



## **COORDINATED SAMPLING PROJECT 21 – Meat Pies**

*Conducted December 2017 through March 2018 with Local Government's across Western Australia*



**Local Health Authorities Analytical Committee**

**Edith Cowan University  
Building 19, 270 Joondalup Drive**

**JOONDALUP WA 6027**

## Executive Summary

This Coordinated Sampling Project (CSP) focused on the meat content in meat pies. The Local Health Authorities Analytical Committee (LHAAC) worked with Western Australian Local Government Authorities (LGA) to execute this project. It is important that consumers in Western Australia (WA) can rely on the accuracy of the contents of their food to make informed purchasing decisions.

The purpose of this project was to measure the content of meat flesh present in meat pies sold throughout WA, and to compare the results with those obtained in the CSP4 project on Meat Pies, conducted in 2011. The meat pie samples were assessed against Standard 2.2.1, Meat and Meat Products, Section 2.2.1—2 of the Food Standards Code (FSC). This project was executed by Western Australian Environmental Health Officers who submitted samples for assessment to Agrifood Technology (Agrifood) or Analytical Reference Laboratory (ARL), the two appointed analysts to LHAAC, from December 2017 through to March 2018.

At the end of the sampling period, 157 samples of meat pies were submitted to the analysts for assessment. The majority (92%) of the samples complied with the guidelines set forth within section 2.2.1—2 of the FSC which states “meat pie means a pie containing no less than 250 g/kg of meat flesh” whereby meat flesh is defined as “...meat that consists of skeletal muscle and any attached: (a) animal rind; or (b) fat; or (c) connective tissue; or (d) nerve; or (e) blood; or (f) blood vessels; or (g) skin, in the case of poultry” (Food Standards Australia and New Zealand [FSANZ], 2018). Consumers in WA can be re-assured that the majority of the meat pies tested within this CSP adhered to the requirements for the minimum proportion of meat flesh as prescribed under the FSC. Furthermore, there was a considerable improvement in the results from this CSP compared to the results from the CSP4 project on meat pies.

Due to the importance of meat content expectations in informing consumer choices, LGA's are encouraged to participate in follow up action on inconsistent products in their locality in order to ensure continued compliance with the FSC.

## Contents

Introduction	3
Methodology	4
Results	4
Discussion	6
Limitations	8
Conclusion	8
Action on non-complying products	9
References	10
Appendix A	11
Appendix B	12
Appendix C	13
Appendix D	14

## List of Abbreviations

Agrifood	Agrifood Technology
ARL	Analytical Reference Laboratory
CSP	Coordinated Sampling Project
FSANZ	Food Standards Australia and New Zealand
FSC	Food Standards Code
g	Gram
kg	Kilogram
kJ	Kilojoule
LGA	Local Government Authorities
LHAAC	Local Health Authorities Analytical Committee
NATA	National Association of Testing Authorities
NHMRC	National Health and Medical Research Council
WA	Western Australia

## Introduction

Meat pies are a popular food, it is estimated that 270 million meat pies are consumed each year in Australia (FSANZ, 2017). Meat pies are categorised as a discretionary food, which means that they do not provide nutritional value and are therefore not necessary for inclusion in a person's diet (National Health and Medical Research Council [NHMRC], 2013). The Australian Dietary Guidelines advise a reduction in the consumption of meat pies since they are high in saturated fat and are therefore energy dense (NHMRC, 2013). In 2011-2012, 35% of the average Australians total daily energy was obtained from the consumption of discretionary foods (Australian Bureau of Statistics, 2016). The average Australian can consume up to 8,700 kJ (approximately 2,071 Calories) per day to maintain current weight (Eat for Health, 2015). To reduce the risk of chronic diseases, the NHMRC (2013) suggest that a person's total dietary energy intake should not exceed 20 - 35% (up to 725 Calories) from fat, 45 - 65% (up to 1,346 Calories) from carbohydrates and 15 - 25% from protein (up to 518 Calories).

As per Section 2.2.1—2 of the FSC, meat pies must contain no less than 250 g/kg of meat flesh which is defined as the skeletal muscle and any attached animal rind, fat, connective tissue, nerve, blood, blood vessels, or skin in the case of poultry (FSANZ, 2018). Meat includes any animal permitted for human consumption, including buffalo, camel, cattle, deer, goat, hare, pig, poultry, rabbit or sheep (FSANZ, 2018). Put simply, at least 25% of a meat pie must contain meat, often the remaining 75% is made up of a mix of pastry, gravy and vegetable protein (FSANZ, 2017). Western Australian consumers have the right to have access meat pie products which are compliant with the meat pie content standards outlined in the FSC.

There has been a history of Australian meat pie products demonstrating non-compliance with the meat content requirement of the FSC. In the early 1990's the Health Protection Service conducted multiple surveys to assess the meat content in pies sold throughout the Australian Capital Territory. Three surveys were conducted and the results found moderate levels of non-compliance (ACT Health, 1996). Between 36% and 56% of analysed meat pie samples contained less than the required 25% meat content (ACT Health, 1996). More recently in 2011, LHAAC's CSP4 found 22% of sampled meat pies purchased throughout WA were non-compliant with Section 2.2.1—2 of the FSC.

The purpose of the implementation of this CSP21 was to determine the current compliance rates of meat pies sold in WA with the FSC requirements. Furthermore, this CSP was conducted to allow a comparison with the findings from CSP4 to analyse for any change in compliance rates.

## Methodology

Sampling instructions were supplied to all LGA's including an attached schedule which outlined specific products to be sampled, in order to avoid duplication (Appendix A). The schedule proposed that seven metropolitan LGA's sample from the major supermarket chains and retail outlets, since these areas typically host more of the supermarket outlets. If the products listed in the schedule could not be found by the LGA, it was recommended that a substitute product, ideally not one listed on the schedule, be selected for purchase from the supermarket or another food business. Metropolitan and non-metropolitan LGA's which were not listed in the schedule were encouraged to collect samples from any food business selling meat pies in their area such as bakers, cafes, restaurants, pubs and hotels. The number of samples to be collected by each LGA was determined by the LGA population, in accordance with Table 1.

*Table 1.* The number of samples to be collected by each participating LGA.

LGA Population	Max no. of Samples	Sample Details
1 - 2000	2 (each of three pies)	Meat pies are the target sample. The analyst requires 3 samples of the same meat pie to perform analysis. A single pie therefore requires a minimum of three example of that pie. A pack of pies should be a minimum of three of the same pie.
2001 – 10,000	4 (each of three pies)	
10,001 – 50,000	6 (each of three pies)	
> 50,0000	10 (each of three pies)	

From December 2017 to March 2018, samples were submitted to Agrifood or ARL. Agrifood and ARL conducted analysis with National Association of Testing Authorities (NATA) accredited methods (Appendix D). The sample size requested by the analyst was a minimum of three pies of the same recipe (Table 1). A meat pie must contain only meat which includes any animal permitted for human consumption, but does not include pies which consist of a mix of meat and vegetables. The meat pies submitted to the analyst were tested for their meat flesh content to assess compliance with Section 2.2.1—2 of the FSC. Tests were also conducted for percentage of fat, protein and carbohydrates. Following testing procedures, LGA's were notified of the results and requested to review the results and, if necessary, to participate in the suggested follow up actions for non-complying products.

## Results

At the end of the sampling period, a total of 157 meat pie samples were submitted by 33 WA LGA's to Agrifood and ARL for assessment (Appendix B). The 157 samples submitted consisted of seven different categories of meat types (Figure 1). Samples which were not clearly labelled with meat type were categorised under "not specified" and samples labelled as steak were categorised under beef. Beef was the predominant type of meat pie analysed, followed by chicken, lamb, a mix of beef and pork, kangaroo, pork and goat (Figure 1).

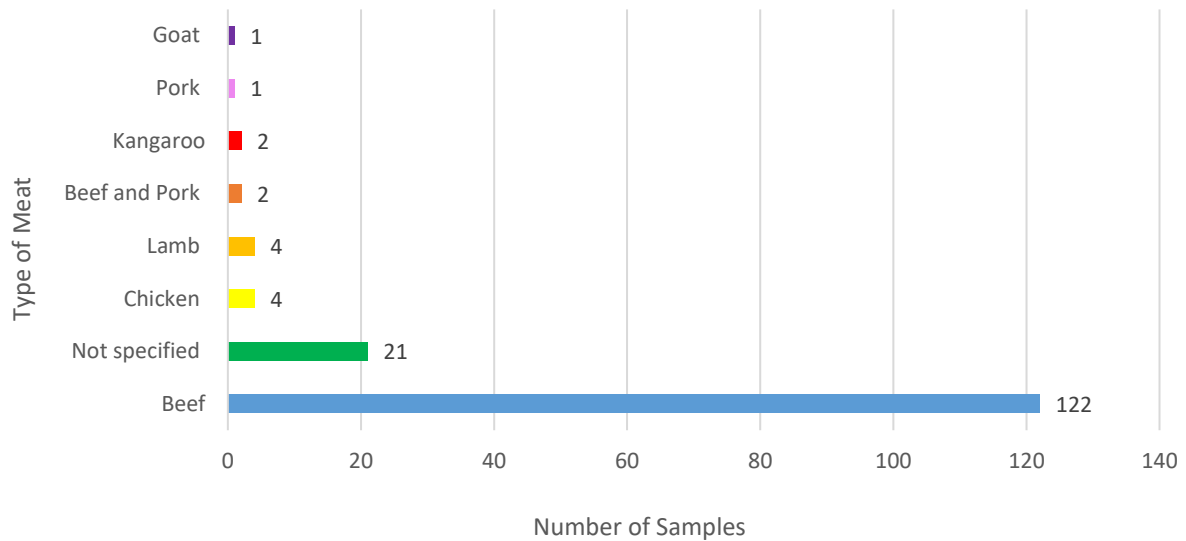


Figure 1. The number of meat pie samples (n = 157) categorised by meat type.

The results demonstrated a high level of compliance with the meat content requirement prescribed as per Section 2.2.1—2 of the FSC. The majority of the meat pie samples (92%, n = 144) contained at least 250g of meat flesh per kg of the total pie (Figure 1). The highest value of meat flesh percentage of the total pie was 59%, observed in one sample. A smaller portion of the meat pie samples (8%, n = 13) were non-compliant with the FSC and contained less than 25% meat flesh (Figure 2). The lowest value of meat flesh percentage was 18%, observed in two separate samples. Overall, the average meat flesh content of all 157 samples was 334 g per kg of the total pie (34% meat flesh of the total pie).

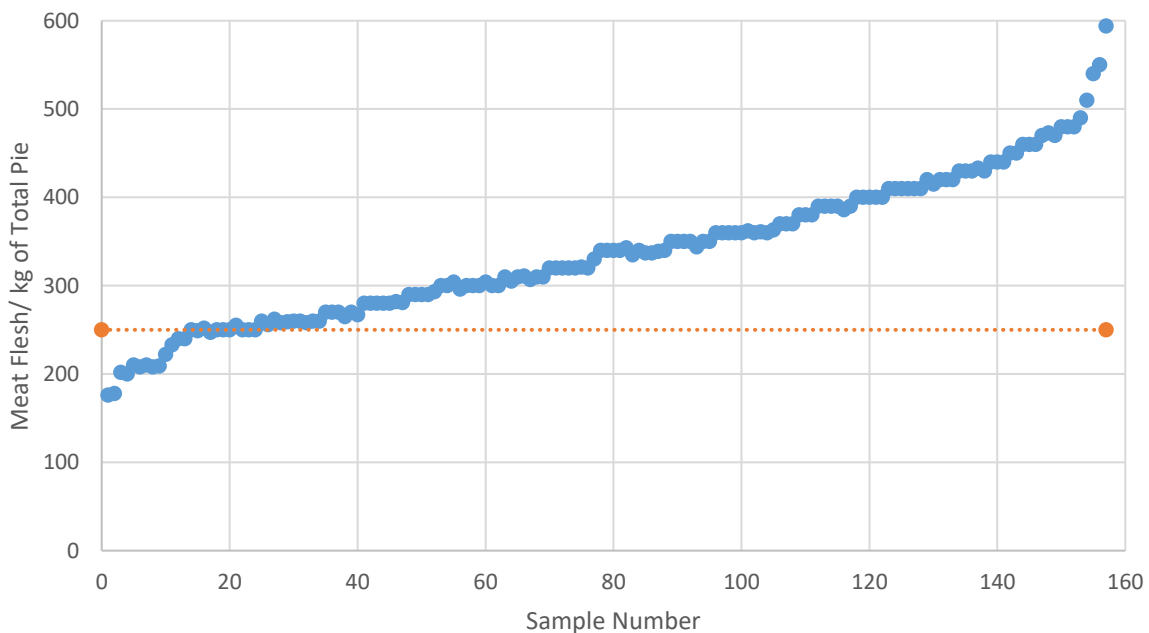


Figure 2. The meat flesh (g) per kg of the total pie for each sample number. The orange line represents the cut off compliance value outlined in the FSC (250g of meat flesh /kg of total meat pie).

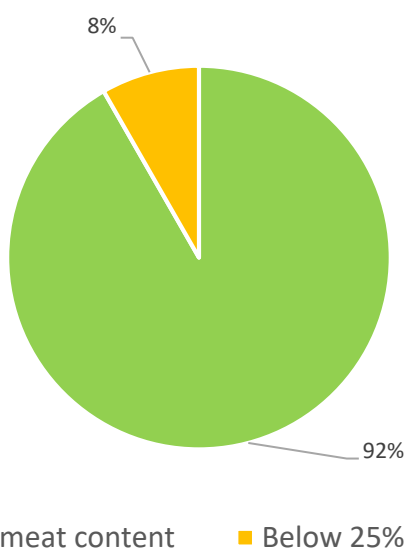


Figure 3. The percentage of meat pie samples (n = 157) compliant or non-compliant with the FSC meat content requirement.

The amount of fat, protein and carbohydrates in the pie filling was analysed and the results varied greatly between the meat pie samples (Table 2).

Table 2. Nutritional Information of the meat pie filling for the 157 samples.

	Average (% of filling)	Minimum (% of filling)	Maximum (% of filling)
Fat	5.96	0.5	17.3
Protein	14.19	7	23.2
Carbohydrates	7.17	< 1	14

## Discussion

### Meat Percentage Content

The findings from this CSP are generally reassuring for consumers since the majority (92%) of the analysed pies were compliant with the minimum meat requirement of the FSC. In addition, it is positive to see compliance rates have improved in this CSP compared to the CSP4 which was conducted by LHAAC in 2011 (Table 3). This CSP21 found 92% of meat pie samples were compliant. In contrast, the CSP4 found lower rates of compliance (78%). Moreover, the minimum meat content observed in this CSP was 18% in two samples and the CSP4 demonstrated poorer results with one sample containing 14% meat content. Overall, this CSP demonstrated the average meat content in meats pies was 34%, a figure that is 4% higher than the average meat content observed in the CSP4 (30%).

*Table 3.* Comparison between the results of the minimum meat flesh content observed in meat pie samples obtained from the CSP4 and the CSP21.

	CSP4 (n = 96)	CSP21 (n = 157)	Improvement in this CSP21 compared to CSP4
Compliance rate with the FSC	78%	92%	✓
Non-compliance rate with the FSC	22%	8%	✓
Minimum meat content	14%	18%	✓
Average meat content	30%	34%	✓

### **Nutritional Information**

The nutritional information results demonstrated that there was a vast difference in the content of fat, protein and carbohydrate between meat pie samples. There is insufficient information available to compare the declared nutritional information with the results obtained from analysis.

Table 4 and Table 5 were calculated in consideration that carbohydrate provides 4 calories per gram, protein provides 4 calories per gram and fat provides 9 calories per gram (United States Department of Agriculture, n. d.). The average pie size of 175g was determined by calculating the average weight of 18 pie products analysed in this CSP (Appendix C). Based off the results, meat pies are a high fat containing product. The average meat pie filling analysed contained 13% of the average person's daily intake of fat (Table 4). Furthermore, the pie filling with the highest observed fat content contained 38% of the average person's daily intake of fat (Table 5).

*Table 4.* The average nutritional information of the meat pie filling for the 157 samples.

	Average Quantity Per 100g	Average Quantity Per 175g	% Daily Intake*
Fat (g)	5.96g	10.41	13%
Protein (g)	14.19g	24.83	19%
Carbohydrates (g)	7.17g	12.55	4%

\* Based off the Australian Dietary Guidelines for a person's total dietary energy intake of approximately 2,071 Calories per day. Daily diet should not exceed 35% (725 Calories) from fat, 65% (1,346 Calories) from carbohydrates and 25% from protein (518 Calories) (NHMRC, 2013).



Table 5. The maximum nutritional information of the meat pie filling.

	Maximum Quantity Per 100g	Average Quantity Per 175g	% Daily Intake*
Fat (g)	17.3g	30.25	38%
Protein (g)	23.2g	40.6	31%
Carbohydrates (g)	14g	24.5	7%

\* Based off the Australian Dietary Guidelines for a person's total dietary energy intake of approximately 2,071 Calories per day. Daily diet should not exceed 35% (725 Calories) from fat, 65% (1,346 Calories) from carbohydrates and 25% from protein (518 Calories) (NHMRC, 2013).

## Limitations

There are limitations associated with this project. The meat pies analysed predominantly contained beef, and thus the results may not be generalizable for all types of animal meat pies. Further research should focus on the analysis of the meat content in a broader range of meat types, including chicken, lamb and pork. The inclusion of nutritional information panel data would have been useful to compare the obtained meat content percentage and nutritional information with the labelling information.

## Conclusion

This CSP analysed 157 meat pies sold in WA for their meat flesh content to analyse compliance with Section 2.2.1—2 of the FSC which requires meat pies to contain no less than 250 g/kg of meat flesh. In other words, 25% of a meat pie must be meat flesh. The majority (92%) of the meat pies analysed in this study were compliant with this FSC requirement. This is a substantial improvement compared to LHAAC's CSP4, which found compliance in 78% of analysed meat pies. It is important that meat pie producers continue to lift their standards until a 100% compliance rate with the FSC is observed. All meat pies sold in WA must comply with the minimum meat requirements outlined in the FSC. It is recommended that LGA's conduct follow-up action for non-compliant products. It is anticipated that compliance rates will continue to rise in the future if sampling programs aimed to monitor industry standards are effective.

## Action on non-complying products

To help to ensure consistent follow-up action on non-complying products the following actions are recommended:

1. Inform the retail outlet in writing that the relevant product does not comply with the Code.
2. When the manufacturer is based in WA, write to the manufacturer and the Local Government Authority in which the manufacturer is located.
3. In situations where the product is not manufactured in WA, the details of the non-compliance should be sent to the Department of Health who will pass the information to the correct enforcement agency in the State or Territory in which the manufacturer is located under the Home Jurisdiction Rule. A copy of the sample submission sheet and the results of analysis should be submitted to the Department of Health Environmental Health Directorate with a description and details of the non-compliance.
4. Enforcement action can be initiated by a Local Government if the agency is not satisfied with the actions taken by the retailer and/or manufacturer for a product that does not comply with the Code. Where only the retail outlet is within the local government's area, this enforcement action can only be taken for sale of product that does not comply with the Code.

## References

- ACT Health. (1996). *Report on Meat Content of Meat Pies*. Retrieved from: <http://health.act.gov.au/datapublications/reports/food-survey-reports/food-survey-reports-996-97/report-meat-content-meat>
- Australian Bureau of Statistics. (2014). *Discretionary foods*. Retrieved from: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4364.0.55.007~2011-12~Main%20Features~Discretionary%20foods~700>
- Australian Bureau of Statistics. (2016). *Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011-12*. Retrieved from: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.012main+features12011-12>
- Eat for Health. (2015). *Food Essentials: Frequently Asked Questions*. Retrieved from: <https://www.eatforhealth.gov.au/food-essentials/frequently-asked-questions>
- Food Standards Australia and New Zealand. (2017). *Meat Pies*. Retrieved from: <http://www.foodstandards.gov.au/consumer/generalissues/meatpie/Pages/default.aspx>
- Food Standards Australia and New Zealand. (2018). *Food Standards Code*. Retrieved from: <http://www.foodstandards.gov.au/code/Pages/default.aspx>
- National Health and Medical Research Council. (2013). *Australian dietary guidelines: Summary*. Retrieved from: [https://www.nhmrc.gov.au/\\_files\\_nhmrc/file/publications/n55\\_australian\\_dietary\\_guidelines1.pdf](https://www.nhmrc.gov.au/_files_nhmrc/file/publications/n55_australian_dietary_guidelines1.pdf)
- United States Department of Agriculture. (n. d.). How many calories are in one gram of fat, carbohydrate, or protein. Retrieved from: <https://www.nal.usda.gov/fnic/how-many-calories-are-one-gram-fat-carbohydrate-or-protein>

## Appendix A

*Table 1A.* List of pie products by manufacturer and LGA allocation

<b>Manufacturer</b>	<b>Product Description</b>	<b>LGA</b>	<b>Quantity</b>
Balfours	Traditional Frozen Pies 4 Pack 680g	City of Armadale	1 Pack
Balfours	Frozen Party Pies 12 Pack 600g	City of Armadale	1 Pack
Four N Twenty	Angus Beef & Pepper 4 Pack 760g	City of Belmont	1 Pack
Herbert Adams	Kind Island Beef 2 Pack 420 g	City of Belmont	2 Packs
Herbert Adams	Chunky Slow Cooked Beef 2 Pack	City of Belmont	2 Packs
Coles	Frozen Meat Pie 6 Pack 900g	City of Cockburn	1 Pack
Coles	Deli Patchett Pork Pie 100g	City of Cockburn	3 Pies
Coles	Simply Gluten/Fr meat pie 2 Pack	City of Cockburn	2 Packs
Four n Twenty	Frozen Meat Pie 4 Pack 700g	City of Gosnells	1 Pack
Katzy's	Frozen Meat Pies 2 Pack 480g	City of Gosnells	2 Packs
Sargents	Frozen Meat Pie 4 Pack 700g	City of Gosnells	1 Pack
Scott's	Frozen Meat Pie 6 Pack 900g	City of Gosnells	1 Pack
Herbert Adams	S/Cooked Beef &Pepper 2 Pack 400g	City of Joondalup	2 Packs
Herbert Adams	Lamb & R'Mary 2 Pack 400g	City of Joondalup	2 Packs
Mrs Mac's	Beef Pies 4 Pack 700g	City of Joondalup	1 Pack
Sargents	Prem Angus Beef 4 Pack 700g	City of Rockingham	1 Pack
Woolworths	Frozen Meat pies 4 Pack 700g	City of Rockingham	1 Pack
Woolworths	Small Pork Pie 160g	City of Rockingham	3 Pies
Woolworths	Chunky Beef Family Pie 500g	City of Rockingham	3 Pies
Sargents	Ch/Beef Smoky BBQ 4 Pack 700g	City of Stirling	1 Pack
Sargents	Ch/Beef & Pepper 4 Pack 700g	City of Stirling	1 Pack
Sargents	Prem Angus Beef 550g (single)	City of Stirling	3 Pies
Sargents	Prem Ch/Angus Beef 4 Pack 600g	City of Stirling	1 Pack

## Appendix B

*Table 1B.* The number of meat pie samples submitted by participating LGA's

<b>Local Government</b>	<b>Number of Meat Pie Samples</b>	<b>Local Government</b>	<b>Number of Meat Pie Samples</b>
City of Albany	6	City of Vincent	4
City of Armadale	9	City of Wanneroo	5
City of Bayswater	10	Shire of Augusta Margaret River	1
City of Belmont	3	Shire of Dandaragan	2
City of Busselton	2	Shire of Dardanup	1
City of Canning	7	Shire of Harvey	4
City of Cockburn	5	Shire of Manjimup	5
City of Gosnells	4	Shire of Nannup	2
City of Joondalup	15	Shire of Northam	3
City of Kalgoorlie Boulder	6	Shire of Northampton	2
City of Karratha	6	Shire of Serpentine Jarrahdale	6
City of Mandurah	10	Shire of Shark Bay	2
City of Melville	5	Shire of Toodyay	3
City of Perth	4	Town of Claremont	3
City of Rockingham	8	Town of Port Hedland	3
City of Stirling	4	Town of Victoria Park	3
City of Subiaco	4	<b>TOTAL</b>	<b>157</b>

## Appendix C

Table 1C. Average weight of a meat pie (g)

Manufacturer	Product	Quantity	Weight of One Pie (g)
Balfours	Traditional Frozen Pies	4 Pack 680g	170
Four N Twenty	Angus Beef & Pepper	4 Pack 760g	190
Herbert Adams	Kind Island Beef	2 Pack 420 g	210
Coles	Frozen Meat Pie	6 Pack 900g	150
Coles	Deli Patchett Pork Pie	1 Pie 100g	100
Four n Twenty	Frozen Meat Pie	4 Pack 700g	175
Katzy's	Frozen Meat Pies	2 Pack 480g	240
Sargents	Frozen Meat Pie	4 Pack 700g	175
Scott's	Frozen Meat Pie	6 Pack 900g	150
Herbert Adams	S/Cooked Beef & Pepper	2 Pack 400g	200
Herbert Adams	Lamb & R'Mary	2 Pack 400g	200
Mrs Mac's	Beef Pies	4 Pack 700g	175
Sargents	Prem Angus Beef	4 Pack 700g	175
Woolworths	Frozen Meat pies	4 Pack 700g	175
Woolworths	Small Pork Pie	1 Pie 160g	160
Sargents	Ch/Beef Smoky BBQ	4 Pack 700g	175
Sargents	Ch/Beef & Pepper	4 Pack 700g	175
Sargents	Prem Ch/Angus Beef	4 Pack 600g	150
<b>Average weight of one pie (g)</b>			<b>175</b>

## Appendix D

### **Raw Data**

For further questions or inquiries about raw data contact LHAAC Coordinator Trevor Chapman:

Local Health Authorities Analytical Committee

Edith Cowan University

Building 19, 270 Joondalup Drive

JOONDALUP WA 6027

Email: [t.chapman@ecu.edu.au](mailto:t.chapman@ecu.edu.au)

Phone: (08) 6304 2104