	ND
Swab: Area used to cut cooked chicken	ND	ND
Swab: Area used to cut cooked chicken (dirty)	ND	ND
Swab: Area used to prepare raw chicken (dirty)	ND	ND
Swab: Area where chickens are stored (clean)	ND	ND
Swab: Bench to prepare raw chicken (unclean)	ND	ND
Swab: Board in rear wash room (dirty)	ND	ND
Swab: Chick table prior to cutting	ND	ND
Swab: Chicken burger station	ND	ND
Swab: Chicken display base (hot)	ND	ND
Swab: Chicken large rotisserie skewers stored for use in cool room	ND	ND
Swab: Cooked chicken carrying tray	ND	ND
Swab: Cooked chicken cutting area	ND	ND
Swab: Cooked chicken cutting area (clean)	ND	ND
Swab: Cooked chicken cutting area, stainless steel top	ND	ND
Swab: Cooked chicken preparation	ND	ND
Swab: Cooked chicken preparation area (clean)	ND	ND
Swab: cool room inside door handle	ND	ND
Swab: Cool room door handle	ND	ND
Swab: Cutting area for cooked chicken	ND	ND
Swab: Food display	ND	ND
Swab: Food display	ND	ND
Swab: Food display (clean)	ND	ND
Swab: Fresh chicken preparation bench 1	ND	ND
Swab: Fresh chicken preparation bench 2	ND	ND
Swab: Fresh chicken preparation bench 2	ND	ND
Swab: Handle of cool room door (dirty)	ND	ND
Swab: Handle of cool room door (dirty)	ND	ND
Swab: Inside bain marie	ND	ND

Product name	Salmonella /25g	Campylobacter (/25g)
Swab: Inside cool room wall – adjacent to raw chicken	ND	ND
Swab: Inside rotisserie	ND	ND
Swab: Measuring cup for stuffing mix	ND	ND
Swab: Near chicken cutting area – non contact (clean)	ND	ND
Swab: Near hot hold display	ND	ND
Swab: Non food contact surface near bench, near cold bain marie (cold)	ND	ND
Swab: Racks for raw chicken	ND	ND
Swab: Raw chicken	ND	ND
Swab: Raw chicken and salad preparation area	ND	ND
Swab: Raw chicken prep	ND	NT
Swab: Raw chicken prep	ND	ND
Swab: Raw chicken prep bench	ND	ND
Swab: Raw chicken preparation area	ND	ND
Swab: Raw chicken preparation area	ND	ND
Swab: Raw chicken preparation area	ND	ND
Swab: Raw chicken preparation area (dirty)	ND	ND
Swab: Raw chicken storage surface	ND	ND
Swab: Rear cool room door handle	ND	ND
Swab: Salad and chicken preparation area	ND	ND
Swab: Salad bar area	ND	ND
Swab: Salad preparation area	ND	ND
Swab: Salad preparation area	ND	ND
Swab: Salad preparation area	ND	ND
Swab: Salad preparation area	ND	ND
Swab: Sink area for preparing raw chicken	ND	ND
Swab: Sink area to prep raw chicken (dirty)	ND	ND
Swab: Strip of bench behind salad display	ND	ND
Swab: Tray for cutting cooked chicken	ND	ND
Swab: Tray under raw chicken storage	ND	ND
Swab: Tray used to cut cooked chicken (clean)	ND	ND
Swab: Tub for chicken preparation (marinating)	ND	ND
Swab: Utensils area	ND	ND
Swab: Walls of raw chicken fridge	ND	ND
Swab: Wooden board near front food display unit	ND	ND
Utensils		
Swab: Chicken cutters stored in pot of sanitiser	ND	ND
Swab: Chicken cutting scissors (dirty)	ND	ND
Swab: Chicken serving tongs	ND	ND
Swab: Chicken serving tongs & scissors	ND	ND
Swab: Chicken sheers	ND	ND
Swab: Chicken tongs (dirty)	ND	ND
Swab: Cold rice serving spoon (in use)	ND	ND
Swab: Food utensil (clean)	ND	ND
Swab: Fork used to skewer cooked chickens	ND	ND

Product name	Salmonella /25g	Campylobacter (/25g)
Swab: Knife for cutting cooked chicken	ND	ND
Swab: Meat cleaver (clean)	ND	ND
Swab: Salad serving spoons	ND	ND
Swab: Salad serving spoons (clean)	ND	ND
Swab: Salad spoon	ND	ND
Swab: Salad tongs	ND	ND
Swab: Scissors for display chicken (dirty)	ND	ND
Swab: Scissors for serving cooked chicken	ND	ND
Swab: Serving knife/spoons	ND	ND
Swab: Serving spoon	ND	ND
Swab: Serving spoon (dirty)	ND	ND
Swab: Serving spoon in seafood salad	ND	ND
Swab: Serving spoon used for salad (clean)	ND	ND
Swab: serving spoons (in water ready to be used)	ND	ND
Swab: Serving spoons for salads (clean)	ND	ND
Swab: Serving tongs	ND	ND
Swab: Serving tongs hot chicken	ND	ND
Swab: Serving tongs surface (clean)	ND	NT
Swab: Serving utensil	ND	ND
Swab: Serving utensil tongs	ND	ND
Swab: Serving utensils	ND	ND
Swab: Shears (dirty)	ND	ND
Swab: Spoon stored in pot with cous cous salad	ND	ND
Swab: Tong used for cooked chicken	ND	ND
Swab: Tongs for cooked food in use	ND	ND
Swab: Tongs for handling roast chicken	ND	ND
Swab: Tongs for salad (spoon)	ND	ND
Swab: Tongs for serving chicken	ND	ND
Swab: Tongs for serving chicken	ND	ND
Swab: Tongs for serving hot chicken	ND	ND
Swab: Tongs from serving area	ND	ND
Swab: Tongs used to hold chicken (clean from pot of sanitiser)	ND	ND
Swab: Tongs used to serve chickens from bain maire	ND	ND
Swab: Tongs used to serve hot chickens	ND	ND
Swab: Utensil (dirty)	ND	ND
Swab: Utensil	ND	ND
Swab: Utensil – tongs	ND	ND
Swab: Utensil metal tongs handle cooked chicken	ND	ND
Swab: Utensil tong	ND	ND
Swab: Utensil/tongs	ND	ND
Swab: Utensils	ND	ND
Swab: Utensils	ND	ND
Swab: Utensils	ND	ND
Swab: Utensils	ND	ND
Swab: Utensils – serving spoons, knives	ND	ND

Product name	Salmonella /25g	Campylobacter (/25g)
Swab: Utensils (soiled)	ND	ND
Swab: Utensils chicken tongs	ND	ND
Swab: Utensils for sauce (dirty)	ND	ND
Swab: Utensils – tongs	ND	NT

Appendix 3: Food handling questionnaire for takeaway hot chicken shops

Take away hot chicken survey

1. Checklist: To be completed by sampling officer during sampling

Store: _____ Date: _____
Address: _____ Start time: _____
_____ End time: _____
Contact person: _____ Council:_____
EHO: _____

1. How is the chicken received?

○ Refrigerated (fresh) ○ Frozen ○ unsure

2. Is the temperature of the chicken checked when delivered?

○ yes ○ no ○ unsure

3. How is frozen chicken thawed?

○ Refrigerator ○ Bench ○ Microwave ○ Sink with running water ○ unsure ○ n/a

How long does it take for the chicken to thaw?

4. Where is marinating chicken stored?

○ refrigerator ○ bench ○ freezer ○ unsure ○ n/a

How long does the chicken sit in marinade before cooking?

5. Is the temperature of the chicken checked during cooking?

○ Yes ○ no ○ unsure

How long does it take for the chicken to cook

6. Where in the oven is the chicken placed during cooking?

○ raw chicken on top ○ raw chicken on bottom ○ unsure ○ n/a

Other (please specify)

7. If the cooked chicken is displayed in a bain marie -

	yes	no	unsure	n/a
Is the bain marie (used to display the chicken) clean?	○	○	○	○
Is the cooked chicken displayed in the same temperature control unit as raw food?	○	○	○	○

8. Gravy, Stuffing and Mayonnaise information -

	yes	no	unsure	n/a
Is the stuffing cooked before use?	☐	☐	☐	☐
Is the temperature of the stuffing checked during cooking?	☐	☐	☐	☐
Is the gravy made in house?	☐	☐	☐	☐
Is the mayonnaise made in house?	☐	☐	☐	☐
IF THE MAYONNAISE IS MADE IN HOUSE - Is raw egg being used as an ingredient?	☐	☐	☐	☐
- Is the pH of mayonnaise checked before use?	☐	☐	☐	☐

Take away hot chicken survey

9. What ingredients are used in the stuffing? (tick all that apply)

☐ Bread crumbs ☐ Butter ☐ Egg ☐ Herbs & spices ☐ unsure ☐ n/a

Other (please specify)

10. If the stuffing uses bread crumbs - from where are they sourced? (tick all that apply)

☐ Prepared in-house ☐ Bought pre-packaged ☐ Use left over bread ☐ Use fresh bread ☐ unsure ☐ n/a

Other (please specify)

11. What are the ingredients of the gravy? (tick all that apply)

☐ Chicken dripping ☐ Butter ☐ unsure

☐ Beef dripping ☐ Cream ☐ n/a

☐ Stock ☐ Commercial gravy powder

Other (please specify)

12. Gravy information -

What size is the container used when cooling gravy?

How long does the gravy take to cool?

What temperature is the gravy displayed at?

13. FOR MAYONNAISE BASED SALADS ONLY - What are the ingredients? (tick all that apply)

☐ Pasta ☐ Potato ☐ Rice ☐ Meat (eg ham) ☐ Chicken ☐ Vegetables

Other (please specify)

14. What is the average length of time the following are displayed?

	<2 hours	2-4 hours	>4 hours	unsure	n/a
gravy	☐	☐	☐	☐	☐
mayonnaise based salad	☐	☐	☐	☐	☐
cooked chicken	☐	☐	☐	☐	☐

15. At the end of the day what happens to the:

	Discarded	Given away	Stored, to be used the next day	Stored to be used in other products	unsure	n/a
cooked chicken	☐	☐	☐	☐	☐	☐
gravy	☐	☐	☐	☐	☐	☐
stuffing	☐	☐	☐	☐	☐	☐
mayonnaise based salad	☐	☐	☐	☐	☐	☐

Other (please specify)

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Take away hot chicken survey

16. Where is the cooked chicken cut?

☐ bench ☐ wooden chopping board ☐ glass chopping board ☐ plastic chopping board ☐ other chopping board ☐ unsure ☐ n/a

Other (please specify)

17. Chopping board condition -

	yes	no	unsure	n/a
Is the chopping board used to cut cooked chicken clean?	☐	☐	☐	☐
Are there signs of scoring or damage on chopping board?	☐	☐	☐	☐

18. What type of cleaning tools are used in the food preparation area?

☐ Sponge ☐ Cleaning cloth ☐ Single use paper towel ☐ unsure

☐ Other (please specify)

19. Is sanitising agent used on utensils & chopping board?
If so: How often do utensils & chopping boards get santitised?

☐ Every hour ☐ Every 2 hours ☐ Every 4 hours ☐ At the end of the day ☐ unsure ☐ n/a

Other (please specify)

20. If sanitising agent is used -

What brand of sanitiser is used

What strength is used

How much time is taken to sanitise (minutes)

21. Food handlers and hand washing information

	yes	no	unsure	n/a
Are gloves used while handling food?	☐	☐	☐	☐
Are hair nets worn while handling food?	☐	☐	☐	☐
Is the same person handling both raw and cooked food?	☐	☐	☐	☐
Is there a separate area for raw and cooked food?	☐	☐	☐	☐
Are separate utensils used for different foods?	☐	☐	☐	☐
Is there a container to store utensils when not in use?	☐	☐	☐	☐
Does this container contain water?	☐	☐	☐	☐
Is the water clean?	☐	☐	☐	☐
Do staff have relevant skills and knowledge in this area of work?	☐	☐	☐	☐
Is there a separate sink for food preparation and hand washing?	☐	☐	☐	☐
Is the hand washing facility adequate?	☐	☐	☐	☐
Are single use paper towels and liquid soap available?	☐	☐	☐	☐
Is the hot and cold water through a single spout?	☐	☐	☐	☐
Do staff appear to wash their hands regularly?	☐	☐	☐	☐
Do staff have adequate hand washing techniques?	☐	☐	☐	☐

any comments

Appendix 4: Foodborne illness attributed to takeaway chicken shops in Australia (January 2004 – March 2010)

Year	State	Food implicated	Pathogen	Contributing factors	Cases	Reference
2006	NSW	Chicken schnitzel in gravy	-	-	3	OzFoodNet, 2007
2006	NSW	Roast pork	*C. perfringens*		80	OzFoodNet, 2007
2005	QLD	Chicken	*S.* Typhimurium 170/108	-	2	OzFoodNet, 2006
2005	NSW	Chicken, rice, coleslaw, potatoes	*S.* Typhimurium 9	-	4	OzFoodNet, 2006
2005	QLD	Gravy	*S. aureus*	-	2	OzFoodNet, 2006
2004	NSW	Chicken	-	-	5	OzFoodNet, 2005
2004	NSW	Chicken (suspected)	*S.* Typhimurium 170	-	3	OzFoodNet, 2005
2003	NSW	Chicken	*S.* Typhimurium	-	12	OzFoodNet, 2004
2003	NT	Roast turkey (suspected)	*S.* Typhimurium	-	7	OzFoodNet, 2004
2002	NSW	BBQ chicken	-	-	2	OzFoodNet, 2003
2001	NSW	BBQ chicken (suspected)	-	-	3	OzFoodNet, 2002
2001	NSW	Chicken (suspected)	-	-	2	OzFoodNet, 2002
2001	WA	Chicken (suspected)	-	-	10	OzFoodNet, 2002
2001	QLD	Lettuce (in chicken salad wrap)	*S.* Bovismorbificans PT 32	Contaminated lettuce shredded at supplier	36	FSA & Minter Ellison Consulting, 2002
2000	QLD	Chicken	-	-	4	FSA & Minter Ellison Consulting, 2002
2000	QLD	Chicken	*S. aureus*	Temperature abuse and possible cross contamination	3	FSA & Minter Ellison Consulting, 2002
1999	QLD	Gravy	*S. aureus* (?)	Gravy was stored at RT for several hours before reheating for service	6	FSA & Minter Ellison Consulting, 2002
1998	VIC	Cooked chicken	*S.* Typhimurium PT 64	Undercooking or cross contamination	46	Kirk *et al.*, 1999
1995	ACT	Roast chicken	*S.* Bredney	-	3	FSA & Minter Ellison Consulting, 2002

Appendix 5: Selected studies on microbiological quality of food commonly sold in takeaway chicken shops

Year	Country	Samples	No of sample tested	Organisms tested	No of positive samples	Reference
Cooked Chicken						
2009	Australia (SA)	Cooked chicken (whole, cut)	50	*Salmonella* *Campylobacter*	0 0	Thompson, 2010
2003 – 2005	United Kingdom	Rotisserie chicken	117	APC - unsatisfactory *E. coli* *S. aureus* *B. cereus* *Salmonella* *Listeria* spp. *L. monocytogenes*	5 (4.3%) 0 0 0 0 0 0	Meldrum et al., 2006
2003 – 2004	Australia (WA)	Cooked diced chicken	80	APC - unsatisfactory *L. monocytogenes* *E. coli*	25 (31.3%) 13 (16.3%) 1 (1.3%)	West Australian Food Monitoring Program, n.d.
Unknown	Iran	Grilled chicken	54	*E. coli* *S. aureus* *Salmonella* *L. monocytogenes*	3 (5.5%) 0 0 0	Tavakoli & Riazipour, 2008
Unknown	United Kingdom	Rotisserie chicken	5	APC (30°C) - unsatisfactory Enterobacteriaceae *E. coli* *S. aureus*	1 0 0 0	Willis & Greenwood, 2003

Year	Country	Samples	No of sample tested	Organisms tested	No of positive samples	Reference
				B. cereus	0	
				Listeria	0	
				Salmonella	0	
Unknown	Mexico	Roasted chicken	100	*Campylobacter*	27 (27%)	Quiñones-Ramĭrez et al., 2000
Breaded chicken products						
Unknown	Italy	Breaded chicken products	20	*S. aureus*	15 (75%)	Pepe et al., 2006
				Staphylococcal enterotoxin A	0	
Unknown	USA	Fully cooked, nuggets, tenders and strips	36	*B. cereus*	25 (69.4%)	Smith et al., 2004
Unknown	Northern Ireland	RTE poultry products	1,061	*Campylobacter*	0	Moore et al., 2002
Salad vegetables						
2007	UK	Salad vegetables eg lettuce, cucumber, tomato (kebab shops)	1,213	*E. coli* - unsatisfactory	47 (3.9%)	Meldrum et al., 2009
				S. aureus – unsatisfactory	12 (1%)	
				S. aureus - unacceptable	2 (0.2%)	
				Salmonella spp	1 (0.1%)	
2001	UK	Salad vegetables (restaurants, sandwich bars, cafes, takeaways, mobile food premises)	2,950	*Enterobacteriaceae*	2478 (84%)	Sagoo et al., 2003
			2,944	*E. coli*	197 (6.7%)	
			2,934	*Listeria*	125 (4.3%)	
			2,934	*L. monocytogenes*	88 (3%)	
			2,870	*Campylobacter* spp	0	
			2,943	*Salmonella* spp	0	
			2,820	*E. coli* O157:H7	0	
1995 – 2003	UK	Prepared mixed salads	224	APC	18 (8%)	Meldrum et al., 2005

Year	Country	Samples	No of sample tested	Organisms tested	No of positive samples	Reference
		(takeaways)		*E. coli* *Listeria* *L. monocytogenes* *B. cereus* *S. aureus* *C. perfringens*	0 0 0 1 (0.4%) 1 (0.4%) 0	
Unknown	South Africa	Salad (street vendor)	35	*B. cereus* *C. perfringens*	0 1 (2.9%)	Kubheka et al., 2001
Unknown	South Africa	Salad (street vendor)	12	*B. cereus* *C. perfringens* *Campylobacter* spp *E. coli* O157:H7 *L. monocytogenes* *Salmonella* spp *S. aureus* *V. cholera* *Y. enterocolitica*	3 0 0 0 0 0 0 0 0	Mosupye & von Holy, 1999
Unknown	USA	Salad ingredients eg lettuce, tomatoes (salad bars)	144	APC (log CFU/g) Coliforms (log CFU/g) Yeasts/moulds (log CFU/g)	5.8 5.4 7.1	Albrecht et al., 1995
Mayonnaise-based salad						
2005 – 2006	South Africa	Assorted salads eg fruit and vegetables, mixed with mayonnaise	35	APC (log CFU/g) *S. aureus* (log CFU/g) *B. cereus* (log CFU/g)	7 2 2	Christison et al., 2008

Year	Country	Samples	No of sample tested	Organisms tested	No of positive samples	Reference
		(delicatessens)		*L. monocytogenes* *Salmonella*	1 (3%) 4 (11%)	
2000 – 2001	USA	Deli salad – tuna, potato, pasta, coleslaw (deli counter)	4,445	*L. monocytogenes*	160 (3.6%)	Gombas et al., 2003
1997 – 1998	Belgium	Mayonnaise based salad – ham, chicken, seafood, vegetables (supermarket)	874	*L. monocytogenes*	186 (21.3%)	Uyttendaele et al., 1999b
1995 – 2003	UK	Coleslaw (takeaways)	226	APC *E. coli* *L. monocytogenes* *B. cereus* *S. aureus* *C. perfringens*	34 (15%) 1 (0.4%) 0 0 1 (0.4%) 1 (0.4%)	Meldrum et al., 2005
Sauces and Gravy						
2007	UK	Sauces eg chilli, garlic sauce (kebab shops)	1208	*E. coli* – unsatisfactory *S. aureus* – unsatisfactory *B. cereus* – unsatisfactory *B. cereus* – unacceptable *Salmonella* spp	8 (0.7%) 3 (0.2%) 46 (3.8%) 6 (0.5%) 1 (0.1%)	Meldrum et al., 2009
Unknown	UK	RTE gravy and stock (takeaways)	82	APC – unsatisfactory Coliforms *E. coli* *S. aureus* – unacceptable	7 (8.5%) 0 1 (1.2%) 1 (1.2%)	Willis & Greenwood, 2003

Year	Country	Samples	No of sample tested	Organisms tested	No of positive samples	Reference
				B. cereus – unsatisfactory	1 (1.2%)	
				C. perfringens	0	
				Listeria	0	
				L. monocytogenes	0	
Unknown	South Africa	RTE gravy (street vendor)	35	*B. cereus*	0	Kubheka, Mosupye & von Holy, 2001
				C. perfringens	1 (2.9%)	
Unknown	South Africa	RTE gravy (street vendor)	9	*B. cereus*	1 (11.1%)	Mosupye & von Holy, 1999
				C. perfringens	0	
				Campylobacter spp	0	
				E. coli O157:H7	0	
				L. monocytogenes	0	
				Salmonella spp	0	
				S. aureus	0	
				V. cholera	0	
				Y. enterocolitica	0	

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