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Microbiological quality of filled savoury pastries

A survey to determine the safety of ready-to-eat filled savoury pastries sold in NSW

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Executive summary

From March to June 2009, a total of 172 ready-to-eat filled savoury pastries were purchased from 45 bakeries across NSW by Environmental Health Officers from local councils and NSW Food Authority officers. Samples included pies, sausage rolls, quiches and pasties.

The samples 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*. Thus, the results were assessed against the NSW Food Authority microbiological quality guide for ready-to-eat foods (New South Wales Food Authority, 2009).

During the same period, a questionnaire was undertaken to assess the food handling practices in bakeries where filled savoury pastries were sold. Forty seven bakeries participated. The questionnaire collected information on where the products were prepared and how they were prepared, reheated and displayed.

The safety of filled savoury pastries products relies largely on bakeries using adequate food handling and hygiene practices. Overall, the results from the questionnaire demonstrated that respondents had a good awareness of the potential hazards with these products and overall used good manufacturing practices. A few businesses could improve practices by more effectively cooling the pie filling and/or reheating the final product prior to display. The overall good observational results were supported by the microbiological results, which indicated that all samples tested were either categorised as microbiologically good or acceptable.

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1. Introduction

A diverse range of filled savoury pastries is sold in Australia including meat pies, sausage rolls, pasties and quiches. They are made from pastry with meat, vegetable, egg-based and/or other fillings (e.g. fish) and can also contain ingredients such as thickeners, vegetable proteins and spices. Spices, in particular, and vegetables can carry a high microbial spore load.

The diversity of products is matched by a diversity in methods of preparation. The typical process used for making pies and pasties involves pre-cooking the fillings to about 85ºC before placing the filling (either hot or cold) into the prepared raw pastry shell, glazing the pastry and baking the complete product. The alternative method involves filling the raw pastry with the uncooked filling mix, sealing with the pastry lid and then baking to an internal temperature of 85ºC. This can then be followed by injection of gelatine/agar solution into the pie headspace after partial cooling (Grau, 2001).

In the case of sausage rolls, the sausage mix, usually finely minced meat, dry ingredients and breadcrumbs, is extruded or formed onto sheets of pastry which are rolled over the meat. The rolls are cut to size, glazed and baked. Quiche is usually prepared by adding an egg-based filling to a cooked pastry base which is cooked until the filling has set.

These products satisfy the definition of 'potentially hazardous foods' because they may contain microbial pathogens and the food can support pathogen growth at certain temperatures. As such, they must be prepared using good manufacturing practices and stored at temperatures that minimise the potential growth of pathogenic microorganisms or formation of microbial toxins in the food.

Reheating of the product immediately prior to consumption does not ensure product safety as reheating temperatures are usually not high enough to destroy pathogenic bacteria that may be present. The bacteria may be present as a result of post-heating contamination or the germination of spore forming bacteria. The time taken to cool and any subsequent reheating provides an opportunity for bacteria to increase in numbers. As a result, businesses producing meat pies were identified as Priority 1 in the Business Sector Food Safety Risk Classification Framework (Australian Government Department of Health and Ageing, 2006).

To date, there have been two documented outbreaks linked to consumption of meat pies in Australia. In 1999, Queensland Health reported an outbreak of *C. perfringens* (10^6 cfu/g were isolated from the sample) associated with meat pies. The actual number of people affected is unknown. The outbreak was believed to be caused by cooked pies being left in a warm environment for several hours before being distributed. Another outbreak occurred in NSW in 2000 associated with pies made at a retail bakery. Three people were affected. The factors contributing to this outbreak remain unknown (FSA & Minter Ellison Consulting, 2002).

In the United Kingdom, between 1992 and 1997 there were three reported outbreaks of food poisoning due to the consumption of contaminated quiche purchased from retail premises in England and Wales, affecting 52 people and putting at least 82 at risk. Two of the outbreaks were associated with *Salmonella* Enteritidis PT4 and one was of unknown aetiology. Vegetarian quiche (stilton and broccoli; cheese and onion) was the suspected vehicle of infection in two of the outbreaks and a meat-based quiche (Quiche Lorraine) was the suspected vehicle of infection in the other outbreak (Gillespie, Little & Mitchell, 2001)

Two studies have been conducted by LACORS/PHLS Co-ordinated Food Liaison Group Microbiological Sampling Programme in the UK to determine the microbiological quality of ready-to-eat quiche, meat pies and pasties at retail level. Quiche samples were collected from supermarket delicatessens, sandwich bars, cafes, bakers, butchers and delicatessens. Meat pie and pasty samples were also collected from mobile and stall based caterers such as those at markets, football matches and fairs. The study found that 94% of quiches and 93% of

meat pies and pasties samples were acceptable microbiologically (de Louvois, Nichols & Cunningham, 1995 and Gillespie, Little & Mitchell, 2001).

2. Method of analysis

From March to June 2009, 172 ready-to-eat filled savoury pastries were purchased from 45 bakeries across NSW by Environmental Health Officers from local councils or by NSW Food Authority officers. Samples included pies, sausage rolls, quiches and pasties.

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. Methods used in the analysis of samples

Tests undertaken	Method
Bacillus cereus - enumeration	AS 1766.2.6
Clostridium perfringens - enumeration	AS 1766.2.8
Coagulase positive staphylococci - enumeration	AS 1766.2.4
Thermotolerant coliforms *and Escherichia coli* - enumeration	AS 1766.2.3
Salmonella spp. - detection	AS 1766.2.5

Filled savoury pastries 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 *NSW Food Authority microbiological quality guide for ready-to-eat foods*, as shown in Table 2, was used to assess the microbiological results from this survey (860 tests).

Table 2. Guideline levels for determining the microbiological quality of ready-to-eat foods (NSW Food Authority, 2009)

Test	Microbiological result (cfu/g)			
	Good	Acceptable	Unsatisfactory	Potentially hazardous
Indicators				
Enterobacteriaceae	$<10^2$	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 $<10^4$	$\geq 10^4$
C. perfringens	$<10^2$	10^2 to $<10^3$	10^3 to $<10^4$	$\geq 10^4$
Coagulase positive staphylococci	$<10^2$	10^2 to $<10^3$	10^3 to $<10^4$	$\geq 10^4$
Salmonella	Not detected in 25g			Detected in 25g

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*).

3. Food handling questionnaire

At the time of product sampling, a survey was conducted to assess food handling practices at bakeries where filled savoury pastries are sold (see Appendix 1 - Food handling questionnaire for bakeries). Forty seven bakeries in NSW were surveyed. The questionnaire collected information on where the products were prepared and how they were prepared, reheated and displayed.

The survey responses were collated and analysed using SurveyMonkey™.

4. Results

Microbiological results

A summary of the microbiological results is shown in Table 3. When compared with the microbiological guidelines, all samples were judged to be good or acceptable. One sample contained *E. coli, B. cereus* and thermotolerant coliforms, but at levels which were considered within the acceptable range (4 cfu/g, 300 cfu/g, and 75 cfu/g respectively).

Table 3. Assessment of results for products using the microbiological criteria for ready-to-eat foods (NSW Food Authority, 2009)

Products	No of samples	Microbiological Quality (%)			
		Good	Acceptable	Unsatisfactory	Potentially hazardous
Pies	101	100 (99%)	1 (1%)	-	-
Sausage rolls	38	38 (100%)	-	-	-
Quiches	11	11 (100%)	-	-	-
Others	22	22 (100%)	-	-	-

Responses to Food Handling Questionnaire

Preparation of filled savoury pastries

Responses to the survey indicated that 32 of 47 (68.1%) made products in-house. Of those preparing the products in-house:

- 30 (93.8%) cook the meat filling before depositing it in the pastries;
- 17 (53.1%) deposit the filling while it is still hot;
- 10 (31.3%) refrigerate the filling for a maximum of 24 hours prior to assembling the products (container size ranged from 1 litre up to 50 litres); and
- After baking, 10% of bakeries display the products; 83.4% refrigerate the products for use later; 3.3% freeze the product and 3.3% allow the products to cool down prior to refrigerating.

Reheating and display of savoury pastries

More than half of the respondents (52.5%) stated that they use a pie oven to reheat the products. The remainder use a cooking oven. The stated temperature of the pie or cooking oven varied from 60 to 250ºC and reheating took between 10 and 90 minutes depending on the temperature of the oven.

In regard to display; 8/38 (21%) bakeries keep products in a warm display cabinet for a maximum of two hours; ten bakeries (26.3%) keep products for a maximum of four hours and the rest (52.7%) keep products on display until sold. At the time of the survey, the actual temperatures of the display cabinets ranged from 60 to 200ºC.

The majority, (87.2%), of bakeries indicated that unsold or left over filled savoury pastries were discarded or given away at closing, with the remainder either taking the products home (6.4%) or refrigerating them for later use (6.4%).

5. Discussion

Both the questionnaire on food handling practices and the results from the microbiological testing illustrate that, overall, ready-to-eat savoury pastries are prepared and handled satisfactorily resulting in a low rate of microbial contamination.

The responses from the food handling practices would suggest that the majority of bakeries follow good handling practices during preparation of these products, as required in the *Australia New Zealand Food Standards Code* Standard 3.2.2 Food Safety Practices and General Requirements. Similar conclusions can be made from the responses to the question regarding the reheating and display of savoury pastries.

The food handling questionnaire did identify in a few premises some practices with the potential to allow the growth of pathogenic microorganism, that being:

- Cooling of cooked filling in large containers; and
- Reheating at low temperatures (ie 60°C)

Cooling of cooked foods 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. The *Australia New Zealand Food Standards Code* Standard 3.2.2 includes provisions for the cooling of foods, that being to cool from 60°C to 21°C within 2 hours, following by cooling from 21°C to 5°C within a further 4 hours.

Reheating foods in an oven set at 60°C is likely to result in taking a long time to reheat. During this time, the food will be within the Temperature Danger Zone (greater than 5°C and less than 60°C). While food is kept within the Temperature Danger Zone, microorganisms are able to grow. As such, when reheating savoury pastries, oven temperatures should be sufficient to ensure the food will reach a temperature of 60°C or above in as quick a time as possible and within 2 hours (Food Standards Australia New Zealand, 2009).

The overall good response to the food handling practices survey is supported by the results from the microbiological survey, which found that all products sampled were either of good (99%) or acceptable (1%) microbiological quality when assessed against microbiological guidelines for ready-to-eat foods.

The results from this survey were comparable to other surveys conducted on savoury pastries. A UK study found that 94% of quiches were of acceptable quality, 6% were unsatisfactory quality due to high aerobic plate counts and <1% were of unacceptable quality due to an elevated level of *E. coli* (Gillespie, Little & Mitchell, 2001). Another survey conducted on meat pies and pasties found 93% samples satisfactory, 6% were unsatisfactory due to high aerobic plate counts, *E. coli, B. cereus* or *S. aureus*, and 0.5% was unacceptable due to high *B. cereus* levels (de Louvois, Nichols & Cunningham, 1995).

The sound microbiological quality of filled savoury pastries is most likely attributable to both the use of good manufacturing practices and the intrinsic nature of the products. The pre-cooking of fillings and the baking process will inactivate vegetative cells, so only microbial spores remain after baking. The barrier of dry pastry provides protection against post-baking contamination of the filling. However, slow cooling of any pre-cooked fillings can provide an opportunity for spore forming pathogens to grow and for some to produce toxin.

6. Conclusion

The safety of filled savoury pastries products relies largely on adequate handling and hygiene practices. The questionnaire on food handling practices showed that overall, the respondents displayed awareness of the potential hazards with these products and had good manufacturing practices. A few businesses could improve practices by more effectively cooling the pie filling and/or reheating the final product prior to display. This information will form the basis of guidance material for local council when inspecting food businesses preparing or serving savoury pastries. The overall good results are supported by the microbiological results which indicate that all samples tested were categorised as either good or acceptable.

7. Acknowledgements

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- Griffith City Council
- Holroyd City Council
- The Council of the Shire of Hornsby
- Penrith City Council
- City of Ryde
- Sutherland Shire Council

8. References

Australian Government Department of Health and Ageing. (2006). *Business sector food safety risk priority classification framework*.

De Louvois, J., Nichols, G. & Cunningham, C. (1995). Survey of cooked pies and pasties from mobile vendors. Retrieved July 10, 2009 from LACORS Web site: http://www.lacors.gov.uk/lacors/ContentDetails.aspx?id=3509&authCode=

Food Science Australia & Minter Ellison Consulting. (2002). *National risk validation project*.

Food Standards Australia New Zealand (2009). Food safety standards – temperature control requirements. Retrieved September 3, 2009 from http://www.foodstandards.gov.au/newsroom/factsheets/foodsafetyfactsheets/foodsafetystandardst857.cfm.

Institute of Food Technologists (IFT). (2003). Evaluation and definition of potentially hazardous foods – a report of the Institute of Food Technologist for the Food and Drug Administration of the United States Department of Health and Human Services. *Comprehensive Reviews in Food Science and Food Safety 2* (S):8 – 204. Retrieved July 24, 2009 from http://members.ift.org/NR/rdonlyres/F537AA13-CFDB-420D-94BC-ED763D9C0A4D/0/crfsfssupn2p001007.pdf

Gillespie, I.A., Little, C.L. & Mitchell, R.T. (2001). Microbiological examination of ready-to-eat quiche from retail establishments in the United Kingdom. *Communicable Disease and Public Health, 4* (1), 53 – 59.

Grau, F.H. (2001). Meat and meat products. In: C. Moir, Editor in Chief, *Spoilage of Processed Foods: Causes and Diagnosis*. Australian Institute of Food Science and Technology (NSW Branch) Food Microbiology Group, Sydney, Australia.

NSW Food Authority (2009). Microbiological quality guide for ready-to-eat foods.

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Appendix 1: Food handling questionnaire for bakeries selling filled savoury pastries

Business name:

Address:

Products sold

- **If pre-bought, indicate if "fully cooked"**
- **Of made in-house, indicate if "prepared filling" used**

Product	Pre-bought	Made in-house	Product	Pre-bought	Made in-house
Pies					
Sausage rolls					
Pasties					
Quiches					

Pre-bought products

1. At what temperature do you receive product?

2. Where do you keep the products before warming?

3. How long do you keep them before warming?

4. If received frozen product or freeze them yourself, how do you defrost them?

5. For partially cooked products how do you cook them?

Made in-house

1. For what products do you cook the filling before placing it inside the pastry?

2. For these products, do you fill them when they are still hot?

3. Do you use the filling straight away? Yes/No
   - If no, how do you cool and store the filling and how long do you keep it for? (indicate size of container)

4. Where do you keep the products after cooking?

Reheating

1. What do you use to reheat the products?
    a. Cooking oven
    b. Pie oven
2. At what temperature is the oven set? _____ºC
3. How long do they take to reheat? _____minutes/hours
4. Do you ever measure the temperature of the product after reheating? Yes/No
    - If yes, what temperature does it usually reach? _____ ºC

Product display

1. At what temperature is the pie oven set?_____°C
2. How long do you keep them inside the warming oven? _____
3. Do you calibrate the temperature gauge on the warming oven or has the gauge ever been checked? Yes/No
    - If yes, how often is this performed and by whom? _____

What happens to remaining products at the end of the day?

Discarded

Given away

Refrigerated for reuse later

Kept in the pie oven

Don't know

Other

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Appendix 2: Results of testing

Product name	Thermotolerant coliforms (MPN/g)	*E. coli (MPN/g)*	CPS (cfu/g)	*B. cereus (cfu/g)*	*Salmonella (/25g)*	*C. perfringens (cfu/g)*
Spinach & cheese roll	<3	<3	<100	<100	ND	<100
Beef pie	<3	<3	<100	<100	ND	<100
Shepherds pie	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Cheese & spinach roll	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Vegetable pasty	<3	<3	<100	<100	ND	<100
Shepherds pie	<3	<3	<100	<100	ND	<100
Steak & kidney pie	<3	<3	<100	<100	ND	<100
Chicken & vegetable pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Beef pie	<3	<3	<100	<100	ND	<100
Shepherds pie	<3	<3	<100	<100	ND	<100
Quiche	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Chunky steak pie	<3	<3	<100	<100	ND	<100
Bacon pie	<3	<3	<100	<100	ND	<100
Chicken pie	<3	<3	<100	<100	ND	<100
Beef & mushroom pie	<3	<3	<100	<100	ND	<100
Spinach potato & cheese pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Chicken pie	<3	<3	<100	<100	ND	<100
Ham & cheese croissant	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Steak cheese & bacon pie	<3	<3	<100	<100	ND	<100
Mushroom pie	<3	<3	<100	<100	ND	<100
Vegetable pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Beef pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Chicken pie	<3	<3	<100	<100	ND	<100
Steak pie	<3	<3	<100	<100	ND	<100
Steak & mushroom pie	<3	<3	<100	<100	ND	<100
Beef pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Cheese bacon beef pie	<3	<3	<100	<100	ND	<100
Cheese bacon roll	<3	<3	<100	<100	ND	<100

Product name	Thermotolerant coliforms (MPN/g)	*E. coli (MPN/g)*	CPS (cfu/g)	*B. cereus (cfu/g)*	*Salmonella (/25g)*	*C. perfringens (cfu/g)*
Sausage roll	<3	<3	<100	<100	ND	<100
Cheese & spinach roll	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Chicken & vegetable pie	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Spinach & ricotta roll	<3	<3	<100	<100	ND	<100
Bacon & cheese pie	<3	<3	<100	<100	ND	<100
Cheese egg & spinach pasty	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Chicken curry & vegetable pie	<3	<3	<100	<100	ND	<100
Shepherds pie	75	4	<100	300	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Beef pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Pie plain beef	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Pizza pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Cheese & spinach pasty	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Quiche	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Cheese & spinach roll	<3	<3	<100	<100	ND	<100
Steak pie	<3	<3	<100	<100	ND	<100
Steak bacon & cheese pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Bacon & egg quiche	<3	<3	<100	<100	ND	<100
Chicken & corn roll	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Potato pie	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Vegetable pasty	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Mushroom pie	<3	<3	<100	<100	ND	<100
Bacon & cheese pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100

Product name	Thermotolerant coliforms (MPN/g)	*E. coli (MPN/g)*	CPS (cfu/g)	*B. cereus (cfu/g)*	*Salmonella (/25g)*	*C. perfringens (cfu/g)*
Chicken & vegetable pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Chicken supreme pie	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Meat pie	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Steak pie	<3	<3	<100	<100	ND	<100
Steak & vegetable pie	<3	<3	<100	<100	ND	<100
Chicken pie	<3	<3	<100	<100	ND	<100
Bacon & tomato quiche	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Shepherds pie	<3	<3	<100	<100	ND	<100
Spinach & cheese pasty	<3	<3	<100	<100	ND	<100
Steak pie	<3	<3	<100	<100	ND	<100
Spinach & cheese quiche	<3	<3	<100	<100	ND	<100
Spinach & cheese pasty	<3	<3	<100	<100	ND	<100
Shepherds pie	<3	<3	<100	<100	ND	<100
Steak & vegetable curry pie	<3	<3	<100	<100	ND	<100
Chicken pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Steak pie	<3	<3	<100	<100	ND	<100
Mushroom pie	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Vegetable pasty	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100
Shepherds pie	<3	<3	<100	<100	ND	<100
Pasty	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Cheese & bacon pie	<3	<3	<100	<100	ND	<100
Quiche	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Meat & vegetable pasty	<3	<3	<100	<100	ND	<100

Product name	Thermotolerant coliforms (MPN/g)	*E. coli (MPN/g)*	CPS (cfu/g)	*B. cereus (cfu/g)*	*Salmonella (/25g)*	*C. perfringens (cfu/g)*
Quiche Lorraine	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100
Chicken pasty	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Mushroom pie	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Chicken pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Beef & vegetable pasty	<3	<3	<100	<100	ND	<100
Seafood pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Thai chicken roll	<3	<3	<100	<100	ND	<100
Mince beef pie	<3	<3	<100	<100	ND	<100
Chicken pepper mushroom pie	<3	<3	<100	<100	ND	<100
Lamb & rosemary pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Spinach roll	<3	<3	<100	<100	ND	<100
Shepherds pie	<3	<3	<100	<100	ND	<100
Beef pie	<3	<3	<100	<100	ND	<100
Vegetable pasty	<3	<3	<100	<100	ND	<100
Bacon & cheese quiche	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Chicken pie	<3	<3	<100	<100	ND	<100
Cheese & bacon pie	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Mushroom pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100
Vegetable quiche	<3	<3	<100	<100	ND	<100
Mushroom quiche	<3	<3	<100	<100	ND	<100
Mushroom pie	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Plain pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Chicken pie	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Mushroom pie	<3	<3	<100	<100	ND	<100
Ham & cheese quiche	<3	<3	<100	<100	ND	<100

Product name	Thermotolerant coliforms (MPN/g)	*E. coli* (MPN/g)	CPS (cfu/g)	*B. cereus* (cfu/g)	*Salmonella* (/25g)	*C. perfringens* (cfu/g)
Plain pie	<3	<3	<100	<100	ND	<100
Potato pie	<3	<3	<100	<100	ND	<100
Curry pie	<3	<3	<100	<100	ND	<100
Sausage roll	<3	<3	<100	<100	ND	<100
Creamy chicken pie	<3	<3	<100	<100	ND	<100
Curry chicken pie	<3	<3	<100	<100	ND	<100

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