



/// South West Queensland Nutrition Survey 2004



Queensland Government
Queensland Health

© State of Queensland, Queensland Health 2006

This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced by any process without written permission from Queensland Health. Material from this work may be reproduced with appropriate acknowledgment.

/// Suggested citation:

Southern Area Population Health Services 2006, *The South West Queensland Nutrition Survey 2004*, Queensland Health. Brisbane.

/// For further information:

Director Public Health Nutrition
Southern Area Population Health Services

PO Box 333
Archerfield Q 4108

Ph (07) 3000 9148

Fax (07) 3000 9121

Email SPHUN-Nutrition@health.qld.gov.au

/// Acknowledgements:

The South West Queensland Nutrition Survey 2004 was undertaken by the Southern Area Population Health Services in collaboration with the Health Information Branch, Queensland Health. The authors of this report were Elizabeth Nitschke, Simone Lawson, Annette Neill, Ian Hunter and Morton Bell.

The funding to conduct the interviews was received from the Public Health Services Branch Board of Directors.

Thanks and acknowledgement goes to a number of Queensland Health staff in the Southern Area Population Health Services. Primary assistance from the Epidemiology Services Unit was provided by Kerry Brady, Dr Terry Coyne and Kirstine Sketcher-Baker. Valuable comment was received by Debbie-Ann Alick, Ian Gillespie, Rita Goodman, Janny Goris, Melinda Hammond, Catherine Harper, Jane Hedger, Sherelle Iuretigh, Mary King, Dr Amanda Lee, Elizabeth O'Neill, Peta Patterson and Brad Wheeler.

The authors acknowledge the work and enthusiasm of the telephone interviewers. Thank you also to the South West Queenslanders who gave of their time to contribute to this research.

The South West Queensland Nutrition Survey 2004 presents information on the consumption of vegetables and fruit; other selected indicators of nutritional status; and food buying practices amongst people living in South West Queensland.

The South West Queensland Nutrition Survey 2004 was a priority project of the Southern Area Population Health Services and recognises nutrition as a key factor that impacts on the health of people living in rural and remote areas of southern Queensland.

People living in remote areas, such as South West Queensland, are more likely to die of coronary heart disease, stroke, diabetes, chronic obstructive pulmonary disease, asthma and lung cancer compared to people living in urban and regional areas. They are also more likely to be overweight or obese, and physically inactive. In addition, healthy food costs more in remote areas. South West Queensland has a higher proportion of Indigenous residents compared to the Queensland average. Relative to the non-Indigenous population of Queensland, rural and remote Indigenous people have higher death and hospitalisation rates due to all causes, including coronary heart disease and diabetes.

Addressing risk factors such as good nutrition and regular physical activity through coordinated interventions, in partnership with a wide range of organisations outside the health sector, is the way forward. Good nutrition is essential throughout the life cycle, and all Queenslanders need access to good quality and affordable food to support health and wellbeing. Vegetables and fruit are a key component of a healthy diet, and their consumption is a good indicator of the nutritional status of the population. Queenslanders do not eat enough vegetables and fruit, and South West Queenslanders are no exception.

Our aim is to work with communities and organisations across South West Queensland to increase the consumption of vegetables and fruit in the population. The data obtained from *The South West Queensland Nutrition Survey 2004* will contribute to the development and implementation of strategies that will focus on improving the nutritional status and the subsequent health of our rural communities. It showcases Queensland Health's commitment to preventing chronic diseases and the unnecessary burden of ill health on our families and communities. Through accurate monitoring and surveillance of key determinants of health, such as vegetable and fruit intake, we will be able to better focus our work and monitor our progress and success.

I encourage everyone with an interest in the health of rural and remote Queenslanders to use this information in planning and implementing projects that will improve the health of our communities.

Mr David Logan
Manager
Southern Area Population Health Services

	Executive summary	3
	Acronyms and abbreviations	4
	Definitions	5
1	Introduction	6
2	Methodology	8
	2.1 Interviews	8
	2.2 Questionnaire	8
	2.3 Response rate	8
	2.4 Weighting procedures	8
	2.5 Data analysis	9
	2.6 Data limitations	9
3	Results	11
	3.1 Demographic profile of sample	11
	3.2 Vegetable and fruit consumption compared to national recommendations	12
	3.3 Frequency of fresh, tinned/bottled, dried, frozen vegetable and fruit consumption	15
	3.4 Fruit juice consumption	15
	3.5 Soft drink and sports drink consumption	17
	3.6 Take-away food consumption	18
	3.7 Milk consumption	19
	3.8 Knowledge of national vegetable and fruit consumption guidelines	20
	3.9 Multivariate analysis	27
	3.10 Food supply and food security	27
	3.11 Perceived importance of vegetables and fruit for health	32
	3.12 Perceptions of vegetable and fruit quality	33
4	Discussion	34
5	Conclusion	38
6	Recommendations	39
7	Appendices	40
	7.1 Questionnaire	40
	7.2 List of tables	50
	7.3 List of figures	51
8	References	52

/// Executive summary

The South West Queensland Nutrition Survey 2004 provided data on the consumption of vegetables and fruit amongst people living in rural and remote areas of southern Queensland. The benefits of eating a diet high in vegetables and fruit are well documented and include lower risks of ischaemic heart disease, stroke and several major cancers (WHO 2004). Behavioural and knowledge factors that contribute to dietary intake, such as buying practices, and a knowledge of vegetable and fruit consumption guidelines, were also surveyed and are reported here.

The survey used the computer assisted telephone interviewing (CATI) system of data collection to conduct interviews with 1228 people aged 18 years or over. Data were weighted to infer results for the total population. Univariate and multivariate analyses were performed to detect significant results.

/// Key results were:

- The majority of the population (92 per cent) reported not meeting the national recommendations of consuming both five serves of vegetables and two serves of fruit each day.
- Compared to the Queensland population, more people in South West Queensland reported eating recommended amounts of vegetables, but fewer reported eating recommended amounts of fruit.
- Those who reported consuming the recommended number of serves of both vegetables and fruit each day were significantly more likely to never or rarely consume take-away food, to drink skim milk and to know the daily recommendations for vegetables and fruit serves.
- People who never or rarely reported consuming take-away foods were almost three times more likely to report consuming the recommended number of serves of vegetables and fruit compared to those who reported eating take-away at least once per week.
- Those who reported consuming the recommended serves of fruit each day were significantly more likely to be female, to consume skim milk, to drink fruit juice and to report never drinking soft drink. Higher education levels were also associated with consuming the recommended serves of fruit, as were people who reported correct knowledge of the recommended serves.
- Fresh vegetables and fruit were reportedly consumed far more frequently than frozen, tinned/bottled or dried types.
- People who lived outside of town were more likely to grow their own vegetables and fruit compared to those living in town.
- More than 40 per cent of the population reported never consuming soft drink or sport drinks, however 30 per cent reported consuming 1.5 litres or more of these types of drinks each week.

The results from this survey show low consumption of vegetables and fruit, with inadequate vegetable consumption being of greatest concern. An inter-sectoral approach needs to be taken by all levels of government, in partnership with non-governmental agencies, to increase awareness of the need for higher vegetable and fruit consumption. These partnerships are necessary to also improve the affordability, availability and quality of produce in South West Queensland.

These data should be used to contribute to future Queensland Health monitoring and surveillance reports such as *Health Determinants Queensland*. The survey results also provide the evidence and impetus for business areas, across the continuum of care within Queensland Health, to prioritise increasing the consumption of vegetables and fruit in their business and operational planning.

These results, along with the overall results from *Food Supply in Rural and Remote Southern Queensland* project will be presented to key stakeholders that have the potential to impact on increasing demand and improving supply of vegetables and fruit. The Southern Area Population Health Service will support and facilitate action at community and regional level to address this important aspect of health.

Full recommendations of this study can be found in Section 6. In summary, it is recommended that:

- strategies to promote vegetable and fruit consumption in South West Queensland be developed and implemented for the whole population, including strategies specific for:
 - young adults
 - males
 - Indigenous Australians
- strategies should consider shopping habits, distances travelled, transporting practices and greater knowledge and personal skills in using long-life products such as tinned, dried and frozen vegetables and fruit.
- Queensland Health has a renewed investment and greater support for existing behaviour change programs such as The Healthy Weight Program and Lighten Up to a healthier lifestyle across the region.
- a collaborative effort, both within government and with external agencies, is needed to develop and implement sustainable strategies that will increase the supply and demand for vegetables and fruit by the communities across South West Queensland.

Acronyms and abbreviations

ABS	Australian Bureau of Statistics
AGHE	<i>Australian Guide to Healthy Eating</i>
CATI	Computer Assisted Telephone Interviewing
CHD	Chronic Heart Disease
CI	Confidence Interval
ERP	Estimated Resident Population
FFQs	Food Frequency Questionnaires
GAI	Geographic Area of Interest
HFAB	Health Food Access Basket
HIB	Health Information Branch (Queensland Health)
HSD	Health Service District (Queensland Health)
LGA	Local Government Area
NHMRC	National Health and Medical Research Council
NNS	<i>National Nutrition Survey 1995</i>
QPHF	Queensland Public Health Forum
OR	Odds Ratio
SIGNAL	Strategic Inter-governmental Nutrition Alliance
WHO	World Health Organisation

/// Definitions

Aboriginal person:

Describes a person who is of Aboriginal descent who identifies himself or herself as an Aboriginal, and is also accepted as such by the community in which he or she lives.

Estimated Resident Population (ERP):

ABS estimates of the population, obtained by adding the estimated population at the beginning of each period, the components of natural increase and net migration, on a usual residential basis.

Fruit:

Applies to sweet, fleshy edible portion of a plant that arises from the base of a flower and surrounds the seed; apples, oranges, plums, berries, tomatoes and avocados are examples (NHMRC 2003).

Fruit serve:

One medium piece, two small pieces or one cup of canned fruit (Commonwealth Department of Health and Family Services 1998). For the purposes of this survey, 100% fruit juice consumption was not quantified or included as a serve of fruit.

Large town:

Towns located in South West Queensland that are considered to be central locations for shopping, business, etc. These are Roma, St George, Charleville and Cunnamulla.

Legumes:

Refers also to pulses and includes all forms of prepared beans and peas – dried, canned and cooked legumes, bean curd, tofu, and legume-flour products such as pappadams. Among the well-known edible legumes are butter beans, haricot (navy) beans, red kidney beans, soybeans, mung beans, lentils, chick peas, snow peas and various other fresh green peas and beans. Strictly speaking, legumes are specialised forms of fruit since the pod surrounds the seeds and arises from the base of the flower, as occurs with fruit. But because the main food material in legumes is the seeds, they are generally placed in a separate category (NHMRC 2003).

Recommended consumption:

Throughout this document, recommended consumption was defined as five serves of vegetables and two serves of fruit (not including 100% fruit juice) for people aged 18 years and older. This is consistent with the national recommendations in the *Australian Guide to Healthy Eating* (Commonwealth Department of Health and Family Services 1998).

Small town:

Towns, other than large towns, located in South West Queensland that were identified by survey respondents as where they lived.

Take-away:

Meals or snacks, such as burgers, pies, pizza, chicken or chips; excluding sushi, take-away Asian foods, sandwiches or rolls. In South West Queensland, these are typically foods purchased from fish and chip/burger shops, franchised fast food outlets and bakeries.

Torres Strait Islander:

A person who is of Torres Strait Islander descent who identifies himself or herself as a Torres Strait Islander, and is also accepted as such by the community in which he or she lives.

Vegetables:

Includes all leafy green vegetables (eg. spinach, lettuce, silver beet and bok choy), members of the crucifer family (eg. broccoli, cabbages and brussel sprouts), all root and tuber vegetables (for example, carrots, yams and potatoes), edible plant stems (eg. celery and asparagus), gourd vegetables (eg. pumpkin and cucumber), allium vegetables (eg. onion, garlic and shallot) and corn (NHMRC 2003).

Vegetables and/or fruit:

This term refers to the daily consumption of the recommended number of serves of both vegetables and fruit, as well as consumption of the recommended number of serves of vegetables individually, and consumption of the recommended number of serves of fruit individually.

Vegetable serve:

Half a cup of cooked vegetables, one cup of salad vegetables or a 75 gram potato (Commonwealth Department of Health and Family Services 1998).

Valid percent:

A re-calculation of percentages when data are missing. SPSS software uses the number of values present instead of the total number of cases in the sample (SPSS 1999).

There is overwhelming evidence that people who regularly eat diets high in vegetables, legumes and fruit have lower risks of coronary heart disease (CHD), stroke and several major cancers. There is also evidence to suggest other health outcomes such as type II diabetes, chronic obstructive pulmonary disease and cataracts, may be reduced by diets high in vegetables and fruits (WHO 2004).

People living in remote areas, such as South West Queensland, are more likely to die of CHD, stroke, diabetes, chronic obstructive pulmonary disease, asthma and lung cancer compared to people living in urban and regional areas. They are also more likely to be overweight or obese, and physically inactive. In addition, healthy food costs more in remote areas (Queensland Health 2004). South West Queensland has a higher proportion of Indigenous residents compared to the Queensland average. Relative to the non-Indigenous population of Queensland, rural and remote Indigenous people have higher death and hospitalisation rates due to all causes, including CHD and diabetes (Queensland Health 2004).

Coronary heart disease is the largest cause of burden of disease in Queensland and Australia. Mortality due to CHD is higher in males than females, in the Indigenous population, in remote areas, and in areas of high socio-economic disadvantage. The proportion of Indigenous population, socioeconomic disadvantage and rurality of an area are not independent factors. However, the independent effect of each factor is not clear. The greater CHD mortality in these areas may be partially due to an interplay between some or all of these factors (Queensland Health 2004).

Monitoring vegetable and fruit consumption provides one indicator of the nutritional status of a population and highlights potential areas for improving population health. The aim of this survey was to measure and report on the current consumption of vegetables and fruit amongst people in South West Queensland. It also investigated knowledge of national recommendations for vegetable and fruit consumption, and other factors contributing to dietary intake and domestic food supply.

The survey provided data for current vegetable and fruit consumption that can be compared to the national recommendations. For the purpose of this survey, the recommended daily consumption was five serves of vegetables and two serves of fruit. The authors acknowledge that actual recommendations vary depending on age, sex, pregnancy and lactation.

Little information on dietary intake and dietary habits of people living in rural and remote locations in Queensland is collected and/or published. The information published, that is specific to remote and rural populations, largely describes the situation for Aboriginal and Torres Strait Islander people living in discrete communities. South

West Queensland has a higher proportion of Aboriginal and Torres Strait Islander residents than the Queensland average, but no discrete Indigenous communities exist in the region (Queensland Health 2004). Aboriginal and Torres Strait Islander people, and people living in rural and remote locations, are considered priority population groups in *Eat Well Queensland 2002-2012* (QPHF 2002).

The 2004 Healthy Food Access Basket (HFAB) survey has shown the mean cost of the "healthy food access basket" was 29.6 per cent (\$113.89) higher in stores in very remote areas, and the vegetables, fruit and legumes in the basket 20.3 per cent (\$32.34) higher compared with the major cities category. Within the very remote category there was variation across Queensland, and stores in the southern area of Queensland were cheaper than those in the same category in the very remote north (Queensland Health 2005).

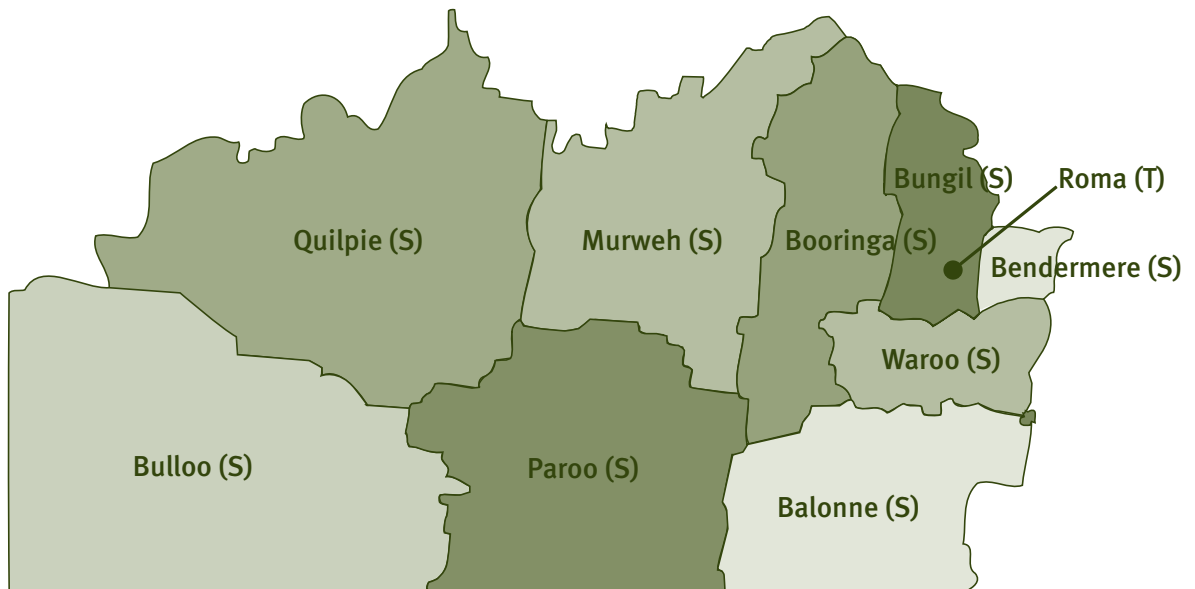
Local knowledge supports the HFAB findings and suggests that people not only pay more, but that people pay more for what is perceived to be of lesser quality and smaller range of produce. As part of an overall food supply project, it was important to ascertain accurate consumption data. These data can be used across the state with similar populations, and used as a baseline measure for interventions aimed at improving supply and consumption.

This is the first time in Queensland that data on current vegetable consumption, compared to the national recommendation of "five serves of vegetables" each day, has been reported (Commonwealth Department of Health and Family Services 1998). In previous surveys, consumption data were collected but grouped during interpretation and reporting in a combined four to five serve category.

The nutrition, food transport and knowledge data have contributed to the broad picture of the food supply situation in South West Queensland. The information in this report will be used as baseline data for the Food Supply in Rural and Remote Southern Queensland project and value-add to data on price, availability and transport routes for food in the South West. Together this information will be used to engage key stakeholders and communities and provide direction for strategies to address food supply issues.

These results also build upon other nutrition surveys. Queensland results from the 2004 CATI Data Pooling Pilot Project provide comparison data for vegetable and fruit consumption, and type of milk consumed (South Australian Department of Health and Western Australian Department of Health 2004). The Queensland Health 2001 Omnibus Survey investigated vegetable, fruit and take-away food consumption, as well as type of milk consumed (Health Information Centre 2001). The 1995 National Nutrition Survey (NNS) indicated that the mean

Figure 1: South West Queensland



daily intake of vegetables by adults was highest in rural and remote areas, but actually lowest in rural towns (ABS 1999). The South West Queensland Nutrition Survey 2004 will contribute to the growing picture of the nutritional status of people living in rural and remote Queensland.

Addressing food supply issues is a priority action area in Eat Well Queensland (Queensland Public Health Forum 2002). Food supply and food security are priority issues for Eat Well Australia (SIGNAL 2001). It is also an aim of the Australian Food and Nutrition Policy, "to identify barriers to the availability, accessibility and cost of nutritious foods for communities with a socioeconomic or geographic disadvantage" and provide a "view to action to overcome these barriers" (Commonwealth Department of Health 1992).

The survey used the CATI system for data collection and the expertise of the Health Information Branch (HIB), Queensland Health.

The geographic area of interest (GAI) was South West Queensland, defined as the South West Statistical Division 2004 (Figure 1), which covers the local government areas (LGAs) of:

- Balonne
- Bendemere
- Booringa
- Bulloo
- Bungil
- Murweh
- Paroo
- Quilpie
- Roma
- Warroo

South West Queensland, as defined in this report, is a large geographic area of 322,655 square kilometres and is rural and remote in nature. As at 30 June 2004, the estimated resident population (ERP) of South West Queensland was 26,952 persons, representing 0.7 per cent of the state's population (ABS 2004).

2.1 Interviews

Interviews were conducted using the HIB CATI system in October and November 2004. Trained telephone interviewers and supervisors were employed to conduct the interviews.

The target population was households in the GAI with at least one individual aged 18 years or over.

The following individuals were excluded from the survey:

- those under 18 years of age
- those unable to speak English sufficiently well for an interview to be conducted
- those with a mental or physical disability which prevented them from being able to take part in a telephone interview
- usual residents of the selected household who were absent from the household, during the interviewing hours, during the interview period
- visitors to the selected household who did not usually live in that household.

A simple random sample of households was selected by randomly choosing telephone numbers from the last five editions of the electronic White Pages. Before calling a phone number, it was pre-determined if a male or a female would be interviewed in that household. If there was more than one eligible individual in a household contacted, the eligible person who had most recently celebrated their birthday was asked to participate.

A combination of day time and evening interviewing sessions was used in order to give people, particularly shift workers, every opportunity to participate. Sessions were Monday to Thursday (9.30am - 1.30pm & 3.00pm - 8.00pm), Friday (3.00pm - 8.00pm) and Saturday (9.30am - 4.30pm). If a respondent was contacted at an inconvenient time, an appointment was made for a better time, if possible.

2.2 Questionnaire

The questionnaire contained 45 questions which included respondent screening, data collection, and demographic questions (Appendix 7.1). The questionnaire took approximately 18 minutes for the interviewer to complete.

The key vegetable and fruit consumption questions (question F1 and V1 in Appendix 7.1) were sourced from the 1995 NNS (ABS 1999). Questions about the type of milk consumed were also from the 1995 NNS; soft drink and take away consumption were sourced from the Office of Economic and Statistical Research Queensland Young Adults Longitudinal Survey and the 2003 Infant and Child Nutrition Survey respectively. They have been validated using dietary assessment methods, such as three-day

weighted food records (Riley, Rutishauser and Webb 2001), 24-hour recalls (Marks et al. 2001) (Resnicow et al. 2000) and food frequency questionnaires (FFQs) (Serdula et al. 1993) (Resnicow et al. 2000). These questions were included to enable future comparison with other surveys and to indicate changes in overall dietary habits.

Questions regarding domestic food supply, food buying habits, knowledge of recommendations, and perceptions of quality were adapted from previous questionnaires and/or developed by the study authors.

2.3 Response rate

A total of 1228 persons aged 18 years and over, living in the GAI completed The South West Queensland Nutrition Survey 2004. The response rate among eligible individuals was 80.3 per cent.

2.4 Weighting procedures

Weighting is the process of adjusting results from a sample survey to be able to infer results for the total population. The aim of weighting is to minimise any bias in the data resulting from an over- or under-representation of a particular age group or sex and to adjust for the chance of the respondent being included in the survey. To do this, a 'weight' is allocated to each respondent.

The first step in calculating weights for The South West Queensland Nutrition Survey 2004 was to assign an initial weight. Initial weights were based on how many people in the respondent's household were eligible to respond to the survey. A person's initial weight was calculated as the inverse of the probability of being selected within their household. For example, if the respondent was the only eligible person in their household then they had a probability of one of being selected, so they were assigned an initial weight of one. If there were two eligible people in the household, then the respondent had a probability of 1/2 of being selected so they were assigned an initial weight of two.

The initial weights were adjusted to align with independent estimates of the population of interest, referred to as 'benchmarks', in designated sex by age categories. Weights adjusted against population benchmarks compensate for over- or under-enumeration of particular categories of persons and ensure that the survey estimates conform to the independently-estimated distribution of the population by age and sex, rather than to the distribution within the sample itself.

The South West Queensland Nutrition Survey 2004 was benchmarked to population counts from the Estimated Resident South West Statistical Area Population at 30 June 2003, based on results from the 2001 Census of Population and Housing.

2.5 Data analysis

After the data were weighted, a demographic profile of the study population was completed, which included describing peoples' personal characteristics and their geographic location. This was followed by an analytical investigation of the information. Descriptive, univariate and multivariate analyses of the data were performed using SPSS (Version 12.0).

Univariate measures of association were examined for three categories of outcome (dependent) variables, namely: persons meeting the national daily consumption recommendations for both vegetables (five serves) and fruit (two serves); persons meeting the national daily consumption recommendations for vegetables (five serves); and persons meeting the national daily consumption recommendations for fruit (two serves).

Univariate measures of association between the outcome variables and a number of independent variables were investigated. Demographic variables analysed included sex, age, Aboriginal and Torres Strait Islander status, place of residence (see survey questions R1, R1a, R2, R3 Appendix 7.1), income, education, employment status, household type, and marital status. Other variables relating to usual food consumption patterns were also investigated, these include 100% fruit juice consumption, soft drink and sports drink consumption, take-away food consumption, type of milk consumed, and reported knowledge of national vegetable and fruit consumption recommendations.

Only valid percent was reported. This ensures that missing data are excluded and bases analysis on the number of values present.

Following univariate analysis, adjusted measures of association between variables of interest and the outcome variables were determined by conducting multivariate logistic regression analysis of the data. The logistic regression model was constructed by entering all significantly associated variables into the equation simultaneously and running the full model. A backward elimination procedure was employed to determine which variables remained significant. The Wald test was used to evaluate significance.

2.6 Data limitations

Limitations of nutrition data

Aboriginal and Torres Strait Islander people were under-represented in The South West Queensland Nutrition Survey 2004. Approximately 9.6 per cent of the South West population identify as Aboriginal and/or Torres Strait Islander, compared with 3.1 per cent in Queensland (Queensland Health 2004). For this survey, the proportion of people in the sample who identified as Aboriginal and/or Torres Strait Islander was 6.2 per cent (n=76). It was a limitation of the CATI survey method that only people with a household telephone could be surveyed. Local knowledge indicates that telephone ownership is more unlikely amongst Aboriginal and Torres Strait Islander people. Other survey methods that could have been employed with Aboriginal and Torres Strait Islander people, such as face to face interviews or focus groups were not conducted due to the time and cost required to gather sufficient data.

It was important to survey as many Aboriginal and Torres Strait Islander people as possible to capture nutrition data for this population in the South West. Across Queensland, Aboriginal and Torres Strait Islander people suffer a greater burden of disease due to nutrition-related causes compared to non-Indigenous people (Queensland Health 2004) The South West Queensland Nutrition Survey 2004 was able to make some assessment of the vegetable and fruit intake of Aboriginal and Torres Strait Islander people, but the small number of respondents (n=76) limited the analysis that could be conducted and the authors note results reported should be treated as an indication only, due to the very small numbers surveyed. Despite the small numbers, reporting this analysis was deemed important by study authors.

Some of the questions in this survey were not evaluated or validated prior to inclusion. This means that the results of some questions (full questionnaire in Appendix 7.1) may not provide true results, nor is there other data to which the results can be compared (questions N3 to N7; S3 to S10a Appendix 7.1).

Sports drink consumption may be seasonal and possibly under-estimated in this survey. The survey was conducted in October and November 2004. This is a hot climatic period for South West Queensland and few sporting activities are conducted. Sports drinks are most likely to be consumed during the cooler months when people are more active with organised sport. It is likely that consumption of these drinks has been under-estimated.

Great care was taken to ensure the results of the survey were as accurate as possible. However, certain factors, that cannot be compensated for, may affect the results and are discussed below.

■ **Sampling variability**

All estimates in this survey are based on a sample of the population and therefore may differ from the figures which would have been obtained had the entire population of the South West Statistical Division 2004 been interviewed.

■ **Non-sampling errors**

Non-sampling error refers to errors that occur in any enumeration, whether it is a full count or a sample. Every effort was made to minimise non-sampling error through careful design of questionnaires; intensive training and supervision of interviewers; and efficient operating procedures. The main types of non-sampling error are discussed below:

1. Errors related to scope and coverage

The South West Queensland Nutrition Survey 2004 was conducted by telephone. This meant that some people were not included in the survey:

- people living in households without a fixed telephone
- people unable to speak English sufficiently well for an interview to be conducted
- people with a mental or physical disability which prevented them from being able to take part in a telephone interview
- people who were usual residents of the selected household who were absent from the household during the interviewing hours during the interview period.

Also, despite intensive interviewer training, some individuals may have been wrongly excluded or included as a result of difficulties (for both the interviewer and the respondent) in applying the rules regarding selection of the appropriate adult from the household.

2. Rounding errors

As described in weighting procedures, each respondent is allocated a weight. Therefore discrepancies may occur between the sum of the categories and the total eligible sample size.

3. Response errors

Response errors may have arisen in the survey as a result of deficiencies in the questionnaire design, imperfections in reporting by respondents and recording by interviewers, and errors made in coding and processing data. Where possible, attempts were made to minimise these potential sources of error.

4. Non-response bias

There are two main types of non-response - when people cannot be contacted, and when people refuse to participate. Non-response may bias the results to the extent that non-responders differ from respondents in the characteristics being measured. It was not possible to quantify these differences in this study but attempts were made to keep the non-response rate as low as possible.

/// 3 Results

/// 3.1 Demographic profile of sample

A total of 1228 persons aged 18 years and over, living in the GAI completed the survey. Of these, eight people were unable to be assigned to a LGA. As seen in Table 1, there was general agreement in the geographic distribution of persons interviewed compared to the 2003 ERP, which is based on census data. The only exceptions were in Roma LGA, which was over sampled (29.8 per cent compared with 24.5 per cent) and Bungil LGA which was under sampled (3.9 per cent compared with 7.5 per cent).

Table 1: Distributions of persons aged 18 and over by local government areas in the South West Statistical Division for *The South West Queensland Nutrition Survey 2004 and 2003 Estimated Resident Population*

LGA	Survey		2003 ERPs	
	Number	Percentage (%)	Number	Percentage (%)
Balonne	253	20.7	3982	20.3
Bendemere	53	4.3	708	3.6
Booringa	90	7.4	1419	7.2
Bulloo	19	1.6	354	1.8
Bungil	47	3.9	1473	7.5
Murweh	207	17	3634	18.5
Paroo	83	6.8	1590	8.1
Quilpie	58	4.8	841	4.3
Roma	364	29.8	4822	24.5
Warroo	41	3.4	824	4.2
Total	1220	100	19647	100

The proportion of the study sample that identified as Aboriginal and/or Torres Strait Islander was 6.2 per cent (76 persons).

For the purpose of analysis, respondents were categorised into residential locations: 'large town', 'small town' or 'out of town'. For this survey, Roma, St George, Charleville and Cunnamulla were classified as large towns. In the sample, 44.0 per cent, 20.3 per cent and 35.6 per cent of people lived in 'large towns', 'small towns' and 'out of town', respectively. Respondents reported how far by road they lived from their nearest town. For those who lived out of town, 33.6 per cent lived less than 20 kilometres from town, 56.5 per cent lived 20 kilometres to 100 kilometres from their nearest town and 9.9 per cent were more than 100 kilometres from town.

The education level of respondents is shown in Table 2. Almost 60 per cent of respondents reported having a secondary or primary education as their highest education level attained.

Table 2: Distribution of persons aged 18 years and over by education level attained in *The South West Queensland Nutrition Survey 2004*

Education Level	Number	Percentage (%)
Tertiary education	157	12.8
Trade or technical	350	28.6
Secondary education	500	40.9
Primary education	215	17.6
Total	1222	100

Respondents were asked about their annual gross household income (Table 3). Approximately 11 per cent of people declined to answer the question and almost 50 per cent reported an annual income of \$50,000 or less.

Table 3: Distribution of persons aged 18 and over by gross annual household income in *The South West Queensland Nutrition Survey 2004*

Income (\$)	Number	Percentage (%)
<25 000	244	19.9
25 001-50 000	328	26.9
50 001-100 000	352	28.7
>100 000	166	13.5
Missing	138	11.2
Total	1228	100

To infer results for the total population of the South West Statistical Division, the data were weighted for age and sex, as outlined in the methodology section.

3.2 Vegetable and fruit consumption compared to national recommendations

The results from this survey have been analysed and reported around three key areas:

- People who reported meeting both the vegetable and fruit consumption recommendations (five serves of vegetables and two serves of fruit daily)
- People who reported meeting the vegetable consumption recommendation (five serves of vegetables daily)
- People who reported meeting the fruit consumption recommendation (two serves of fruit daily). The survey found that as few as 7.5 per cent of people reported usually consuming both the recommended five serves of vegetables and two serves of fruit each day (Figure 2). The proportion of people usually achieving the recommended daily vegetable intake was 14.6 per cent, whereas the proportion usually meeting the recommended daily fruit intake was 43.1 per cent.

Sex and age

In univariate analysis, females (9.7 per cent) were significantly more likely than males (5.5 per cent) to report consuming the recommended serves of both vegetables and fruit (OR 1.9, 95%CI: 1.2-2.9) (Table 4).

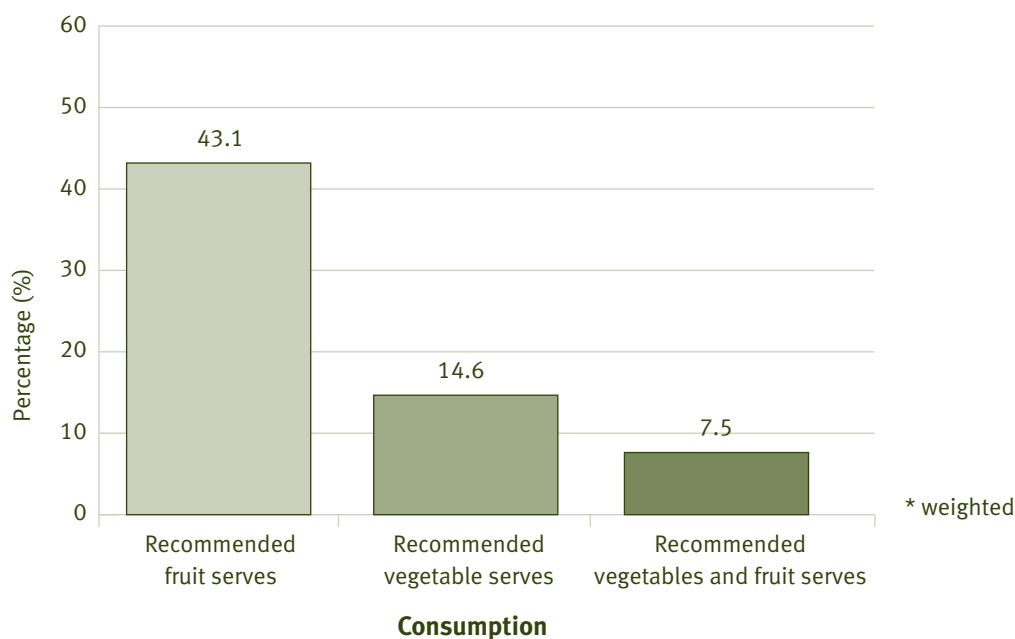
Similarly, females (17.0 per cent) were significantly more likely than males (12.3 per cent) to report consuming recommended serves of vegetables (OR 1.5, 95%CI: 1.1-2.0). Females (50.8 per cent) were also significantly more likely than males (36.0 per cent) to report consuming recommended serves of fruit (OR 1.8, 95%CI: 1.5-2.3).

On average, the largest proportion of people reported usually consuming two serves of vegetables (30.3 per cent) (Figure 3) and one serve of fruit per day (35.4 per cent) (Figure 4).

A similar trend was also seen by age (Figure 5 and Figure 6). For the purposes of presenting these data, age groups were collapsed where data were similar. Usual vegetable intake increased with increasing age (Figure 5). A comparable trend was observed for usual fruit consumption (Figure 6).

People aged 30 years and over were significantly more likely than young people aged 18 to 29 years to report usually consuming recommended serves of both vegetables and fruit (Table 4).

Figure 2: Proportion of people who reported usually consuming recommended daily serves of vegetables and fruit*, *The South West Queensland Nutrition Survey 2004*



/// 3 Results

Figure 3: Proportion of males/females by reported usual intake of vegetables*,
The South West Queensland Nutrition Survey 2004



Figure 4: Proportion of males/females by reported usual daily intake of fruit*,
The South West Queensland Nutrition Survey 2004

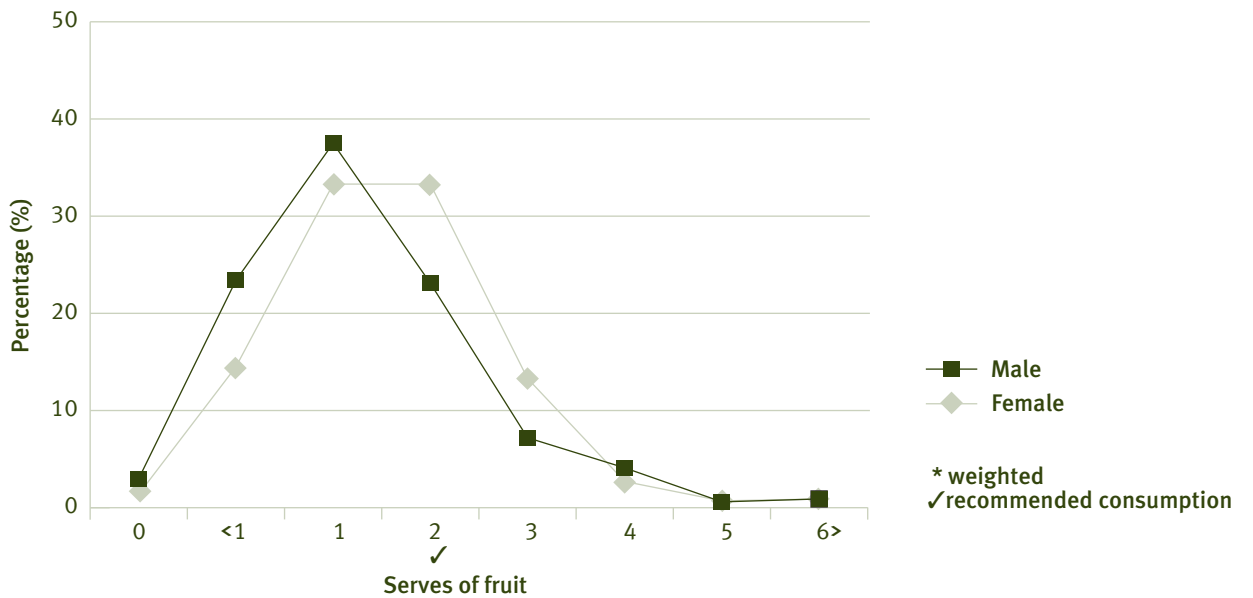


Figure 5: Proportion of people by reported usual intake of vegetables*,
The South West Queensland Nutrition Survey 2004

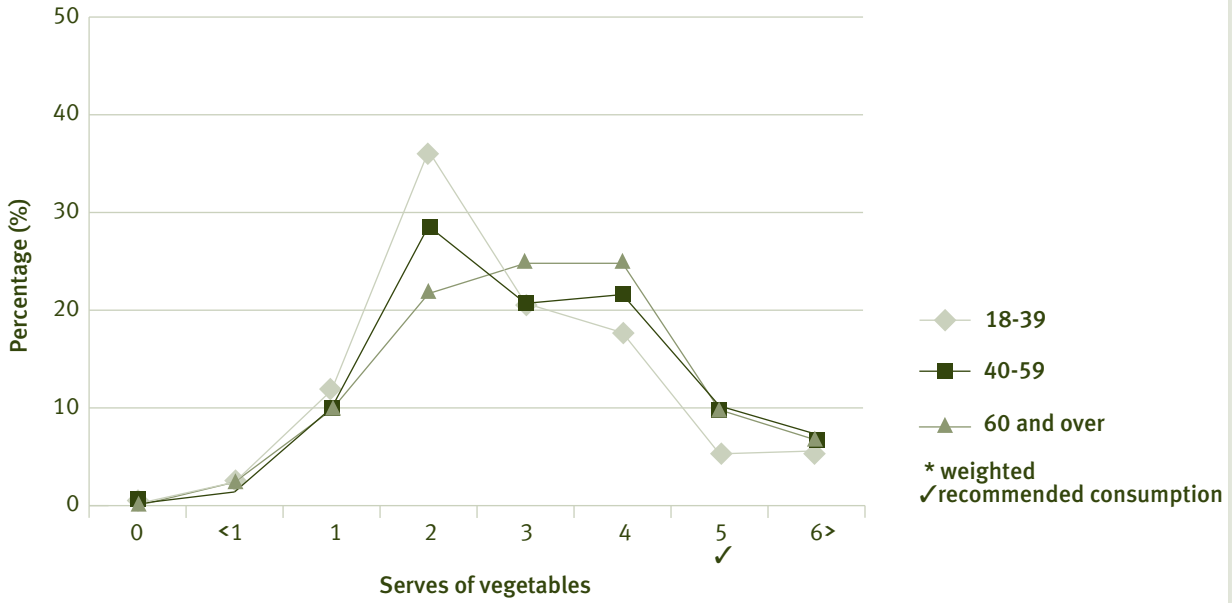
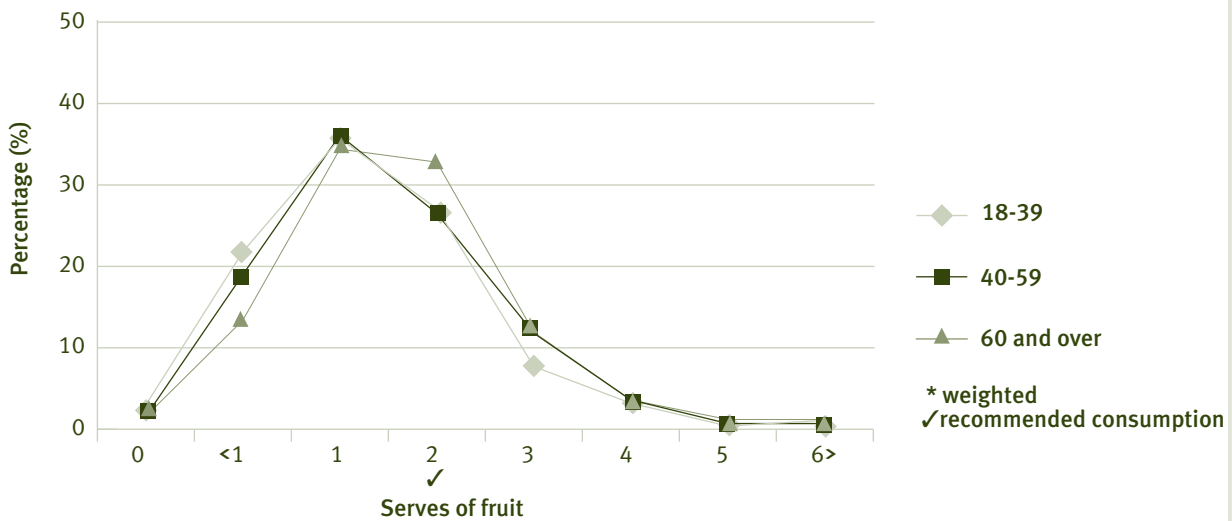


Figure 6: Proportion of people by reported usual intake of fruit*,
The South West Queensland Nutrition Survey 2004



■ **Aboriginal and Torres Strait Islander status**

Aboriginal and Torres Strait Islander people were more likely to report consuming recommended serves of vegetables (19.0 per cent, $n=1$) compared to non-Indigenous people (14.2 per cent), however the result was not statistically significant. Non-Indigenous people (44.0 per cent) were significantly more likely than Aboriginal and Torres Strait Islander people (31.0 per cent) to report consuming recommended serves of fruit daily (OR 1.8, 95%CI: 1.1-2.9) (Table 6).

■ **Residential location**

In univariate analysis, people who lived 20 kilometres or more from their nearest town were significantly more likely than people who lived in town to report consuming recommended daily serves of both vegetables and fruit (OR 1.7, 95%CI: 1.1-2.8) (Table 4). People who lived 20 kilometres or more from town were also significantly more likely than people who lived in town to report consuming the recommended daily serves of fruit (OR 1.4, 95%CI: 1.1-1.8) (Table 6).

■ **Income**

No significant associations were found between income level and reported consumption of recommended daily serves of vegetables and/or fruit.

■ **Household type and marital status**

No associations were demonstrated between marital status or household type (people living with and without children) and reported usual consumption of recommended serves of vegetables and/or fruit.

■ **Education**

In general, no significant associations were found between education levels and reported usual consumption of recommended daily serves of vegetables and/or fruit. However, people with a higher education level were significantly more likely than those with primary school education to report usually consuming the recommended daily fruit intake (Table 6).

■ **Employment**

For most employment categories, there were no significant associations found between employment categories and reported usual consumption of recommended daily serves of vegetables and/or fruit. However, retired people were significantly more likely than working people to report consuming recommended serves of both vegetables and fruit (OR 2.0, 95%CI: 1.1-3.7) (Table 4) and to report consuming recommended serves of vegetables only (OR 1.7, 95%CI: 1.1-2.8) (Table 5).

/// 3.3 Frequency of fresh, tinned/ bottled, dried, frozen vegetable and fruit consumption

The median weekly reported consumption of fresh vegetables was seven times per week, twice per week for frozen vegetables and once per week for tinned/bottled vegetables. Dried vegetables were rarely reported to be consumed (Figure 7). The median reported fresh fruit consumption was seven times per week. Consumption frequency of other forms of fruit was reported less than once per week (Figure 8).

/// 3.4 Fruit juice consumption

About one-third (34.6 per cent) of people reported never consuming 100% fruit juice. Approximately half (47.6 per cent) reported drinking fruit juice rarely or not every day and 17.8 per cent reported drinking juice daily or more frequently.

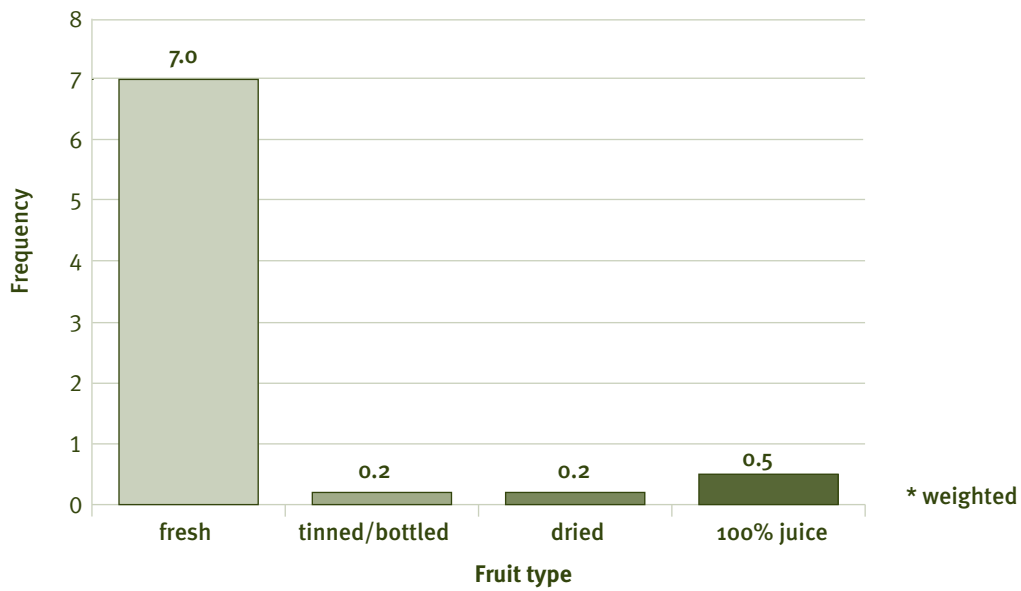
■ **Vegetable and fruit consumption**

The reported usual consumption of recommended serves of vegetables was not significantly associated with reported consumption of 100% fruit juice. However, people who reported consuming 100% fruit juice at least daily were twice as likely to report consuming two serves of fruit per day, compared to those who never drank fruit juice (OR 2.1, 95%CI: 1.5-2.9) (Table 6).

Figure 7: Median weekly reported consumption by vegetable type*,
The South West Queensland Nutrition Survey 2004

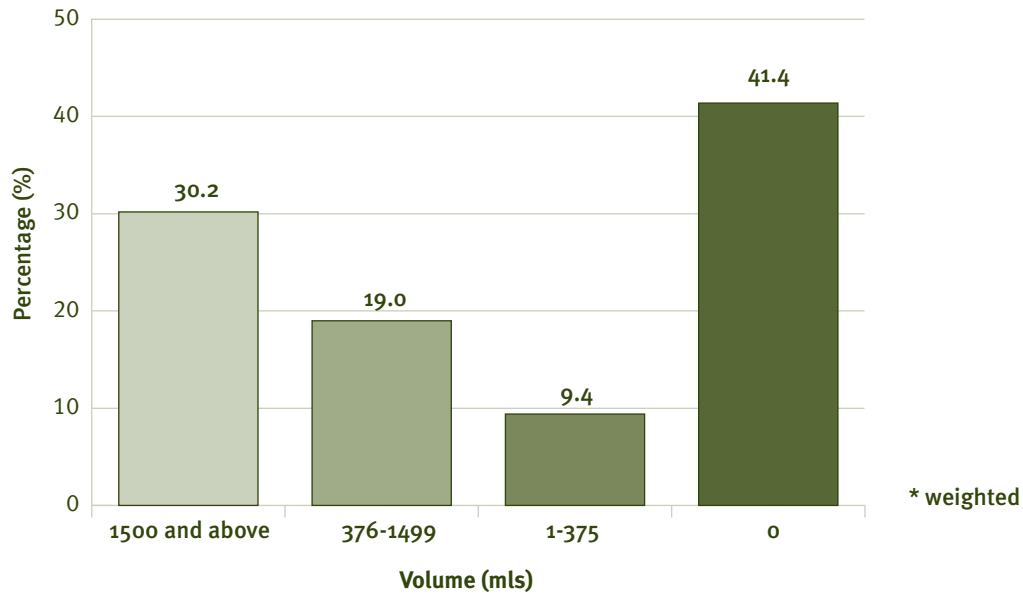


Figure 8: Median weekly reported consumption by fruit type*,
The South West Queensland Nutrition Survey 2004



/// 3 Results

Figure 9: Proportion of people by reported weekly soft drink and sports drink consumption*,
The South West Queensland Nutrition Survey 2004



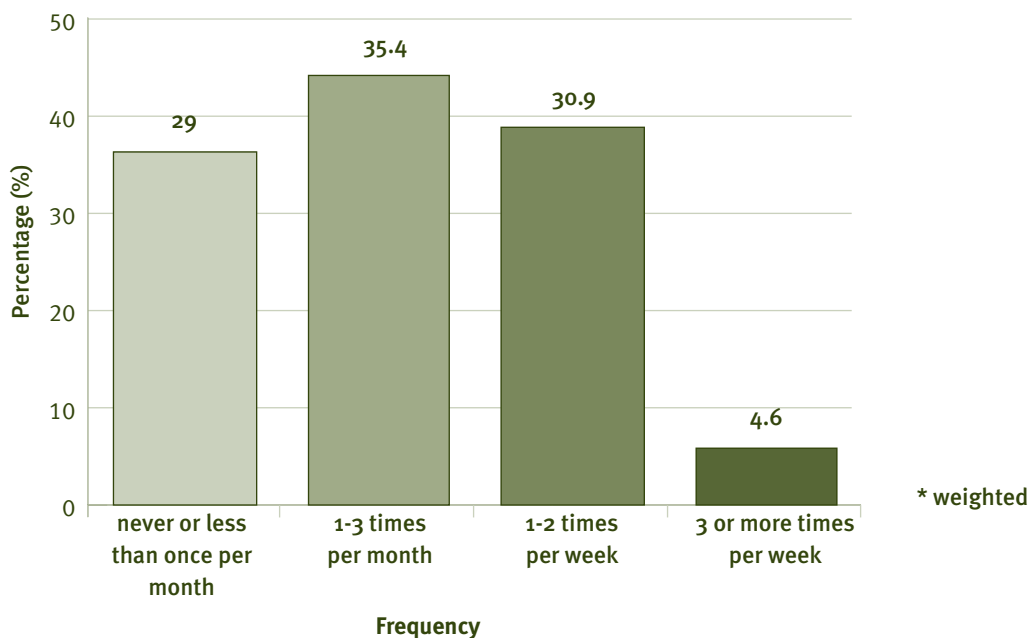
/// 3.5 Soft drink and sports drink consumption

More than 40 per cent of the population reported never consuming soft drink or sports drink. However, 30 per cent of the population reported consuming 1.5 litres or more each week (Figure 9).

■ Vegetable and fruit consumption

People who reported never drinking soft drink and sports drink were almost three times more likely to report consuming the recommended daily serves of both vegetables and fruit compared to those who drank 1.5 litres or more per week (OR 2.8, 95%CI; 1.6-5.0) (Table 4). Similarly, people who reported never drinking soft drink and sports drink were significantly more likely than those consuming 1.5 litres or more per week to consume recommended daily serves of vegetables (OR 1.7, 95%CI; 1.2-2.5) (Table 5) and fruit (OR 2.6, 95%CI; 2.0-3.5) (Table 6).

Figure 10: Proportion of people by reported frequency of take-away food consumption*,
The South West Queensland Nutrition Survey 2004



/// 3.6 Take-away food consumption

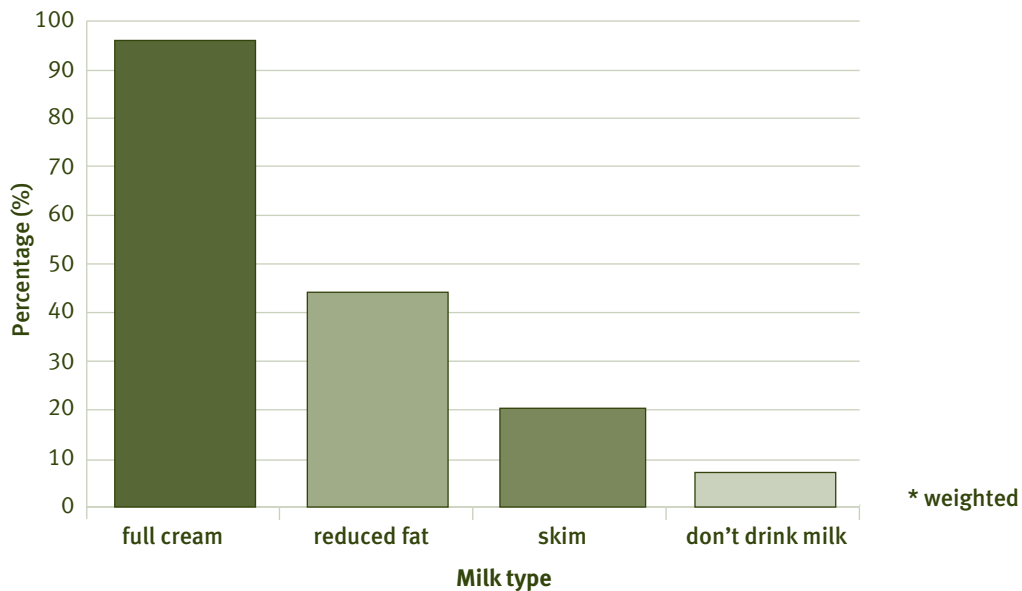
The highest proportion of people reported consuming take-away food one to three times per month (35.4 per cent). Almost five per cent of the population reported consuming take-away food three or more times per week (Figure 10).

■ Vegetable and fruit consumption

In univariate analysis, people who never or rarely reported consuming take-away food were four times more likely than people who reported eating take-away food at least weekly, to report consuming the recommended serves of both vegetables and fruit (OR 4.0, 95%CI: 2.2-7.1) (Table 4). People who reported never or rarely consuming take-away food were also significantly more likely than people who reported consuming take-away food at least weekly, to report consuming the recommended daily serves of vegetables only (OR 2.6, 95%CI: 1.8-3.8) (Table 5) and fruit only (OR 1.7, 95%CI: 1.3-2.2) (Table 6). None of the people who reported consuming take-away foods three or more times per week reported consuming the recommended daily serves of both vegetables and fruit.

/// 3 Results

Figure 11: Proportion of people by reported fat content of milk consumed*
The South West Queensland Nutrition Survey 2004



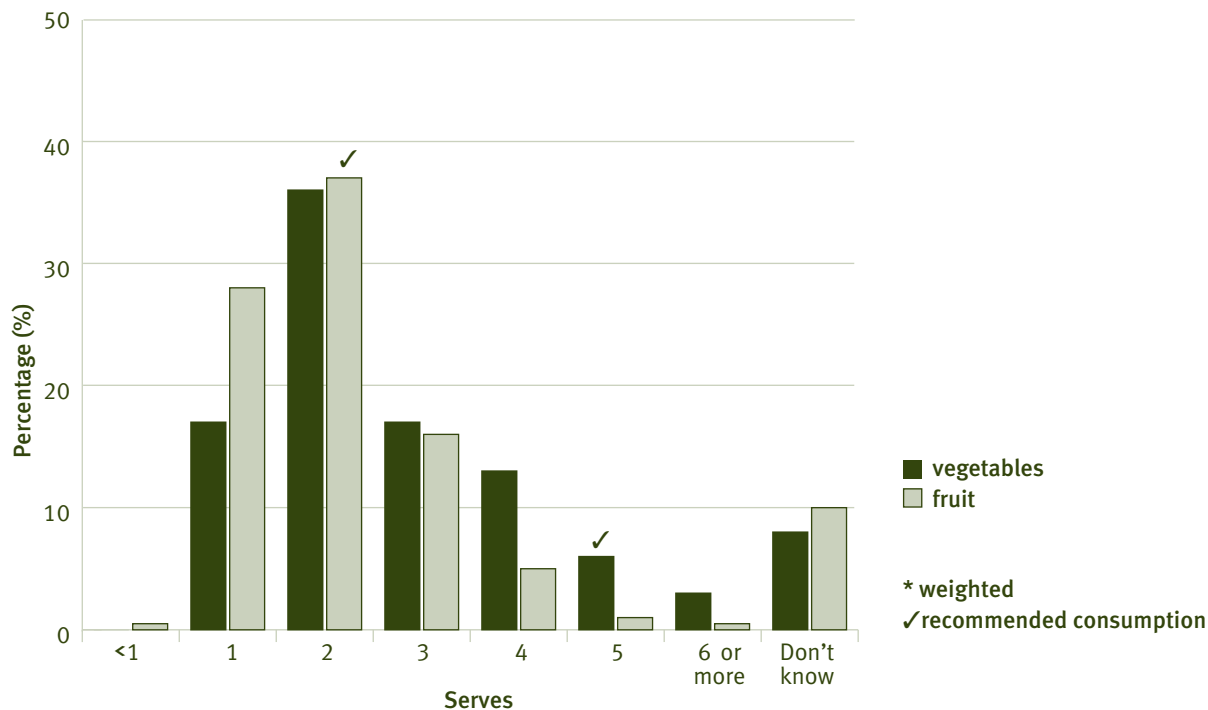
/// 3.7 Milk consumption

Of the total population, 57.8 per cent reported drinking full cream milk, 26.3 per cent reported drinking reduced fat milk, 11.7 per cent reported drinking skim milk and 4.2 per cent reported not drinking milk (Figure 11).

■ Vegetable and fruit consumption

In univariate analysis, people who reported drinking skim milk were greater than six times more likely to report consuming recommended daily serves of both vegetables and fruit compared to those who reported not drinking milk (OR 6.6, 95%CI: 1.3-33.2) (Table 4). In addition, people who reported drinking skim milk (OR 3.3, 95%CI: 1.7-6.4) or reduced fat milk (OR 2.1, 95%CI: 1.1-3.9) were significantly more likely than people who did not drink milk to report consuming the recommended daily serves of fruit (Table 6).

**Figure 12: Reported knowledge of recommended daily intake of fruit and vegetables*
The South West Queensland Nutrition Survey 2004**



3.8 Knowledge of national vegetable and fruit consumption guidelines

Approximately six per cent of people reported the correct response for recommended daily number of serves of vegetables (five serves) and 37.1 per cent reported the correct response for recommended daily fruit serves (two serves). Nine per cent (vegetables) and 10.9 per cent (fruit) of people reported that they did not know (Figure 12).

Vegetable and fruit consumption

People who reported correct knowledge of the recommended serves of vegetables and fruit were significantly more likely, than those who did not have this knowledge, to also consume the recommended serves of both vegetables and fruit (OR 5.1, 95%CI 2.1-12.1) (Table 4). Similarly, people who reported correct knowledge of the recommended serves of vegetables were significantly more likely to consume recommended daily serves of vegetables (OR 6.0, 95%CI; 3.7-9.7) (Table 5) and fruit (OR 1.4, 95%CI; 1.1-1.8) (Table 6).

/// 3 Results

Table 4: Univariate analysis of reported consumption of recommended daily serves of both vegetables and fruit by selected variables, The South West Queensland Nutrition Survey 2004

Variable	Odds Ratio	95% Confidence Interval	P-value
Sex			
Male	1.0	Reference	
Female	1.858	1.201-2.875	0.005**
Age group (years)			
18-29	1.0	Reference	0.013**
30-39	3.719	1.426-9.699	0.007**
40-49	4.212	1.618-10.963	0.003**
50-59	5.725	2.206-14.856	0.000**
60-69	5.460	1.977-15.081	0.001**
70 and over	5.054	1.813-14.091	0.002**
Aboriginal and Torres Strait Islander status			
Yes	1.0	Reference	
No	1.443	0.547-3.808	0.459
Distance from nearest town			
In town	1.0	Reference	0.063
Less than 20km	0.939	0.449-1.963	0.868
More than 20km	1.717	1.071-2.752	0.025**
Income			
Less than \$25,000	1.0	Reference	0.333
\$25,001-\$50,000	1.717	0.859-3.430	0.126
\$50,001-\$100,000	1.197	0.583-2.461	0.624
Over \$100,000	1.048	0.435-2.520	0.917
Education			
Primary	1.0	Reference	0.945
Secondary	0.892	0.486-1.637	0.712
Trade or technical	0.966	0.510-1.829	0.916
Tertiary	0.805	0.362-1.791	0.595
Employment			
Working	1.0	Reference	0.157
Home duties	1.105	0.571-2.137	0.767
Unemployed or permanently ill or unable to work	0.509	0.104-2.487	0.404
Student	2.423	0.226-25.955	0.464
Retired	2.025	1.106-3.711	0.022**

Variable	Odds Ratio	95% Confidence Interval	P-value
100% fruit juice consumption			
Never consume	1.0	Reference	0.685
Rarely to less than daily	1.137	0.699-1.851	0.604
Daily or more	1.305	0.712-2.390	0.389
Soft drink and sports drink consumption			
1500 ml and above per week	1.0	Reference	0.001*
376-1499 ml per week	1.167	0.535-2.546	0.698
1-375 ml per week	1.823	0.772-4.306	0.171
Never	2.829	1.589-5.037	0.000*
Take-away food consumption			
1 or more times per week	1.0	Reference	0.000*
1-3 times per month	1.797	0.963-3.355	0.066
Never or less than once per month	3.960	2.214-7.084	0.000*
Type of milk consumed			
Does not drink milk	1.0	Reference	0.000*
Full cream	2.110	0.430-10.353	0.358
Reduced fat	1.962	0.385-9.994	0.417
Skim milk	6.569	1.300-33.185	0.023*
Knowledge of recommended serves			
Incorrect knowledge	1.0	Reference	
Correct knowledge: 5 vegetables 2 fruit serves daily	5.078	2.122-12.148	0.000*

*P ≤ 0.05, denotes statistical significance

/// 3 Results

Table 5: Univariate analysis of reported consumption of recommended daily serves of vegetables by selected variables, The South West Queensland Nutrition Survey 2004

Variable	Odds Ratio	95% Confidence Interval	P-value
Sex			
Male	1.0	Reference	
Female	1.447	1.051-1.990	0.023**
Age group (years)			
18-29	1.0	Reference	0.050**
30-39	1.512	0.871-2.627	0.142
40-49	2.047	1.195-3.506	0.009**
50-59	2.258	1.295-3.936	0.004**
60-69	2.105	1.128-3.929	0.019**
70 and over	1.993	1.061-3.743	0.032**
Aboriginal and Torres Strait Islander status			
Yes	1.0	Reference	
No	0.711	0.401-1.261	0.244
Distance from nearest town			
Live in town	1.0	Reference	0.784
Live less than 20km from nearest town	1.000	0.601-1.666	0.999
Live more than 20km from nearest town	1.141	0.782-1.665	0.495
Income			
Less than \$25,000	1.0	Reference	0.390
\$25,001-\$50,000	1.467	0.889-2.422	0.134
\$50,001-\$100,000	1.203	0.723-2.000	0.476
Over \$100,000	1.020	0.548-1.899	0.951
Education			
Primary	1.0	Reference	0.377
Secondary	0.800	0.517-1.238	0.316
Trade or technical	0.775	0.486-1.238	0.287
Tertiary	0.585	0.319-1.073	0.083
Employment			
Working	1.0	Reference	0.097
Home duties	1.008	0.607-1.674	0.976
Unemployed or permanently ill or unable to work	2.000	0.978-4.088	0.058
Student	1.158	0.109-12.327	0.903
Retired	1.734	1.062-2.832	0.028**

Variable	Odds Ratio	95% Confidence Interval	P-value
100% fruit juice consumption			
Never consume	1.0	Reference	0.759
Rarely to less than daily	1.128	0.788-1.616	0.509
Daily or more	1.154	0.728-1.831	0.542
Soft drink and sports drink consumption			
1500 ml and above per week	1.0	Reference	0.045*
376-1499 ml per week	1.135	0.687-1.876	0.622
1-375 ml per week	1.351	0.736-2.479	0.332
Never	1.699	1.146-2.519	0.008*
Take-away food consumption			
1 or more times per week	1.0	Reference	0.000*
1-3 times per month	1.091	0.713-1.670	0.688
Never or less than once per month	2.593	1.752-3.837	0.000*
Type of milk consumed			
Does not drink milk	1.0	Reference	0.220
Full cream	0.889	0.406-1.947	0.769
Reduced fat	0.811	0.357-1.843	0.617
Skim milk	1.374	0.583-3.236	0.468
Knowledge of recommended serves			
Incorrect knowledge	1.0	Reference	
Correct knowledge: 5 vegetable serves daily	6.008	3.713-9.721	0.000*

*P ≤ 0.05, denotes statistical significance

/// 3 Results

Table 6: Univariate analysis of reported consumption of recommended daily serves of fruit by selected variables, The South West Queensland Nutrition Survey 2004

Variable	Odds Ratio	95% Confidence Interval	P-value
Sex			
Male	1.0	Reference	
Female	1.837	1.461-2.308	0.000**
Age group (years)			
18-29	1.0	Reference	0.026**
30-39	1.182	0.835-1.675	0.346
40-49	1.221	0.856-1.742	0.271
50-59	1.348	0.926-1.963	0.119
60-69	2.132	1.386-3.278	0.001**
70 and over	1.375	0.895-2.110	0.146
Aboriginal and Torres Strait Islander status			
Yes	1.0	Reference	
No	1.783	1.103-2.881	0.018**
Distance from nearest town			
Live in town	1.0	Reference	0.042**
Live less than 20km from nearest town	1.282	0.897-1.834	0.173
Live more than 20km from nearest town	1.389	1.056-1.827	0.012**
Income			
Less than \$25,000 per year	1.0	Reference	0.380
\$25,001-\$50,000 per year	0.900	0.638-1.270	0.549
\$50,001-\$100,000 per year	1.179	0.842-1.653	0.340
Over \$100,000 per year	1.042	0.695-1.563	0.841
Education			
Primary	1.0	Reference	0.000**
Secondary	1.495	1.060-2.107	0.022**
Trade or technical	1.716	1.196-2.462	0.003**
Tertiary	3.248	2.114-4.991	0.000**
Employment			
Working	1.0	Reference	0.051
Home duties	1.380	0.975-1.954	0.069
Unemployed or permanently ill or unable to work	0.473	0.239-0.936	0.031**
Student	0.644	0.104-3.966	0.635
Retired	1.195	0.807-1.770	0.375

Variable	Odds Ratio	95% Confidence Interval	P-value
100% fruit juice consumption			
Never consume	1.0	Reference	0.000*
Rarely to less than daily	1.353	1.047-1.749	0.021*
Daily or more	2.084	1.496-2.903	0.000*
Soft drink and sports drink consumption			
1500 ml and above per week	1.0	Reference	0.000*
376-1499 ml per week	2.038	1.451-2.862	0.000*
1-375 ml per week	1.191	0.764-1.859	0.440
Never	2.625	1.979-3.481	0.000*
Take-away food consumption			
1 or more times per week	1.0	Reference	0.000*
1-3 times per month	1.583	1.206-2.077	0.001*
Never or less than once per month	1.686	1.267-2.244	0.000*
Type of milk consumed			
Does not drink milk	1.0	Reference	0.000*
Full cream	1.061	0.585-1.927	0.845
Reduced fat	2.107	1.138-3.902	0.018*
Skim milk	3.296	1.690-6.429	0.000*
Knowledge of recommended serves			
correct knowledge	1.0	Reference	
Correct knowledge: 2 fruit serves daily	1.423	1.117-1.813	0.004*

*P ≤ 0.05, denotes statistical significance

/// 3.9 Multivariate analysis

Logistic regression analyses of population sub-group variables were performed to identify which independent variables were significantly associated with daily consumption of the recommended serves of both vegetables and fruit (Table 4), recommended serves of vegetables (Table 5) and variables that were significantly associated with recommended serves of fruit (Table 6). Remaining independent variables that were significantly associated with daily consumption of recommended serves were then included in final multivariate logistic regression models. These models provide an estimate of the magnitude of the association between variables and consumption of recommended serves after adjusting simultaneously for a number of potential confounding factors.

Sex and age were kept in the model as potential confounders. Looking at the outcome of recommended daily consumption of both vegetables and fruit, the following variables were included in the final model for logistic regression analysis: age; sex; type of milk consumed; amount of soft drink consumed; frequency of take-away food consumption; distance residing from closest town; and reported knowledge of recommended serves of vegetables and fruit.

The model was run using a backwards elimination procedure where non-significant variables were progressively excluded until only independent variables that were significantly associated with the dependent variable (recommended serves) remained. The variables that remained significantly associated with reported consumption of the recommended serves of both vegetables and fruit were reported consumption of take-away food never or less than once per month (adj OR 2.7, 95%CI: 1.4-5.3); reported consumption of skim milk (adj OR 6.6, 95%CI: 1.3-34.4); and reported knowledge of recommended daily serves of vegetables and fruit (adj OR 4.3, 95%CI: 1.6-11.1).

Similarly, variables that were significantly associated with reported daily consumption of the recommended serves of fruit were included in a final multivariate logistic regression model. The following variables were included in the model: age; sex; Aboriginal and Torres Strait Islander status; education level; employment status; type of milk consumed; fruit juice consumption; amount of soft drink consumed; frequency of take-away food consumption; distance residing from closest town; and knowledge of recommended serves of fruit. The model was run using the backward elimination procedure as before.

The variables that remained significantly associated with reported consumption of the recommended serves of fruit included female sex, where females were 50 per cent more likely to consume recommended serves of fruit compared to males (adj OR 1.5, 95%CI: 1.1-1.9), reported consumption of skim milk (adj OR 2.6, 95%CI: 1.2-5.7), and reported never drinking soft drink (adj OR 1.9, 95%CI: 1.3-2.7). People who reported drinking fruit juice at least daily were more than twice as likely as those who never consumed fruit juice to consume the recommended daily serves of fruit (adj OR 2.4, 95%CI: 1.6-3.5).

In addition, people with tertiary as highest education level were three times more likely than those with primary school as highest level to consume recommended serves of fruit (adj OR 3.2, 95%CI: 1.8-5.4). Those with trade or technical qualifications as highest level education were twice as likely as those with primary school as highest level to consume recommended serves of fruit (adj OR 2.0, 95%CI: 1.2-3.1). Those who reported correct knowledge of recommended daily serves of fruit were also significantly more likely than those who did not report this knowledge to consume the recommended serves (adj OR 1.4, 95%CI: 1.1-1.8).

No significant associations were shown for any variables when the final logistic regression model was run for the reported consumption of recommended daily serves of vegetables.

/// 3.10 Food supply and food security

■ Sourcing vegetables and fruit

People who lived in town reported getting their fresh vegetables and fruit from their closest local town more often than those who reported living outside of town. People who lived outside of town were more likely to report getting their fresh vegetables and fruit from another town; buy them through country order; or grow their own, compared to those who reported living in town (Figure 13) (Figure 14). Respondents could report multiple sources of fresh vegetables and fruit.

Aboriginal and Torres Strait Islander people were more likely to report getting vegetables and fruit from another town, but less likely to grow them and be given them. No Aboriginal and Torres Strait Islander people reported using country order to get their vegetables and fruit (Figure 15) (Figure 16). Respondents were able to report multiple sources of fresh vegetables and fruit.

Figure 13: Reported source of fresh vegetables by residential location*,
The South West Queensland Nutrition Survey 2004

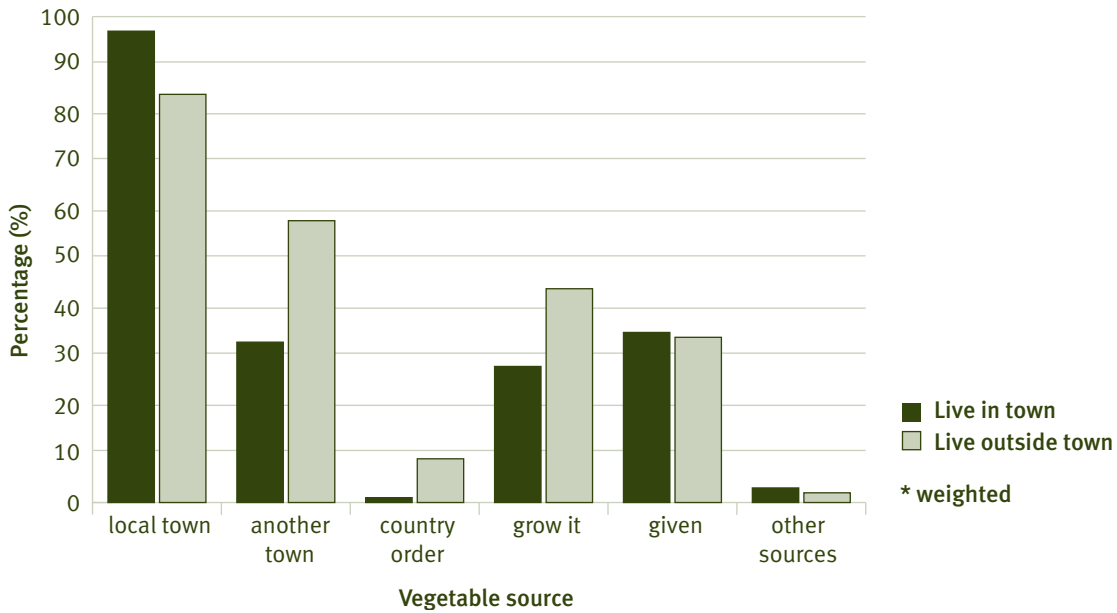


Figure 14: Reported source of fresh fruit by residential location*,
The South West Queensland Nutrition Survey 2004

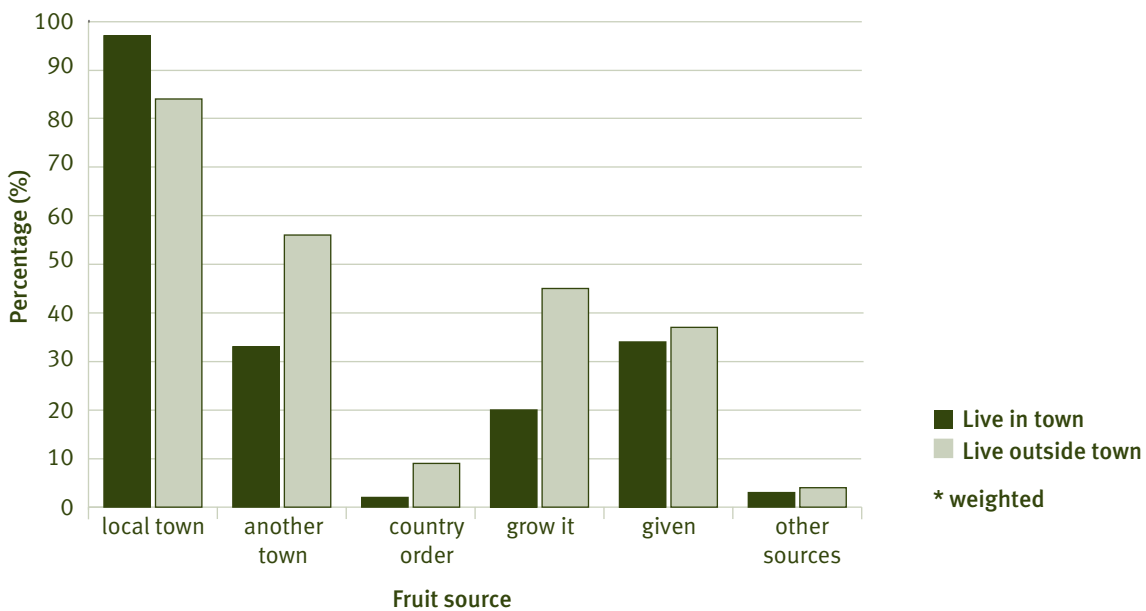


Figure 15: Reported source of fresh vegetables by Indigenous status*,
The South West Queensland Nutrition Survey 2004

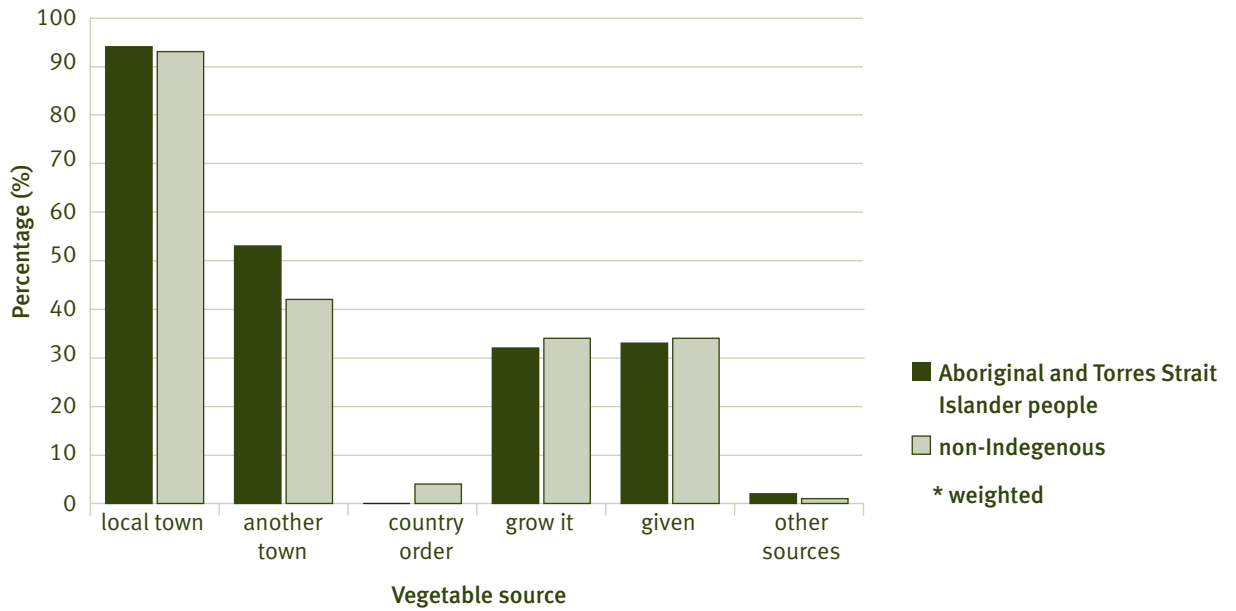


Figure 16: Reported source of fresh fruit by Indigenous status*,
The South West Queensland Nutrition Survey 2004

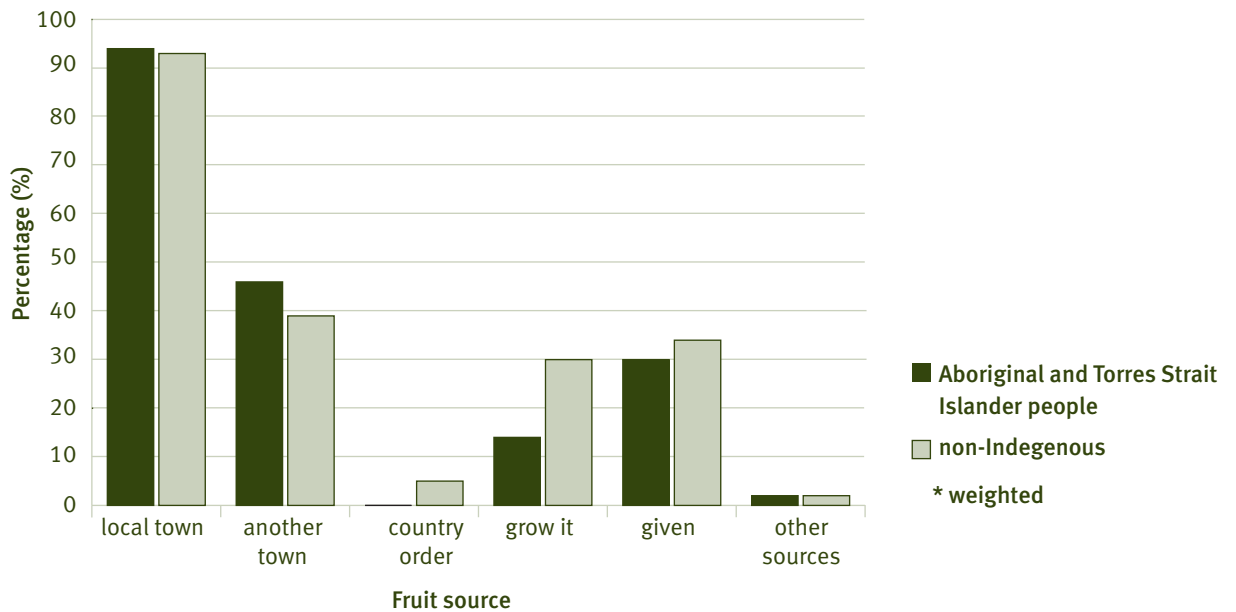
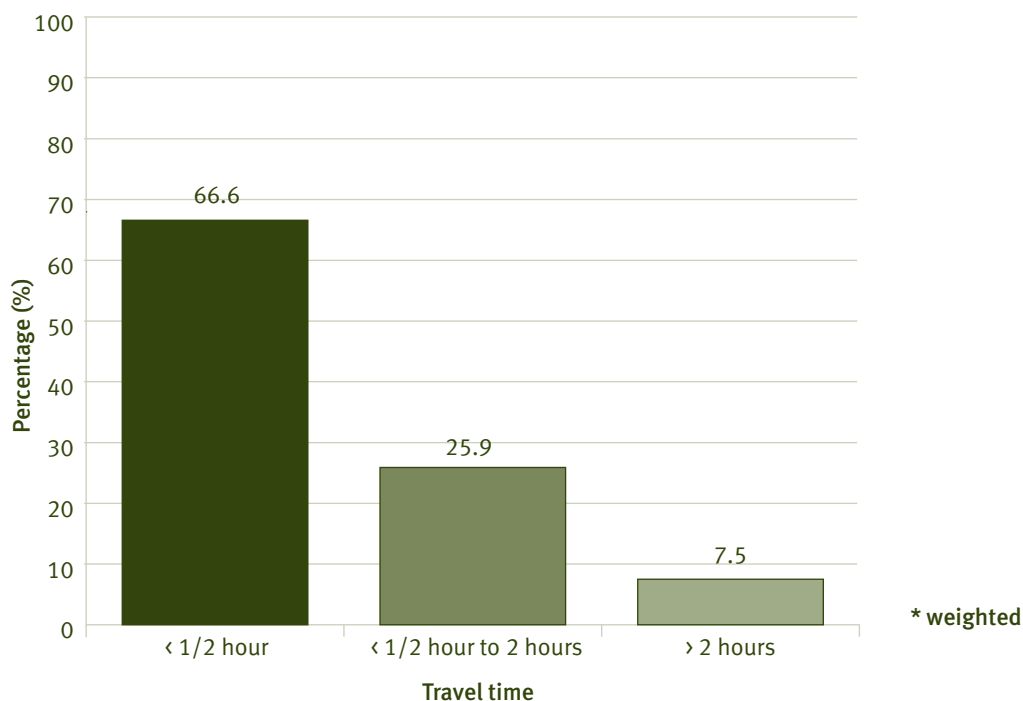


Figure 17: Proportion of people by reported time taken to transport vegetables and fruit home*,
The South West Queensland Nutrition Survey 2004



■ **Shopping for vegetables and fruit**

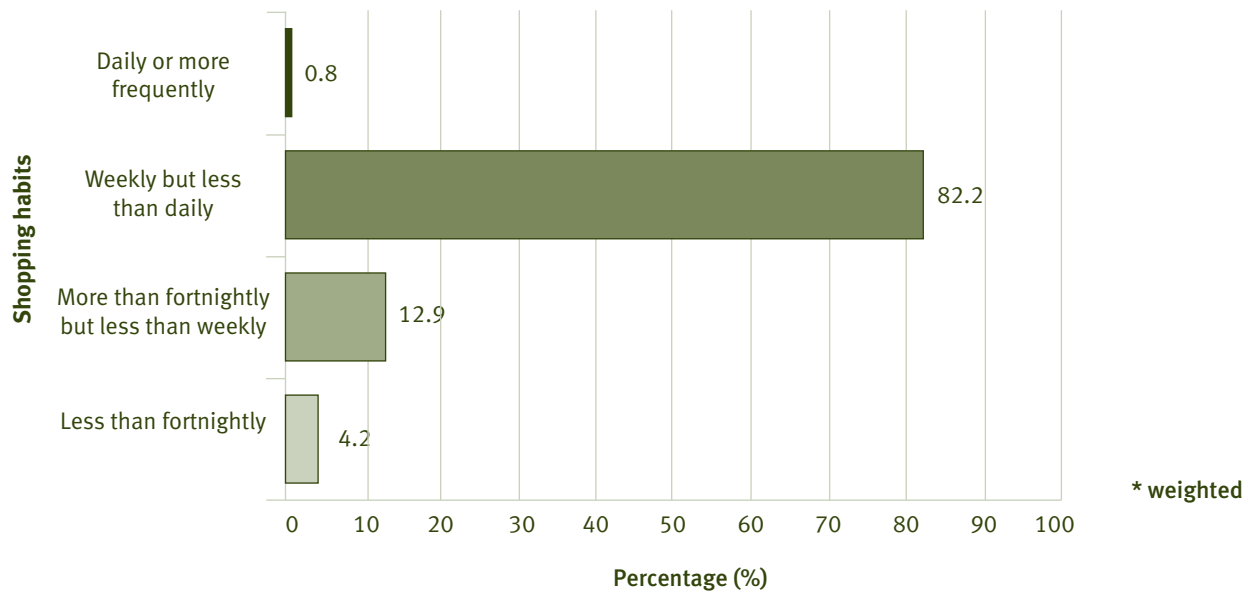
Respondents were asked about transporting and purchasing habits that may impact on the quality of fresh and frozen produce.

The largest proportion of people (66.6 per cent) reported usually taking less than half an hour from the time they obtained their vegetables and fruit until they got home.

It was reported to take between half an hour and two hours for 25.9 per cent of people, and more than two hours for 7.5 per cent of people to get their vegetables and fruit home (Figure 17).

Purchasing fresh vegetables and fruit was reported to occur at least daily for 0.8 per cent of people, more often than weekly but less than daily for 82.2 per cent of people, 12.9 per cent reported shopping more often than fortnightly but less than weekly and 4.2 per cent reported shopping less often than fortnightly (Figure 18).

Figure 18: Proportion of people by reported frequency of purchasing vegetables and fruit home*, *The South West Queensland Nutrition Survey 2004*



When shopping, 42.5 per cent of people reported using an insulated container to transport frozen vegetables and fruit home. Of those who reported taking half an hour or more to get frozen vegetables and fruit home after shopping, 79.7 per cent reported using an insulated container (Table 7).

Table 7: Reported use of insulated containers for frozen vegetables and fruit by time taken to travel home*

		< 1/2hour	1/2hour to 2 hours	>2 hours	Total
Insulated	Number	193	241	81	515
	Percentage (%)	23.9	76.8	90	42.5
Not Insulated	Number	573	53	1	627
	Percentage (%)	71	16.9	1.1	51.8
Don't Know	Number	41	20	8	69
	Percentage (%)	5.1	6.4	8.9	5.7
Total	Number	807	314	90	1211
	Percentage (%)	100	100	100	100

* weighted

■ Running out of vegetables and fruit

In the 12 months prior to the survey, 37.7 per cent of people reported running out of fresh vegetables or fruit on at least one occasion. The main reported reasons given for not buying more fresh vegetables and fruit after running out were that it is usually not a priority, it is a long distance to the shops and lack of time (Table 8). Respondents were able to report multiple reasons.

Table 8: Reasons given for not buying more fresh vegetables or fruit immediately after running out*

	Number	Percentage (%)
Usually not a priority	132	10.8
Too far	124	10.1
No time to go shopping	83	6.7
Shop closed	55	4.5
Not enough money	47	3.9
No access to shops for environmental reason (eg flood)	36	3.0
Good quality produce not available for purchase	33	2.7
Too expensive	31	2.6
No access to shops for other reason (specify reason)	25	2.0
Not available to purchase	22	1.8
Other (specify)	20	1.6
Family structure makes shopping difficult	15	1.2
Personal health makes shopping difficult	10	0.8
Don't know	8	0.6

* weighted

/// 3.11 Perceived importance of vegetables and fruit for health

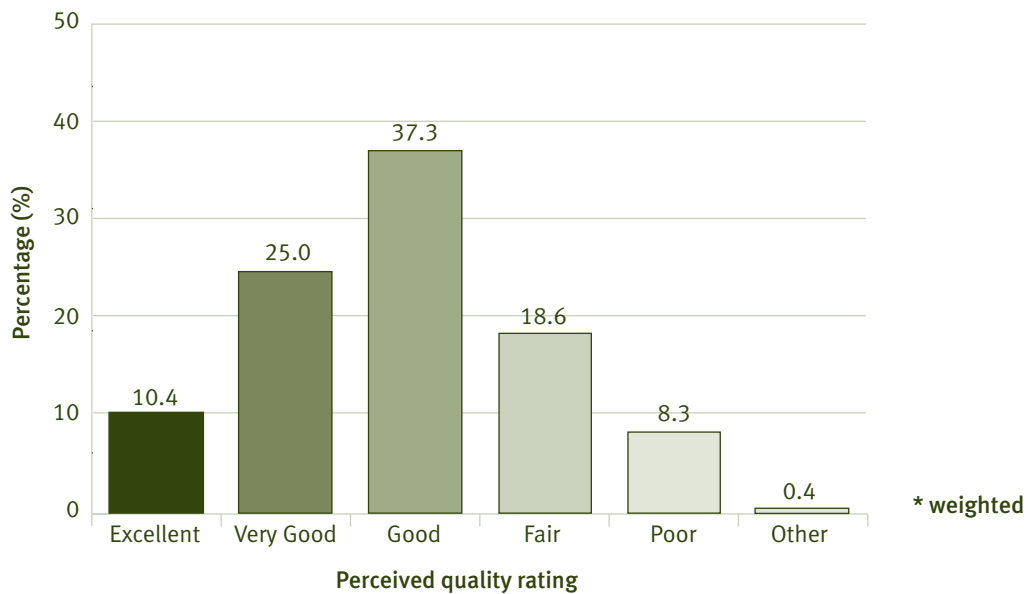
Men were less likely than women to report that fruit was very important for health (Table 9). However, most of the population still reported vegetables and fruit to be very important for health.

Table 9: Reported perceived importance of fruit and vegetables by sex*

	Vegetables Percentage (%)		Fruit Percentage (%)	
	Male	Female	Male	Female
Very important	92.2	96.1	82.8	92.8
Somewhat important	7.5	3.4	15.4	6.5
Of little importance	0.2	0.5	1.6	0.5
Not important	0.2	0	0.3	0.2

*weighted

Figure 19: Reported perceived quality of fresh vegetables and fruit available for purchase in the close town*, *The South West Queensland Nutrition Survey 2004*



/// 3.12 Perceptions of vegetable and fruit quality

The largest proportion of people (72.6 per cent) reported that the quality of fresh vegetables and fruit available for purchase in their closest town was good, very good or excellent, and 26.9 per cent reported them to be fair or poor (Figure 19). The response category of 'other' included answers that didn't fall into the categories provided, such as that there are seasonal differences in quality.

This study showed that people in South West Queensland, like other Queenslanders (South Australian Department of Health and Western Australian Department of Health 2004), consume vegetables and fruit in amounts well below the recommended levels that promote and support good health. Approximately 92 per cent of people did not meet the national recommendations of both five serves of vegetables and two serves of fruit per day. These results suggest there is a great potential for improvements to health for South West Queenslanders through increased vegetable and fruit intake.

Looking at vegetable consumption and fruit consumption separately, more people in South West Queensland reported eating recommended amounts of vegetables, but fewer reported eating recommended amounts of fruit, compared with the Queensland population. South West Queensland women reported consuming more vegetables and fruit than men (Figure 20) (Figure 21). Multivariate analysis found that women were 50 per cent more likely than men to consume recommended serves of fruit. Older people reported consuming more vegetables and fruit

than younger people, which are similar patterns to those observed in the Queensland population (South Australian Department of Health and Western Australian Department of Health 2004).

The reported consumption of vegetables and fruit by younger people in South West Queensland was much higher than in the Queensland population (South Australian Department of Health and Western Australian Department of Health 2004). Direct comparison was not possible due to different age categories used. For South West Queensland data, there was no noticeable differential in consumption across the ages of 18 to 39 years, hence these data were grouped. For Queensland, more than 40 per cent of 18 to 24 year olds reported usually consuming one serve of vegetables or less per day and almost one fifth reported consuming no fruit (South Australian Department of Health and Western Australian Department of Health 2004). By comparison, 14.5 per cent of 18 to 39 year olds in South West Queensland consumed one serve or less of vegetables per day and 3.1 per cent did not eat fruit.

Figure 20: Proportion of population, by sex reporting usual consumption of five or more serves of vegetables per day*

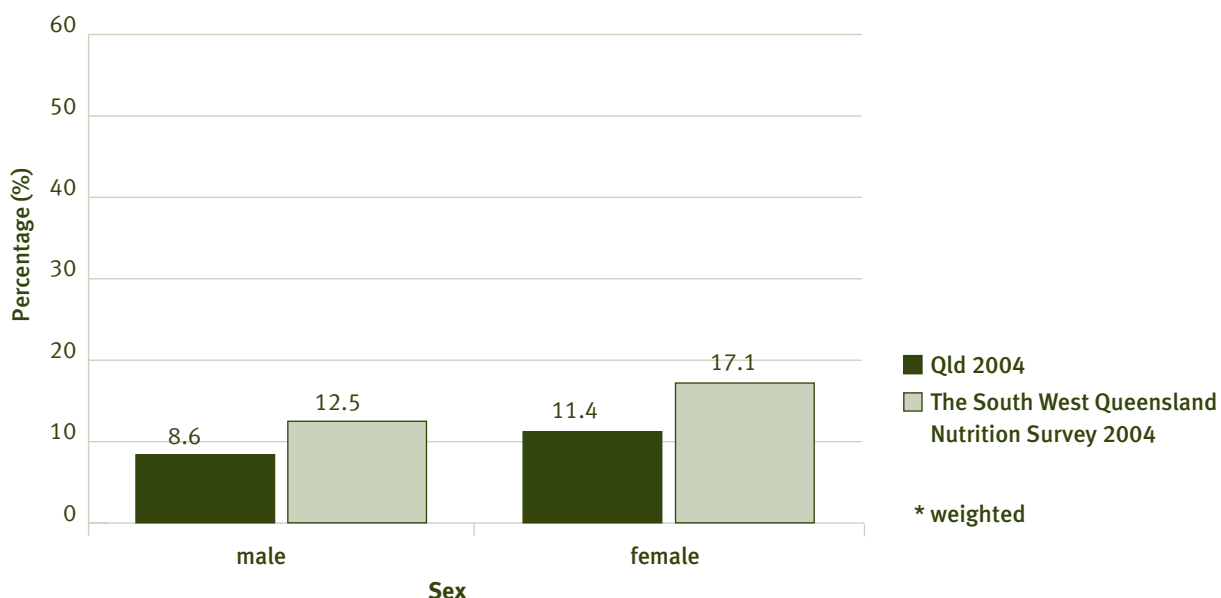
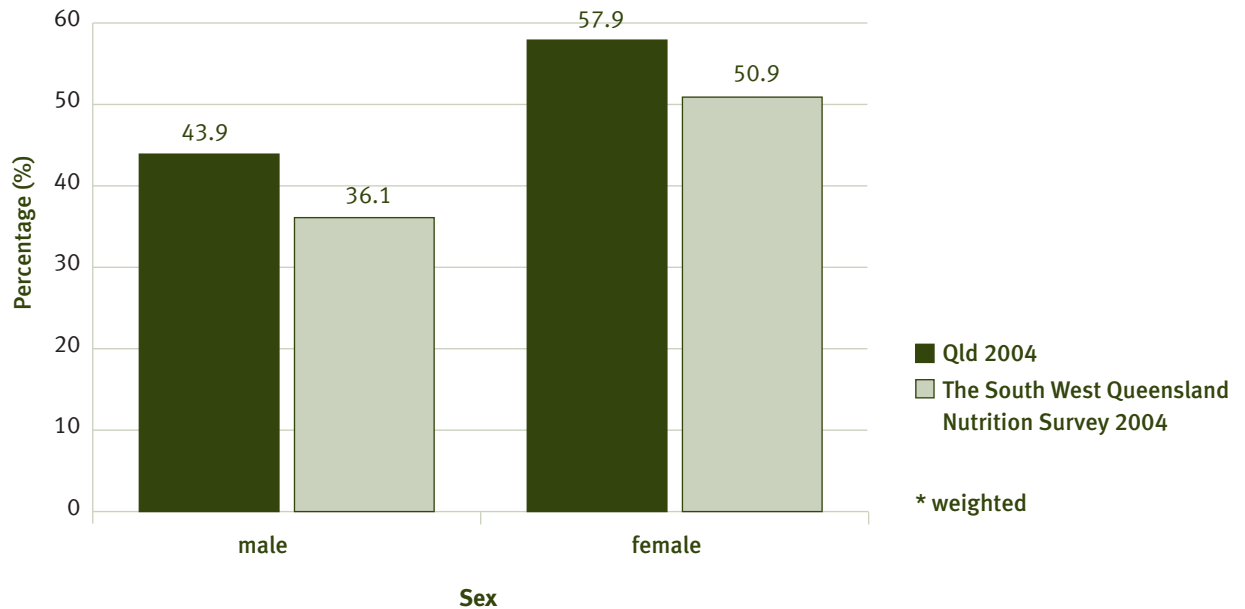


Figure 21: Proportion of population, by sex reporting usual consumption of two serves or more of fruit per day*



Non-Indigenous people reported eating more serves of fruit per day than Aboriginal and Torres Strait Islander people. Generally, fruit is perceived by Aboriginal and Torres Strait Islander people to be expensive and therefore, infrequently purchased and consumed. Many Aboriginal and Torres Strait Islander people consider value for money to be an important factor when shopping. 'Value for money' means cost per kilogram of product, as well as cost for 'feeling of fullness'.

It is perceived that fruit does not 'fill you up' as much as other foods can. Also, amongst many Aboriginal communities in South West Queensland, meat has always been valued more than plant products. During traditional times, fruit was not commonly eaten in this region (M McKellar 2004 pers. comm., 12 October).

The Australian Guide to Healthy Eating (AGHE) equates half a cup (125ml) of 100% fruit juice to one serve of fruit. In this study, the validated questions used did not permit juice consumption to contribute towards the calculated daily fruit intake. This study did not quantify juice consumption and therefore we have under-estimated serves of fruit consumed, but the extent of under-estimation is unknown. Nutritionally, consumption of whole fruit is preferred to excess consumption of juice due to the fibre content of whole fruit and the potential energy

density of fruit juice. For this reason, the authors present fruit intake in this report as is, even though it is an acknowledged unquantifiable under-estimation.

More South West Queenslanders reported meeting the recommendations for fruit consumption than for vegetable consumption. This pattern is similar to other population surveys, and will be partially due to the number of serves required, per se, to meet recommendations; ie. it is simply easier to consume two serves of fruit compared to consuming five serves of vegetables. Fruit is sweeter and considered more palatable by many people. Further investigation is needed to investigate preferences for fruit and vegetables. Regardless, at least five serves of vegetables each day is considered necessary to promote health and well being and consumption levels reported by South West Queenslanders are well below this recommendation.

Reported consumption patterns for vegetables and fruit in South West Queensland was not related to income. It is important to highlight that 11 per cent of people declined to answer the income question, which is a higher refusal rate than is usual for CATI surveys. In rural and remote areas, particularly in the current economic climate and drought conditions, reporting on annual income may be not be possible due to variations in income patterns

associated with farming. Further, property owners/farmers may be more sensitive to disclosing income on a government survey. For future surveys in rural areas, the standard income question may need to be reviewed to ensure appropriateness for this target group.

Coding and analysis for the education question also presented problems that may have impacted on the results. The category 'trade or technical' encompasses a wide range of qualification levels, making this a very heterogeneous group which should be noted during the interpretation of the results.

Fresh vegetables and fruit are far more popular than preserved types such as frozen, tinned/bottled, dried and 100% fruit juice. Considering the large distances many people travel to the shops, this was an unexpected finding. It was thought that the long-life and convenience of frozen, tinned/bottled and dried vegetables and fruit would be popular among people living in rural and remote areas. Our finding suggests that the population puts a higher value on fresh produce despite the perishable nature of the product. Given the low levels of vegetable and fruit consumption overall, and the large scale changes in transport systems required to improve access to fresh produce, opportunity exists to promote use of long-life produce as one strategy to increase consumption levels. Such strategies could focus on improving food knowledge, cooking, preparation and shopping skills around the use of dried, tinned and frozen produce. This should not take the place of improving access to fresh produce, but compliment such strategies.

The results on the knowledge of AGHE recommendations for vegetable and fruit consumption were valuable. The correct response was given by six per cent of the population for vegetable consumption guidelines and 37 per cent gave the correct response for recommended fruit intake. In multivariate analysis, those who reported correct knowledge of the recommended serves were significantly more likely to consume the recommended serves of both vegetables and fruit. Evidence in health promotion consistently shows that knowledge about health does not result in behaviour change, but that knowledge is necessary to contribute to an individual's capability to prepare for, and be successful at, changing behaviour (Nutbeam and Harris 2004). The Queensland Government Go For 2 Fruit and 5 Veg campaign is currently focussing on increasing knowledge of recommended serves. These data support the need to ensure campaign reach encompasses South West Queensland and is applicable to this area.

People who lived more than 20 kilometres from town were more likely to report meeting the recommendations for both vegetable and fruit consumption. A similar result was also found in the FoodWest study (Central Public Health Unit Network 2001). People who live large distances from

a town may plan their shopping and consumption of food in detail; be budget conscious; and choose staple items, like vegetables and fruit, due to the difficult economic times currently experienced by people in primary industries. These people do not have ready access to shops if they run out of food, and meal planning may be an essential element to food security in isolated areas. The infrequent shopping occasions may mean that there are fewer spontaneous decisions being made regarding the purchase of energy-dense, nutrient-poor foods, eg. a meat pie for lunch or a quick trip to the store to buy a packet of chips. It is also likely to be a cultural 'norm' that people working in agriculture expect and enjoy a dinner of 'meat and three vegetables'. Farmers often make a point of pausing work for lunch and dinner where it is traditional to have a 'proper' meal, probably including vegetables and a dessert with fruit (M King 2004 pers. comm., 3 September).

A large proportion of the population reported not drinking soft drink, and the rest reported consuming a total of between 75 millilitres and 56 litres per week. Nutritionally, soft drink is an energy-dense, nutrient-poor food that can contribute excess energy to the diet. Almost 30 per cent of the population reported consuming 1.5 litres or more of soft drink each week. For these soft drink consumers, this equates to 9.6 kilograms or more of sugar per person per year (range 9.6 kilograms – 358.2 kilograms) (based on 12.3 grams sugar/100 millilitres) from soft drink alone. As little as one soft drink per day has been linked with an 83 per cent increased risk of developing diabetes in women (Schulze et al. 2004), and a 1.6 times increased risk of developing obesity among children (Swinburn et al. 2002).

People who reported never consuming take-away foods or eating them less than once per month were almost three times more likely to report consuming the recommended number of serves of both vegetables and fruit, compared to those who reported eating take-away food at least weekly. Reported take-away food consumption is suspected to be underestimated in this study. Local knowledge indicates that small, independent take-away food shops are popular at lunch time, selling pies, sausage rolls and deep-fried foods. These items were identified in the take-away food question as secondary examples; however respondents may have not considered them as take-away foods because they were not purchased from the more well-known, nationally-franchised take-away food stores. For future surveys of rural and remote populations, where there are not many of the nationally-franchised take-away food stores, more emphasis should be placed on the examples of more common take-away foods that should be included when answering this question.

/// 4 Discussion

People who reported drinking skim milk were more than six times as likely to report consuming recommended serves of both vegetables and fruit than those who did not drink any type of milk. This was also the case for reported consumption of fruit, but not vegetables, when analysed separately. This finding suggests that healthier food choices may extend across the overall diet.

Full cream milk was overwhelmingly the most popular type of milk consumed. The type of milk consumed has been evaluated and shown to be a good indicator of percentage of energy obtained from total fat and saturated fat in the diet (Rutishauser et al. 2001). Assessing fat intake of the population was not an aim of this survey, hence little has been discussed regarding this aspect of nutrition. However, the data on type of milk consumed may prove to be useful in the future, as it can also be compared to other data such as the Queensland results from the CATI Data Pooling Pilot Project 2004 and the Queensland Health Omnibus Survey 2001.

People reported sourcing their fresh vegetables and fruit from a variety of sources, with purchasing produce as the most reported method. People who lived outside of town were more likely to report that they grow vegetables and fruit, though overall, the proportion of this South West Queensland population who grow their own produce was high. This finding confirms and provides data to support the commonly-held ideal that country people grow their own produce. Fewer people than expected sourced their fresh produce by country order, and no Indigenous people reported using this service. To use country order, one requires access to cheque, credit, fax and/or internet facilities. Such facilities are likely to be more difficult to access for disadvantaged people and thus country order is not considered a viable option.

Most people took less than half an hour to get shopping home and shopped at least weekly. Of those who lived half an hour or more from town, the majority used an insulated container to transport vegetables and fruit. However, 13 per cent of the population, who travelled longer than half an hour, did not use insulated containers, suggesting future strategies should include attention to transport behaviours that maximise the shelf life of fresh produce and keep food safe from potentially harmful bacteria.

The South West Queensland Nutrition Survey 2004 has provided data on vegetable and fruit consumption. We have compared these data to the national recommendations for vegetable and fruit consumption in the AGHE, and made assessments of eating behaviours of South West Queenslanders. Ninety-two per cent of the population reported not meeting the national recommendations of consuming both five serves of vegetables and two serves of fruit each day.

The results from this survey show very low consumption of vegetables and low consumption of fruit, with vegetable consumption being of greatest concern. The nutrients provided by both food groups (ie fruit and vegetables) are all essential for a healthy lifestyle and consistently consuming limited amounts of any food group increases the risk of poor health. The results show that the majority of the population in South West Queensland usually consume vegetables and fruit at levels below what is recommended and it is clear that more work needs to be done to increase vegetable and fruit consumption.

Valuable information on domestic food supply and shopping behaviours that may impact on end-consumption and quality of vegetables and fruit was collected. Similar to other studies, it showed that many people in South West Queensland travel long distances to buy their vegetables and fruit, even bypassing their closest local store.

Data for consumption patterns of foods, including soft drink, sports drinks, take-away foods and type of milk, have also been presented here. Multivariate analysis showed that people who reported never eating take-away food or eating it less than once per month; drinking skim milk; and who knew the AGHE recommendations for vegetable and fruit consumption were significantly more likely to report consuming both five serves of vegetables and two serves of fruit per day.

This survey has contributed to state data and provided baseline results which will assist in the development of a broad picture of the food supply situation in South West Queensland.

6 Recommendations

- Develop and implement strategies to promote the consumption of vegetables and fruit in South West Queensland, with a particular focus on promoting the consumption of vegetables to the whole population, and vegetables and fruit to males and young adults. The current Queensland Government Go For 2 Fruit and 5 Veg campaign needs to be tailored to ensure applicability and reach to South West Queenslanders.
- Develop and implement strategies that promote the consumption of fruit to Indigenous people.
- Include strategies that promote greater consumption of long-life products, such as tinned, dried and frozen vegetables and fruit.
- Health promotion strategies should consider the shopping habits, distances travelled and transporting habits of people in rural and remote areas to maximise shelf life and increase product appeal.
- Broader public health nutrition strategies that increase the demand for vegetables and fruit should be implemented by Queensland Health health service districts. Programs such as The Healthy Weight Program and Lighten Up to a healthier lifestyle, Fun Not Fuss with Food are currently available and relevant for increased investment in rural and remote areas.
- The development and implementation of recommended strategies requires a collaborative effort across the continuum of care, and with external agencies. Population health services and local HSDs should collaborate to develop such strategies and work with external partners to ensure maximum efficiency for investment.
- Repeat The South West Queensland Nutrition Survey in five years' time, in October and November 2009. The questions around education level attained and annual household income should be revised so that they encourage a better response rate and provide more accurate data. The take-away food question needs to emphasise more common take-away foods that can be included when responding to this question.
- Future vegetable and fruit consumption surveys should continue to use serve response categories that have not been grouped. This way, comparison to the AGHE recommendations is possible.
- Calculating average numbers of serves of vegetables and fruit consumed has not been possible due to the response categories of 'less than one serve' and 'six or more serves' not being quantifiable. Although it is not a common way of presenting food consumption data, calculating the average number of serves consumed may be a useful result in the future. Hence, the response categories should be reconsidered for future surveys.

7.1 Questionnaire

Question CORRECT

Hello, my name is I'm calling from the Queensland Health Department.

Can I check whether I have rung (read out phone no.)?

IF IN ANY DOUBT SAY: "Can I ask whether I have reached a residential number?"

(INTERVIEWER: Press 1 to continue with interview if residential. Press CTRL/END to terminate for engaged, no answer, non-residential.)

Question pcode

Thank-you. As I said, my name is

The Department of Health is interested in finding out about the availability of fruit and vegetables in your region and how much of these people eat.

To achieve this we are currently conducting short interviews on this subject. We only need to interview a certain number of people from each area so, firstly, can I ask what is the postcode for the house where we've called?

(INTERVIEWER: If R hesitant, say: "Today we're interviewing only in certain postcodes in the South West of the State. Can you tell me your postcode so I can see if you are in the area we're looking for?")

- 1 Gave postcode (Type postcode)
- 2 Don't know – will ask again later
- 3 Refused to answer

Question intro1

The interviews are aimed at people aged 18 years or more.

And it is important that we speak with equal numbers of men and women.

So for this particular interview I need to speak with a [man/woman] living in the house aged 18 or more.

(INTERVIEWER: if person on phone is female and asking for a man continue by saying "and we are always lagging behind in our interviews with men" If F hesitant offer 1800 number and arrange CB-don't wait for her to ask)

Is there anyone living in the household who fits this description?

(INTERVIEWER: If R wants to know why we are asking for a [man woman] say "the [female/male] quota may be full")

- 1 Yes
- 2 No
- 3 Refused to answer.

Question introR

The interview is completely confidential and only takes about 10 to 15 minutes.

Could you spare a little time to answer some questions for me please?

(IF NECESSARY SAY: Your telephone number was randomly selected by computer and participation is completely confidential and voluntary. It is a very important project aimed to better understand what influences people's fruit and vegetable consumption. Are you sure you wouldn't be willing to take part?)

(INTERVIEWER: If respondent says no, ask "Is that because the time is inconvenient? I would be happy to call you back at a suitable time")

- 1 Agreed to interview
- 2 Agreed to interview but suggested a call-back
- 3 No, refused interview.

Question fred1

Can I just check, you said you are aged 18 or over?

- 1 Yes
- 2 No
- 3 Refuses to continue interview.

Question good

Good, thank-you. Before we begin, I should stress the importance of answering the questions as accurately as possible.

So please feel free to take as much time as you need before responding. Also if there are any questions you would rather not answer, just say so.

Some calls are monitored by my supervisor for training and quality purposes

(Interviewer: If R is concerned about someone 'listening in' on their conversation, tell them that "My supervisor sometimes listens to check that I am conducting the interview properly, and reading the questions correctly")

Question F1

To begin with I'll ask you some general questions about food and nutrition. So, the first question is about your USUAL consumption of fruit, including fresh, dried, frozen and tinned fruit.

How many serves of fruit do you USUALLY eat each day, where a 'serve' is 1 medium piece or 2 small pieces of fruit or a cup of diced pieces?

(INTERVIEWER: This does NOT include fruit juices. For dried fruit, consider the equivalent amount of reconstituted fruit eg. a serve is 4 apricot halves or 1.5 tablespoons of sultanas)

7 Appendices

If consumption variable, ask for AVERAGE over a week (serves/day)

- 1 1 serve
- 2 2 serves
- 3 3 serves
- 4 4 serves
- 5 5 serves
- 6 6 or more serves
- 7 Less than one serve a day
- 8 Don't eat fruit
- 9 Don't know
- 10 Refused to answer

Question V1

And how many serves of vegetables do you USUALLY eat each day, where a 'serve' is half a cup of cooked vegetables or 1 cup of salad vegetables?

This includes fresh, dried, frozen and tinned.

(INTERVIEWER: Also includes dried beans, lentils or legumes such as baked beans, bean soup, lentil soup or split pea soup. This does NOT include vegetable juices)

If consumption variable, ask for AVERAGE over a week (serves/day)

- 1 1 serve
- 2 2 serves
- 3 3 serves
- 4 4 serves
- 5 5 serves
- 6 6 or more serves
- 7 Less than one serve a day
- 8 Don't eat vegetables
- 9 Don't know
- 10 Refused to answer.

Question M1

What type of milk do you usually consume?

(INTERVIEWER: Choose one type of milk only. If R mentions more than one type of milk, ask which they consume most often or usually.)

- 1 Whole – full cream
- 2 Low or reduced fat, eg. Trim
- 3 Skim – no fat
- 4 Powdered (specify full cream or skim)
- 5 UHT (specify full cream, reduced fat, skim)
- 6 Soy milk (specify full or reduced fat, skim)

- 7 Evaporated or sweetened condensed (specify full fat or light)
- 8 Other (specify goat's milk, rice milk, nut milks, etc)
- 9 None of the above/don't drink milk
- 10 Don't know
- 11 Refused to answer

Question N1

The next question is about soft drinks and sports drinks. By soft drink I mean fizzy drinks such as Coke and Lemonade, and by sports drinks I mean energy drinks such as Gatorade, Sportsade and Lucozade, whether they are fizzy or not.

This does not include soda water, plain mineral water, cordial mixed with water or diet soft drinks.

How often do you drink soft drink or sports drink? Would it be.....

(INTERVIEWER: Read out options 1-7. Powdered sports drinks like Gatorade are included)

- 1 Daily or almost daily
- 2 Several times per week
- 3 About once a week
- 4 About once a fortnight
- 5 About once a month
- 6 Less often than once a month or
- 7 Never
- 8 Don't know
- 9 Refused to answer.

if (ans = 1) skipto N1dc

if (ans = 2) skipto

if (ans = 3) skipto N1wc

if (ans > 3) skipto N2

Question N1dc

On average, how much soft drink or sports drink do you have every day?

- 1 Enter number of CANS
- 2 Enter number of BOTTLES
- 3 Enter number of GLASSES
- 4 Enter number of OTHER containers
- 5 Don't know
- 6 Refused to answer.

if (ans < 5) skipto N1dvn

if (ans > 4) skipto N2

■ Question N1ds

How big are the (cans/bottles/glasses/other containers)?

- 1 Enter number of mls/(can/bottle/glass/other container)
- 2 Enter number of litres/(can/bottle/glass/other container)
- 3 Don't know
- 4 Refused to answer.

skipto N2

■ Question N1wc

On average, how much soft drink or sports drink do you have every week?

- 1 Enter number of CANS
- 2 Enter number of BOTTLES
- 3 Enter number of GLASSES
- 4 Enter number of OTHER containers
- 5 Don't know
- 6 Refused to answer.

if (ans < 5) skipto N1wvn

if (ans > 4) skipto N2

■ Question N1ws

How big are the (cans/bottles/glasses/other containers)?

- 1 Enter number of mls/(can/bottle/glass/other container)
- 2 Enter number of litres/(can/bottle/glass/other container)
- 3 Don't know
- 4 Refused to answer.

if (ans > 2) skipto N2

■ Question N2

How often, on average, do you have meals or snacks such as burgers, pizza, chicken or chips from places like McDonalds, Hungry Jacks, Pizza Hut, Red Rooster or local take-away food places?

(INTERVIEWER: Includes pies, sausage rolls, and fish and chips.

Includes these things if bought from supermarkets etc.

Does NOT include sushi, take-away Asian foods, sandwiches or rolls)

- 1 Enter number of times per WEEK
- 2 Enter number of times per MONTH
- 3 Enter number of times per YEAR
- 4 Rarely
- 5 Never
- 6 Don't know
- 7 Refused to answer.

if (eatv = 0) skipto F2

skipto V2

■ Question V2

The next group of questions asks more specifically about your eating pattern over the PAST 12 MONTHS.

How often, on average, do you eat FRESH vegetables?

(INTERVIEWER: Fresh vegetables such as potato, tomato, cauliflower, broccoli, carrot, mushrooms, onion, etc.)

- 1 Enter number of times per DAY
- 2 Enter number of times per WEEK
- 3 Enter number of times per MONTH
- 4 Rarely
- 5 Never
- 6 Don't know
- 7 Refused to answer.

■ Question V3

How often, on average, do you eat FROZEN vegetables?

(INTERVIEWER: Frozen vegetables such as mixed vegetables, stir fry mix, peas, carrots, green beans, corn)

- 1 Enter number of times per DAY
- 2 Enter number of times per WEEK
- 3 Enter number of times per MONTH
- 4 Rarely
- 5 Never
- 6 Don't know
- 7 Refused to answer.

■ Question V4

How often, on average, do you eat TINNED or BOTTLED vegetables?

(INTERVIEWER: Tinned or bottled vegetables such as tomatoes, peas, beetroot, mushrooms, carrots, 3 bean mix, baked beans, vegetable soup)

(INTERVIEWER: excludes pasta sauces)

- 1 Enter number of times per DAY
- 2 Enter number of times per WEEK
- 3 Enter number of times per MONTH
- 4 Rarely
- 5 Never
- 6 Don't know
- 7 Refused to answer.

7 Appendices

■ Question V5

How often, on average, do you eat DRIED vegetables?

(INTERVIEWER: Dried vegetables such as split peas, lentils, chick peas, or dried potato like Deb)

- 1 Enter number of times per DAY
- 2 Enter number of times per WEEK
- 3 Enter number of times per MONTH
- 4 Rarely
- 5 Never
- 6 Don't know
- 7 Refused to answer.

■ Question F2

Now, still thinking about your eating pattern over the PAST 12 MONTHS,

How often, on average, do you drink pure or 100% fruit juice?

(INTERVIEWER: Fruit juice such as orange, apple, pineapple juice, etc. with 'no added sugar' – NOT tomato juice)

- 1 Enter number of times per DAY
- 2 Enter number of times per WEEK
- 3 Enter number of times per MONTH
- 4 Rarely
- 5 Never
- 6 Don't know
- 7 Refused to answer.

■ Question F3

How often, on average, do you eat FRESH fruit?

(INTERVIEWER: Fresh fruit such as banana, apple, orange, pawpaw, watermelon, mango)

- 1 Enter number of times per DAY
- 2 Enter number of times per WEEK
- 3 Enter number of times per MONTH
- 4 Rarely
- 5 Never
- 6 Don't know
- 7 Refused to answer

■ Question F4

How often, on average, do you eat DRIED or SEMI DRIED fruit?

(INTERVIEWER: Dried fruit such as prunes, dates, sultanas, mixed fruit, apricots, apple, banana)

- 1 Enter number of times per DAY
- 2 Enter number of times per WEEK

3 Enter number of times per MONTH

4 Rarely

5 Never

6 Don't know

7 Refused to answer.

■ Question F5

How often, on average, do you eat TINNED or BOTTLED fruit?

(INTERVIEWER: Tinned or bottled fruit such as peaches, pears, apple, fruit salad)

1 Enter number of times per DAY

2 Enter number of times per WEEK

3 Enter number of times per MONTH

4 Rarely

5 Never

6 Don't know

7 Refused to answer

■ Question N3

We also need to know what you THINK about fruit and vegetables.

How important do you think eating FRUIT is for health? Would you say it is

(INTERVIEWER: Read out highlighted options 1-4)

1 Very important

2 Somewhat important

3 Of little importance

4 Not important

5 Don't know

6 Refused to answer.

■ Question N4

How important do you think eating VEGETABLES is for health? Would you say it is

(INTERVIEWER: Read out highlighted options 1-4)

1 Very important

2 Somewhat important

3 Of little importance

4 Not important

5 Don't know

6 Refused to answer

■ Question N5

Remembering that a 'serve' of fruit is 1 medium piece or 2 small pieces or a cup of diced pieces, what do you think is the recommended number of serves of FRUIT that should be eaten each day?

(INTERVIEWER: For an Australian adult aged 18 years or older)

- 1 1 serve
- 2 2 serves
- 3 3 serves
- 4 4 serves
- 5 5 serves
- 6 6 or more serves
- 7 Less than one serve a day
- 8 Don't know
- 9 Refused to answer

■ Question N6

What do you think is the recommended number of serves of VEGETABLES that should be eaten each day, where a 'serve' is 1/2 cup of cooked vegetables or 1 cup of salad vegetables?

(INTERVIEWER: For an Australian adult aged 18 years or older)

- 1 1 serve
- 2 2 serves
- 3 3 serves
- 4 4 serves
- 5 5 serves
- 6 6 or more serves
- 7 Less than one serve a day
- 8 Don't know
- 9 Refused to answer

■ Question N7

What do you think of the quality of fresh fruit and vegetables that are available for purchase in your closest town?

Do you think the quality is

(INTERVIEWER: Read out highlighted responses 1-5)

- 1 Excellent
- 2 Very Good
- 3 Good
- 4 Fair
- 5 Poor
- 6 Other (specify)
- 7 Don't know
- 8 Refused to answer.

■ Question screenq

The next group of questions are about the purchasing and transport of fruit and vegetables for your household.

Are YOU familiar with HOW someone in your household gets the fruit and vegetables?

(INTERVIEWER: If R is uncertain suggest trying the questions and see how they go)

- 1 Yes
- 2 No
- 3 Refused to answer

if (ans = 1) skipto S1

if (ans > 1) skipto D1

■ Question S1

The next 2 questions are about whom you live with. We want to know this information because it may relate to how much fruit and vegetables you eat.

Including yourself, how many adults, aged 18 or more, USUALLY live in your household?

The household includes people who usually live and eat with you.

(INTERVIEWER: includes people who live and work on the property and whose meals are provided by this household)

- 1 Enter number
- 2 Refused to answer.

■ Question S2

And how many children, aged less than 18 years, USUALLY live in your household?

- 1 Enter number
- 2 Refused to answer.

if (ans = 1) skipto S2a

if (ans = 2) skipto S3

7 Appendices

■ Question S3

Now I'd like to ask about how you get your FRESH fruit and vegetable supplies.

Where do you get your FRESH FRUIT from? Do you...

(INTERVIEWER: multiple responses allowed read highlighted options 1-6)

- 1 Buy them from your local town (specify town)
- 2 Buy them from another town (specify town)
- 3 Buy them by country order (specify town ordered from)
- 4 Grow them
- 5 Are you given them
- 6 Do you get them from some other source (specify)
- 7 Don't use fresh fruit
- 8 Don't know
- 9 Refused to answer
- 10 EXIT

■ Question S4

And where do you get your FRESH VEGETABLES from? Do you ...

(INTERVIEWER: multiple responses allowed read highlighted options 1-6)

- 1 Buy them from your local town (specify town)
- 2 Buy them from another town (specify town)
- 3 Buy them by country order (specify town ordered from)
- 4 Grow them
- 5 Are you given them
- 6 Do you get them from some other source (specify)
- 7 Don't use fresh vegetables
- 8 Don't know
- 9 Refused to answer
- 10 EXIT

if ((buyf=0) & (buyv=0)) skipto S7

■ Question S6

When you transport FRESH [fruit and vegetables] home, what type of container do you use?

Would it be

(INTERVIEWER: Read highlighted responses 1-6, multiple responses allowed, tick all that apply)

- 1 An Esky or styrofoam box with a lid
- 2 A portable refrigerator
- 3 A portable freezer
- 4 Shopping bags
- 5 Cardboard boxes
- 6 Any other containers (specify)

7 Don't transport fresh F/V

8 Don't know

9 Refused to answer

10 Exit

■ Question S7

When transporting FROZEN fruit or vegetables home what type of container do you use?

Would it be

(INTERVIEWER: Read highlighted responses 1-6, multiple responses allowed, tick all that apply)

- 1 An Esky or styrofoam box with a lid
- 2 A portable refrigerator
- 3 A portable freezer
- 4 Shopping bags
- 5 Cardboard boxes
- 6 Any other containers (specify)
- 7 Do not transport frozen F/V
- 8 Don't know
- 9 Refused to answer
- 10 Exit

if ((buyf=0) & (buyv=0) & (frozen=0)) skipto S10

■ Question S5

When transporting [FRESH OR FROZEN] [fruit and vegetables] home, are they transported

(INTERVIEWER: Read highlighted responses 1-6, multiple responses allowed, tick all that apply)

- 1 In an air conditioned vehicle cabin
- 2 In a non air conditioned vehicle cabin
- 3 In a vehicle boot
- 4 On an open ute tray
- 5 On a ute tray with a canopy or tonneau cover
- 6 Do you walk home and take them with you
- 7 Or some other way (specify)
- 8 Don't know
- 9 Refused to answer
- 10 Exit.

■ **Question S8**

How long would it USUALLY be from the time you obtain your fruit and vegetables until you get them home?

(INTERVIEWER: Specific time in HOURS and MINUTES)

- 1 Enter time in HOURS & MINUTES
- 2 I don't collect our fruit and vegetables
- 3 Don't know
- 4 Refused to answer

if ((ans > 1) & (buyf=1)) skipto S9

if ((ans > 1) & (buyv=1)) skipto S9

skipto S10

■ **Question S9**

How often do you usually purchase FRESH (fruit and vegetables)

- 1 Enter number of times per WEEK
- 2 Enter number of times per FORTNIGHT
- 3 Enter number of times per MONTH
- 4 Don't know
- 5 Refused to answer

skipto S10

■ **Question S10**

In the past 12 months, have you ever run out of FRESH fruit or vegetables?

By this I mean that you had no FRESH fruit or vegetables for at least one meal when you would normally use them.

(INTERVIEWER: does not include situations where they used up their F&V, but then bought more straight away, so they didn't actually miss out on any.)

- 1 Yes
- 2 No
- 3 Do not use fresh fruit or vege
- 4 Don't know
- 5 Refused to answer.

if (ans = 1) skp S10a

if (ans > 1) skipto D1

■ **Question S10a**

Why didn't you buy more straight away?

(INTERVIEWER: This is an open question; as R answers, Multiple responses allowed. Prompt with 'any other reason?')

- 1 Not enough money
- 2 Too expensive
- 3 Not available for purchase

4 Good quality produce not available for purchase

5 No time to go shopping

6 No access to shops for environmental reason (eg flood)

7 No access to shops for other reason (specify reason)

8 Personal health makes shopping difficult

9 Family structure makes shopping difficult

10 Usually not a priority

11 -----(deleted option-Unexpected spoilage of food)

12 Other (specify)

13 Don't know

14 Refused to answer

15 Exit.

■ **Question D1**

(INTERVIEWER: What is the sex of the respondent? Do not ask this question aloud)

- 1 Male
- 2 Female
- 3 Don't know

■ **Question D2**

Finally I'd like to ask you some background questions about yourself.

(INTERVIEWER: If R is hesitant about answering this sort of question say: 'These questions are important as they enable us to look at different groups within the community, for example younger people, those who are married, employed or retired and see whether those groups have different experiences')

Could you please tell me your date of birth?

(INTERVIEWER: If R is hesitant about answering this question say: "Date of birth is asked as most people find it easier to remember their date of birth than their age")

- 1 Enter date of birth
- 2 Refused to answer

if (ans = 1) skipto D3

If (ans = 2) skipto D2b

■ **Question D2b**

Well, could you please tell me what was your age last birthday?

- 1 Enter exact age
- 2 Refused to answer

if (ans = 1) skipto D3

If (ans = 2) skipto D2d

7 Appendices

■ Question D2d

Would you be willing to say which of the following categories your age is in:

(INTERVIEWER: Read out categories 1 to 6)

- 1 18-29
- 2 30-39
- 3 40-49
- 4 50-59
- 5 60-69
- 6 70 and over
- 7 Refused to answer

■ Question D3

What is your current marital status? Are you.....

(INTERVIEWER: read out highlighted categories)

- 1 Married
- 2 De facto
- 3 Separated
- 4 Divorced
- 5 Widowed, or
- 6 Never married
- 7 Don't know
- 8 Unwilling to say.

■ Question D4

Including yourself, how many (men/women*) aged 18 and over, live in your household?

** same sex as respondent (for weighting)*

■ Question D5

Are you of Aboriginal or Torres Strait Islander origin?

- 1 Yes
- 2 No
- 3 Refused to answer

■ Question D6gate

Did you obtain any education or training qualification after you left school?

(INTERVIEWER this includes: university or college degree technical certificate or diploma trade certificate or diploma)

- 1 Yes
- 2 No
- 3 Refused to answer

if (ans = 1) skipto D6a

if (ans = 2) skipto D6c

if (ans = 3) skipto D7

Question D6a

Now, could you think about the HIGHEST level of education or training that you have COMPLETED? (PAUSE)

I'll now read out a list of education levels, please tell me when one applies to you.

Have you COMPLETED a university or college degree?

- 1 Yes
- 2 No
- 3 Other (specify)
- 4 Don't know
- 5 Refused.

if (ans = 1) skipto D7

if (ans > 3) skipto D7

■ Question D6b

Have you COMPLETED a trade or technical certificate or diploma?

- 1 Yes
- 2 No
- 3 Other (specify)
- 4 Don't know
- 5 Refused

if (ans = 1) skipto D7

if (ans > 3) skipto D7

■ Question D6h

Can you describe the qualification you obtained after you left school for me?

- 1 Yes (specify)
- 2 Don't know
- 3 Refused

■ Question D6c

Have you COMPLETED senior high school?

(INTERVIEWER: Grade 12, age 17-18 in QUEENSLAND)

- 1 Yes
- 2 No
- 3 Other (specify)
- 4 Don't know
- 5 Refused

if (ans = 1) skipto D7

if (ans > 3) skipto D7

Question D6d

Have you COMPLETED junior high school?

(INTERVIEWER: Grade 10, age 15-16 in QUEENSLAND)

- 1 Yes
- 2 No
- 3 Other (specify)
- 4 Don't know
- 5 Refused

if (ans = 1) skipto D7

if (ans > 3) skipto D7

■ **Question D6e**

Have you COMPLETED primary school?

(INTERVIEWER: Grade 7, age 12-13 in QUEENSLAND)

- 1 Yes
- 2 No
- 3 Other (specify)
- 4 Don't know
- 5 Refused

if (ans = 1) skipto D7

if (ans > 3) skipto D7

■ **Question D6f**

Did you leave before completing primary school, or did you not do any formal schooling?

- 1 Yes (left before finishing primary / did no formal school)
- 2 No (finished primary)
- 3 Other (specify)
- 4 Don't know
- 5 Refused

if (ans <> 2) skipto D7

■ **Question D6g**

Can you describe your education level for me?

- 1 Yes (specify)
- 2 Don't know
- 3 Refused

■ **Question D7**

Which one of the following BEST describes your current employment status?

(INTERVIEWER: Read out highlighted options 1-9)

- 1 Station or property owner
- 2 Employed full-time
- 3 Employed part-time or casual
- 4 Home duties or carer
- 5 Unemployed
- 6 Full-time student

7 Part-time student

8 Retired

9 Permanently ill/unable to work

10 Other (specify)

11 Don't know

12 Refused to answer.

■ **Question D8**

Which of the following FOUR BROAD categories does your total GROSS annual household income from ALL sources fall into? That is the total income from ALL members of your household before tax is deducted. Would it be...

(INTERVIEWER: Read out highlighted categories 1-4)

- 1 Less than \$25,000
- 2 \$25 001-\$50 000
- 3 \$50 001-\$100 000
- 4 Over \$100 000
- 5 Don't know
- 6 Refused to answer

■ **Question R1**

What town do you live in, or what is your nearest town?

- 1 Augathella
- 2 Bollon
- 3 Charleville
- 4 Cunnamulla
- 5 Dirranbandi (Dirran)
- 6 Eulo
- 7 Mitchell
- 8 Morven
- 9 Mungindi
- 10 Quilpie
- 11 Roma
- 12 St George
- 13 Surat
- 14 Thallon
- 15 Thargomindah (Thargo)
- 16 Yowah
- 17 Other (specify)
- 18 Don't know
- 19 Refused to answer

if (ans < 18) skipto R1a)

skipto thanks

7 Appendices

■ Question R1a

Do you live IN town or outside of the town?

- 1 IN town
- 2 OUTSIDE the town
- 3 Refused

if (ans = 2) skipto R2

skipto thanks

■ Question R2

How far by road do you live from (town name)?

- 1 I live in town
- 2 Less than 20km
- 3 20-100km
- 4 More than 100km
- 5 Don't know
- 6 Refused

■ Question R3

And what direction do you live from (town name)?

(INTERVIEWER: what direction would R have to travel from town to get home)

- 1 N
- 2 S
- 3 E
- 4 W
- 5 N-E
- 6 N-W
- 7 S-E
- 8 S-W
- 9 Other (specify)
- 10 Don't know
- 11 Refused

■ Question thanks

That's the end of the interview.

THANK-YOU VERY MUCH FOR ALL YOUR HELP.

Once again, my name is _____ calling from the Queensland Health Department.

GOOD BYE!

7.2 List of tables

Table 1: Distributions of persons aged 18 and over by LGAs in the South West Statistical Division for South West Nutrition Survey 2004 and 2003 Estimated Resident Population	12
Table 2: Distribution of persons aged 18 and over by education level attained in The South West Queensland Nutrition Survey 2004	12
Table 3: Distribution of persons aged 18 and over by income in The South West Queensland Nutrition Survey 2004 ...	12
Table 4: Univariate analysis of consumption of recommended daily serves of both vegetables and fruit by selected variables	22
Table 5: Univariate analysis of consumption of recommended daily serves of vegetables by selected variables	24
Table 6: Univariate analysis of consumption of recommended daily serves of fruit by selected variables	26
Table 7: Use of insulated containers for frozen vegetables and fruit by time taken to travel home in South West Statistical Division 2004	32
Table 8: Reasons given for not buying more fresh vegetables or fruit after running out.....	33
Table 9: Perceived importance of fruit and vegetables by sex in South West Statistical Division 2004	33

7 Appendices

7.3 List of figures

Figure 1: South West Queensland	8
Figure 2: Proportion of people who reported usually consuming recommended daily serves of vegetables and fruit	13
Figure 3: Proportion of males/females by reported usual intake of vegetables	14
Figure 4: Proportion of males/females by reported usual intake of fruit	14
Figure 5: Proportion of people by reported usual intake of vegetables	15
Figure 6: Proportion of people by reported usual intake of fruit	15
Figure 7: Median weekly reported consumption by vegetable type	17
Figure 8: Median weekly reported consumption by fruit type	17
Figure 9: Proportion of people by reported weekly soft drink and sports drink consumption	18
Figure 10: Proportion of people by reported frequency of take-away food consumption	19
Figure 11: Proportion of people by reported fat content of milk consumed	20
Figure 12: Reported knowledge of recommended daily intake of fruit and vegetables	21
Figure 13: Reported source of fresh vegetables by residential location	29
Figure 14: Reported source of fresh fruit by residential location	29
Figure 15: Reported source of fresh vegetables by Indigenous status	30
Figure 16: Reported source of fresh fruit by Indigenous status	30
Figure 17: Proportion of people by reported time taken to transport vegetables and fruit home	31
Figure 18: Proportion of people by reported frequency of purchasing fresh vegetables and fruit	32
Figure 19: Reported perceived quality of fresh vegetables and fruit available for purchase in closest town	34
Figure 20: Proportion of population reporting usual consumption of five or more serves of vegetables per day	35
Figure 21: Proportion of population reporting usual consumption of two serves or more of fruit per day	36

- ABS 1999, *National Nutrition Survey: users' guide, Australia, 1995*, Australian Bureau of Statistics, Canberra.
- ABS 2004, *2004 ERPs by SLA catalogue no. 3235.3.55.001*, Australian Bureau of Statistics, Canberra.
- Central Public Health Unit Network 2001, *Vegetable and fruit consumption in central west Queensland: Baseline survey report*, Queensland Health, Brisbane.
- Commonwealth Department of Health and Family Services 1998, *Australian Guide to Healthy Eating*, Commonwealth Department of Health and Family Services, Canberra.
- Commonwealth Department of Health 1992, *Food and Nutrition Policy*, Australian Government Publishing Services, Canberra.
- Coyne T, Ibiebele TI, McNaughton S, et al. 2005, 'Evaluation of brief dietary questions to estimate vegetable and fruit consumption – serum carotenoids and red cell folate', *Public Health Nutrition*, vol 8, no. 3, pp. 298-303.
- Health Information Centre 2001, *Omnibus 2001 Survey*, Queensland Health, Brisbane.
- Marks G, Webb K, Rutishauser I, et al. 2001, *Monitoring food habits in the Australian population using short questions*. Commonwealth Department of Health and Aged Care, Canberra.
- NHMRC 2003, *Dietary guidelines for Australian adults*, Commonwealth Department of Health and Ageing, Canberra.
- Nutbeam D, Harris E, *Theory in a nutshell*, McGraw-Hill, Australia.
- Queensland Health: Harper C, Cardona M, Bright M, Neill A, McClintock C, McCulloch B, Hunter I, Bell M 2004, *Health Determinants Queensland 2004*, Public Health Services, Queensland Health, Brisbane.
- Queensland Health 2005 *The 2004 healthy food access basket (HFAB) survey: summary report*, Public Health Services, Queensland Health, Brisbane.
- Queensland Public Health Forum 2002, *Eat Well Queensland 2002-2012: Smart Eating for a Healthier State*, Queensland Public Health Forum, Brisbane.
- Resnicow K, Odom E, Wang T, et al. 2000, 'Validation of three food frequency questionnaires and 24-hour recalls with serum carotenoid levels in a sample of African-American adults', *American Journal of Epidemiology*, vol. 152, pp. 1072-80.
- Riley M, Rutishauser IHE, Webb K 2001, *Comparison of short questions with weighed dietary records*, Commonwealth Department of Health and Aged Care, Canberra.
- Rutishauser IHE, Webb K, Abraham B, et al. 2001, *Evaluation of short dietary questions from the 1995 National Nutrition Survey*, Commonwealth Department of Health and Aged Care, Canberra.
- Schulze MB, Manson JE, Ludwig DS et al. 2004, 'Sugar-sweetened beverages, weight gain, and incidence of type 2 diabetes in young and middle-aged women', *Journal of the American Medical Association*, vol. 292, no. 8, pp. 927-34.
- Serdulla M, Coates R, Byers T, et al. 1993, 'Evaluation of a brief telephone questionnaire to estimate fruit and vegetable consumption in diverse study populations', *Epidemiology*, vol. 4, pp 455-63.
- SIGNAL 2001, *Eat Well Australia: an agenda for action for public health nutrition 2000-2010*, National Public Health Partnership, Canberra.
- South Australian Department of Health and Western Australian Department of Health 2004, *CATI Data Pooling Pilot Project: Filling the gaps in data pooling 2004, Queensland survey methodology*.
- SPSS 1999, *SPSS(r) Base 9.0 Applications Guide*, SPSS Incorporated, Chicago.
- Swinburn BA, Caterson I, Seidell JC et al. 2002, *Background paper for Joint WHO/FAO Expert Consultation on diet, nutrition and the prevention of chronic diseases*, World Health Organisation, Geneva.
- WHO: Ezzati M, Lopez AD, Rodgers A, Murray CJL 2004, *Comparative quantification of health risks: Global and regional burden of diseases attributable to selected major risk factors*, volume 1, World Health Organisation, Geneva.

