

National Nutrition Survey 2010 Singapore

Research & Strategic Planning Division
Health Promotion Board

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**REPORT OF THE NATIONAL NUTRITION SURVEY 2010
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Health Promotion Board, Singapore

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foreword

The National Nutrition Survey is part of the Health Promotion Board's ongoing surveillance of the diet of Singaporeans – it informs how our eating habits have evolved, and whether we are eating too little (or too much) of required nutrients. Since the first National Nutrition Survey (NNS) in 1993, the information collected has been a rich information source that has helped to shape our health promotion policies. In addition for this 2010 snapshot, salt intake has been estimated for the first time using 'gold-standard' urinary collection methods.

We have noted from the findings that Singaporeans are now choosing to eat more unrefined carbohydrates from wholegrain foods such as wholemeal bread, oats and brown rice. Vitamin and mineral intakes are also on the increase. However, there are also notable trends which are a cause for concern and which have implications of our long-term obesity rates, as they will fuel a rise in chronic diseases like high blood cholesterol, if not addressed. The study findings indicate that more people are consuming excessive calories and fat. One reason for this is growing affluence as the NNS 2010 reveals that some 60% of Singaporeans now eat out regularly at places like hawker centres, food courts and coffee shops, because eating out is now within easy reach.

Moving forward, a sustained effort to address not just the quality of foods consumed but also the quantity is imperative. Rather than fight social trends, HPB's strategy is also to leverage cultural preferences and nudge them along through efforts such as the Healthier Hawker Centre programme. So even as Singaporeans eat out more, we want to make sure that affordable versions of their favourite dishes are readily available. This means working across the entire value chain, from the development of healthier ingredients, to the distribution and supply of these ingredients, to the front-end food preparation by our food vendors to serve healthy and tasty dishes. That the consumption of wholegrains and the use of healthier oils have increased in the past few years, supports this strategy and encourages us to continue nudging consumers towards healthier eating habits.

I would like to take this opportunity to acknowledge all who have contributed to the successful completion of NNS 2010. Special thanks to the Epidemiology and Disease Control Division, Ministry of Health, for their kind assistance and collaboration during the Survey. Lastly, I wish to thank all participants of the Survey who have given their time to take part, without whom this Survey would not have been possible.



Ang Hak Seng
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executive summary

1.1 ABOUT THE SURVEY

A healthy diet is associated with reduced risks of chronic diseases such as cancer, cardiovascular disease and diabetes mellitus. Since consuming excessive calories, excessive salt and foods high in fat can potentially lead to obesity, high blood pressure and high blood cholesterol, it is essential that the intake and dietary practices of a population are determined and tracked over time. Such monitoring highlights areas of public health concern which require action, and drives the development of health-promoting nutrition policy and programmes.

The National Nutrition Survey (NNS) was first conducted in 1993, then subsequently in 1998 and 2004, in conjunction with the National Health Survey (NHS). The main components of the NNS 2010 were the dietary practices questionnaire (DPQ), the food frequency questionnaire (FFQ) and the salt intake study (SIS). SIS was a new aspect in the NNS compared to previous surveys. It captured information on dietary sodium intake at the population level using 24-hour urinary collection. In addition, FFQ was also expanded in NNS 2010 to collect information on wholegrain consumption.

In Singapore, the nutritional quality of a diet is evaluated against two dietary standards – the Recommended Dietary Allowances (RDAs) and the Dietary Guidelines – developed by the Health Promotion Board. The RDAs are levels of energy and nutrient intake required for the needs of the majority¹ of people in the Singapore population to be met. The food-based Dietary Guidelines for adult Singaporeans recommend a diet that contains a variety of food using the Healthy Diet Pyramid (HDP) as a guide.

1.2 CONTENTS OF THIS REPORT

The results in this report cover adult Singapore residents aged 18-69 years old in the following areas:

- a) Intake of energy and major nutrients
- b) Intake and consumption of Healthy Diet Pyramid (HDP) food groups and major food types
- c) Sodium levels from urinary excretion measurement
- d) Dietary practices

¹ RDAs are deemed to meet the needs of 97.5% of the target population.

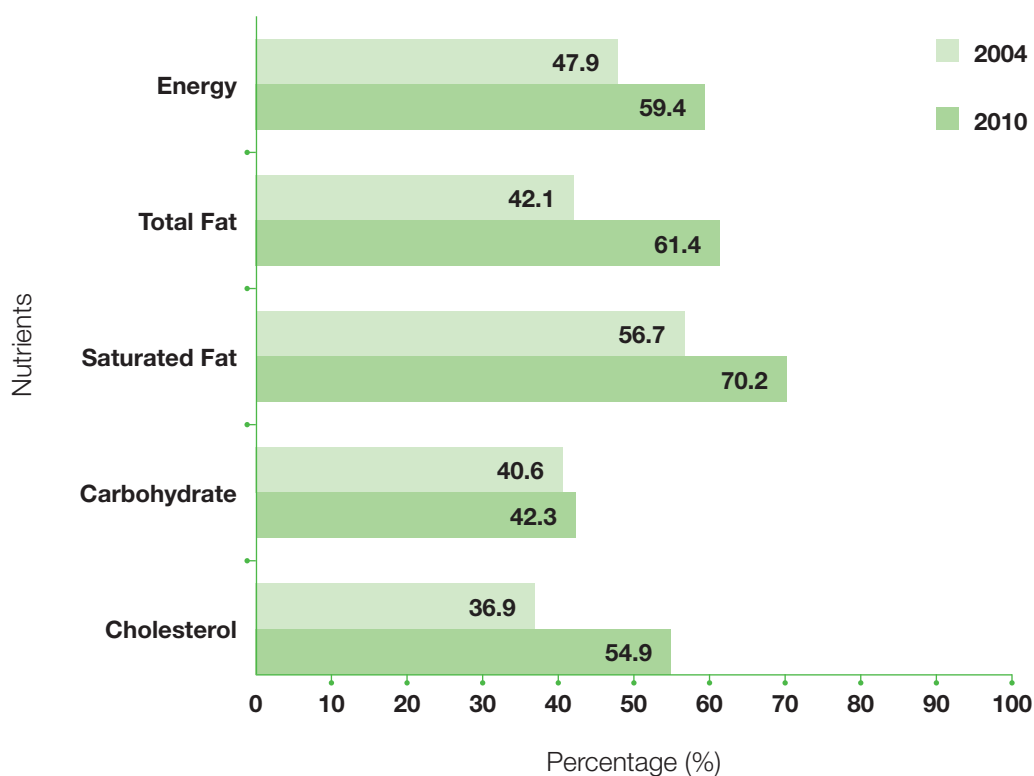
1.3 KEY FINDINGS

The key findings of the NNS 2010 are as follows:

1.3.1 Intake of energy and major nutrients

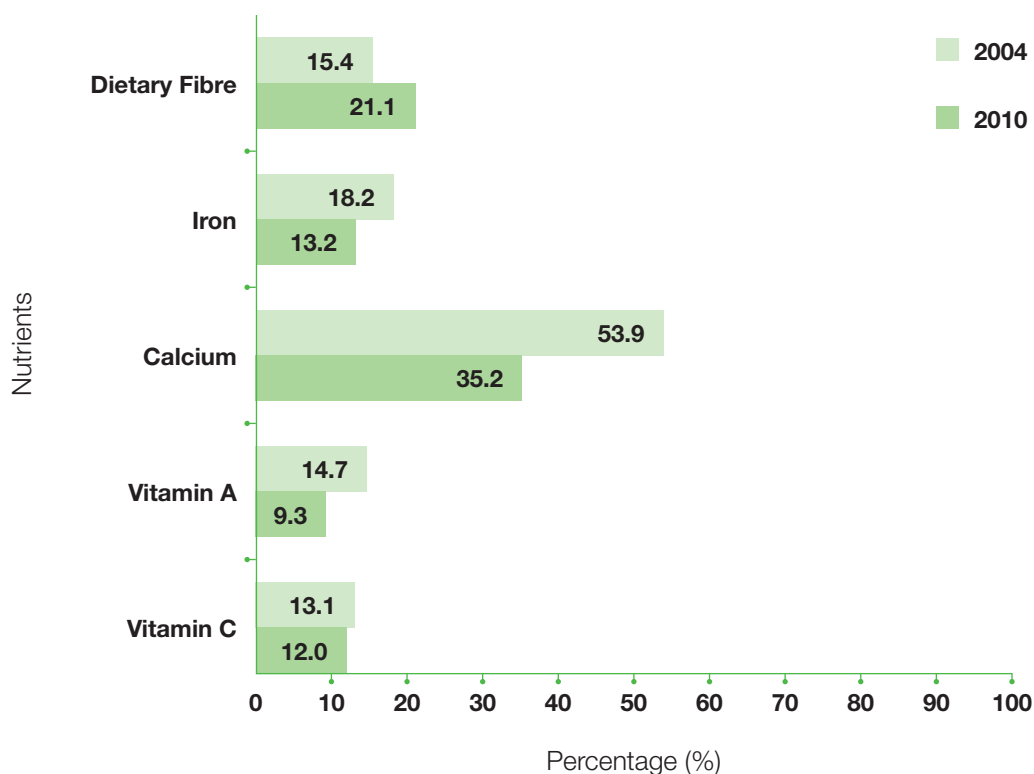
- The mean daily intake of energy among adult Singapore residents increased significantly across time from 2004 to 2010 (2378 kcal vs 2624 kcal). In 2010, about six in ten (59.4%) exceeded the daily recommendation for energy.
- Total energy derived from total fat (31.4%) has gradually increased over time and is now slightly above the recommended range of less than 30%. In 2010, the mean daily intake of total fat was 93.0g, compared to 77.0g in 2004. Again, six in ten (61.4%) exceeded the recommended intake for total fat in 2010. Saturated fat (38%) was proportionally higher in the Singaporean diet compared with other fats, and contributed to 11.8% of total energy intake.

Figure A: Dietary Excesses² of Energy and Selected Nutrients, 2004 and 2010



- In comparison with 2004, slightly more people (21.1%) did not consume sufficient fibre. However, improvements were noted in the consumption of iron, calcium and some vitamins, where more people consumed the recommended level.

² Dietary Excesses: intake above or beyond the recommendation level (more than 100% of the respective RDA)

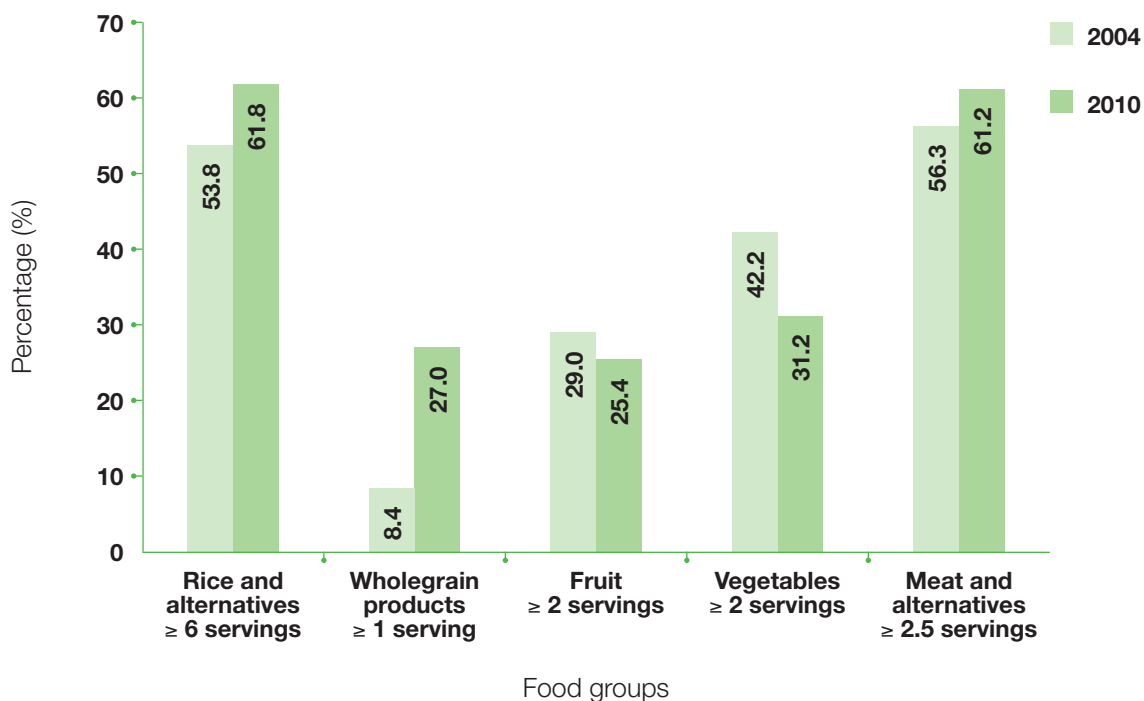
Figure B: Dietary Insufficiencies³ of Selected Nutrients, 2004 and 2010

1.3.2 Intake and consumption of HDP food groups and major food types

- One in four adult Singapore residents (25.4%) met the Dietary Guidelines of eating at least two servings of fruit daily. Three in ten (31.2%) met the two-servings-a-day recommendation for vegetables. Malays had the lowest daily consumption of vegetables and were least likely to meet the Dietary Guidelines for vegetables (25.0%). Those aged 18-29 years consumed the least servings of fruit where only 18.3% fulfilled the two-servings-a-day recommendation.
- Only 11.2% of adult Singapore residents consumed at least two servings of both fruit and vegetables in a day, compared to 14.3% in 2004.
- Daily intake of wholegrain products increased over the past six years. In 2010, almost three in ten (27.0%) adult Singapore residents consumed at least one serving of wholegrain products per day. For example, 49.0% usually chose wholemeal bread or a mixture of white and wholemeal bread, compared to 28.9% in 2004.

³ Dietary Insufficiencies: intake below the recommendation level (less than 70% of the respective RDA)

Figure C: Proportion of adult Singapore residents meeting the Dietary Guidelines, 2004 and 2010



1.3.3 Sodium levels

- Eight in ten (80.2%) adult Singapore residents exceeded the salt intake recommendation of less than 5g per day, with an average intake of 8.3g per day. Males (9.6g) consumed more salt per day than their female counterparts (7.2g). Those aged 30-49 years were found to consume the most salt among the various age groups.

1.3.4 Dietary practices

- There was an increase in the proportion of adult Singapore residents consuming sweet desserts and snacks more than twice per week (27.1%) compared with in 2004 (18.9%).
- The proportion of people skipping breakfast has doubled from 2004 (6.9%) to 2010 (14.1%).
- More Singapore residents reported eating out at hawker centres, coffee shop stalls, food courts, restaurants and/or coffee houses for lunch and/or dinner. The proportion usually eating out at least four times a week has increased from 47.8% in 2004 to 60.1% in 2010.

1.4 IMPLICATIONS AND RECOMMENDATIONS

The findings of this survey were mixed; there have been improvements in some areas of diet quality such as wholegrain consumption and vitamin and mineral intakes, however there has been a parallel worsening in other areas, with more people consuming excessive calories and an increasing role of fat in the diet. Continual effort is required to address quantity as well as quality. The new area of salt intake assessment through urinary collection confirms that most people exceed recommended intake levels and provides baseline data with which to monitor programmes and interventions.

Eating patterns and locations

Skipping breakfast and having meals away from home are associated with higher intake of total energy and are potential risk factors of higher Body Mass Index (BMI). Efforts addressing the evolving eating patterns and strategies engaging popular eating places to provide healthier options are important in public health to combat obesity.

Promoting consumption of healthy foods

The survey findings suggest that the recent national public health efforts in promoting wholegrain intake may have had positive effects. Wholegrain products such as wholemeal bread, brown rice and wholegrain noodles are gradually gaining acceptability among the population. Nonetheless, efforts in promotion are still required as only three in ten ate at least one serving of wholegrains per day.

The actual consumption of fruit and vegetables decreased over time, both by approximately one tenth of a serving. More than one quarter of the population met the daily recommendation for each. Continuing efforts to re-emphasise the '2 plus 2' message to the population are warranted.

Limiting intake of unhealthy foods

Excessive intake of salt is a key risk factor for high blood pressure (i.e. hypertension). Even small dietary salt reductions can lower blood pressure and the incidence of stroke and heart disease. Current strategies that engage community and food manufacturers have to continue to promote food with lower sodium content as well as other healthy foods.

The survey reported that the total energy contributed by total fat has gradually increased across time. Although changes are small in magnitude, they indicate that population-level trends have occurred which may need to be addressed further in the development of programmes aiming at obesity prevention.

methodology

2.1 SAMPLE

The National Nutrition Survey 2010 (NNS 2010) was carried out in conjunction with the National Health Survey 2010 (NHS 2010). The sampling methodology for the NHS 2010 is described in the NHS 2010 report.

For NNS 2010, sampling was based on a selection matrix stratified by gender, race and age. The Malay and Indian participants were over-sampled to provide adequate numbers for statistical comparisons between the ethnic groups.

2.2 STUDY DESIGN

The main components of the NNS 2010 consist of:

a) **Dietary Practices Questionnaire (DPQ) and Food Frequency Questionnaire (FFQ) Study:**

A face-to-face interview using DPQ and FFQ was administered concomitantly at the designated survey venues of the NHS by interviewers from the Health Promotion Board. The DPQ collected information on dietary practices whereas the FFQ assessed consumption of various food items to estimate amounts of intake of energy, major nutrients and selected food groups.

The DPQ used in NNS 2010 consisted of 26 multiple-choice questions. The topics covered in the questionnaire included usual eating places of meals, choices on food products, consumption of selected foods and some health conscious behaviours.

The validated FFQ had been used in NNS 1998 and NNS 2004. For NNS 2010, minor modifications to the FFQ were made mainly to better differentiate consumption of wholegrain and non-wholegrain foods, and include capture of fish intake. A total of 397 food items were included.

The adequacy of intake of individual nutrients and various food groups was assessed by comparing the levels of intake with dietary standards including the Recommended Dietary Allowances (RDAs) [Annex I].

A copy of the DPQ and FFQ can be found at Annex III and Annex IV, respectively.

b) Salt Intake Study (SIS):

The 'gold standard' 24-hour urinary collection method was used. Participants were instructed to collect all the urine they passed during a 24-hour collection period starting from their second morning urine pass of a pre-arranged collection day, and ending with their first urine pass on the following morning. Concurrently, they kept a record diary to capture start time, end time, urine missed or spilled, and medications taken. Participants were reminded to maintain their normal routine during the urine collection period.

The completed urine samples were collected by fieldwork staff at the participants' homes or other venues convenient to them, and despatched to a designated, qualified laboratory within 24 hours after the end of the collection period. The urine samples were then analysed and sodium levels were assessed based on an indirect potentiometric procedure using an ion selective electrode.

2.3 TRAINING OF INTERVIEWERS

All the interviewers of NNS 2010 were trained on the survey methodology and underwent rigorous training in the survey procedures assigned to them. During the fieldwork, regular audit of the interviewers was conducted to ensure strict adherence to the procedures and standards of the survey.

2.4 FIELDWORK

For the DPQ and FFQ Study, fieldwork was conducted from March to June 2010 at five government polyclinics and one community club. Subjects were recruited for SIS at the same time as for the DPQ and FFQ Study. However, fieldwork for SIS was conducted from March to July 2010 at the household of the participants.

2.5 INFORMED CONSENT

For the DPQ and FFQ Study, the consent form was part of the overall consent form for NHS 2010. All NHS 2010 participants provided informed consent to participate on the actual day of the study. A separate informed consent was obtained from the invited participants for SIS.

2.6 DATA ANALYSIS**Data coding**

DPQ and FFQ data were entered into the Food Information and Nutrient Database (FIND) system of the Health Promotion Board.

Statistical Analysis

Sample weights were applied to the analyses to represent the population. For analyses of DPQ and FFQ data, the overall sample weight was the product of three weightage components:

- a) for the household enumeration exercise, sample weights to account for unequal probability of selection and non-response (refer to details in the NHS 2010 Report);
- b) for the survey fieldwork, sample weights to account for unequal probability selection that were computed based on four attributes-gender, ethnicity and age group by survey site; and
- c) post-stratification weight based on gender, ethnic and age distribution of 2010 Census Singapore resident population figures to account for over-sampling of Malay and Indian participants and to extrapolate the findings to the general population.

For SIS, a fourth weight was included to account for non-response among consenting participants.

Where comparison is made with NNS 2004 and NNS1998, the data from the past surveys were standardised to the 2010 Census Singapore resident population. For energy and selected nutrients, the RDAs have been revised over time. Figures from NNS 2004 and NNS 1998 were first corrected for the new RDAs and then standardised for comparison. 95% confidence intervals (95% CI) were computed to assess whether there were statistically significant differences between data.

Data were analysed using multiple statistical software including STATA version 11.0, SPSS version 17.0 and R version 2.13.0.

2.7 ETHICS APPROVAL

The NNS 2010 methodology, protocol and procedures were approved by the Health Promotion Board Medical and Dental Board Ethics Committee.

All invitation letters, consent forms, questionnaires and instructions to the participants were translated into Chinese, Malay and Tamil.

subjects

A total of 1,661 respondents aged 18 to 69 years took part in the DPQ and FFQ Study of NNS 2010. Fourteen persons from the original sample were ineligible (age and ethnicity) and were excluded from NNS. The eventual sample size was 1647 eligible respondents. In the FFQ analyses, a further 20 persons with extreme daily energy intake were excluded⁴.

A total of 1,182 subjects aged 18 to 69 years were invited to the SIS of NNS 2010. Exclusion procedures⁵ yielded a final sample size of 739 eligible participants and an overall response rate of 63% out of all invited subjects.

Demographic Characteristics	DPQ Sample Size (unweighted)	FFQ Sample Size (unweighted)	SIS Sample Size (unweighted)
Total	1647	1627	739
Gender			
Males	817	808	377
Females	830	819	362
Ethnic Group			
Chinese	673	666	250
Malay	501	491	247
Indian	473	470	242
Age Group (years)			
18-29	391	383	153
30-39	398	390	175
40-49	404	403	173
50-59	284	283	122
60-69	170	168	116

⁴ Extreme daily energy intake: male >7000kcal/d or <500kcal/d; female >5000kcal/d or <500kcal/d.

⁵ Exclusion criteria for SIS: ineligible (e.g. belonged to an ethnic group other than Chinese, Malay or Indian); the urine collection period not within 24±4 hours; the urine sample not despatched to the designated laboratory within 24 hours after the end of the urine collection period.

results

INTAKE OF ENERGY AND MAJOR NUTRIENTS

3.1 ENERGY

The average Recommended Dietary Allowances (RDAs) for energy are 2595 kcal for males and 2038 kcal for females respectively. In 2010, the mean daily energy intake of adult Singapore residents was 2624 kcal. Overall, about six in ten (59.4%) adult Singapore residents had a total energy intake higher than the recommended level.

Males (2927kcal) had a higher mean daily intake of energy than their female counterparts (2322kcal). Daily energy intake was higher among young adults. Those aged 18-29 years consumed 17% more energy from food in a typical day than those aged 60-69 years.

The proportion exceeding the recommendation was fairly similar between genders. Additionally, the youngest age group (18-29 years) was more likely to have excessive energy intake compared with other age groups. Please refer to Annex I for the RDA for energy.

In comparison with 2004, the mean daily intake of energy in 2010 was higher in all subgroups and more people had energy intakes beyond their requirements.

Table 3.1.1, Table 3.1.2, Table 3.1.3 and Table 3.1.4

3.2 PROTEIN

The recommended protein intake for an adult Singapore resident is 1.07g/kg body weight per day. According to the Dietary Reference Intakes (DRIs) published by the USDA, the recommended contribution of protein to total energy should be between 10% and 15%. In 2010, protein provided 15.3% of energy for adult Singapore residents, compared to 14.0% and 13.4% in 2004 and 1998 respectively.

Mean daily protein intake was higher than the daily recommended level in both genders. About four in five exceeded their respective requirements and four in ten consumed 1.5 times more than the recommendation. Among the ethnic groups, the Chinese (83.8%) were more likely to consume excessive proteins compared with non-Chinese (range: 66.5%-72.0%).

Similar increases in protein intake over the years were observed regardless of gender and ethnic group. In general, people were eating approximately 21% more proteins in 2010 compared with in 2004.

*Figure 3.1.1, Figure 3.1.2, Figure 3.1.3,
Table 3.2.1, Table 3.2.2, Table 3.2.3 and Table 3.2.4*

3.3 TOTAL FAT

The DRIs recommend that total fat contributes 25% to 30% of total energy intake and hence the recommended intake was 86.5g and 67.9g for males and females respectively. The mean total fat intake of adult Singapore residents was 93.0g per day in 2010. Approximately six in ten (61.4%) met or exceeded their recommended intake for total fat. On average, total fat contributed 31.4% to the total dietary energy intake. This percent contribution to energy from total fat has consistently increased over the years from 1998.

Males had a 24% higher mean intake of total fat compared to females (103.0g vs 83.0g). Malays (95.4g) had a higher total fat intake than Indians (93.3g) and Chinese (92.5g). Similar to energy and protein, the daily intake of total fat was significantly higher in all subgroups in 2010 compared with in the past surveys.

The major food sources of total fat in 2010 were similar to those in 2004 and 1998. Most of the total fat eaten by adult Singapore residents came from stir-fried vegetables (12.3%); biscuits, pastries, cakes, nuts, titbits, snacks and local snacks (12.4%); rice, noodle, meat dishes, and desserts containing coconut milk (10.6%); fried noodles (5.6%); and flavoured rice (5.1%).

*Figure 3.1.1, Figure 3.1.2, Figure 3.1.3,
Table 3.3.1, Table 3.3.2, Table 3.3.3, Table 3.3.4 and Table 3.3.5*

3.4 SATURATED FAT

It is recommended that saturated fat should contribute no more than 10% of total energy intake. Hence the average recommended intake levels for males and females were 28.8g and 22.6g respectively. NNS 2010 found that the mean saturated fat intake for adult Singapore residents was 35.2g per day. Almost seven in ten adult Singapore residents (70.2%) met or exceeded their recommended intake for saturated fat.

Males had a significantly higher intake (39.4g) than females (31.0g). Malays (38.3g) consumed more saturated fat than the other two ethnic groups. Both Malays (78.1%) and Indians (76.0%) were more likely to consume excessive saturated fat compared with Chinese (67.9%). Comparing the figures from 2010 with those from 1998, daily saturated fat intake was significantly higher in all subgroups.

In NNS 2010, the top contributor of saturated fat was from plant-based sources such as coconut oil and coconut milk. Malay and Indian dishes prepared with coconut milk (16.3%) made the highest contribution to the total saturated fat intake. The other major contributors were biscuits, pastries, cakes, nuts, titbits, snacks and local snacks (14.4%) and stir-fried vegetables (9.0%).

Table 3.4.1, Table 3.4.2, Table 3.4.3, Table 3.4.4 and Table 3.4.5

3.4.1 Ratio of Fatty Acids Relative to Saturated Fat

Polyunsaturated fat (PUFA) and monounsaturated fat (MUFA) are two types of unsaturated fats, generally known as the 'good fats' because they are more heart-healthy. The recommended PUFA, MUFA and saturated fat (SFA) ratio for all adults is 1.00: 1.00: 1.00 (P: M: S ratio).

The P: M: S ratio for adult Singapore residents was 0.50: 1.00: 1.00, indicating that MUFA and SFA were the two major types of fatty acid consumed by adult Singapore residents and the respective energy contribution were 5.8%, 11.6% and 11.8%. MUFA was the predominant type of fatty acid in the Chinese diet while Malays consumed more SFA (38.3g) and less PUFA (16.5g) compared with non-Malays.

Table 3.4.1.1, Table 3.4.1.2, Table 3.4.1.3 and Table 3.4.1.4

3.5 CARBOHYDRATES

DRIs recommend that carbohydrates should contribute 55-65% of dietary energy and hence the average recommended intake for males and females was 389.3g and 305.7g respectively. In 2010, the overall mean daily carbohydrate intake for adult Singapore residents was 337.4g which was similar to that in 2004.

However, the percentage of energy derived from carbohydrates has steadily decreased from 1998 onwards. In 2010, carbohydrates contributed 52.1% to total energy, in comparison with 56.7% in 2004 and 60.1% in 1998.

Males consumed 26% more carbohydrates from foods than females (376.6g vs 298.2g). In terms of ethnic groups, Malays (353.8g) and Indians (355.6g) consumed more carbohydrates than Chinese (331.7g).

*Figure 3.1.1, Figure 3.1.2, Figure 3.1.3,
Table 3.5.1, Table 3.5.2, Table 3.5.3 and Table 3.5.4*

3.6 CHOLESTEROL

Intake of cholesterol should not exceed 300mg daily. According to the NNS 2010, the mean cholesterol intake for adult Singapore residents was 341mg per day. More than half of adult Singapore residents (54.9%) met or exceeded their recommended intake for cholesterol.

Males had a significantly higher cholesterol intake than females (382mg vs 300mg). Chinese (60.0%) were more likely to meet or exceed the recommended levels than non-Chinese. This group also had the largest increase in daily cholesterol level over six years from 2004.

Table 3.6.1, Table 3.6.2, Table 3.6.3 and Table 3.6.4

3.7 DIETARY FIBRE

The RDA for dietary fibre for adult Singaporeans is a daily intake of 26.0g for males and 20.4g for females. The mean daily intake of dietary fibre for adult Singapore residents in 2010 was 23.7g; slightly lower than in 2004 (24.8g per day). Insufficient intake of dietary fibre is defined as intake of less than 70% of the respective RDA. More adult Singapore residents had insufficient dietary fibre intake in 2010 (21.1%) compared with in 2004 (15.4%).

Malays (22.9g) had the lowest daily intake of dietary fibre compared with other ethnic groups. They also had lower consumption of fruit and vegetables. Consequently, more Malays (26.5%) did not consume sufficient amounts of dietary fibre. Males (26.2%) were more likely to have insufficient fibre intake than females (16.0%).

Table 3.7.1, Table 3.7.2, Table 3.7.3 and Table 3.7.4

3.8 IRON

The average RDA for iron is 6.0mg per day for males and 17.7mg per day for females. Males and females had similar mean daily intakes of iron (18.9mg vs 16.8mg). Fewer females (26.3%) had insufficient iron intake (meeting less than 70% of the respective RDA) in 2010 compared with in 2004 (35.9%).

Table 3.8.1, Table 3.8.2, Table 3.8.3 and Table 3.8.4

3.9 CALCIUM

Calcium is a mineral that is essential for good bone health. The RDA for calcium for adults aged 18 years and those above 51 years is 1000mg. The RDA for those who are aged 19-50 years is 800mg.

In 2010, the mean daily intake of calcium among adult Singapore residents was 794mg per day. In comparison with 2004, there was a reduction in the proportion of adult Singapore residents having insufficient daily intakes of calcium (35.2% in 2010 vs 53.9% in 2004). The improvement was more notable among females.

Table 3.9.1, Table 3.9.2, Table 3.9.3 and Table 3.9.4

3.10 VITAMIN A

The mean daily intake of vitamin A for both males and females was above the RDA of 750mcg per day, with no significant difference between males and females.

Fewer adult Singapore residents had insufficient vitamin A intake (intake less than 70% of the RDA) in 2010 compared with in 2004; an improvement largely attributable to fewer males having insufficient intake. More Malays (16.9%) had insufficient vitamin A intake compared with non-Malays, as did older adults aged 60-69 years (15.6%) compared with other age groups.

Table 3.10.1, Table 3.10.2, Table 3.10.3 and Table 3.10.4

3.11 VITAMIN C

The RDA for vitamin C for adult males aged 18 years and above and females aged 19 years and above is 105mg and 85mg per day, respectively. For females aged 18 years, the RDA is 80mg.

The mean daily intake of vitamin C of adult Singapore residents was 131mg. Only 12% of adult Singapore residents in 2010 had insufficient vitamin C intake (intake below 70% of the RDA), and this was not significantly different from the proportion in 2004.

There was no significant difference in mean daily intake between males and females. Malays (116mg) had a lower mean daily intake of vitamin C, and a higher proportion of people with insufficient intake (23.4%) than the other ethnic groups.

Table 3.11.1, Table 3.11.2, Table 3.11.3 and Table 3.11.4

INTAKE AND CONSUMPTION OF HEALTHY DIET PYRAMID (HDP) FOOD GROUPS AND MAJOR FOOD TYPES

4.1 INTAKE OF HDP FOOD GROUPS

The food-based Dietary Guidelines for adult Singapore residents recommend an intake of 5-7 servings of rice and alternatives (of which at least one serving should be a wholegrain product), 2 servings of fruit, 2 servings of vegetables, and 2-3 servings of meat and alternatives per day. These types of food form the Healthy Diet Pyramid which can be used as a guide to achieve a well-balanced diet.

For the purpose of evaluation of this section, 6 servings and 2.5 servings were used as cut-offs for rice and alternatives and meat and alternatives, respectively.

In 2010, the mean daily intake of the HDP food groups among adult Singapore residents were 6.90 servings of rice and alternatives (including 0.76 servings of wholegrain products), 1.27 servings of fruit, 1.78 servings of vegetables and 3.16 servings of meat and alternatives. Males consumed significantly more servings of rice and alternatives (7.78 vs 6.01 servings) and meat and alternatives (3.45 vs 2.87 servings) than females.

About six in ten adult Singaporeans consumed adequate servings of rice and alternatives (61.8%) and meat and alternatives (61.2%). More than one quarter (27.0%) of the population consumed at least one serving of wholegrain products per day. For fruit and vegetables, proportions meeting the Guidelines were close to 30% (25.4% and 31.2% respectively).

Malays ate fewer wholegrain products, fruit, and vegetables compared with non-Malays. Hence fewer Malays met the Guidelines for these types of food. Those aged 18-29 years consumed the least fruit compared with other age groups with only 18.3% of them meeting the Guideline. The oldest age group (60-69 years) had the lowest consumption of vegetables and meat and alternatives among all age groups. Only 23.7% met the Guideline for vegetables. Less than half of them (49.0%) met the Guideline for meat and alternatives.

Figure 4.1.1, Figure 4.1.2, Figure 4.1.3,

Table 4.1.1(a), Table 4.1.1(b), Table 4.1.2(a), Table 4.1.2(b), Table 4.1.3(a) and Table 4.1.3(b)

4.2 COMPARISON OF THE INTAKE OF HDP FOOD GROUPS, NNS 2004 AND NNS 2010

There was a significant increase in the mean daily intake of wholegrain products among adult Singapore residents, from 0.19 servings in 2004 to 0.76 servings in 2010. Approximately three in ten adult Singapore residents consumed at least one serving of wholegrain products daily in 2010 (27.0%) compared to 8.4% in 2004.

However the consumption of fruit and vegetables dropped from 1.37 and 1.90 servings to 1.27 and 1.78 servings per day over the past six years, respectively. Fewer Singapore residents met the Guidelines for fruit (25.4% vs 29.0%) and vegetables (31.2% vs 42.2%) in 2010 compared with in 2004. In addition, fewer Singapore residents consumed at least two servings of both fruit and vegetables in 2010 compared with in 2004 (11.2% vs 14.3%).

Figure 4.2.1, Figure 4.2.2 and Figure 4.2.3

4.3 INTAKE OF MAJOR FOOD TYPES

Gender Differences

In general, males consumed more of all the main food types, with the exception of fruit and vegetables, compared to females. Males also had a higher consumption of alcohol than females. Looking at sub-food types, further differences were observed in the intake patterns between males and females. Females tended to have a healthier eating pattern, i.e. they ate more wholemeal bread and wholegrain cereals, brown rice or porridge, wholegrain noodles, dark green leafy vegetables, dishes with poultry without skin, reduced fat milk, yogurt and cheese, and dishes with tofu or beancurd compared to males.

Ethnic Differences

Among the ethnic groups, Chinese ate more rice or porridge dishes, noodle dishes, poultry dishes, meat dishes and eggs compared with other ethnic groups. They had a higher consumption of alcohol than the other two ethnic groups. They also consumed the least amount of milk and dairy products as well as bread and breakfast cereals. Although Chinese consumed overall less vegetables compared with Indians, they tended to eat more dishes with pale green and dark green leafy vegetables.

Malays consumed more fish and seafood dishes, soy products, fast food and soft drinks than the other ethnic groups. They also had the lowest consumption of fruit and vegetables.

Indians consumed the most bread and breakfast cereals, vegetable dishes, fruit, milk and dairy products compared with others. They also ate fewer eggs, poultry and meat dishes.

Age Differences

The youngest adults (18-29 years) consumed the most rice or porridge dishes, noodle dishes, poultry and meat dishes, eggs, fast food and soft drinks compared with other age groups. This group also consumed the least fruit, wholemeal bread and wholegrain cereals.

Older adults (60-69 years) consumed the most wholemeal bread and wholegrain cereals, and milk and dairy products. They also consumed the least amount of poultry and meat dishes, eggs and soy products.

*Tables 4.3.1, Table 4.3.2, Table 4.3.3, Table 4.3.4,
Table 4.3.5, Table 4.3.6, Table 4.3.7 and Table 4.3.8*

SODIUM

5.1 SODIUM LEVELS FROM URINARY EXCRETION MEASUREMENT

Among adult Singapore residents, mean urinary sodium excretion was 142.2mmol/24hr. The estimated salt intake was 8.3g (or 3265mg sodium) per day.

The estimated salt intake was significantly higher among males (9.6g or 3777mg sodium) than females (7.2g or 2832mg sodium). There were no significant differences in salt intake among the ethnic groups. However, an inverted U-shaped pattern was observed among the various age groups, with the highest salt intake level in the 30-39 and 40-49 year olds.

The Dietary Guidelines for adults recommend that salt intake should be reduced to less than 5g (2000mg of sodium) per day. About eight in ten Singapore residents (80.2%) exceeded the recommended dietary limit for salt. Moreover, 27.7% of the population consumed double the recommended limit.

Tables 5.1.1, Table 5.1.2 and Table 5.1.3

DIETARY PRACTICES

6.1 EATING VENUES

6.1.1 Venues of Breakfast, Lunch and Dinner

The majority of adult Singapore residents reported usually having home-prepared breakfast (55.6%). Among those who had their breakfast away from home, the most frequented venues were hawker centres/coffee shop stalls/food courts (20.5%), followed by workplace/school canteens (8.4%). However, 14.1% of Singapore residents reported usually skipping breakfast. Malays (26.9%) and those aged 18-29 years (26.1%) were most likely to skip breakfast.

Figure 6.1.1(a) and Table 6.1.1(a)

About seven in ten adult Singapore residents reported usually having lunch away from home (70.7%). Among ethnic groups, Chinese (78.4%) were most likely to have lunch away from home. The most frequented lunch venue was hawker centres/coffee shop stalls/food courts (58.5%).

Figure 6.1.1(b) and Table 6.1.1(b)

The majority of Singapore residents usually had home-prepared dinner (65.5%) while another 28.3% had dinner at hawker centres. Compared to Malays and Indians, Chinese were most likely to usually have dinner at hawker centres (34.8%).

Figure 6.1.1(c) and Table 6.1.1(c)

6.1.1.1 Comparison of Venues of Breakfast, Lunch and Dinner, NNS 2004 and NNS 2010

In both 2004 and 2010 the majority of adult Singapore residents reported usually consuming breakfast at home. However, the proportion of Singapore residents who had breakfast at workplace/school canteens was significantly lower in 2010 (8.4% vs 12.8% in 2004), whereas the proportion who skipped breakfast was significantly higher (14.1% vs 6.9% in 2004).

The proportion of Singapore residents who usually had lunch at hawker centres/coffee shop stalls/food courts was significantly higher in 2010 (49.9% vs 41.0% in 2004), while the proportion having lunch at workplace/school canteens was significantly lower (25.9% in 2004 vs 17.5% in 2010).

For dinner, the proportion of Singapore residents who reported usually eating at hawker centres/coffee shop stalls/food courts for dinner was also significantly higher in 2010 (28.3% vs 21.3% in 2004). In contrast, the proportion of Singapore residents who reported eating at home for dinner dropped significantly by 8.1% points compared with in 2004.

For lunch and/or dinner, the proportion of Singapore residents who reported usually eating at hawker centres/coffee shop stalls/food courts increased significantly from 46.7% in 2004 to 56.9% in 2010. Including restaurants/coffee houses with these venues, the proportion increased significantly from 47.8% to 60.1%.

Table 6.1.1.1 and Table 6.1.1.2

6.1.2 Frequency of Eating at Hawker Centres/Food Courts/Coffee Shops and Western Fast Food Restaurants

The participants were asked how often they ate at hawker centres/food courts/coffee shops and at Western fast food restaurants for any meals of the day. The majority of adult Singapore residents (80.7%) reported eating at hawker centres/food courts/coffee shops at least twice a week. In addition, nearly half (45.1%) had their meals at hawker centres/food courts/coffee shops six times a week or more.

Figure 6.1.2(a) and Table 6.1.2(a)

About one in ten Singapore residents dined at Western fast food restaurants at least twice a week. This proportion was considerably higher among Malays (20.7%) and those aged 18-29 years (28.5%).

Figure 6.1.2(b) and Table 6.1.2(b)

6.1.2.1 Comparison of Frequency of Eating at Hawker Centres/Food Courts/Coffee Shops and Western Fast Food Restaurants, NNS 2004 and NNS 2010

In both 2004 and 2010, about one in two adult Singapore residents dined at hawker centres/coffee shop stalls/food courts (for any meals of the day) six times a week or more (48.6% in 2004 vs 45.1% in 2010). The proportion dining at Western fast food restaurants once a week or less (for any meals of the day) remained at about nine in ten (90.0% in 2004 vs 89.5% in 2010).

Table 6.1.2.1 and Table 6.1.2.2

6.2 CHOICE OF FOOD PRODUCTS

6.2.1 Types of Bread and Rice Consumed

The Dietary Guidelines for adult Singaporeans recommend a diet rich in wholegrains. Examples of wholegrain food include wholemeal bread and brown/red rice. The participants were asked the types of bread and rice that they usually consumed.

Almost half (45.4%) of the adult Singapore residents usually consumed white bread (ordinary/enriched) only. 15.9% usually consumed wholemeal bread only, while 33.1% consumed a mixture of white and wholemeal bread. Altogether, 49.0% of the Singapore residents consumed wholemeal bread in their diet. Males were less likely to consume any wholemeal bread (either alone or together with white bread) (46.3%) compared to females (51.7%).

Figure 6.2.1(a) and Table 6.2.1(a)

Most (80.7%) adult Singapore residents consumed white rice only. A small proportion (4.5%) consumed brown/red rice only; 14.2% reported consuming a mixture of white and brown/red rice. In total, 18.7% of the Singapore residents consumed brown/red rice in their diet. Males (15.7%) were less likely to consume any brown/red rice (either alone or together with white rice) compared to females (21.7%).

Figure 6.2.1(b) and Table 6.2.1(b)

6.2.1.1 Comparison of Types of Bread Consumed, NNS 2004 and NNS 2010

A significantly higher proportion of Singapore residents reported consuming any wholemeal bread compared with in 2004 (28.9% vs 49.0% in 2010).

Table 6.2.1.1

6.2.2 Types of Fat and Oil Used for Cooking at Home

The most commonly used oil for cooking at home was blended vegetable oil (32.9%), followed by monounsaturated oils (e.g. olive oil and canola oil) (32.4%) and polyunsaturated oils (e.g. corn oil and sunflower oil) (26.6%). Very few Singapore residents used animal fat such as butter, ghee and lard for cooking at home (0.4%).

Among the three ethnic groups, blended vegetable oil was most commonly used by Malays (57.8%). Monounsaturated oils and polyunsaturated oils were the most common choices for Chinese (35.4%) and Indians (43.1%), respectively.

Figure 6.2.2 and Table 6.2.2

6.2.2.1 Comparison of Types of Fat and Oil Used for Cooking at Home, NNS 2004 and NNS 2010

Use of monounsaturated oils was 13.2% points higher in 2010 compared with in 2004, while use of blended vegetable oil was lower by 9.8% points.

Table 6.2.2.1

6.2.3 Types of Fat Spread Used

The majority of adult Singapore residents (71.4%) used some form of fat spread on bread or crackers. The most common fat spreads used were soft margarine (28.5%) and butter (28.0%). Among males butter was most commonly used, whereas among females soft margarine was most common. Almost one-third (30.1%) of Chinese did not use any fat spread at all, whereas 37.2% of Malays and 32.8% of Indians reported butter as their usual fat spread.

Figure 6.2.3 and Table 6.2.3

6.2.3.1 Comparison of Types of Fat Spread Used, NNS 2004 and NNS 2010

Significantly more adult Singapore residents used butter as fat spread on bread or crackers in 2010 compared with in 2004 (14.2% points increase) whereas fewer Singapore residents used soft margarine as fat spread (17.9% points decrease).

Table 6.2.3.1

6.2.4 Types of Milk Consumed and Milk Added to Beverages

Among adult Singapore residents, the most common type of milk consumed was low fat milk (38.1%) followed by full cream milk (14.4%) and non-fat milk (1.7%). Almost a half (45.5%) and a quarter (26.6%) did not consume any milk or did not add any milk to the beverages, respectively. Compared with Malays (33.5%) and Indians (37.8%), a higher proportion of Chinese did not drink milk at all (49.0%).

Figure 6.2.4(a) and Table 6.2.4(a)

The most common type of milk/milk substitute added to beverages was sweetened condensed milk (31.4%), which is higher in energy and sugar content than other milks. More males (36.5%) than females (26.2%) used sweetened condensed milk with their beverages. 16.8% of the population used full cream milk whereas 9.0% used low fat or non-fat milk. About a quarter of the Singapore residents (26.0%) did not add any milk/milk substitutes to their beverages. Malays (44.5%) were more likely to add sweetened condensed milk to their beverages compared with Chinese (29.7%) and Indians (25.4%).

Figure 6.2.4(b) and Table 6.2.4(b)

6.2.4.1 Comparison of Types of Milk Consumed and Milk Added to Beverages, NNS 2004 and NNS 2010

About one in two reported not consuming any milk or milk-based drinks at all (45.5% in both 2010 and 2004). Fewer adult Singapore residents consumed non-fat milk in 2010 (1.7%) compared with in 2004 (5.4%).

Condensed milk remained the key type of milk added to beverages for one in three adult Singapore residents (31.4% in 2010 vs 35.0% in 2004). More Singapore residents reported choosing full cream milk in 2010 (16.8% vs 9.0% in 2004).

Table 6.2.4.1

6.2.5 Types of Sweetening Agent Added to Beverages

The majority of adult Singapore residents (59.8%) added sugar to tea, coffee and other beverages. Nonetheless, a considerable proportion (38.6%) did not use any sweetening agent at all. Males (64.4%) and Indians (66.6%) were more likely to add sugar to beverages compared to females and the other ethnic groups, respectively.

Figure 6.2.5 and Table 6.2.5

6.2.5.1 Comparison of Types of Sweetening Agent Added to Beverages, NNS 2004 and NNS 2010

More Singapore residents reported adding sugar to their beverages in 2010 (59.8% vs 51.9% in 2004).

Table 6.2.5.1

6.3 CONSUMPTION OF WATER AND SELECTED FOODS

6.3.1 Consumption of Plain Water

More than half of adult Singapore residents (55.0%) met the recommended intake of at least 1.5 litre (equivalent to 6 glasses) of plain water per day. Adults aged 60-69 years (42.7%) were least likely to meet this recommendation compared to the other age groups.

Figure 6.3.1 and Table 6.3.1

6.3.1.1 Comparison of Consumption of Plain Water, NNS 2004 and NNS 2010

In 2010, significantly more adult Singapore residents consumed the recommended amount of plain water per day (55.0% vs 47.8% in 2004).

Figure 6.3.1.1

6.3.2 Consumption of Deep Fried Food

The Dietary Guidelines for adult Singapore residents recommend limiting consumption of deep fried food to no more than twice per week. The majority of adult Singapore residents (56.2%) met this guideline, and 9.6% did not eat any deep fried foods at all. However, one-third (34.2%) exceeded the recommended limit. About half of Malays (51.0%) exceeded the dietary limit for deep fried food, and young adults aged 18-39 years reported consuming deep-fried food more often than older age groups.

Figure 6.3.2 and Table 6.3.2

6.3.2.1 Comparison of Consumption of Deep Fried Food, NNS 2004 and NNS 2010

The proportion of adult Singapore residents who exceeded the dietary limit for deep fried food consumption was similar over time (37.0% in 2004 vs 34.2% in 2010). However, significantly fewer Singapore residents reported not consuming any deep fried food (from 14.6% in 2004 to 9.6% in 2010) while more Singapore residents reported consuming such food twice a week or less (from 48.4% in 2004 to 56.2% in 2010).

Table 6.3.2.1

6.3.3 Consumption of Sweetened Drinks

Nearly half (45.4%) of adult Singapore residents consumed sweetened drinks, such as soft drinks, cordials and fruit drinks more than once per week. In addition, 15.6% consumed sweetened drinks at least seven times a week. Compared to females (39.9%), more males (50.9%) consumed sweetened drinks twice or more per week. More Malays (61.0%) consumed sweetened drinks twice or more per week compared to Chinese (41.9%) and Indians (48.8%). Young adults aged 18-39 years reported consuming sweetened drinks more often than older age groups.

Figure 6.3.3 and Table 6.3.3

6.3.3.1 Comparison of Consumption of Sweetened Drinks, NNS 2004 and NNS 2010

Between 2004 and 2010, the proportion of adult Singapore residents who consumed sweetened drinks more than once per week remained at about 45%. As with consumption of deep fried food, significantly fewer Singapore residents reported not consuming sweetened drinks at all (from 39.4% in 2004 to 26.5% in 2010) while more Singapore residents consumed sweetened drinks once a week or less (from 15.9% in 2004 to 28.2% in 2010).

Table 6.3.3.1

6.3.4 Consumption of Sweet Desserts and Snacks

The majority of adult Singapore residents (58.0%) consumed sweet desserts and snacks no more than twice per week and 14.9% of them did not eat these foods at all. However, about a quarter of the Singapore residents (27.1%) ate these foods three times or more per week. Among all age groups, the 18-29 years olds were most likely to eat sweet desserts and snacks. In this age group, four out of ten (39.4%) consumed sweet desserts and snacks three times or more per week, and only 6.5% did not eat these foods at all.

Figure 6.3.4 and Table 6.3.4

6.3.4.1 Comparison of Consumption of Sweet Desserts and Snacks, NNS 2004 and NNS 2010

Overall, significantly more adult Singapore residents consumed sweet desserts and snacks more than twice per week (27.1%) compared with in 2004 (18.9%). The proportion eating these foods once or twice a week was also higher in 2010 (58.0% vs 42.9% in 2004). Correspondingly, there was a marked decline in the proportion of Singapore residents who reported not consuming any sweet desserts and snacks at all.

Table 6.3.4.1

6.4 HEALTH CONSCIOUS BEHAVIOURS

6.4.1 Adding Salt and Sauces at the Table

Most adult Singapore residents did not add salt or sauces to their food at the table (72.4%), while 19.0% reported adding salt or sauces when food is not tasty enough. A small proportion (8.6%) added salt and sauces at the table before tasting the food. Chinese (9.3%) were more likely to add any salt or sauces before tasting the food compared to Malays (6.8%) and Indians (6.1%).

Figure 6.4.1 and Table 6.4.1

6.4.1.1 Comparison of Adding Salt and Sauces at the Table, NNS 2004 and NNS 2010

The proportion of Singapore residents who did not add salt or sauces to their food at the table increased from 63.8% in 2004 to 72.4% in 2010.

Table 6.4.1.1

6.4.2 Trimming Fat from Meat and Trimming Skin from Poultry

The majority of adult Singapore residents (69.6%) trimmed off all or some of the visible fat from the meat they consumed. Females (53.4%) were more likely to trim off all visible fat than males (40.5%). Half of Indians (49.6%) trimmed off all the visible fat from meat eaten whereas one-third of them (30.0%) did not eat any meat. One fifth (20.3%) of adult Singapore residents did not trim off any visible fat. A higher proportion of Chinese (22.3%) and Malays (18.7%) did not trim off any visible fat from meat compared with Indians (8.4%).

Figure 6.4.2(a) and Table 6.4.2(a)

Approximately seven in ten adult Singapore residents (67.7%) trimmed off all or some of the skin from the poultry they consumed. However, a quarter (27.0%) did not trim off any skin. Similar to findings on trimming fat from meat, females (54.8%) were more likely than males (42.0%) to trim off all the skin from poultry eaten. Compared to Indians (11.3%), more Malays (34.1%) and Chinese (27.8%) did not trim off any of the skin.

Figure 6.4.2(b) and Table 6.4.2(b)

6.4.2.1 Comparison of Trimming Fat from Meat and Trimming Skin from Poultry, NNS 2004 and NNS 2010

There were no significant changes in Singapore residents' habits of trimming fat from meat and trimming skin from poultry between 2004 and 2010.

Table 6.4.2.1

6.4.3 Dieting for Weight Loss

The majority (73.8%) of adult Singapore residents had never dieted to lose weight. 18.8% reported that they had dieted occasionally or frequently in the past, while 7.4% reported continually dieting. More females (33.4%) than males (18.9%) had dieted before or were continually dieting. The younger age groups, 18-29 years and 30-39 years, were more likely to have dieted or be dieting (34.8%-35.9%) compared to other age groups.

Figure 6.4.3 and Table 6.4.3

6.4.3.1 Comparison of Dieting for Weight Loss, NNS 2004 and NNS 2010

Between 2004 and 2010 there were no significant changes in the proportion of Singapore residents who had dieted in the past or were continually dieting for weight loss.

Table 6.4.3.1

6.5 GENDER, ETHNIC AND AGE DIFFERENCES IN DIETARY PRACTICES

Gender Differences

Males	Females
<ul style="list-style-type: none"> • More likely to eat at hawker centres/coffee shop stalls/food courts • More frequently consume deep fried food • More frequently consume sweetened drinks • More likely to add sweetened condensed milk to beverages • More likely to add sugar to beverages 	<ul style="list-style-type: none"> • More likely to be dieting/have dieted before • More likely to consume wholegrains (e.g. wholemeal bread and brown/red rice) • More likely to trim off any visible fat/skin from meat/poultry

Ethnic Differences

Chinese	Malays	Indians
<ul style="list-style-type: none"> • More likely to eat at hawker centres/coffee shop stalls/food courts • Less likely to consume wholemeal bread • Less likely to consume any milk/milk-based beverages • More likely to add salt/sauces at the table before tasting the food • Less likely to trim off any visible fat/skin from meat/poultry 	<ul style="list-style-type: none"> • More likely to skip breakfast • More frequently eat at Western fast food restaurants • Less likely to consume wholegrains (e.g. wholemeal bread and brown/red rice) • Less likely to drink $\geq 1.5L$ plain water • More frequently consume deep fried food • More frequently consume sweetened drinks • More likely to use blended oil for cooking • More likely to add sweetened condensed milk to beverages • Less likely to trim off any visible fat/skin from meat/poultry 	<ul style="list-style-type: none"> • Less likely to consume brown/red rice • More likely to add sugar to beverages

Age Differences

18-29 years	30-59 years	60-69 years
<ul style="list-style-type: none"> • More likely to skip breakfast • More frequently eat at Western fast food restaurants • Less likely to consume wholegrains (e.g. wholemeal bread and brown/red rice) • More frequently consume deep fried food • More frequently consume sweetened drinks • More frequently consume sweet desserts and snacks • More likely to add sweetened condensed milk to beverages • More likely to be dieting/have dieted before 	<ul style="list-style-type: none"> • More likely to eat at hawker centres/coffee shop stalls/food courts • Less likely to consume any milk/milk-based beverages • More likely to be dieting/have dieted before (among 30 to 39 year olds) 	<ul style="list-style-type: none"> • Less likely to consume brown/red rice • Less likely to drink ≥ 1.5L plain water • Less likely to consume any milk/milk-based beverages

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annexes

Annex I: Recommended Dietary Allowances (RDAs)

Energy

Formulae to calculate the daily energy requirements

Age Group	Energy (kcal)
Males	
18-29	$(16.0*W+545)*1.61$
30-59	$(14.2*W+593)*1.61$
60-69	$(13.5*W+514)*1.61$
Females	
18-29	$(13.1*W+558)*1.61$
30-59	$(9.74*W+694)*1.61$
60-69	$(10.1*W+569)*1.61$

* *W* - Weight in kilograms

The previous WHO formulae used in NNS 2004 contained a disproportionate number of Italian subjects. Energy requirements for Asian populations may have been overestimated. In the NNS 2010, equations developed by Henry (2005) were used, in which Italian subjects were excluded and a large number of people from the tropics were included. According to NHS 2010, the mean weight of Singaporeans was 71.3 kilograms for males and 58.5 kilograms for females, respectively.

RDA for energy (kcal), by gender and age (years) groups

Age Group	18-29	30-39	40-49	50-59	60-69
Males	2721	2606	2606	2606	2249
Females	2081	2048	2048	2048	1876

The average RDAs for energy are 2595 kcal for males and 2038 kcal for females respectively.

Protein

The recommended protein intake for an adult is 0.75g/kg body weight per day (WHO, 1985). As the net protein utilisation (NPU) of a mixed diet in Singapore is estimated to be 70%, the recommended protein intake for an adult Singapore resident is 1.07g/kg body weight per day (Health Promotion Board, 2003).

The average RDAs for protein are 76.3g and 62.6g for males and females, respectively.

Total Fat

The recommended limit used for total fat in this section is 30% of the RDA for energy of each gender and age group divided by the factor 9. This conversion factor used for fat is based on the estimation that one gram of fat provides around 9 kcal of energy.

RDA for total fat (g), by gender and age (years) groups

Age Group	18-29	30-39	40-49	50-59	60-69
Males	90.7	86.9	86.9	86.9	75.0
Females	69.4	68.3	68.3	68.3	62.5

The average RDAs for total fat are 86.5g and 67.9g for males and females respectively.

Saturated Fat

The recommended limit for saturated fat is 10% of the RDA for energy of each gender and age group divided by the factor 9.

RDA for saturated fat (g), by gender and age (years) groups

Age Group	18-29	30-39	40-49	50-59	60-69
Males	30.2	29.0	29.0	29.0	25.0
Females	23.1	22.8	22.8	22.8	20.8

The average RDAs for saturated fat are 28.8g and 22.6g for males and females respectively.

Carbohydrates

The recommended carbohydrate intake used in this section is 60% (mid-point of the recommended range) of the mean RDA for energy for each gender and age group divided by the factor 4. This conversion factor is based on the estimation that one gram of carbohydrate provides about 4 kcal of energy.

RDA for carbohydrate (g), by gender and age (years) groups

Age Group	18-29	30-39	40-49	50-59	60-69
Males	408.2	390.9	390.9	390.9	337.3
Females	312.1	307.1	307.1	307.1	281.5

The average RDAs for carbohydrates are 389.3g and 305.7g for males and females, respectively.

Cholesterol

The Dietary Guidelines recommend that cholesterol intake should not exceed 300mg per day across gender and age groups.

Dietary Fibre

The Dietary Guidelines recommend a daily intake of 10g of dietary fibre per 1000 kcal of energy requirement for adults.

RDA for dietary fibre (g), by gender and age (years) groups

Age Group	18-29	30-39	40-49	50-59	60-69
Males	27.2	26.1	26.1	26.1	22.5
Females	20.8	20.5	20.5	20.5	18.8

The average RDA for dietary fibre is 26.0g for males and 20.4g for females.

Iron

The requirements of iron were obtained from the Report of the Joint FAO/WHO Expert Group, FAO, Rome, 1970.

RDA for iron (mg), by gender and age (years) groups

Age Group	18-29	30-39	40-49	50-59	60-69
Males	6.0	6.0	6.0	6.0	6.0
Females	19.0	19.0	19.0	19.0	6.0

The average RDA for iron is 6.0mg for males and 17.7mg for females.

Calcium

The Report of the Joint FAO/WHO Expert Group, FAO, Rome, 1961, recommends that the RDA for calcium for adult Singapore residents aged 18 years and those aged above 51 years is 1000mg. The RDA for those who are aged 19-50 years is 800mg.

RDA for calcium (mg), by gender and age (years) groups

Age Group	18	19-29	30-39	40-49	50	51-59	60-69
Males	1000	800	800	800	800	1000	1000
Females	1000	800	800	800	800	1000	1000

Vitamin A

The requirements for vitamin A intake have been taken from the Report of the Joint FAO/WHO Expert Group, FAO, Rome, 1965. The RDA for vitamin A is 750mcg for adults aged 18-69 years.

Vitamin C

The requirements of vitamin C were obtained from the Report of the Joint FAO/WHO Expert Group, FAO, Rome, 1970. The RDA for vitamin C for adult males aged 18 years and above and females aged 19 years and above is 105mg and 85mg respectively. For females aged 18 years, the RDA for vitamin C is 80mg.

RDA for vitamin C (mg), by gender and age (years) groups

Age Group	18	19-29	30-39	40-49	50-59	60-69
Males	105	105	105	105	105	105
Females	80	85	85	85	85	85

Annex II: Figures and Tables

Figure 3.1.1: Energy contribution (%) of macronutrients to total^A energy intake among adult Singapore residents, by gender



Figure 3.1.2: Energy contribution (%) of macronutrients to total^A energy intake among adult Singapore residents, by gender and ethnic groups

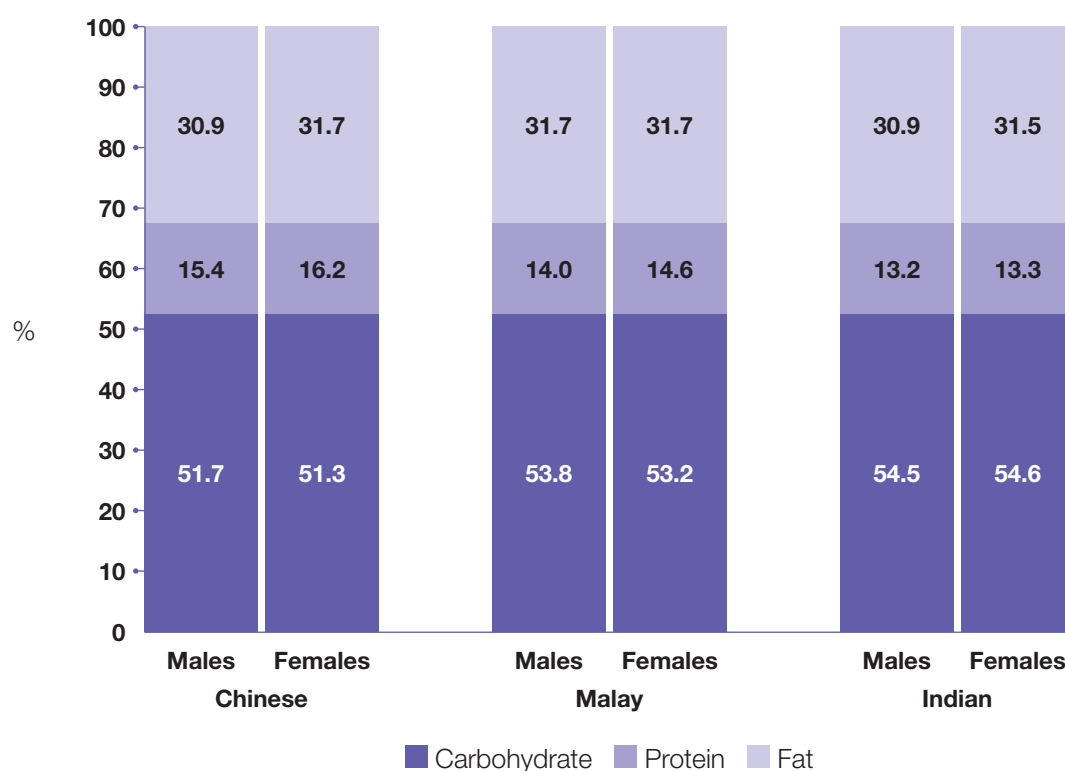
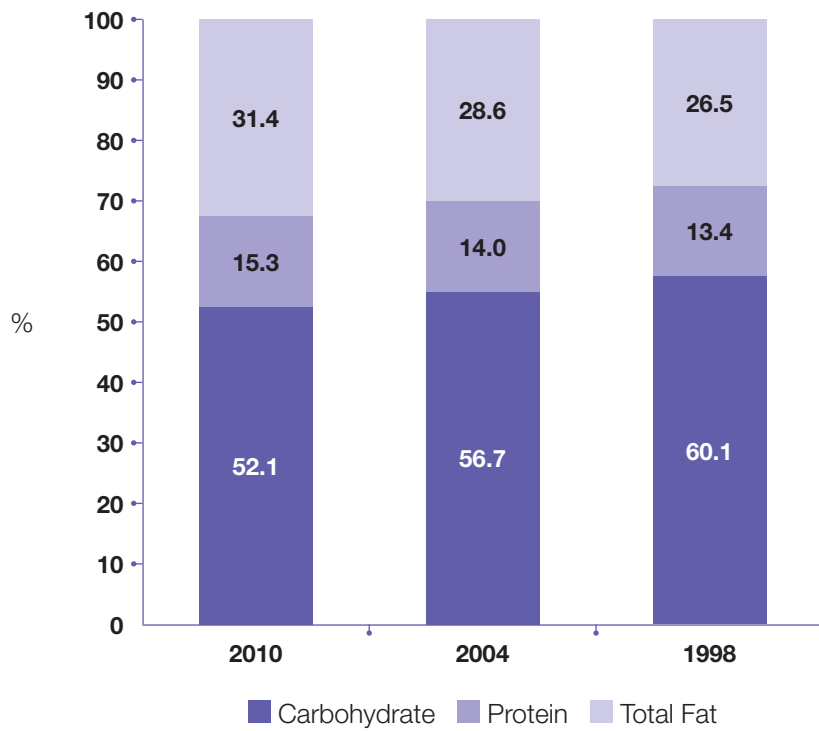


Figure 3.1.3: Energy contribution (%) of macronutrients to total[^] energy intake among adult Singapore residents by year, NNS 1998, NNS 2004 and NNS 2010



[^] Percentages do not add up to 100% because there are other components that contribute to the total daily energy intake (e.g. alcohol).

Table 3.1.1: Mean (SE) and percentile distribution of daily energy intake (kcal) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (kcal)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	2906	59.6	1650	1826	2245	2703	3305	4212	4696
Malay	2990	114.5	1524	1678	2134	2743	3668	4672	5311
Indian	2983	91.7	1265	1768	2248	2949	3467	4254	4681
Females									
Chinese	2322	44.0	1263	1503	1776	2290	2747	3241	3628
Malay	2379	66.5	1070	1354	1859	2228	2864	3701	4041
Indian	2229	55.1	1145	1431	1695	2122	2676	3262	3491
All Ethnic Groups									
Chinese	2613	40.3	1428	1642	1975	2522	3096	3790	4379
Malay	2671	69.0	1213	1532	1911	2428	3151	4081	4721
Indian	2643	60.2	1192	1469	1927	2514	3258	3836	4423
Males									
18-29	3302	100.1	1931	2077	2494	3120	3899	4746	5384
30-39	2980	121.6	1295	1691	2233	2841	3466	4599	4905
40-49	2915	77.4	1669	1858	2256	2712	3458	3992	4266
50-59	2750	97.2	1692	1813	2119	2683	3185	3785	4441
60-69	2610	144.6	1444	1587	1962	2569	2886	3548	4289
Females									
18-29	2436	70.2	1157	1577	1876	2320	2879	3394	3902
30-39	2472	68.9	1402	1639	1969	2413	2863	3411	3833
40-49	2221	67.0	1239	1420	1728	2046	2550	3121	3698
50-59	2221	85.5	1133	1336	1640	2204	2704	3084	3620
60-69	2227	91.6	1285	1434	1736	2408	2592	3107	3202
All Age Groups									
18-29	2853	67.0	1496	1712	2160	2702	3371	4141	4771
30-39	2722	73.0	1362	1640	2010	2596	3294	4104	4648
40-49	2546	57.7	1332	1665	1877	2401	3093	3837	4079
50-59	2500	76.0	1329	1570	1943	2428	2955	3496	4370
60-69	2438	94.2	1344	1446	1820	2456	2717	3213	3774
Total									
Males	2927	48.4	1593	1811	2244	2726	3408	4263	4798
Females	2322	35.0	1234	1446	1781	2286	2751	3344	3698
ALL	2624	32.4	1383	1638	1960	2515	3123	3871	4409

SE - standard error of mean

Table 3.1.2: Distribution (%) of percentage of RDA met for energy intake among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	0.7	8.2	38.9	61.1	35.4	14.2	2.0
Malay	2.6	11.9	43.9	56.1	33.8	17.5	5.0
Indian	4.7	11.8	38.7	61.3	41.8	14.1	3.2
Females							
Chinese	1.9	7.7	41.1	58.9	41.9	14.3	2.4
Malay	3.6	12.2	39.9	60.1	35.8	20.7	3.6
Indian	1.7	12.1	47.9	52.1	35.8	13.7	1.5
All Ethnic Groups							
Chinese	1.3	7.9	40.0	60.0	38.7	14.3	2.2
Malay	3.1	12.1	41.8	58.2	34.9	19.2	4.2
Indian	3.3	11.9	42.9	57.1	39.1	13.9	2.4
Males							
18-29	0.0	3.7	34.9	65.1	39.7	19.9	5.0
30-39	5.0	13.4	39.7	60.3	41.8	17.9	2.2
40-49	1.1	8.8	41.7	58.3	39.1	13.3	1.7
50-59	0.6	10.7	46.2	53.8	29.0	9.7	0.3
60-69	0.0	8.7	31.0	69.0	28.4	12.8	4.6
Females							
18-29	1.9	8.8	34.2	65.8	40.4	17.3	2.5
30-39	0.9	4.8	36.7	63.3	47.0	20.5	4.1
40-49	3.0	11.1	50.4	49.6	31.5	12.6	3.2
50-59	3.5	11.9	44.5	55.5	37.2	10.8	1.4
60-69	0.4	5.1	40.3	59.7	54.0	15.2	0.0
All Age Groups							
18-29	1.0	6.3	34.6	65.4	40.1	18.6	3.7
30-39	2.9	9.0	38.2	61.8	44.5	19.2	3.1
40-49	2.1	10.0	46.3	53.7	35.1	12.9	2.5
50-59	2.0	11.3	45.4	54.6	32.9	10.2	0.8
60-69	0.2	7.1	35.1	64.9	39.9	13.9	2.5
Total							
Males	1.4	9.1	39.6	60.4	35.9	14.6	2.5
Females	2.1	8.8	41.6	58.4	40.4	15.2	2.5
ALL	1.8	9.0	40.6	59.4	38.2	14.9	2.5

Table 3.1.3: Comparison of mean (CI) energy intake (kcal) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (kcal) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	2335	2304 (2253, 2355)	2688	2668 (2588, 2748)	2927 (2832, 3022)	623
Females	1838	1818 (1780, 1855)	2112	2093 (2032, 2154)	2322 (2253, 2391)	504
Ethnic Group						
Chinese	2060	2035 (1996, 2075)	2367	2356 (2294, 2419)	2613 (2534, 2692)	578
Malay	2173	2138 (2057, 2220)	2523	2467 (2334, 2600)	2671 (2536, 2806)	533
Indian	2237	2214 (2133, 2294)	2499	2451 (2335, 2566)	2643 (2525, 2761)	429
Overall	2087	2062 (2028, 2095)	2398	2378 (2325, 2431)	2624 (2561, 2688)	562

Age-Std: Age standardised

CI: Confidence Interval

Table 3.1.4: Comparison of proportion (%) of adult Singapore residents consuming \geq 100% of RDA for energy, by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	33.2 (30.0, 36.3)	47.2 (43.0, 51.3)	60.4 (55.1, 65.8)	27.2
Females	34.2 (31.2, 37.2)	48.6 (44.3, 52.8)	58.4 (53.4, 63.5)	24.2
Overall	33.7 (31.5, 35.8)	47.9 (44.9, 50.8)	59.4 (55.7, 63.1)	25.7

Std: Age standardised and calculated based on updated RDA formulae

CI: Confidence Interval

Table 3.2.1: Mean (SE) and percentile distribution of daily protein intake (weight in grams) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (g)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	112.0	2.9	56.3	65.6	80.7	105.8	134.4	166.0	184.0
Malay	105.1	4.1	45.5	56.8	72.8	93.2	129.7	171.8	193.0
Indian	99.2	3.5	39.0	51.8	71.6	93.0	122.9	149.9	169.9
Females									
Chinese	94.2	2.1	47.7	55.2	71.4	91.3	112.9	133.8	153.3
Malay	86.7	2.5	37.4	46.4	60.9	81.6	108.5	132.8	147.6
Indian	74.6	2.1	38.1	44.3	54.6	69.8	91.5	111.5	124.1
All Ethnic Groups									
Chinese	103.0	1.9	53.9	59.8	77.1	97.0	122.9	150.6	169.0
Malay	95.5	2.5	39.3	51.9	68.1	88.4	118.9	147.8	173.0
Indian	88.1	2.2	38.7	46.4	61.2	83.4	105.8	133.4	156.2
Males									
18-29	125.9	4.1	64.8	77.5	91.5	115.8	150.2	188.1	224.7
30-39	110.8	5.8	52.1	61.8	77.2	104.3	129.9	178.3	197.0
40-49	108.7	3.7	55.5	61.7	81.1	98.2	129.8	163.6	180.5
50-59	102.0	5.0	54.8	60.1	77.4	97.0	126.8	148.4	153.4
60-69	97.3	6.0	50.6	55.5	72.1	90.8	105.8	136.0	171.1
Females									
18-29	93.6	2.9	41.6	56.0	73.1	88.7	112.5	135.5	146.6
30-39	98.9	3.6	49.6	59.0	75.1	94.2	116.5	148.0	168.9
40-49	86.1	2.9	44.5	51.9	63.2	83.0	100.6	132.5	147.5
50-59	88.7	4.4	38.6	47.5	59.3	85.5	112.6	128.5	147.8
60-69	87.2	4.5	46.0	56.2	60.6	85.4	109.8	121.4	125.8
All Age Groups									
18-29	109.2	2.7	53.5	64.3	80.1	104.4	130.5	159.3	188.7
30-39	104.7	3.4	52.2	60.5	76.0	97.7	123.6	161.7	183.6
40-49	96.7	2.5	48.1	57.2	70.3	89.5	114.6	149.9	166.5
50-59	95.7	3.6	47.3	54.6	72.0	94.4	118.9	138.3	150.7
60-69	92.8	3.9	48.3	55.7	69.1	91.3	109.4	126.2	149.3
Total									
Males	109.5	2.3	55.6	63.0	79.6	101.5	130.7	165.7	184.4
Females	91.1	1.6	45.0	53.0	66.7	87.1	111.4	132.4	150.4
ALL	100.3	1.5	48.8	56.5	73.3	94.2	121.2	149.9	168.7

SE - standard error of mean

Table 3.2.2: Distribution (%) of percentage of RDA met for protein among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	0.0	1.6	16.0	84.0	65.2	39.6	13.6
Malay	1.6	8.1	28.8	71.2	52.5	32.8	14.5
Indian	4.2	9.9	28.7	71.3	51.6	31.6	9.2
Females							
Chinese	1.6	3.6	16.5	83.5	70.9	46.6	15.1
Malay	1.6	8.0	27.2	72.8	56.9	38.3	15.6
Indian	2.8	8.8	39.4	60.6	42.9	22.4	4.8
All Ethnic Groups							
Chinese	0.8	2.6	16.2	83.8	68.1	43.1	14.4
Malay	1.6	8.1	28.0	72.0	54.8	35.7	15.1
Indian	3.6	9.4	33.5	66.5	47.7	27.4	7.2
Males							
18-29	0.0	0.6	8.6	91.4	74.6	53.5	20.8
30-39	2.4	4.4	24.1	75.9	59.6	39.6	16.3
40-49	0.7	4.0	20.6	79.4	60.5	37.3	14.8
50-59	0.0	3.5	18.1	81.9	55.1	32.0	5.4
60-69	0.5	5.9	28.0	72.0	60.0	21.5	8.3
Females							
18-29	1.9	4.9	13.7	86.3	73.5	42.8	16.8
30-39	0.0	2.4	12.8	87.2	74.9	50.1	17.2
40-49	2.6	4.6	20.6	79.4	58.6	32.7	11.1
50-59	2.7	7.1	30.9	69.1	59.9	44.9	15.7
60-69	0.3	4.4	26.7	73.3	63.2	49.0	6.9
All Age Groups							
18-29	1.0	2.8	11.2	88.8	74.0	48.0	18.8
30-39	1.2	3.4	18.4	81.6	67.4	45.0	16.8
40-49	1.7	4.3	20.6	79.4	59.5	34.9	12.9
50-59	1.3	5.2	24.1	75.9	57.4	38.1	10.3
60-69	0.4	5.3	27.4	72.6	61.5	33.9	7.7
Total							
Males	0.7	3.5	19.2	80.8	61.9	37.7	13.2
Females	1.7	4.7	20.3	79.7	66.1	43.0	14.2
ALL	1.2	4.1	19.8	80.2	64.0	40.4	13.7

Table 3.2.3: Comparison of mean (CI) protein intake (weight in grams) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (g) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	76.5	75.5 (73.6, 77.3)	91.5	90.9 (88.0, 93.7)	109.5 (105.1, 113.9)	34.0
Females	63.1	62.3 (60.9, 63.7)	75.3	74.6 (72.3, 76.9)	91.1 (87.9, 94.4)	28.8
Ethnic Group						
Chinese	70.3	69.5 (68.1, 70.9)	83.8	83.5 (81.3, 85.7)	103.0 (99.4, 106.6)	33.5
Malay	67.5	66.4 (63.8, 69.0)	82.4	80.8 (76.3, 85.2)	95.5 (90.7, 100.4)	29.1
Indian	67.8	67.2 (64.6, 69.8)	79.6	77.8 (73.8, 81.7)	88.1 (83.7, 92.4)	20.9
Overall	69.8	68.9 (67.7, 70.1)	83.3	82.7 (80.8, 84.6)	100.3 (97.5, 103.2)	31.4

Age-Std: Age standardised

CI: Confidence Interval

Table 3.2.4: Comparison of proportion (%) of adult Singapore residents consuming ≥ 100% of RDA for protein, by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	45.2 (41.9, 48.6)	64.4 (60.4, 68.4)	80.8 (77.1, 84.5)	35.6
Females	48.1 (44.9, 51.2)	65.1 (61.0, 69.2)	79.7 (75.3, 84.1)	31.6
Overall	46.6 (44.3, 49.0)	64.8 (61.9, 67.6)	80.2 (77.3, 83.1)	33.6

Std: Age standardised and calculated based on updated RDA formulae

CI: Confidence Interval

Table 3.3.1: Mean (SE) and percentile distribution of daily fat intake (weight in grams) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (g)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	101.9	3.0	47.3	55.2	71.5	93.3	124.6	161.2	186.1
Malay	107.2	4.4	43.6	52.9	70.9	95.0	141.2	182.7	208.5
Indian	104.9	4.2	37.4	51.4	74.8	100.2	132.7	162.9	181.8
Females									
Chinese	83.1	2.0	37.6	48.3	59.4	78.6	102.8	121.9	135.4
Malay	84.5	2.6	36.8	44.6	62.4	79.4	103.4	137.0	147.1
Indian	79.3	2.5	36.3	40.4	57.4	75.0	98.0	121.8	134.9
All Ethnic Groups									
Chinese	92.5	1.9	43.1	49.7	65.6	85.9	113.0	138.8	167.1
Malay	95.4	2.7	39.2	48.5	63.4	83.5	117.8	156.1	182.8
Indian	93.3	2.6	36.3	45.0	64.5	86.5	117.9	149.8	168.3
Males									
18-29	122.4	4.3	62.2	66.4	86.2	109.7	148.5	188.0	214.7
30-39	108.1	5.7	47.4	53.3	75.4	101.4	128.3	177.2	211.4
40-49	102.3	3.6	48.3	56.1	72.9	95.1	123.0	156.5	176.0
50-59	91.3	5.1	47.1	51.6	66.8	80.2	110.9	138.2	161.9
60-69	87.4	7.2	36.6	42.1	56.2	80.0	94.6	133.7	178.2
Females									
18-29	90.1	3.0	40.7	52.1	65.9	84.5	109.0	133.5	145.5
30-39	90.4	3.1	48.4	52.8	66.7	84.8	109.3	134.3	146.3
40-49	79.3	2.7	35.9	47.4	62.4	72.9	90.9	119.0	136.6
50-59	76.9	3.9	32.5	38.2	52.1	71.5	99.3	115.4	124.0
60-69	74.6	4.6	32.5	42.8	49.5	68.3	92.8	111.6	119.7
All Age Groups									
18-29	105.6	2.8	50.9	59.0	76.5	97.7	127.6	160.9	188.5
30-39	99.1	3.3	48.1	53.4	69.8	93.7	118.5	152.5	180.7
40-49	90.1	2.4	42.8	51.9	64.5	80.0	112.8	140.7	160.0
50-59	84.5	3.5	37.8	48.2	59.3	77.5	106.2	124.6	158.4
60-69	81.6	4.5	36.4	42.2	51.9	80.2	93.7	124.2	149.5
Total									
Males	103.0	2.4	46.5	53.7	71.6	94.8	124.6	161.9	190.3
Females	83.0	1.6	37.1	47.5	59.8	78.7	101.3	123.6	138.3
ALL	93.0	1.5	41.7	49.5	64.8	85.8	113.5	143.1	170.7

SE - standard error of mean

Table 3.3.2: Distribution (%) of percentage of RDA met for total fat among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	2.3	14.6	40.8	59.2	40.5	19.5	6.7
Malay	3.9	17.9	42.3	57.7	40.8	27.7	12.0
Indian	5.6	14.4	37.5	62.5	43.3	25.9	6.9
Females							
Chinese	2.3	8.2	36.1	63.9	47.2	26.2	4.7
Malay	3.9	12.5	36.8	63.2	43.0	25.2	10.9
Indian	2.9	14.0	40.9	59.1	40.9	20.6	4.6
All Ethnic Groups							
Chinese	2.3	11.4	38.4	61.6	43.9	22.9	5.7
Malay	3.9	15.1	39.4	60.6	41.9	26.4	11.4
Indian	4.4	14.2	39.0	61.0	42.2	23.5	5.9
Males							
18-29	0.6	6.8	27.2	72.8	51.7	31.1	12.9
30-39	3.9	13.5	37.7	62.3	46.9	24.4	10.2
40-49	3.1	12.6	40.8	59.2	41.0	21.1	5.3
50-59	2.1	21.5	55.4	44.6	31.4	13.4	3.1
60-69	5.9	22.4	38.8	61.2	32.2	17.2	6.3
Females							
18-29	2.2	8.8	29.4	70.6	51.0	30.5	8.0
30-39	0.9	4.5	27.5	72.5	56.2	31.3	7.5
40-49	3.7	10.4	42.2	57.8	36.4	19.6	5.1
50-59	4.5	13.1	43.4	56.6	41.3	22.9	3.2
60-69	0.7	10.5	43.6	56.4	46.3	22.1	3.1
All Age Groups							
18-29	1.4	7.9	28.3	71.7	51.3	30.8	10.4
30-39	2.4	8.9	32.5	67.5	51.6	27.9	8.8
40-49	3.4	11.5	41.5	58.5	38.5	20.3	5.2
50-59	3.2	17.5	49.7	50.3	36.1	17.9	3.2
60-69	3.6	17.1	40.9	59.1	38.5	19.4	4.9
Total							
Males	2.9	15.1	40.6	59.4	40.9	21.4	7.5
Females	2.6	9.4	36.7	63.3	45.9	25.5	5.6
ALL	2.7	12.2	38.6	61.4	43.4	23.5	6.6

Table 3.3.3: Comparison of mean (CI) fat intake (g) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (g) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	71.0	69.3 (67.1, 71.4)	86.8	85.9 (82.7, 89.1)	103.0 (98.3, 107.6)	33.7
Females	56.1	55.0 (53.4, 56.6)	69.2	68.3 (65.8, 70.9)	83.0 (79.9, 86.1)	28.0
Ethnic Group						
Chinese	62.1	60.7 (59.1, 62.3)	76.2	75.7 (73.2, 78.2)	92.5 (88.8, 96.1)	31.8
Malay	69.1	67.2 (63.7, 70.6)	85.2	82.9 (77.5, 88.3)	95.4 (90.1, 100.6)	28.2
Indian	69.8	69.0 (65.6, 72.4)	83.3	81.2 (76.5, 85.9)	93.3 (88.2, 98.4)	24.3
Overall	63.6	62.2 (60.8, 63.5)	77.9	77.0 (74.9, 79.2)	93.0 (90.1, 95.9)	30.8

Age-Std: Age standardised

CI: Confidence Interval

Table 3.3.4: Comparison of proportion (%) of adult Singapore residents consuming excessive fat (fat contributing \geq 30% of recommended energy requirements), by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	25.5 (22.7, 28.4)	40.1 (36.1, 44.2)	59.4 (53.8, 64.9)	33.9
Females	25.8 (23.1, 28.5)	44.1 (39.9, 48.3)	63.3 (58.3, 68.4)	37.5
Overall	25.7 (23.7, 27.6)	42.1 (39.2, 45.1)	61.4 (57.6, 65.1)	35.7

Std: Age standardised and calculated based on updated RDA formulae

CI: Confidence Interval

Table 3.3.5: Major sources of total fat in the diet of adult Singapore residents by year, 1998, 2004 and 2010

Food Items	1998 (%)	2004 (%)	2010 (%)
Stir fried vegetables*	12.4	13.6	12.3
Biscuits, pastries, cakes, nuts, titbits, snacks, local snacks**	13.8	12.2	12.4
Rice, noodles, meat dishes and desserts containing coconut milk/cream	10.3	11.3	10.6
Fried noodles	6.7	7.6	5.6
Flavoured rice e.g. chicken rice, nasi briyani, claypot rice etc	6.5	5.7	5.1

* Plain or with meat/seafood/oyster sauce or sambal

** Crackers, puff pastries, nuts, salty snacks, chocolates, etc

Table 3.4.1: Mean (SE) and percentile distribution of daily saturated fat intake (weight in grams) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (g)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	38.1	1.2	16.3	20.2	26.1	34.6	47.3	61.0	73.8
Malay	43.2	1.8	16.3	21.8	29.3	37.9	55.7	73.6	85.5
Indian	42.9	1.7	17.3	20.6	29.9	40.2	54.3	67.3	76.9
Females									
Chinese	30.3	0.8	13.4	15.8	20.9	28.5	38.3	46.3	50.8
Malay	33.8	1.1	13.5	17.5	24.4	31.2	41.6	55.5	60.7
Indian	31.9	1.1	11.9	14.8	22.0	30.6	39.9	49.2	56.8
All Ethnic Groups									
Chinese	34.2	0.7	14.4	17.5	23.6	31.7	41.3	52.7	63.0
Malay	38.3	1.1	14.9	18.5	25.8	33.4	46.7	63.9	73.9
Indian	37.9	1.1	12.7	17.9	25.5	35.6	47.3	63.2	68.8
Males									
18-29	47.0	1.8	22.3	24.7	32.3	41.0	56.2	74.4	85.7
30-39	41.7	2.1	17.2	20.2	27.4	39.0	50.2	73.9	80.5
40-49	38.7	1.4	17.8	22.8	26.8	35.7	48.0	61.4	65.2
50-59	35.1	2.2	16.6	19.0	24.1	29.8	41.2	55.5	61.3
60-69	33.2	2.6	11.1	14.1	22.4	33.6	36.4	56.4	71.8
Females									
18-29	34.6	1.3	15.3	18.0	24.5	32.6	43.0	51.3	57.6
30-39	33.8	1.2	15.7	19.0	24.6	32.3	41.5	54.3	58.0
40-49	29.2	1.1	12.7	16.1	20.8	27.2	33.8	44.7	48.7
50-59	27.9	1.6	10.1	13.7	17.1	26.6	35.2	44.8	48.2
60-69	28.4	1.7	12.2	14.9	20.4	26.8	36.3	41.6	46.6
All Age Groups									
18-29	40.5	1.1	17.4	21.5	27.6	37.5	49.3	64.6	75.1
30-39	37.6	1.3	16.7	19.7	25.6	34.6	44.9	59.3	73.7
40-49	33.7	1.0	15.5	18.4	23.4	30.4	41.2	53.2	63.5
50-59	31.7	1.5	13.5	14.7	21.5	28.5	39.1	51.3	58.9
60-69	31.0	1.7	12.2	14.8	20.5	29.3	36.6	47.0	57.9
Total									
Males	39.4	0.9	16.5	20.4	26.3	36.0	49.7	63.6	75.2
Females	31.0	0.6	13.3	16.1	21.5	29.2	38.7	47.3	56.4
ALL	35.2	0.6	14.5	17.7	24.1	32.3	43.0	56.6	66.2

SE - standard error of mean

Table 3.4.2: Distribution (%) of percentage of RDA met for saturated fat among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	2.0	9.0	34.7	65.3	53.3	30.0	13.1
Malay	1.5	8.5	24.5	75.5	58.5	37.8	21.8
Indian	4.3	9.5	22.0	78.0	63.8	44.1	19.6
Females							
Chinese	2.8	9.5	29.5	70.5	53.3	34.4	11.5
Malay	1.6	8.8	19.4	80.6	67.2	38.5	20.2
Indian	4.7	11.3	26.4	73.6	59.3	40.1	15.7
All Ethnic Groups							
Chinese	2.4	9.2	32.1	67.9	53.3	32.2	12.3
Malay	1.6	8.6	21.9	78.1	63.0	38.2	21.0
Indian	4.5	10.3	24.0	76.0	61.8	42.3	17.8
Males							
18-29	0.6	1.7	19.4	80.6	68.6	43.4	23.8
30-39	2.1	9.5	26.5	73.5	58.4	38.3	16.9
40-49	2.2	6.3	31.6	68.4	52.0	32.2	11.1
50-59	1.8	12.1	48.8	51.2	43.8	24.4	9.8
60-69	5.4	18.0	28.4	71.6	56.0	24.2	14.6
Females							
18-29	3.3	5.3	19.5	80.5	62.6	48.0	19.4
30-39	0.8	4.8	19.0	81.0	66.0	42.7	15.0
40-49	2.9	7.4	32.9	67.1	48.6	24.8	10.4
50-59	5.5	22.2	38.6	61.4	48.8	27.3	8.5
60-69	0.2	7.1	27.9	72.1	53.5	36.8	13.0
All Age Groups							
18-29	2.0	3.6	19.5	80.5	65.5	45.8	21.5
30-39	1.4	7.1	22.7	77.3	62.3	40.5	15.9
40-49	2.6	6.9	32.3	67.7	50.2	28.3	10.7
50-59	3.5	16.8	44.0	56.0	46.1	25.7	9.2
60-69	3.1	13.1	28.2	71.8	54.9	29.9	13.9
Total							
Males	2.2	9.0	31.8	68.2	55.3	32.8	15.0
Females	2.8	9.5	27.7	72.3	55.9	35.5	13.2
ALL	2.5	9.3	29.8	70.2	55.6	34.2	14.1

Table 3.4.3: Comparison of mean (CI) saturated fat intake (g) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (g) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	28.7	27.9 (27.0, 28.9)	34.8	34.4 (33.0, 35.8)	39.4 (37.5, 41.2)	11.5
Females	21.9	21.4 (20.7, 22.0)	26.9	26.5 (25.3, 27.7)	31.0 (29.7, 32.3)	9.6
Ethnic Group						
Chinese	24.2	23.6 (22.9, 24.3)	29.6	29.4 (28.3, 30.4)	34.2 (32.7, 35.7)	10.6
Malay	29.6	28.9 (27.3, 30.4)	36.3	35.4 (33.0, 37.8)	38.3 (36.2, 40.5)	9.4
Indian	29.2	28.7 (27.1, 30.4)	34.1	33.1 (31.0, 35.2)	37.9 (35.8, 40.1)	9.2
Overall	25.3	24.6 (24.0, 25.2)	30.8	30.4 (29.5, 31.4)	35.2 (34.0, 36.4)	10.6

Age-Std: Age standardised

CI: Confidence Interval

Table 3.4.4: Comparison of proportion (%) of adult Singapore residents consuming excessive saturated fat (saturated fat contributing $\geq 10\%$ of recommended energy requirements), by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	40.4 (37.2, 43.7)	58.2 (54.0, 62.4)	68.2 (62.9, 73.5)	27.8
Females	38.8 (35.7, 41.8)	55.2 (50.9, 59.5)	72.3 (67.4, 77.1)	33.5
Overall	39.6 (37.4, 41.8)	56.7 (53.7, 59.7)	70.2 (66.7, 73.8)	30.6

Std: Age standardised and calculated based on updated RDA formulae

CI: Confidence Interval

Table 3.4.5: Major sources of saturated fat in the diet of adult Singapore residents by year, 1998, 2004 and 2010

Food Items	1998 (%)	2004 (%)	2010 (%)
Rice, noodles, meat dishes and desserts containing coconut milk/cream	13.9	17.5	16.3
Biscuits, pastries, cakes, nuts, titbits, snacks, local snacks**	13.3	11.9	14.4
Stir fried vegetables*	8.7	10.0	9.0
Fried noodles	8.6	9.7	6.1
Coffee, tea and malt beverages containing milk***	9.7	7.4	5.6

* Plain or with meat/seafood/oyster sauce or sambal

** Crackers, puff pastries, nuts, salty snacks, chocolates, etc

*** Includes full-cream, low fat, skim milk and milk powder, condensed/ evaporated milk, creamer/ whitener

Table 3.4.1.1: Comparison of mean (CI) monounsaturated fat intake (g) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (g) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	24.3	23.7 (22.9, 24.4)	29.7	29.4 (28.2, 30.6)	38.5 (36.7, 40.3)	14.8
Females	18.9	18.4 (17.8, 18.9)	23.4	23.1 (22.2, 24.0)	30.7 (29.5, 31.9)	12.3
Ethnic Group						
Chinese	21.5	21.0 (20.4, 21.6)	26.6	26.4 (25.5, 27.3)	34.9 (33.5, 36.4)	13.9
Malay	22.7	21.9 (20.7, 23.1)	27.4	26.6 (24.7, 28.5)	34.4 (32.5, 36.4)	12.5
Indian	20.5	20.1 (18.9, 21.3)	24.5	23.7 (22.2, 25.3)	32.3 (30.4, 34.2)	12.2
Overall	21.6	21.0 (20.6, 21.5)	26.5	26.2 (25.5, 27.0)	34.6 (33.5, 35.7)	13.6

Age-Std: Age standardised

CI: Confidence Interval

Table 3.4.1.2: Comparison of mean (CI) polyunsaturated fat intake (g) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (g) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	12.6	12.4 (12.0, 12.8)	15.6	15.5 (14.9, 16.1)	18.2 (17.4, 19.1)	5.8
Females	11.2	11.1 (10.7, 11.5)	13.9	13.8 (13.3, 14.3)	15.5 (14.9, 16.1)	4.4
Ethnic Group						
Chinese	11.8	11.6 (11.3, 12.0)	14.5	14.5 (14.0, 14.9)	16.9 (16.2, 17.5)	5.3
Malay	11.5	11.1 (10.4, 11.8)	14.4	14.1 (13.1, 15.1)	16.5 (15.6, 17.4)	5.4
Indian	14.0	14.2 (13.4, 15.0)	17.6	17.4 (16.1, 18.6)	17.3 (16.4, 18.3)	3.1
Overall	11.9	11.8 (11.5, 12.1)	14.8	14.7 (14.2, 15.1)	16.9 (16.3, 17.4)	5.1

Age-Std: Age standardised

CI: Confidence Interval

Table 3.4.1.3: Ratio of fatty acids relative to saturated fatty acid intake among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean Fat Intake (g)	PUFA/ SFA	MUFA/ SFA	SFA/ SFA
Males				
Chinese	101.9	0.49	1.03	1.00
Malay	107.2	0.44	0.90	1.00
Indian	104.9	0.46	0.85	1.00
Females				
Chinese	83.1	0.54	1.04	1.00
Malay	84.5	0.45	0.91	1.00
Indian	79.3	0.50	0.88	1.00
All Ethnic Groups				
Chinese	92.5	0.52	1.04	1.00
Malay	95.4	0.44	0.91	1.00
Indian	93.3	0.48	0.86	1.00
Males				
18-29	122.4	0.47	1.00	1.00
30-39	108.1	0.47	0.97	1.00
40-49	102.3	0.49	1.00	1.00
50-59	91.3	0.47	0.99	1.00
60-69	87.4	0.50	1.01	1.00
Females				
18-29	90.1	0.48	0.99	1.00
30-39	90.4	0.52	1.00	1.00
40-49	79.3	0.56	1.01	1.00
50-59	76.9	0.56	1.05	1.00
60-69	74.6	0.49	0.96	1.00
All Age Groups				
18-29	105.6	0.47	1.00	1.00
30-39	99.1	0.50	0.99	1.00
40-49	90.1	0.53	1.00	1.00
50-59	84.5	0.52	1.02	1.00
60-69	81.6	0.50	0.98	1.00
Total				
Males	103.0	0.48	1.00	1.00
Females	83.0	0.53	1.00	1.00
ALL	93.0	0.50	1.00	1.00

Table 3.4.1.4: Mean (SE) fatty acid intake and mean (SE) percent contribution to total energy intake among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean Intake (g) (SE)			Energy Contribution (%) (SE)		
	PUFA	MUFA	SFA	PUFA	MUFA	SFA
Males						
Chinese	18.0 (0.5)	38.8 (1.2)	38.1 (1.2)	5.5 (0.09)	11.7 (0.15)	11.5 (0.17)
Malay	18.4 (0.8)	38.8 (1.6)	43.2 (1.8)	5.5 (0.08)	11.4 (0.14)	12.8 (0.16)
Indian	19.2 (0.8)	36.4 (1.6)	42.9 (1.7)	5.7 (0.15)	10.7 (0.28)	12.6 (0.28)
Females						
Chinese	15.7 (0.4)	31.1 (0.8)	30.3 (0.8)	6.1 (0.09)	11.9 (0.13)	11.5 (0.15)
Malay	14.7 (0.5)	30.4 (1.0)	33.8 (1.1)	5.5 (0.09)	11.4 (0.13)	12.7 (0.16)
Indian	15.1 (0.4)	27.4 (0.9)	31.9 (1.1)	6.1 (0.09)	10.9 (0.16)	12.6 (0.22)
All Ethnic Groups						
Chinese	16.9 (0.3)	34.9 (0.7)	34.2 (0.7)	5.8 (0.07)	11.8 (0.10)	11.5 (0.11)
Malay	16.5 (0.5)	34.4 (1.0)	38.3 (1.1)	5.5 (0.06)	11.4 (0.10)	12.7 (0.11)
Indian	17.3 (0.5)	32.3 (1.0)	37.9 (1.1)	5.9 (0.09)	10.8 (0.17)	12.6 (0.18)
Males						
18-29	21.4 (0.8)	45.9 (1.6)	47.0 (1.8)	5.8 (0.08)	12.4 (0.15)	12.6 (0.20)
30-39	19.2 (1.0)	40.3 (2.2)	41.7 (2.1)	5.7 (0.11)	11.9 (0.26)	12.3 (0.21)
40-49	18.5 (0.6)	38.4 (1.5)	38.7 (1.4)	5.7 (0.11)	11.6 (0.21)	11.8 (0.21)
50-59	16.0 (0.8)	34.1 (1.9)	35.1 (2.2)	5.2 (0.12)	10.9 (0.27)	11.3 (0.41)
60-69	15.5 (1.5)	32.5 (2.8)	33.2 (2.6)	5.2 (0.28)	10.8 (0.38)	11.0 (0.36)
Females						
18-29	15.7 (0.5)	33.7 (1.2)	34.6 (1.3)	5.8 (0.12)	12.3 (0.13)	12.6 (0.23)
30-39	16.9 (0.6)	33.4 (1.3)	33.8 (1.2)	6.1 (0.10)	12.0 (0.21)	12.1 (0.18)
40-49	15.5 (0.6)	29.0 (1.0)	29.2 (1.1)	6.3 (0.17)	11.6 (0.16)	11.7 (0.19)
50-59	14.9 (0.7)	28.6 (1.4)	27.9 (1.6)	6.0 (0.16)	11.4 (0.23)	11.0 (0.31)
60-69	13.6 (1.0)	27.2 (1.8)	28.4 (1.7)	5.4 (0.27)	10.8 (0.39)	11.3 (0.32)
All Age Groups						
18-29	18.4 (0.5)	39.6 (1.1)	40.5 (1.1)	5.8 (0.07)	12.3 (0.10)	12.6 (0.15)
30-39	18.0 (0.6)	36.8 (1.3)	37.6 (1.3)	5.9 (0.08)	12.0 (0.17)	12.2 (0.14)
40-49	16.9 (0.4)	33.4 (1.0)	33.7 (1.0)	6.0 (0.11)	11.6 (0.13)	11.7 (0.14)
50-59	15.5 (0.5)	31.5 (1.3)	31.7 (1.5)	5.6 (0.11)	11.1 (0.18)	11.1 (0.26)
60-69	14.7 (0.9)	30.1 (1.8)	31.0 (1.7)	5.3 (0.20)	10.8 (0.27)	11.1 (0.24)
Total						
Males	18.2 (0.4)	38.5 (0.9)	39.4 (0.9)	5.5 (0.07)	11.6 (0.12)	11.8 (0.13)
Females	15.5 (0.3)	30.7 (0.6)	31.0 (0.6)	6.0 (0.07)	11.7 (0.10)	11.8 (0.12)
ALL	16.9 (0.3)	34.6 (0.6)	35.2 (0.6)	5.8 (0.05)	11.6 (0.08)	11.8 (0.09)

SE - standard error of mean

Table 3.5.1: Mean (SE) and percentile distribution of daily carbohydrate intake (weight in grams) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (g)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	369.1	6.5	214.6	248.0	293.5	361.2	426.7	517.1	558.6
Malay	397.1	15.2	204.2	240.5	287.4	372.4	474.6	586.5	663.7
Indian	400.3	11.5	212.0	236.4	298.8	388.5	472.8	552.4	643.7
Females									
Chinese	294.6	5.2	168.6	187.9	233.2	286.2	342.6	406.5	458.3
Malay	314.2	8.8	146.1	181.2	235.9	294.5	385.6	471.2	529.2
Indian	301.2	6.8	164.2	193.0	231.5	286.5	358.8	427.8	483.2
All Ethnic Groups									
Chinese	331.7	4.7	183.5	207.1	261.7	321.9	384.8	467.2	522.0
Malay	353.8	9.1	171.4	204.6	261.9	328.5	418.3	536.2	596.9
Indian	355.6	7.8	191.0	211.9	261.1	334.9	434.7	516.3	578.9
Males									
18-29	414.6	12.8	228.6	267.6	325.0	379.3	487.1	577.9	653.2
30-39	380.8	13.6	181.9	214.9	287.7	361.2	472.3	532.0	574.6
40-49	371.5	8.5	224.7	244.9	296.0	358.9	442.1	500.4	539.1
50-59	361.0	11.3	234.8	261.7	283.0	358.5	420.2	468.8	552.9
60-69	348.5	16.1	189.4	214.5	288.1	347.6	387.7	458.4	481.4
Females									
18-29	307.2	8.9	156.7	184.6	235.5	295.5	370.7	428.3	465.6
30-39	311.6	7.9	174.2	199.7	260.7	296.6	356.3	427.6	480.2
40-49	287.0	8.7	156.9	186.8	219.7	272.0	330.3	394.8	461.6
50-59	289.1	9.9	155.0	188.9	231.3	264.4	335.3	394.2	447.8
60-69	297.3	10.9	171.2	181.9	218.8	290.2	347.4	394.6	436.3
All Age Groups									
18-29	358.9	8.5	183.7	212.2	268.4	339.7	418.2	525.0	580.0
30-39	345.6	8.3	180.1	213.1	270.3	322.3	422.4	512.9	534.6
40-49	326.6	7.0	181.4	195.9	247.2	314.7	380.6	471.5	528.7
50-59	327.1	9.1	180.4	210.7	254.8	322.4	379.6	435.7	547.3
60-69	325.5	11.3	180.1	201.3	270.9	315.4	384.7	433.8	464.2
Total									
Males	376.6	5.4	213.5	246.8	293.8	363.2	441.4	523.2	575.0
Females	298.2	4.2	165.2	188.2	233.3	287.1	346.6	416.9	466.1
ALL	337.4	3.9	183.0	207.2	261.9	323.6	395.7	481.4	543.2

SE - standard error of mean

Table 3.5.2: Distribution (%) of percentage of RDA met for carbohydrates among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	2.3	16.6	61.7	38.3	17.0	2.7	0.2
Malay	3.5	17.7	59.5	40.5	26.0	9.1	2.4
Indian	1.6	19.3	52.6	47.4	29.3	8.7	1.0
Females							
Chinese	3.4	18.6	55.2	44.8	17.3	4.3	0.2
Malay	6.1	17.9	52.7	47.3	28.0	11.4	1.4
Indian	2.6	15.2	58.6	41.4	22.4	6.2	0.7
All Ethnic Groups							
Chinese	2.8	17.6	58.4	41.6	17.2	3.5	0.2
Malay	4.9	17.8	56.0	44.0	27.0	10.3	1.9
Indian	2.1	17.4	55.3	44.7	26.2	7.5	0.9
Males							
18-29	0.9	12.3	58.8	41.2	24.8	7.5	1.6
30-39	5.7	18.7	55.4	44.6	28.2	4.9	0.6
40-49	2.2	19.1	64.8	35.2	18.9	3.1	0.3
50-59	2.3	19.6	67.9	32.1	10.3	2.2	0.2
60-69	0.0	13.9	49.2	50.8	17.2	4.1	0.0
Females							
18-29	4.2	18.5	55.7	44.3	22.8	4.7	0.5
30-39	3.4	12.4	52.7	47.3	18.7	7.3	0.1
40-49	4.5	23.6	64.6	35.4	15.2	5.9	1.1
50-59	3.9	20.1	57.1	42.9	16.7	3.7	0.0
60-69	1.1	12.9	34.3	65.7	28.5	7.0	0.0
All Age Groups							
18-29	2.6	15.6	57.2	42.8	23.8	6.0	1.0
30-39	4.5	15.5	54.0	46.0	23.4	6.1	0.3
40-49	3.4	21.5	64.7	35.3	16.9	4.6	0.7
50-59	3.0	19.8	62.8	37.2	13.4	2.9	0.1
60-69	0.5	13.4	42.5	57.5	22.3	5.4	0.0
Total							
Males	2.3	17.1	60.3	39.7	19.7	4.3	0.6
Females	3.7	18.2	55.2	44.8	19.4	5.6	0.4
ALL	3.0	17.6	57.7	42.3	19.6	4.9	0.5

Table 3.5.3: Comparison of mean (CI) carbohydrate intake (g) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (g) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	347.6	344.7 (337.5, 352.0)	378.5	376.0 (364.8, 387.1)	376.6 (365.9, 387.3)	31.9
Females	270.2	268.5 (263.2, 273.7)	295.6	293.5 (285.2, 301.8)	298.2 (290.0, 306.5)	29.7
Ethnic Group						
Chinese	304.9	302.8 (297.1, 308.4)	331.9	330.8 (322.1, 339.4)	331.7 (322.4, 340.9)	28.9
Malay	320.3	317.2 (306.1, 328.2)	356.4	349.3 (331.3, 367.3)	353.8 (335.9, 371.7)	36.6
Indian	334.4	331.0 (319.4, 342.7)	352.9	346.7 (330.5, 362.9)	355.6 (340.3, 370.9)	24.6
Overall	309.0	306.7 (301.9, 311.5)	336.7	334.4 (327.0, 341.8)	337.4 (329.8, 345.0)	30.7

Age-Std: Age standardised

CI: Confidence Interval

Table 3.5.4: Comparison of proportion (%) of adult Singapore residents consuming excessive carbohydrates (carbohydrates contributing \geq 60% of recommended energy requirement), by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	34.1 (30.9, 37.2)	40.1 (36.0, 44.2)	39.7 (33.8, 45.6)	5.6
Females	31.4 (28.5, 34.3)	41.0 (36.9, 45.2)	44.8 (39.8, 49.8)	13.4
Overall	32.7 (30.6, 34.9)	40.6 (37.7, 43.5)	42.3 (38.4, 46.1)	9.9

Std: Age standardised and calculated based on updated RDA formulae

CI: Confidence Interval

Table 3.6.1: Mean (SE) and percentile distribution of daily cholesterol intake (weight in milligrams) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (mg)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	396	13.0	162	189	265	361	483	622	739
Malay	377	18.8	123	162	231	323	485	684	818
Indian	299	14.0	78	98	177	273	377	509	629
Females									
Chinese	313	10.9	88	130	213	308	395	497	567
Malay	296	18.2	114	130	189	250	380	495	562
Indian	204	9.6	54	77	125	173	255	388	424
All Ethnic Groups									
Chinese	354	8.7	125	161	231	332	435	566	661
Malay	335	13.4	118	141	201	276	407	580	705
Indian	256	9.1	70	87	143	219	349	453	534
Males									
18-29	456	17.5	192	230	328	432	524	705	869
30-39	403	26.2	136	161	249	373	482	657	910
40-49	373	16.4	126	166	236	323	511	619	719
50-59	338	21.3	158	183	204	318	436	555	631
60-69	330	27.9	106	136	204	326	377	481	674
Females									
18-29	341	16.6	126	167	239	322	396	564	608
30-39	331	17.7	98	143	219	302	423	500	618
40-49	282	15.5	89	143	188	249	342	483	554
50-59	264	22.1	40	79	142	247	369	417	452
60-69	270	21.5	88	118	133	282	347	461	512
All Age Groups									
18-29	396	12.9	158	194	268	349	488	609	753
30-39	366	16.1	113	151	229	334	439	598	725
40-49	325	11.4	114	159	204	288	403	560	626
50-59	303	16.4	79	126	195	297	401	459	590
60-69	303	18.8	108	125	167	308	363	483	527
Total									
Males	382	10.1	138	178	243	344	474	621	731
Females	300	8.7	83	125	192	285	383	488	566
ALL	341	6.9	111	142	216	323	423	562	661

SE - standard error of mean

Table 3.6.2: Distribution (%) of percentage of RDA met for cholesterol among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	4.2	15.1	31.5	68.5	50.4	28.9	11.1
Malay	7.8	19.5	46.1	53.9	40.3	28.7	14.6
Indian	19.0	36.4	54.0	46.0	33.7	15.5	6.0
Females							
Chinese	14.3	24.6	48.4	51.6	32.7	13.4	3.6
Malay	14.5	35.7	63.6	36.4	26.9	12.3	3.4
Indian	36.3	64.0	81.9	18.1	11.7	3.8	0.8
All Ethnic Groups							
Chinese	9.3	19.9	40.0	60.0	41.5	21.1	7.3
Malay	11.3	28.0	55.2	44.8	33.3	20.1	8.7
Indian	26.8	48.8	66.6	33.4	23.8	10.2	3.6
Males							
18-29	0.6	6.4	19.9	80.1	65.7	41.7	15.5
30-39	7.8	17.3	33.6	66.4	52.9	30.7	14.3
40-49	7.2	16.3	44.6	55.4	43.2	29.7	11.4
50-59	4.5	26.0	42.5	57.5	38.9	15.9	6.1
60-69	15.3	26.8	39.8	60.2	30.5	16.5	6.6
Females							
18-29	8.3	16.1	42.8	57.2	31.5	14.6	6.2
30-39	11.4	23.0	49.7	50.3	38.4	16.1	5.7
40-49	11.4	34.4	63.2	36.8	23.1	12.2	1.6
50-59	29.5	40.7	59.3	40.7	30.4	6.4	1.7
60-69	28.6	41.8	54.0	46.0	23.6	11.9	0.0
All Age Groups							
18-29	4.6	11.4	31.8	68.2	47.9	27.7	10.7
30-39	9.6	20.2	41.8	58.2	45.6	23.3	10.0
40-49	9.5	25.9	54.5	45.5	32.5	20.4	6.2
50-59	16.3	32.9	50.4	49.6	34.9	11.4	4.0
60-69	21.3	33.6	46.2	53.8	27.4	14.4	3.7
Total							
Males	6.4	18.2	36.2	63.8	47.0	27.2	10.9
Females	16.5	30.1	54.0	46.0	29.8	12.3	3.3
ALL	11.5	24.2	45.1	54.9	38.4	19.8	7.1

Table 3.6.3: Comparison of mean (CI) cholesterol intake (mg) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (mg) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	291	283 (273, 294)	324	320 (306, 334)	382 (362, 402)	99
Females	220	214 (207, 221)	246	243 (232, 254)	300 (283, 317)	86
Ethnic Group						
Chinese	255	249 (241, 256)	286	284 (273, 295)	354 (337, 372)	105
Malay	275	265 (248, 283)	312	302 (279, 325)	335 (309, 361)	70
Indian	224	220 (205, 235)	226	219 (201, 237)	256 (238, 274)	36
Overall	255	249 (242, 255)	285	281 (272, 290)	341 (327, 354)	92

Age-Std: Age standardised

CI: Confidence Interval

Table 3.6.4: Comparison of proportion (%) of adult Singapore residents consuming excessive cholesterol (≥ 300 mg), by gender

	1998	2004	2010	Difference (age-std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	37.6 (34.4, 40.8)	47.8 (43.6, 51.9)	63.8 (58.5, 69.2)	26.2
Females	20.3 (17.8, 22.8)	26.2 (22.6, 29.9)	46.0 (41.0, 51.1)	25.7
Overall	29.0 (26.9, 31.1)	36.9 (34.1, 39.7)	54.9 (51.2, 58.7)	25.9

Std: Age standardised and calculated based on updated RDA formulae

CI: Confidence Interval

Table 3.7.1: Mean (SE) and percentile distribution of daily dietary fibre intake (weight in grams) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (g)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	23.9	0.5	13.1	14.4	17.5	22.2	28.9	34.5	40.5
Malay	24.8	0.9	10.2	13.0	17.0	22.4	30.6	38.5	43.9
Indian	30.5	1.0	14.2	16.2	22.2	29.5	37.7	43.1	50.7
Females									
Chinese	22.6	0.6	10.5	13.1	16.6	21.5	27.5	31.7	37.3
Malay	21.1	0.7	8.7	11.6	15.1	19.9	25.6	32.9	38.1
Indian	24.7	0.8	11.6	12.6	17.1	23.9	30.4	37.8	42.2
All Ethnic Groups									
Chinese	23.3	0.4	12.1	13.6	17.0	22.0	27.7	33.5	39.1
Malay	22.9	0.6	9.6	12.2	15.7	20.9	27.5	36.1	40.1
Indian	27.9	0.7	11.9	14.3	19.1	27.2	34.7	41.5	46.2
Males									
18-29	26.6	0.9	13.2	14.4	19.1	25.2	31.1	40.4	49.0
30-39	25.4	1.1	10.8	14.4	17.5	23.9	32.2	38.8	42.7
40-49	24.6	0.7	13.0	13.5	18.2	23.6	29.5	34.9	39.5
50-59	23.8	1.0	13.0	13.6	17.4	22.6	29.9	34.3	38.0
60-69	23.3	1.2	12.3	15.2	18.1	21.8	27.0	34.6	42.7
Females									
18-29	21.2	1.0	8.8	12.5	14.7	20.8	25.9	30.5	32.3
30-39	23.8	1.0	12.7	14.0	16.4	21.8	28.2	37.1	42.8
40-49	21.9	0.7	9.3	12.9	16.4	20.9	25.9	31.4	37.0
50-59	24.2	1.0	9.1	13.5	18.9	23.7	30.1	35.6	39.2
60-69	21.8	1.2	10.4	11.9	15.0	22.7	27.2	29.8	35.0
All Age Groups									
18-29	23.8	0.7	11.7	13.3	16.2	22.5	29.0	35.8	44.8
30-39	24.6	0.7	12.7	14.3	17.0	22.6	29.6	38.6	42.8
40-49	23.2	0.5	11.7	13.2	17.1	22.2	27.6	34.1	38.9
50-59	24.0	0.7	11.6	13.6	17.9	23.3	30.1	35.1	39.8
60-69	22.6	0.9	11.7	13.3	16.0	21.9	27.2	33.1	38.2
Total									
Males	24.8	0.4	13.0	14.3	18.0	22.8	30.0	37.9	42.3
Females	22.6	0.4	10.3	12.9	16.2	21.5	27.5	33.1	39.0
ALL	23.7	0.3	11.8	13.5	17.0	22.3	28.6	35.8	41.1

SE - standard error of mean

Table 3.7.2: Distribution (%) of percentage of RDA met for dietary fibre among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	4.1	27.0	64.1	35.9	17.4	5.2	0.5
Malay	9.8	32.7	62.8	37.2	25.4	9.3	2.0
Indian	3.6	14.0	36.7	63.3	45.2	16.6	4.5
Females							
Chinese	4.5	15.1	42.1	57.9	37.1	12.8	4.3
Malay	7.1	20.9	54.8	45.2	28.6	13.1	2.6
Indian	3.8	15.4	38.2	61.8	47.9	24.2	5.7
All Ethnic Groups							
Chinese	4.3	21.0	53.1	46.9	27.3	9.0	2.5
Malay	8.4	26.5	58.6	41.4	27.1	11.3	2.3
Indian	3.7	14.6	37.4	62.6	46.4	20.0	5.1
Males							
18-29	5.8	23.6	58.6	41.4	24.6	10.0	0.6
30-39	6.1	28.7	56.5	43.5	25.8	6.9	1.4
40-49	5.5	25.2	58.5	41.5	20.8	5.6	1.2
50-59	4.0	32.7	62.4	37.6	14.9	4.6	0.4
60-69	1.7	16.2	70.8	29.2	25.6	10.2	3.4
Females							
18-29	6.5	23.8	49.8	50.2	30.4	7.1	3.9
30-39	3.1	12.5	40.9	59.1	36.2	18.4	5.8
40-49	4.7	18.2	47.8	52.2	32.1	12.1	3.9
50-59	6.5	10.5	38.0	62.0	42.5	16.7	3.8
60-69	2.1	12.9	38.2	61.8	50.6	17.8	3.3
All Age Groups							
18-29	6.2	23.7	54.0	46.0	27.6	8.5	2.3
30-39	4.5	20.5	48.5	51.5	31.1	12.7	3.6
40-49	5.1	21.5	52.8	47.2	26.8	9.1	2.6
50-59	5.2	22.2	50.9	49.1	27.9	10.3	2.0
60-69	1.9	14.7	56.2	43.8	36.8	13.6	3.4
Total							
Males	4.8	26.2	60.7	39.3	21.8	7.1	1.2
Females	4.9	16.0	43.6	56.4	36.8	14.0	4.2
ALL	4.8	21.1	52.2	47.8	29.3	10.5	2.7

Table 3.7.3: Comparison of mean (CI) dietary fibre intake (g) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (mg) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	22.0	21.8 (21.3, 22.4)	26.7	26.6 (25.8, 27.4)	24.8 (23.9, 25.7)	3.0
Females	18.6	18.5 (18.1, 19.0)	23.1	23.0 (22.3, 23.7)	22.6 (21.7, 23.5)	4.1
Ethnic Group						
Chinese	19.7	19.5 (19.1, 19.9)	24.2	24.1 (23.5, 24.7)	23.3 (22.5, 24.0)	3.8
Malay	21.1	21.1 (20.3, 21.9)	25.9	25.7 (24.4, 27.0)	22.9 (21.7, 24.0)	1.8
Indian	25.7	25.6 (24.4, 26.7)	30.5	30.0 (28.5, 31.6)	27.9 (26.5, 29.2)	2.3
Overall	20.3	20.2 (19.8, 20.5)	24.9	24.8 (24.2, 25.3)	23.7 (23.1, 24.3)	3.5

Age-Std: Age standardised

CI: Confidence Interval

Table 3.7.4: Comparison of proportion (%) of adult Singapore residents consuming insufficient dietary fibre (< 70% RDA), by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	33.0 (29.7, 36.2)	19.8 (16.4, 23.3)	26.2 (21.6, 30.8)	-6.8
Females	26.9 (24.0, 29.9)	11.0 (8.3, 13.7)	16.0 (12.7, 19.2)	-10.9
Overall	30.0 (27.8, 32.1)	15.4 (13.2, 17.6)	21.1 (18.3, 23.9)	-8.9

Std: Age standardised and calculated based on updated RDA formulae

CI: Confidence Interval

Table 3.8.1: Mean (SE) and percentile distribution of daily iron intake (weight in milligrams) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (mg)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	18.6	0.4	10.6	11.2	13.9	17.3	22.2	27.3	31.4
Malay	19.2	0.7	8.4	10.4	13.2	17.4	23.1	29.5	35.5
Indian	20.5	0.8	8.2	10.9	15.0	19.3	25.4	29.8	33.3
Females									
Chinese	16.9	0.4	8.7	10.0	12.6	16.6	20.0	23.3	27.5
Malay	16.4	0.5	6.8	9.0	11.5	15.2	20.3	27.3	29.0
Indian	16.2	0.4	7.6	9.3	12.1	15.7	19.4	23.4	26.4
All Ethnic Groups									
Chinese	17.8	0.3	9.8	10.8	13.2	17.0	20.5	25.9	29.7
Malay	17.8	0.5	7.6	9.6	12.3	16.2	21.5	28.3	31.0
Indian	18.5	0.5	8.2	9.8	13.4	17.5	22.5	28.7	29.9
Males									
18-29	21.7	0.8	11.3	12.9	15.1	19.8	26.3	31.3	41.4
30-39	19.3	0.8	9.0	10.7	14.0	18.0	23.7	30.5	33.1
40-49	18.7	0.5	10.5	11.2	14.3	17.7	22.2	26.9	30.2
50-59	17.3	0.7	9.3	10.8	13.4	15.9	19.7	26.3	27.4
60-69	17.5	0.9	9.9	11.1	12.8	17.5	17.9	24.7	31.7
Females									
18-29	16.6	0.5	8.1	10.0	12.6	16.8	20.0	22.8	27.4
30-39	18.4	0.9	9.2	11.2	13.9	16.6	20.4	27.9	31.3
40-49	15.9	0.5	8.0	9.7	11.8	14.5	19.2	22.3	26.6
50-59	16.8	0.6	7.0	9.9	12.6	17.3	19.8	23.8	25.3
60-69	15.9	0.8	6.8	9.0	11.5	16.2	19.3	23.3	24.4
All Age Groups									
18-29	19.1	0.5	9.8	10.8	13.9	17.9	22.5	27.6	31.5
30-39	18.8	0.6	9.2	11.0	13.9	17.2	22.0	29.8	33.0
40-49	17.2	0.4	8.7	10.4	12.7	16.4	20.5	25.7	29.2
50-59	17.1	0.5	9.0	10.6	13.1	16.1	19.8	24.7	27.4
60-69	16.8	0.7	9.2	10.0	12.3	16.6	18.4	23.8	28.8
Total									
Males	18.9	0.4	10.3	11.2	13.9	17.6	22.5	28.6	32.2
Females	16.8	0.3	8.1	9.9	12.3	16.4	20.0	23.7	27.6
ALL	17.8	0.2	9.3	10.6	13.2	17.0	20.8	26.6	30.2

SE - standard error of mean

Table 3.8.2: Distribution (%) of percentage of RDA met for iron among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	0.0	0.0	0.2	99.8	99.6	98.5	85.9
Malay	0.0	0.0	0.5	99.5	97.8	93.8	83.0
Indian	0.0	0.0	0.0	100.0	99.2	93.0	86.4
Females							
Chinese	5.4	24.5	61.5	38.5	21.1	15.1	9.5
Malay	10.0	34.5	66.8	33.2	22.1	13.8	5.4
Indian	8.8	27.9	64.7	35.3	18.7	9.1	4.4
All Ethnic Groups							
Chinese	2.7	12.3	31.0	69.0	60.2	56.6	47.5
Malay	5.2	18.0	35.1	64.9	58.2	52.0	42.5
Indian	4.0	12.6	29.2	70.8	62.9	55.2	49.4
Males							
18-29	0.0	0.0	0.0	100.0	100.0	99.0	93.1
30-39	0.0	0.0	0.0	100.0	99.5	95.1	84.2
40-49	0.0	0.0	0.2	99.8	98.5	97.7	85.1
50-59	0.0	0.0	0.9	99.1	98.9	95.8	82.7
60-69	0.0	0.0	0.0	100.0	100.0	99.6	81.9
Females							
18-29	6.5	27.5	68.1	31.9	10.1	3.5	0.0
30-39	5.6	22.4	65.6	34.4	17.3	9.6	1.0
40-49	8.7	37.4	72.6	27.4	8.1	3.7	1.1
50-59	7.9	29.8	74.6	25.4	13.2	3.4	0.8
60-69	0.0	0.0	0.0	100.0	94.3	90.5	70.7
All Age Groups							
18-29	3.4	14.2	35.3	64.7	53.4	49.5	44.8
30-39	2.8	11.4	33.4	66.6	57.8	51.6	41.9
40-49	4.6	19.9	38.6	61.4	50.5	47.8	40.5
50-59	3.7	14.1	35.6	64.4	58.5	52.2	44.1
60-69	0.0	0.0	0.0	100.0	97.4	95.5	76.9
Total							
Males	0.0	0.0	0.3	99.7	99.3	97.2	85.5
Females	6.4	26.3	62.6	37.4	21.0	14.3	8.4
ALL	3.2	13.2	31.4	68.6	60.2	55.8	47.0

Table 3.8.3: Comparison of mean (CI) iron intake (mg) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (mg) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	15.2	15.0 (14.6, 15.4)	17.8	17.7 (17.0, 18.3)	18.9 (18.2, 19.6)	3.9
Females	12.7	12.5 (12.3, 12.8)	15.1	15.0 (14.5, 15.4)	16.8 (16.2, 17.3)	4.3
Ethnic Group						
Chinese	14.0	13.8 (13.5, 14.1)	16.4	16.4 (15.9, 16.9)	17.8 (17.2, 18.3)	4.0
Malay	13.7	13.5 (12.9, 14.0)	16.4	16.1 (15.2, 17.0)	17.8 (16.8, 18.7)	4.3
Indian	13.8	13.6 (13.1, 14.2)	16.2	15.9 (15.1, 16.8)	18.5 (17.6, 19.5)	4.9
Overall	13.9	13.8 (13.5, 14.0)	16.4	16.3 (15.9, 16.7)	17.8 (17.4, 18.3)	4.0

Age-Std: Age standardised

CI: Confidence Interval

Table 3.8.4: Comparison of proportion (%) of adult Singapore residents consuming insufficient iron (< 70% RDA), by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	0.0 (0.0, 0.0)	0.3 (0.0, 0.7)	0.0 (0.0, 0.0)	0.0
Females	52.4 (49.2, 55.6)	35.9 (31.8, 39.9)	26.3 (22.2, 30.4)	-26.1
Overall	26.1 (24.2, 28.1)	18.2 (15.9, 20.5)	13.2 (11.0, 15.3)	-12.9

Std: Age standardised

CI: Confidence Interval

Table 3.9.1: Mean (SE) and percentile distribution of daily calcium intake (weight in milligrams) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (mg)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	779	19.0	390	451	567	710	968	1237	1322
Malay	853	30.5	346	418	552	799	1057	1357	1564
Indian	1017	45.2	424	503	673	985	1202	1571	1669
Females									
Chinese	766	19.7	350	423	543	709	915	1170	1325
Malay	781	30.4	262	347	516	702	974	1323	1549
Indian	789	26.3	315	426	546	741	966	1220	1444
All Ethnic Groups									
Chinese	772	13.7	363	440	554	710	948	1186	1323
Malay	816	21.9	289	387	530	744	1024	1342	1560
Indian	914	29.6	386	475	580	866	1134	1456	1667
Males									
18-29	934	35.2	367	441	624	890	1173	1373	1633
30-39	845	37.0	448	495	571	762	1060	1289	1345
40-49	805	25.1	379	443	563	755	967	1197	1336
50-59	737	30.0	397	447	550	649	898	1057	1253
60-69	760	46.9	371	406	543	691	893	1140	1550
Females									
18-29	733	26.2	326	392	557	703	892	1064	1182
30-39	814	32.0	368	471	604	781	928	1255	1474
40-49	731	28.9	352	394	522	679	883	1131	1494
50-59	802	36.7	312	385	540	714	1036	1301	1348
60-69	785	67.7	316	341	487	659	1024	1229	1689
All Age Groups									
18-29	830	22.7	347	426	565	781	1051	1266	1388
30-39	829	24.6	407	494	590	766	1004	1288	1473
40-49	766	19.7	380	427	531	720	916	1168	1418
50-59	768	23.9	313	430	548	699	947	1240	1320
60-69	772	40.0	358	385	530	691	985	1198	1606
Total									
Males	817	16.4	388	456	570	735	1012	1262	1464
Females	770	15.7	333	394	541	710	932	1203	1404
ALL	794	11.3	361	436	554	726	980	1244	1432

SE - standard error of mean

Table 3.9.2: Distribution (%) of percentage of RDA met for calcium among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	11.1	38.6	66.8	33.2	19.5	10.7	1.1
Malay	12.6	32.1	55.0	45.0	30.2	14.0	4.8
Indian	5.6	19.0	35.3	64.7	48.7	21.1	9.9
Females							
Chinese	11.9	34.5	66.1	33.9	17.1	6.7	2.3
Malay	16.9	37.5	63.6	36.4	23.1	10.9	2.5
Indian	10.6	34.5	60.0	40.0	23.5	10.1	1.8
All Ethnic Groups							
Chinese	11.5	36.5	66.5	33.5	18.3	8.7	1.7
Malay	14.8	34.9	59.5	40.5	26.5	12.4	3.6
Indian	7.9	26.0	46.4	53.6	37.3	16.1	6.2
Males							
18-29	9.0	20.9	42.1	57.9	42.7	24.0	5.7
30-39	3.3	22.2	53.4	46.6	35.6	15.2	3.4
40-49	6.1	24.6	53.9	46.1	26.0	10.9	2.3
50-59	18.3	52.2	81.9	18.1	7.4	4.4	0.9
60-69	17.7	64.2	78.8	21.2	7.8	6.8	0.4
Females							
18-29	10.3	27.7	66.8	33.2	21.7	3.7	0.2
30-39	6.1	19.7	50.0	50.0	21.9	11.2	3.0
40-49	10.4	38.1	68.8	31.2	17.0	8.2	4.3
50-59	15.7	45.0	71.5	28.5	16.5	7.9	2.5
60-69	27.9	52.0	69.9	30.1	14.2	7.6	0.5
All Age Groups							
18-29	9.7	24.4	54.9	45.1	31.8	13.5	2.8
30-39	4.7	21.0	51.7	48.3	28.7	13.1	3.2
40-49	8.4	31.8	61.8	38.2	21.2	9.5	3.3
50-59	17.1	48.8	77.0	23.0	11.7	6.1	1.7
60-69	22.3	58.7	74.8	25.2	10.7	7.1	0.4
Total							
Males	10.6	35.4	61.5	38.5	24.4	12.7	2.6
Females	12.5	35.0	65.1	34.9	18.7	7.7	2.3
ALL	11.6	35.2	63.3	36.7	21.5	10.0	2.5

Table 3.9.3: Comparison of mean (CI) calcium intake (mg) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (mg) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	529	526 (509, 543)	657	653 (629, 677)	817 (785, 849)	291
Females	472	470 (457, 484)	598	594 (573, 615)	770 (740, 801)	300
Ethnic Group						
Chinese	479	476 (463, 488)	601	598 (579, 616)	772 (745, 799)	296
Malay	575	577 (550, 604)	728	724 (682, 765)	816 (773, 859)	239
Indian	605	602 (571, 634)	731	715 (675, 755)	914 (856, 972)	312
Overall	501	498 (487, 509)	627	623 (607, 639)	794 (772, 816)	296

Age-Std: Age standardised

CI: Confidence Interval

Table 3.9.4: Comparison of proportion (%) of adult Singapore residents consuming insufficient calcium (< 70% RDA), by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	69.1 (66.1, 72.1)	48.9 (44.8, 53.1)	35.4 (29.4, 41.4)	-33.7
Females	77.3 (74.8, 79.8)	58.9 (54.8, 63.0)	35.0 (29.9, 40.0)	-42.3
Overall	73.2 (71.2, 75.1)	53.9 (51.0, 56.9)	35.2 (31.3, 39.1)	-38.0

Std: Age standardised

CI: Confidence Interval

Table 3.10.1: Mean (SE) and percentile distribution of daily vitamin A intake (weight in micrograms) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (mcg)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	973	23.0	515	570	743	935	1130	1466	1604
Malay	975	31.1	388	481	648	928	1197	1529	1718
Indian	1061	30.6	474	578	789	1004	1221	1551	1743
Females									
Chinese	1001	32.9	398	547	714	952	1184	1465	1652
Malay	898	30.9	287	395	621	885	1153	1428	1600
Indian	889	27.6	376	478	627	868	1108	1367	1502
All Ethnic Groups									
Chinese	987	20.2	447	552	729	946	1160	1466	1643
Malay	935	22.2	327	451	640	907	1177	1479	1657
Indian	984	21.4	427	525	704	977	1184	1501	1630
Males									
18-29	1062	36.8	471	597	785	1000	1215	1561	1766
30-39	1021	37.2	580	625	753	985	1184	1599	1675
40-49	995	33.7	501	537	727	965	1173	1445	1650
50-59	901	35.4	426	535	651	827	1091	1330	1459
60-69	936	57.3	444	460	692	959	1015	1207	1779
Females									
18-29	901	31.0	393	480	661	917	1084	1397	1463
30-39	1090	90.5	427	552	727	1001	1208	1517	1839
40-49	978	38.6	418	506	677	948	1223	1496	1785
50-59	970	41.2	356	547	715	948	1180	1503	1588
60-69	908	70.7	334	396	546	866	1197	1336	1579
All Age Groups									
18-29	978	24.2	440	550	713	933	1153	1480	1615
30-39	1056	49.6	503	606	748	988	1201	1555	1720
40-49	986	25.9	470	535	702	954	1205	1494	1699
50-59	934	27.9	375	538	702	874	1147	1398	1559
60-69	923	45.1	389	439	607	916	1134	1317	1710
Total									
Males	983	18.1	465	558	740	948	1151	1487	1669
Females	975	25.5	397	503	679	928	1180	1462	1626
ALL	979	15.6	428	537	713	944	1171	1472	1645

SE - standard error of mean

Table 3.10.2: Distribution (%) of percentage of RDA met for vitamin A among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	1.3	6.3	25.8	74.2	54.1	25.3	8.7
Malay	4.0	14.5	34.3	65.7	52.4	30.2	10.8
Indian	0.9	6.7	23.0	77.0	66.5	34.6	14.1
Females							
Chinese	3.3	9.2	28.6	71.4	55.5	29.5	9.2
Malay	9.4	19.1	38.2	61.8	48.4	26.1	7.0
Indian	4.7	13.9	39.3	60.7	43.0	24.3	5.3
All Ethnic Groups							
Chinese	2.3	7.7	27.2	72.8	54.8	27.4	9.0
Malay	6.8	16.9	36.3	63.7	50.3	28.0	8.8
Indian	2.6	10.0	30.4	69.6	55.9	29.9	10.1
Males							
18-29	0.7	6.5	24.1	75.9	62.0	32.9	14.1
30-39	0.1	2.8	23.2	76.8	60.9	30.9	11.4
40-49	2.0	8.0	26.6	73.4	58.5	29.6	9.7
50-59	3.4	9.4	27.5	72.5	42.6	21.3	4.6
60-69	1.7	11.5	34.0	66.0	54.5	18.4	9.0
Females							
18-29	3.9	11.2	36.1	63.9	51.9	18.4	2.9
30-39	3.6	8.0	27.4	72.6	58.9	30.5	10.4
40-49	3.5	11.2	33.4	66.6	52.7	28.4	9.4
50-59	6.8	9.0	25.3	74.7	53.4	34.4	11.7
60-69	4.2	20.8	34.3	65.7	46.4	33.7	7.8
All Age Groups							
18-29	2.3	9.0	30.3	69.7	56.7	25.4	8.3
30-39	1.9	5.5	25.3	74.7	59.9	30.7	10.9
40-49	2.8	9.7	30.2	69.8	55.4	29.0	9.5
50-59	5.0	9.2	26.5	73.5	47.7	27.5	7.9
60-69	2.8	15.6	34.2	65.8	50.8	25.2	8.4
Total							
Males	1.6	7.4	26.6	73.4	55.3	27.0	9.6
Females	4.4	11.1	31.1	68.9	53.3	28.5	8.5
ALL	3.0	9.3	28.8	71.2	54.3	27.8	9.1

Table 3.10.3: Comparison of mean (CI) vitamin A intake (mcg) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (mcg) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	853	863 (826, 889)	1073	1075 (1018, 1132)	983 (948, 1019)	120
Females	850	863 (825, 902)	1081	1081 (1029, 1132)	975 (925, 1025)	112
Ethnic Group						
Chinese	827	832 (802, 862)	1046	1045 (999, 1091)	987 (948, 1027)	155
Malay	940	991 (919, 1063)	1153	1166 (1087, 1245)	935 (891, 978)	-56
Indian	969	980 (913, 1046)	1265	1263 (1169, 1356)	984 (942, 1025)	4
Overall	852	863 (837, 889)	1077	1078 (1039, 1116)	979 (949, 1010)	116

Age-Std: Age standardised

CI: Confidence Interval

Table 3.10.4: Comparison of proportion (%) of adult Singapore residents consuming insufficient vitamin A (< 70% RDA), by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	24.5 (21.6, 27.5)	17.2 (14.0, 20.5)	7.4 (5.1, 9.7)	-17.1
Females	30.1 (27.1, 33.1)	12.2 (9.5, 15.0)	11.1 (8.1, 14.1)	-19.0
Overall	27.3 (25.2, 29.4)	14.7 (12.6, 16.9)	9.3 (7.4, 11.2)	-18.0

Std: Age standardised

CI: Confidence Interval

Table 3.11.1: Mean (SE) and percentile distribution of daily vitamin C (weight in milligrams) intake among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (mg)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Males									
Chinese	131	3.6	54	66	90	121	162	207	231
Malay	118	4.8	37	45	71	104	154	201	242
Indian	136	6.0	57	71	91	124	158	216	241
Females									
Chinese	138	5.0	51	65	82	123	176	235	277
Malay	114	4.6	31	45	68	107	154	203	211
Indian	119	4.3	47	57	74	106	154	192	232
All Ethnic Groups									
Chinese	134	3.1	54	66	87	123	167	216	241
Malay	116	3.3	33	46	69	106	154	203	230
Indian	129	3.8	52	65	86	120	156	202	237
Males									
18-29	133	5.6	45	60	89	127	162	210	240
30-39	130	6.4	47	65	90	114	155	207	236
40-49	129	5.4	56	65	84	116	165	195	237
50-59	129	6.2	51	58	91	124	167	215	221
60-69	127	8.4	55	68	85	120	142	192	229
Females									
18-29	124	7.7	46	56	80	112	162	199	241
30-39	136	8.0	48	64	81	126	176	213	264
40-49	134	6.6	47	58	88	123	166	223	277
50-59	147	10.6	50	64	83	132	188	234	266
60-69	110	8.9	43	52	67	94	158	188	211
All Age Groups									
18-29	129	4.8	46	59	85	119	162	204	240
30-39	133	5.2	48	64	87	123	166	211	239
40-49	132	4.3	50	62	84	121	166	216	267
50-59	137	6.2	51	60	91	128	172	221	236
60-69	120	6.4	49	66	75	109	142	192	213
Total									
Males	130	2.8	51	64	88	120	160	207	235
Females	132	3.9	47	61	80	120	167	220	266
ALL	131	2.4	49	62	85	120	166	214	240

SE - standard error of mean

Table 3.11.2: Distribution (%) of percentage of RDA met for vitamin C among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Males							
Chinese	4.1	13.1	35.8	64.2	47.1	26.0	9.3
Malay	14.1	27.0	50.4	49.6	38.8	23.4	9.7
Indian	3.0	10.5	33.6	66.4	47.5	25.3	10.7
Females							
Chinese	1.9	7.0	25.7	74.3	65.6	47.2	26.5
Malay	9.7	20.2	35.3	64.7	52.9	35.3	18.3
Indian	3.5	11.0	32.0	68.0	54.7	38.9	17.8
All Ethnic Groups							
Chinese	3.0	10.0	30.7	69.3	56.4	36.6	17.9
Malay	11.8	23.4	42.5	57.5	46.2	29.6	14.2
Indian	3.3	10.7	32.9	67.1	50.8	31.4	13.9
Males							
18-29	7.0	15.8	32.6	67.4	51.0	27.6	10.7
30-39	5.3	12.8	41.7	58.3	43.0	23.0	9.7
40-49	4.7	17.3	40.8	59.2	43.4	26.7	8.5
50-59	5.2	13.8	34.6	65.4	47.9	28.9	11.1
60-69	4.3	13.5	39.0	61.0	43.6	18.2	6.0
Females							
18-29	3.9	10.7	26.7	73.3	62.4	36.5	19.2
30-39	3.1	7.9	27.8	72.2	65.5	47.4	27.0
40-49	3.9	10.0	23.9	76.1	64.0	47.7	22.8
50-59	2.0	7.5	25.3	74.7	68.7	53.9	32.1
60-69	3.3	11.7	43.2	56.8	42.7	30.2	18.5
All Age Groups							
18-29	5.4	13.2	29.6	70.4	56.9	32.2	15.1
30-39	4.2	10.3	34.7	65.3	54.4	35.4	18.5
40-49	4.3	13.4	31.8	68.2	54.3	37.8	16.0
50-59	3.7	10.8	30.2	69.8	57.7	40.7	21.0
60-69	3.9	12.7	40.9	59.1	43.2	23.6	11.6
Total							
Males	5.4	14.7	37.6	62.4	46.0	25.5	9.5
Females	3.3	9.4	27.8	72.2	62.6	44.6	24.4
ALL	4.3	12.0	32.7	67.3	54.3	35.1	16.9

Table 3.11.3: Comparison of mean (CI) vitamin C intake (mg) among adult Singapore residents, by gender and ethnic groups

	1998		2004		2010	Mean Difference (mg) ['10- '98]
	Crude	Age-Std (95% CI)	Crude	Age-Std (95% CI)	Age-Std (95% CI)	
Gender						
Males	142	143 (137, 150)	164	164 (156, 172)	130 (124, 135)	-13
Females	141	141 (135, 148)	177	177 (168, 186)	132 (125, 140)	-9
Ethnic Group						
Chinese	143	143 (138, 149)	172	172 (165, 179)	134 (128, 141)	-9
Malay	130	133 (125, 141)	154	157 (145, 170)	116 (110, 123)	-17
Indian	147	150 (139, 161)	178	180 (167, 192)	129 (121, 136)	-21
Overall	142	142 (138, 147)	170	171 (165, 177)	131 (126, 136)	-11

Age-Std: Age standardised

CI: Confidence Interval

Table 3.11.4: Comparison of proportion (%) of adult Singapore residents consuming insufficient vitamin C (< 70% RDA), by gender

	1998	2004	2010	Difference (Age-Std proportion) ['10- '98]
	Std (95% CI)	Std (95% CI)	Std (95% CI)	
Gender				
Males	24.6 (21.7, 27.5)	17.4 (14.3, 20.5)	14.7 (11.5, 17.9)	-9.9
Females	15.9 (13.4, 18.3)	8.8 (6.3, 11.2)	9.4 (6.9, 11.8)	-6.5
Overall	20.2 (18.3, 22.1)	13.1 (11.1, 15.1)	12.0 (10.0, 14.0)	-8.2

Std: Age standardised and calculated based on updated RDA formulae

CI: Confidence Interval

Figure 4.1.1: Mean daily intake of Healthy Diet Pyramid Food Groups (servings) among adult Singapore residents, by gender

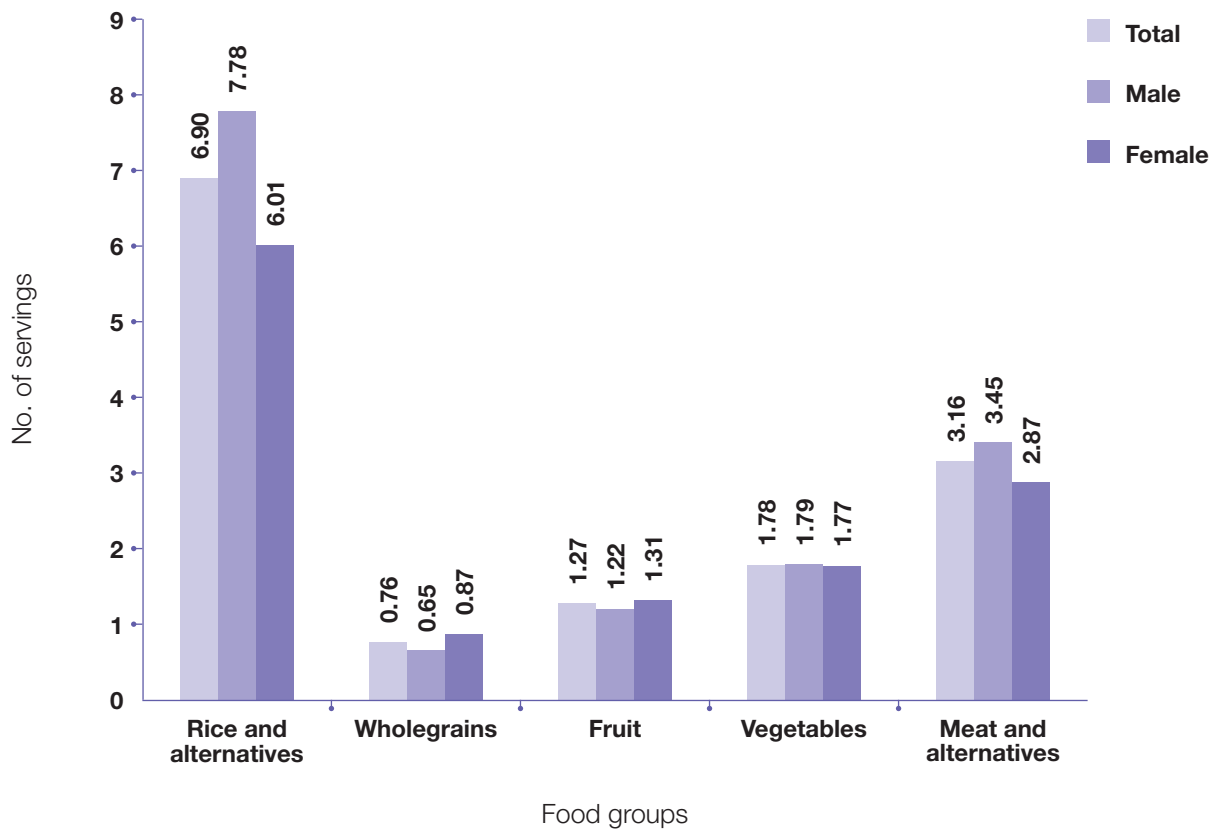


Table 4.1.1(a): Mean (SE) daily intake of Healthy Diet Pyramid Food Groups (servings) among adult Singapore residents, by gender and ethnic groups

	Rice and Alternatives		Fruit	Vegetables	Meat and Alternatives
	Total	Wholegrain Products			
Males					
Chinese	7.66 (0.15)	0.63 (0.07)	1.19 (0.06)	1.82 (0.06)	3.63 (0.13)
Malay	8.20 (0.42)	0.59 (0.07)	1.14 (0.07)	1.58 (0.08)	3.08 (0.12)
Indian	8.00 (0.27)	0.90 (0.12)	1.52 (0.11)	1.89 (0.11)	2.78 (0.12)
Females					
Chinese	5.94 (0.14)	0.92 (0.08)	1.34 (0.11)	1.86 (0.07)	3.01 (0.09)
Malay	6.31 (0.20)	0.57 (0.05)	1.19 (0.09)	1.40 (0.06)	2.66 (0.09)
Indian	6.13 (0.17)	0.91 (0.10)	1.30 (0.07)	1.67 (0.07)	2.11 (0.08)
Total					
Chinese	6.80 (0.12)	0.78 (0.06)	1.26 (0.06)	1.84 (0.04)	3.32 (0.08)
Malay	7.21 (0.24)	0.58 (0.04)	1.17 (0.06)	1.49 (0.05)	2.86 (0.08)
Indian	7.16 (0.18)	0.90 (0.08)	1.42 (0.07)	1.79 (0.07)	2.48 (0.07)

Table 4.1.1(b): Mean (SE) daily intake of Healthy Diet Pyramid Food Groups (servings) among adult Singapore residents, by gender and age (years) groups

	Rice and Alternatives		Fruit	Vegetables	Meat and Alternatives
	Total	Wholegrain Products			
Males					
18-29	8.42 (0.33)	0.68 (0.11)	1.06 (0.08)	1.91 (0.10)	4.02 (0.15)
30-39	7.83 (0.30)	0.61 (0.10)	1.11 (0.10)	1.93 (0.11)	3.52 (0.24)
40-49	7.71 (0.22)	0.65 (0.10)	1.26 (0.08)	1.76 (0.07)	3.49 (0.17)
50-59	7.51 (0.24)	0.66 (0.12)	1.38 (0.12)	1.73 (0.09)	3.18 (0.24)
60-69	7.29 (0.39)	0.67 (0.20)	1.30 (0.16)	1.59 (0.14)	2.93 (0.27)
Females					
18-29	6.01 (0.22)	0.64 (0.15)	1.13 (0.16)	1.66 (0.07)	3.01 (0.11)
30-39	6.26 (0.19)	0.74 (0.11)	1.27 (0.10)	1.90 (0.14)	3.19 (0.15)
40-49	5.85 (0.22)	0.70 (0.09)	1.10 (0.07)	1.94 (0.11)	2.69 (0.12)
50-59	5.70 (0.31)	1.27 (0.18)	1.85 (0.28)	1.75 (0.10)	2.78 (0.19)
60-69	6.53 (0.31)	1.17 (0.20)	1.18 (0.13)	1.39 (0.14)	2.54 (0.20)
Total					
18-29	7.17 (0.22)	0.66 (0.09)	1.10 (0.09)	1.78 (0.06)	3.50 (0.10)
30-39	7.03 (0.19)	0.68 (0.07)	1.19 (0.07)	1.91 (0.09)	3.35 (0.14)
40-49	6.72 (0.18)	0.68 (0.07)	1.18 (0.05)	1.86 (0.07)	3.06 (0.10)
50-59	6.66 (0.23)	0.94 (0.11)	1.60 (0.15)	1.74 (0.07)	2.99 (0.16)
60-69	6.95 (0.27)	0.89 (0.15)	1.25 (0.10)	1.50 (0.10)	2.76 (0.17)

Figure 4.1.2: Mean daily intake of Healthy Diet Pyramid Food Groups (weight in grams) among adult Singapore residents, by gender

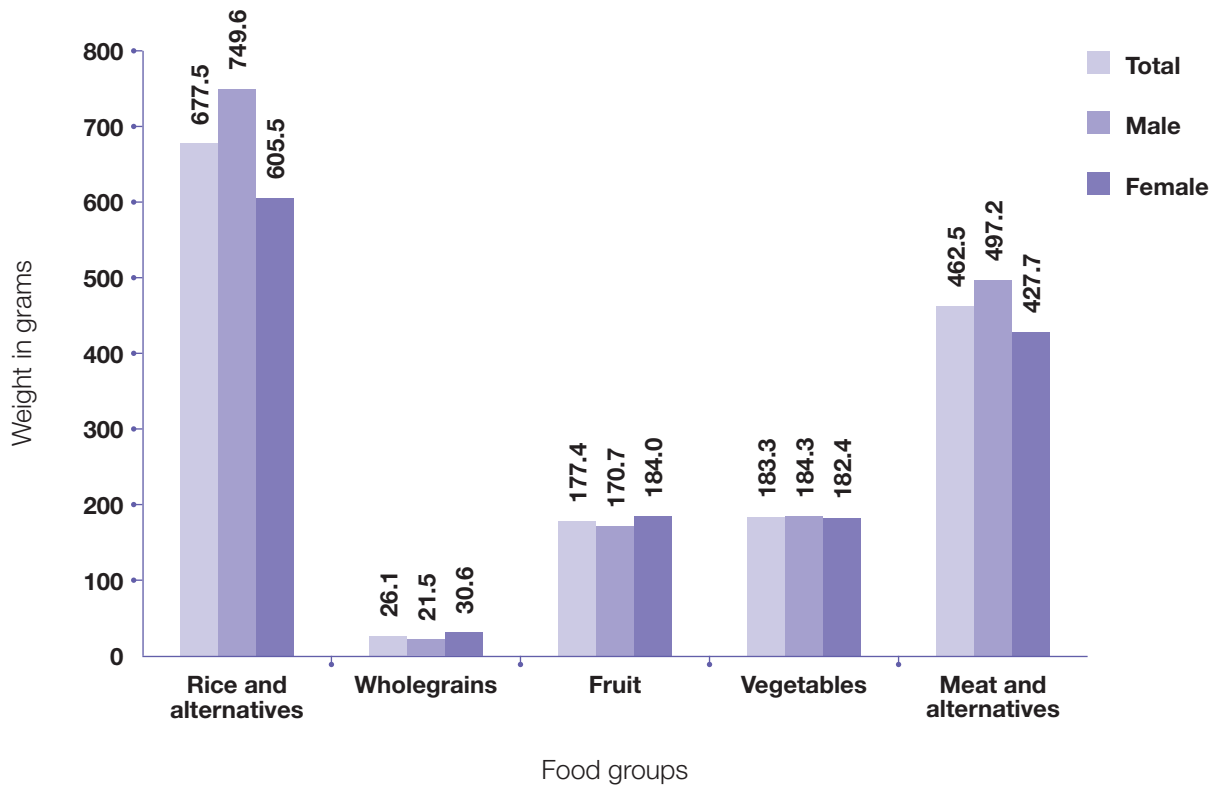


Table 4.1.2(a): Mean (SE) daily intake of Healthy Diet Pyramid Food Groups (weight in grams) among adult Singapore residents, by gender and ethnic groups

	Rice and Alternatives		Fruit	Vegetables	Meat and Alternatives
	Total	Wholegrain Products			
Males					
Chinese	747.2 (19.1)	21.3 (2.7)	165.9 (8.8)	187.1 (5.6)	491.4 (17.5)
Malay	760.7 (37.5)	17.2 (2.5)	161.3 (11.3)	162.4 (8.0)	488.0 (17.5)
Indian	751.8 (31.4)	27.6 (4.2)	211.8 (13.1)	192.2 (11.3)	544.5 (23.3)
Females					
Chinese	609.0 (19.0)	33.6 (3.4)	187.4 (16.0)	191.3 (6.7)	426.0 (12.6)
Malay	593.8 (19.9)	16.2 (1.8)	169.6 (12.3)	145.4 (6.3)	438.0 (19.8)
Indian	596.3 (25.9)	30.1 (4.3)	180.2 (9.8)	171.1 (7.7)	424.6 (19.6)
Total					
Chinese	677.7 (14.0)	27.5 (2.2)	176.7 (9.2)	189.2 (4.4)	458.5 (10.8)
Malay	673.6 (21.5)	16.7 (1.5)	165.6 (8.4)	153.5 (5.1)	461.9 (13.5)
Indian	681.7 (21.4)	28.8 (3.0)	197.6 (8.7)	182.7 (7.1)	490.4 (15.9)

Table 4.1.2(b): Mean (SE) daily intake of Healthy Diet Pyramid Food Groups (weight in grams) among adult Singapore residents, by gender and age (years) groups

	Rice and Alternatives		Fruit	Vegetables	Meat and Alternatives
	Total	Wholegrain Products			
Males					
18-29	786.1 (29.2)	18.8 (3.0)	152.7 (11.0)	194.1 (10.1)	567.5 (21.7)
30-39	751.3 (29.9)	19.9 (3.3)	159.4 (14.6)	196.7 (11.0)	519.8 (24.3)
40-49	746.2 (24.1)	22.3 (3.8)	175.5 (12.0)	181.2 (7.4)	507.5 (21.9)
50-59	746.0 (44.1)	23.9 (6.0)	186.7 (16.2)	177.3 (9.4)	441.9 (31.0)
60-69	702.7 (37.2)	22.6 (7.1)	179.0 (23.7)	168.2 (13.3)	438.4 (49.8)
Females					
18-29	592.3 (33.5)	21.6 (7.1)	162.0 (21.3)	170.3 (7.4)	418.4 (15.9)
30-39	615.2 (22.3)	25.9 (4.5)	180.2 (14.4)	195.9 (14.4)	478.3 (20.4)
40-49	579.4 (26.9)	25.0 (3.6)	155.1 (9.9)	200.3 (10.9)	403.4 (19.0)
50-59	594.1 (39.0)	44.6 (6.3)	253.8 (44.2)	181.2 (10.2)	438.8 (25.3)
60-69	694.1 (44.5)	43.0 (8.5)	163.1 (18.2)	143.6 (13.9)	382.2 (38.6)
Total					
18-29	685.6 (23.1)	20.2 (4.0)	157.5 (12.3)	181.7 (6.3)	490.2 (14.5)
30-39	682.1 (19.3)	23.0 (2.8)	170.0 (10.3)	196.3 (9.1)	498.7 (16.1)
40-49	657.6 (19.3)	23.7 (2.6)	164.7 (7.8)	191.4 (6.8)	452.2 (14.8)
50-59	674.4 (31.7)	33.7 (4.4)	218.4 (23.3)	179.1 (6.9)	440.4 (20.3)
60-69	698.8 (28.6)	31.8 (5.9)	171.8 (15.3)	157.1 (10.0)	413.2 (31.9)

Figure 4.1.3: Proportion of adult Singapore residents (%) meeting the Dietary Guidelines, by gender

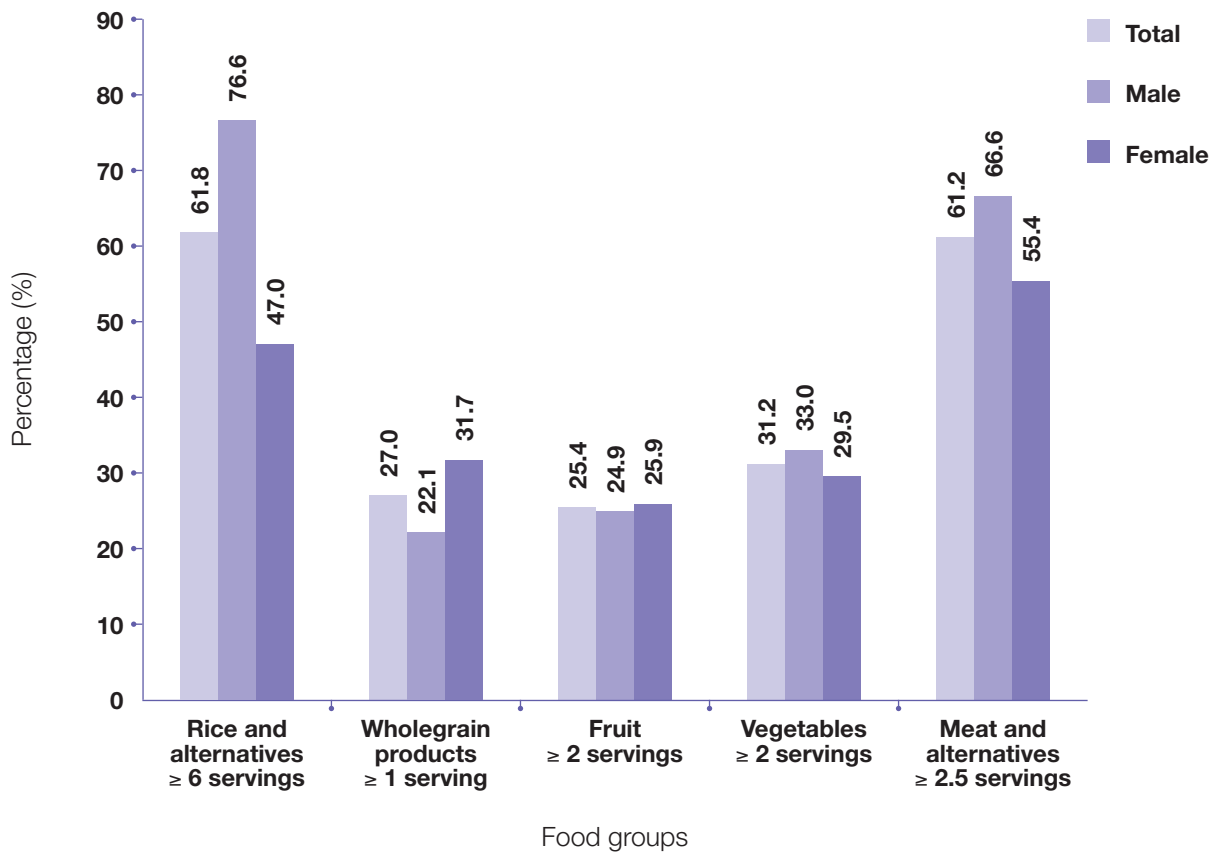


Table 4.1.3(a): Proportion of adult Singapore residents (%) meeting the Dietary Guidelines, by gender and ethnic groups

	Rice and Alternatives		Fruit ≥ 2 servings	Vegetables ≥ 2 servings	Meat and Alternatives ≥ 2.5 servings
	Total ≥ 6 servings	Wholegrain Products ≥ 1 serving			
Males					
Chinese	78.6	21.5	24.4	33.5	70.6
Malay	72.0	20.5	21.8	29.3	58.4
Indian	68.9	28.0	31.8	34.2	50.9
Females					
Chinese	46.4	33.1	26.2	31.4	59.5
Malay	50.4	24.2	25.2	21.1	51.7
Indian	46.0	32.8	24.5	27.4	29.6
Total					
Chinese	62.4	27.4	25.3	32.5	65.0
Malay	60.8	22.4	23.6	25.0	54.9
Indian	58.6	30.2	28.5	31.1	41.3

Table 4.1.3(b): Proportion of adult Singapore residents (%) meeting the Dietary Guidelines, by gender and age (years) groups

	Rice and Alternatives		Fruit ≥ 2 servings	Vegetables ≥ 2 servings	Meat and Alternatives ≥ 2.5 servings
	Total ≥ 6 servings	Wholegrain Products ≥ 1 serving			
Males					
18-29	82.9	28.9	17.1	39.2	81.7
30-39	71.4	16.5	19.8	37.4	66.5
40-49	73.7	24.1	24.8	31.8	67.6
50-59	78.3	19.7	35.7	30.8	62.8
60-69	76.1	21.6	25.2	22.5	48.5
Females					
18-29	45.0	25.8	19.4	28.9	63.3
30-39	53.8	26.7	21.9	30.0	64.4
40-49	41.3	26.9	22.1	34.8	45.9
50-59	44.9	41.5	39.7	25.8	52.2
60-69	54.7	45.0	28.3	25.2	49.7
Total					
18-29	63.2	27.3	18.3	33.9	72.2
30-39	62.5	21.7	20.9	33.7	65.4
40-49	56.5	25.6	23.3	33.4	56.1
50-59	62.6	30.0	37.6	28.5	57.8
60-69	66.5	32.1	26.6	23.7	49.0

Figure 4.2.1: Comparison of mean daily intake of Healthy Diet Pyramid Food Groups (servings) among adult Singapore residents, NNS 2004 and NNS 2010

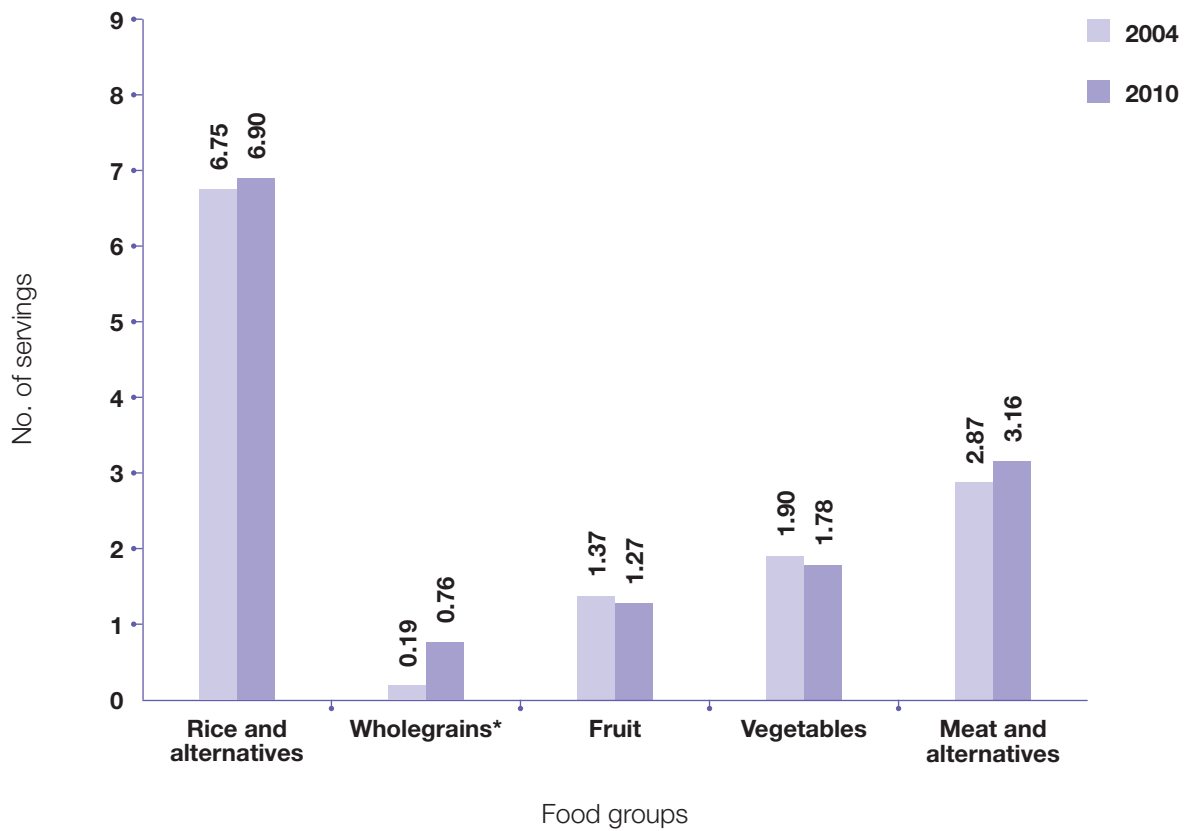


Figure 4.2.2: Comparison of mean daily intake of Healthy Diet Pyramid Food Groups (weight in grams) among adult Singapore residents, NNS 2004 and NNS 2010

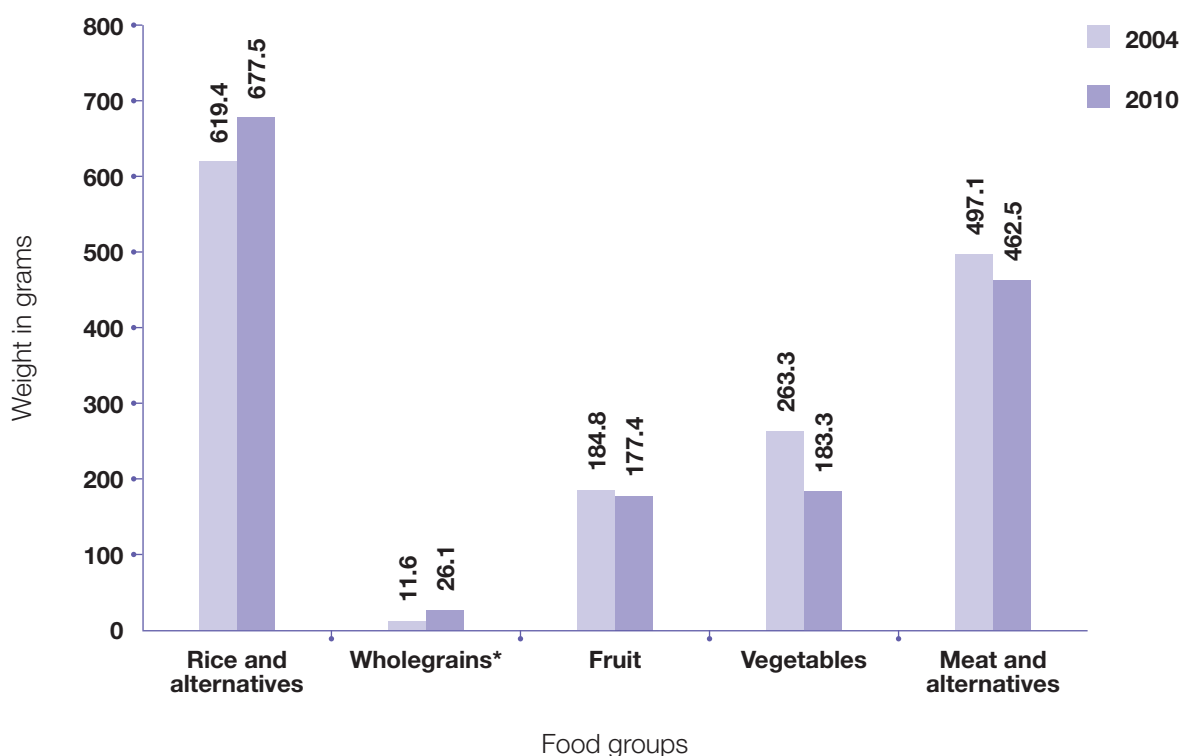
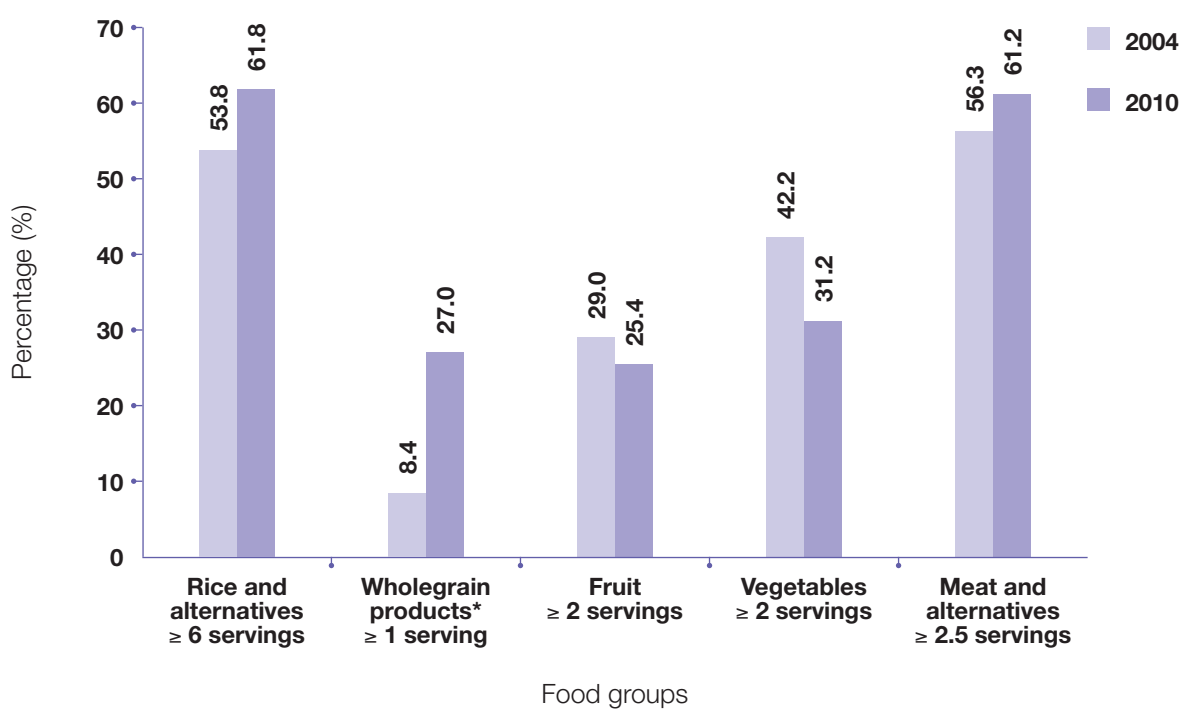


Figure 4.2.3: Comparison of proportion of adult Singapore residents (%) meeting the Dietary Guidelines, NNS 2004 and NNS 2010



* Note the differences in questions between NNS 2004 and NNS 2010. In NNS 2004, the option 'wholemeal/softmeal bread' was used which included bread higher in fibre (e.g. softmeal bread with fruit). In NNS 2010, the consumption of wholemeal bread, wholemeal cereals and wholegrain noodles was captured.

Table 4.3.1: Mean (SE) daily intake of the various food types (weight in grams) among adult Singapore residents, by gender and ethnic groups

	Mean daily intake (grams)					
	Males	Females	Chinese	Malay	Indian	Total
Bread and breakfast cereals	174.0 (9.8)	168.8 (8.7)	122.7 (7.5)	162.6 (8.9)	249.4 (17.1)	171.4 (6.5)
White bread	31.4 (1.3)	24.0 (0.9)	22.6 (1.1)	36.5 (1.7)	25.7 (1.3)	27.7 (0.8)
Bread with fruits and nuts	2.3 (0.4)	1.7 (0.2)	2.1 (0.4)	2.3 (0.4)	1.5 (0.3)	2.0 (0.2)
Cereals and other types of bread (e.g. roti prata, thosai, chapati)	48.7 (2.5)	33.5 (2.1)	15.8 (1.0)	37.8 (2.3)	80.2 (4.4)	41.0 (1.6)
Wholemeal bread and wholegrain cereals	91.5 (9.3)	109.7 (8.3)	82.3 (7.3)	86.1 (8.4)	142.0 (16.8)	100.7 (6.3)
Rice/Porridge and dishes	523.9 (9.2)	376.5 (7.5)	489.6 (9.9)	439.6 (11.1)	403.8 (11.0)	449.7 (6.2)
Plain rice/porridge	377.5 (8.0)	264.2 (6.1)	329.0 (8.6)	324.7 (9.2)	303.9 (9.2)	320.4 (5.2)
Flavoured rice/porridge	133.3 (4.1)	94.0 (3.8)	134.0 (4.6)	109.1 (4.9)	89.0 (5.2)	113.5 (2.8)
Brown rice/porridge	13.1 (1.9)	18.4 (2.3)	26.6 (2.8)	5.8 (2.0)	10.8 (2.6)	15.8 (1.5)
Noodles dishes	304.3 (9.2)	270.5 (8.2)	387.9 (10.3)	251.0 (9.8)	182.6 (9.0)	287.3 (6.2)
Noodles in soup	85.1 (4.2)	92.6 (4.3)	133.4 (5.5)	70.1 (4.7)	45.4 (3.5)	88.8 (3.0)
Dry noodles	60.8 (2.6)	41.0 (2.1)	78.1 (3.1)	36.3 (2.2)	27.4 (2.3)	50.9 (1.7)
Fried noodles	79.9 (3.2)	67.2 (2.8)	95.3 (3.7)	64.6 (3.5)	52.0 (3.5)	73.5 (2.1)
Noodles in lemak gravy	20.8 (1.6)	14.1 (1.1)	20.1 (1.5)	19.1 (1.9)	12.0 (1.6)	17.5 (1.0)
Instant noodles	44.3 (2.4)	40.2 (2.6)	45.2 (3.1)	47.1 (3.2)	33.0 (2.5)	42.3 (1.7)
Pasta	11.2 (1.0)	12.6 (1.0)	13.9 (1.1)	11.1 (1.2)	9.9 (1.3)	11.9 (0.7)
Wholegrain noodles	2.2 (0.5)	2.7 (0.6)	1.9 (0.4)	2.7 (0.8)	3.0 (0.8)	2.4 (0.4)
Vegetarian Chinese	16.9 (1.5)	16.0 (1.3)	21.2 (1.7)	6.0 (0.9)	20.6 (2.1)	16.4 (1.0)

Table 4.3.2: Mean (SE) daily intake of the various food types (weight in grams) among adult Singapore residents, by gender and ethnic groups

	Mean daily intake (grams)					
	Males	Females	Chinese	Malay	Indian	Total
Vegetables & beans/bean products and dishes	236.4 (5.5)	241.4 (5.6)	232.4 (5.9)	205.9 (6.9)	282.8 (7.5)	238.9 (3.9)
Pale green leafy vegetables and dishes	52.0 (2.1)	51.7 (1.8)	54.2 (2.0)	48.3 (2.8)	52.2 (2.4)	51.8 (1.4)
Dark green leafy vegetables and dishes	48.1 (1.7)	54.7 (1.8)	61.7 (2.0)	47.0 (2.3)	41.4 (1.9)	51.4 (1.2)
Tomatoes, carrots, red/yellow peppers and dishes	27.0 (1.5)	28.8 (1.4)	21.6 (1.3)	21.9 (1.5)	43.1 (2.6)	27.9 (1.0)
Legumes/pulses and dishes	23.8 (1.4)	25.0 (1.5)	18.0 (1.2)	14.4 (1.1)	43.9 (2.6)	24.4 (1.0)
Mixed vegetables and dishes	44.0 (2.1)	41.4 (1.9)	41.0 (2.4)	35.7 (2.2)	52.4 (2.7)	42.7 (1.4)
Others (roots/stems) and dishes	41.0 (2.0)	39.2 (1.9)	35.0 (2.1)	38.2 (2.5)	49.2 (2.7)	40.1 (1.4)
Preserved vegetables	0.6 (0.1)	0.6 (0.1)	0.9 (0.2)	0.3 (0.1)	0.6 (0.1)	0.6 (0.1)
Fruits	191.5 (6.2)	205.7 (6.0)	191.8 (6.4)	190.7 (8.0)	216.7 (8.5)	198.6 (4.3)
Orange/red/yellow fruits and juices	73.7 (3.8)	77.0 (3.2)	76.0 (3.5)	74.4 (4.5)	75.5 (5.3)	75.3 (2.5)
Other fruits and juices	116.0 (4.0)	127.1 (4.0)	114.7 (4.2)	114.6 (5.4)	138.7 (5.5)	121.6 (2.9)
Canned fruits	0.6 (0.1)	0.2 (0.0)	0.2 (0.0)	0.6 (0.2)	0.3 (0.1)	0.4 (0.1)
Mixed fruits (dried)	1.2 (0.2)	1.5 (0.2)	0.9 (0.2)	1.1 (0.2)	2.2 (0.3)	1.4 (0.1)
Poultry and dishes	64.1 (2.1)	49.9 (1.7)	61.7 (2.3)	57.6 (2.3)	49.4 (2.4)	56.9 (1.4)
Poultry (without skin) and dishes	31.6 (1.7)	32.5 (1.6)	29.7 (1.7)	28.6 (2.1)	39.0 (2.2)	32.1 (1.1)
Poultry (with skin) and dishes	32.5 (1.9)	17.3 (1.2)	32.0 (2.0)	29.0 (2.0)	10.4 (1.4)	24.9 (1.1)

Table 4.3.3: Mean (SE) daily intake of the various food types (weight in grams) among adult Singapore residents, by gender and ethnic groups

	Mean daily intake (grams)					
	Males	Females	Chinese	Malay	Indian	Total
Meat and dishes	64.3 (2.4)	46.2 (1.9)	81.2 (2.8)	42.8 (2.1)	31.3 (2.1)	55.2 (1.6)
Meat (lean) and dishes	27.6 (1.6)	24.9 (1.4)	36.0 (2.0)	20.5 (1.5)	18.4 (1.6)	26.2 (1.1)
Meat (lean and fat) and dishes	26.0 (1.8)	13.4 (1.1)	32.7 (2.2)	14.4 (1.4)	6.7 (1.1)	19.7 (1.1)
Meat (preserved and cured) and dishes	10.7 (0.7)	7.9 (0.7)	12.5 (1.0)	7.9 (0.6)	6.2 (0.7)	9.3 (0.5)
Fish/Seafood and dishes	81.7 (2.5)	75.1 (2.2)	70.6 (2.4)	99.3 (3.4)	67.5 (2.8)	78.4 (1.7)
Fish and dishes	62.4 (1.9)	60.0 (1.8)	52.1 (1.8)	79.6 (2.7)	54.9 (2.3)	61.2 (1.3)
Other seafood and dishes	19.3 (1.2)	15.1 (0.8)	18.5 (1.1)	19.7 (1.5)	12.7 (1.1)	17.2 (0.7)
Eggs	27.8 (1.0)	19.9 (0.7)	26.2 (0.8)	25.6 (1.6)	18.6 (0.9)	23.8 (0.6)
Milk and dairy products	298.8 (10.9)	244.0 (8.1)	194.5 (8.9)	271.3 (12.0)	379.8 (13.9)	271.2 (6.8)
Milk used with beverages (e.g. in tea, coffee, malt drinks)	217.9 (9.3)	156.2 (6.9)	137.5 (8.2)	176.1 (10.3)	268.0 (11.6)	186.8 (5.8)
Full cream milk (as a drink)	17.6 (2.1)	16.9 (2.0)	11.5 (1.8)	16.9 (2.6)	25.7 (3.4)	17.2 (1.5)
Reduced fat milk (as a drink)	49.5 (4.3)	54.4 (3.4)	37.1 (2.9)	67.5 (5.3)	56.7 (6.3)	52.0 (2.7)
Yogurt/cheese	13.8 (1.5)	16.5 (1.3)	8.3 (0.8)	10.7 (1.1)	29.4 (2.9)	15.1 (1.0)

Table 4.3.4: Mean (SE) daily intake of the various food types (weight in grams) among adult Singapore residents, by gender and ethnic groups

	Mean daily intake (grams)					
	Males	Females	Chinese	Malay	Indian	Total
Miscellaneous	492.4 (12.5)	376.6 (10.6)	489.3 (13.9)	471.2 (15.0)	317.1 (12.4)	434.1 (8.3)
Bread spreads	5.4 (0.3)	3.9 (0.2)	3.9 (0.2)	5.8 (0.4)	4.5 (0.3)	4.6 (0.2)
Soup cream/broth/clear	56.2 (4.2)	55.0 (4.8)	98.3 (6.8)	30.0 (3.4)	21.8 (2.7)	55.6 (3.2)
Salad dressings	1.0 (0.1)	1.0 (0.1)	1.0 (0.1)	1.2 (0.1)	0.8 (0.1)	1.0 (0.1)
Desserts in soup	24.4 (1.6)	19.5 (1.3)	31.8 (2.0)	16.1 (1.4)	14.1 (1.4)	21.9 (1.0)
Local snacks – kueh kueh (steamed)	12.5 (0.9)	10.4 (0.9)	8.8 (0.7)	12.6 (1.2)	13.9 (1.5)	11.4 (0.6)
Other desserts/snacks (e.g. dim sum, goreng pisang, Indian rojak)	21.2 (1.4)	15.3 (1.0)	24.7 (1.7)	15.3 (1.2)	12.1 (0.9)	18.2 (0.8)
Biscuits, pastries and cakes	25.6 (1.3)	24.1 (1.0)	18.1 (1.0)	28.7 (1.6)	30.4 (1.7)	24.9 (0.8)
Fast food and soft drinks	168.3 (6.6)	115.1 (5.5)	127.6 (6.4)	183.6 (9.5)	117.4 (6.4)	141.5 (4.4)
Nuts	4.3 (0.3)	2.8 (0.2)	3.0 (0.3)	2.5 (0.3)	5.2 (0.4)	3.5 (0.2)
Titbits (e.g. fried salty snacks, ice-cream, chocolates)	13.7 (0.8)	12.1 (0.8)	10.8 (0.7)	16.3 (1.3)	12.4 (0.8)	12.9 (0.5)
Beverages with creamer or whitener	47.1 (5.1)	43.2 (4.0)	44.5 (4.5)	53.5 (6.6)	37.3 (6.0)	45.1 (3.2)
Beverages without milk or sugar	112.7 (7.7)	74.2 (5.1)	116.8 (8.1)	105.6 (8.7)	47.2 (5.8)	93.3 (4.6)
Soy products	66.2 (3.5)	62.6 (2.9)	65.2 (3.2)	67.0 (4.1)	60.4 (4.8)	64.4 (2.3)
Tofu/beancurd and dishes	11.5 (0.6)	14.0 (0.9)	13.9 (0.8)	12.1 (0.9)	11.8 (1.1)	12.7 (0.5)
Soy milk and beancurd	54.7 (3.3)	48.6 (2.7)	51.3 (3.0)	54.9 (3.8)	48.6 (4.5)	51.6 (2.1)
Alcohol	63.8 (8.0)	9.4 (2.6)	55.4 (8.2)	8.1 (4.1)	39.1 (7.7)	36.4 (4.3)

Table 4.3.5: Mean (SE) daily intake of the various food types (weight in grams) among adult Singapore residents, by age (years) groups

	Mean daily intake (grams)					
	18-29	30-39	40-49	50-59	60-69	Total
Breads and breakfast cereals	118.3 (7.5)	166.5 (10.5)	157.0 (10.8)	227.7 (25.1)	243.3 (24.1)	171.4 (6.5)
White bread	27.3 (1.7)	28.0 (1.6)	29.3 (1.6)	26.2 (1.8)	26.4 (2.3)	27.7 (0.8)
Bread with fruits and nuts	2.1 (0.6)	2.3 (0.5)	1.5 (0.2)	2.2 (0.5)	1.6 (0.7)	2.0 (0.2)
Cereals and other types of breads (e.g. roti prata, thosai, chapati)	38.3 (2.6)	52.7 (4.1)	42.2 (3.5)	34.1 (3.5)	29.2 (3.9)	41.0 (1.6)
Wholemeal bread and wholegrain cereals	50.6 (6.5)	83.5 (9.5)	84.0 (10.0)	165.1 (24.5)	186.2 (23.7)	100.7 (6.3)
Rice/Porridge and dishes	486.3 (13.4)	450.5 (13.2)	434.4 (12.0)	426.1 (13.3)	440.9 (19.6)	449.7 (6.2)
Plain rice/porridge	334.1 (11.3)	319.5 (10.8)	315.9 (10.5)	310.2 (11.2)	319.6 (16.3)	320.4 (5.2)
Flavoured rice/porridge	140.4 (6.4)	112.9 (6.2)	102.9 (4.8)	100.1 (6.3)	101.3 (9.1)	113.5 (2.8)
Brown rice/porridge	11.8 (2.3)	18.1 (4.0)	15.6 (2.9)	15.7 (3.1)	20.0 (4.6)	15.8 (1.5)
Noodles dishes	331.5 (13.5)	305.2 (12.2)	292.7 (12.5)	247.9 (13.9)	198.2 (17.3)	287.3 (6.2)
Noodles in soup	103.4 (6.1)	99.0 (5.9)	89.4 (6.8)	77.6 (6.9)	49.4 (7.1)	88.8 (3.0)
Dry noodles	50.9 (3.4)	52.8 (3.4)	55.3 (3.6)	47.9 (3.9)	40.5 (5.2)	50.9 (1.7)
Fried noodles	72.8 (4.4)	77.2 (4.5)	76.2 (4.3)	69.7 (4.7)	66.4 (7.1)	73.5 (2.1)
Noodles in lemak gravy	18.8 (2.5)	13.5 (1.5)	21.1 (2.0)	17.9 (2.1)	14.3 (2.7)	17.5 (1.0)
Instant noodles	65.4 (4.8)	43.8 (3.0)	38.4 (2.8)	25.2 (4.1)	23.6 (3.6)	42.3 (1.7)
Pasta	18.6 (1.6)	15.2 (1.8)	9.4 (1.2)	7.4 (1.2)	2.8 (0.8)	11.9 (0.7)
Wholegrain noodles	1.6 (0.5)	3.7 (0.9)	2.8 (0.8)	2.1 (0.8)	1.2 (1.0)	2.4 (0.4)
Vegetarian Chinese	15.6 (2.1)	16.2 (2.1)	17.2 (2.0)	16.4 (1.9)	17.1 (3.2)	16.4 (1.0)

Table 4.3.6: Mean (SE) daily intake of the various food types (weight in grams) among adult Singapore residents, by age (years) groups

	Mean daily intake (grams)					
	18-29	30-39	40-49	50-59	60-69	Total
Vegetables & beans/bean products and dishes	216.8 (7.4)	257.9 (8.7)	254.1 (8.6)	231.5 (8.5)	221.6 (10.4)	238.9 (3.9)
Pale green leafy vegetables and dishes	51.6 (2.8)	55.0 (2.6)	54.6 (2.8)	49.1 (3.8)	43.0 (3.5)	51.8 (1.4)
Dark green leafy vegetables and dishes	44.0 (2.4)	52.3 (2.7)	56.8 (2.5)	51.0 (2.7)	54.0 (4.1)	51.4 (1.2)
Tomatoes, carrots, red/yellow peppers and dishes	22.7 (1.6)	29.2 (2.2)	31.7 (2.5)	28.4 (2.3)	26.7 (3.2)	27.9 (1.0)
Legumes/pulses and dishes	17.3 (1.6)	30.2 (2.5)	27.5 (2.4)	22.4 (1.9)	22.9 (2.8)	24.4 (1.0)
Mixed vegetables and dishes	40.8 (2.8)	47.8 (2.8)	41.2 (3.0)	43.8 (3.7)	37.2 (4.0)	42.7 (1.4)
Others (roots/stems) and dishes	39.9 (2.6)	42.5 (3.3)	41.6 (3.1)	36.3 (2.7)	37.5 (3.6)	40.1 (1.4)
Preserved vegetables	0.6 (0.2)	0.8 (0.2)	0.7 (0.1)	0.4 (0.1)	0.4 (0.1)	0.6 (0.1)
Fruits	175.5 (8.0)	195.8 (8.8)	202.1 (9.0)	224.1 (11.1)	207.1 (12.7)	198.6 (4.3)
Orange/red/yellow fruits and juices	60.7 (3.7)	75.7 (5.1)	76.5 (5.8)	91.5 (6.4)	78.1 (6.9)	75.3 (2.5)
Other fruits and juices	113.5 (5.8)	118.1 (5.5)	123.6 (5.7)	130.9 (7.5)	127.6 (9.0)	121.6 (2.9)
Canned fruits	0.5 (0.1)	0.3 (0.1)	0.5 (0.2)	0.3 (0.1)	0.2 (0.1)	0.4 (0.1)
Mixed fruits (dried)	0.9 (0.2)	1.7 (0.3)	1.5 (0.3)	1.4 (0.3)	1.2 (0.4)	1.4 (0.1)
Poultry and dishes	71.2 (2.9)	62.5 (3.1)	50.0 (2.2)	48.9 (3.4)	41.5 (3.3)	56.9 (1.4)
Poultry (without skin) and dishes	34.9 (2.8)	31.5 (2.2)	28.4 (1.8)	36.1 (3.2)	29.0 (2.9)	32.1 (1.1)
Poultry (with skin) and dishes	36.3 (2.3)	30.9 (3.0)	21.6 (2.1)	12.8 (1.7)	12.5 (2.5)	24.9 (1.1)

Table 4.3.7: Mean (SE) daily intake of the various food types (weight in grams) among adult Singapore residents, by age (years) groups

	Mean daily intake (grams)					
	18-29	30-39	40-49	50-59	60-69	Total
Meat and dishes	69.5 (3.2)	56.5 (3.2)	50.5 (3.4)	48.2 (3.4)	42.7 (3.8)	55.2 (1.6)
Meat (lean) and dishes	27.3 (2.2)	25.0 (2.2)	24.8 (2.0)	29.9 (2.8)	23.6 (2.7)	26.2 (1.1)
Meat (lean and fat) and dishes	26.4 (2.3)	20.9 (2.1)	19.1 (2.6)	13.4 (2.0)	13.6 (2.6)	19.7 (1.1)
Meat (preserved and cured) and dishes	15.8 (1.0)	10.5 (1.4)	6.6 (0.7)	4.8 (0.7)	5.5 (1.1)	9.3 (0.5)
Fish/Seafood and dishes	70.6 (3.3)	72.4 (3.2)	79.7 (3.4)	94.5 (4.4)	79.6 (4.7)	78.4 (1.7)
Fish and dishes	51.5 (2.4)	56.0 (2.6)	62.2 (2.5)	75.6 (3.6)	68.8 (4.3)	61.2 (1.3)
Other seafood and dishes	19.2 (1.7)	16.4 (1.2)	17.5 (1.4)	18.9 (1.9)	10.9 (1.4)	17.2 (0.7)
Eggs	29.5 (1.4)	25.2 (1.6)	21.9 (1.2)	20.4 (1.3)	18.4 (1.5)	23.8 (0.6)
Milk and dairy products	241.8 (12.3)	290.9 (14.4)	271.4 (13.0)	262.7 (16.1)	306.2 (26.6)	271.2 (6.8)
Milk used with beverages (e.g. In tea, coffee, malt drinks)	147.0 (9.6)	199.6 (12.8)	200.9 (11.7)	184.9 (13.8)	217.5 (21.5)	186.8 (5.8)
Full cream milk (as a drink)	21.6 (3.5)	27.1 (3.8)	11.4 (2.1)	10.3 (2.7)	10.2 (3.4)	17.2 (1.5)
Reduced fat milk (as a drink)	59.9 (7.2)	45.7 (4.4)	45.6 (4.7)	53.3 (6.2)	61.6 (9.4)	52.0 (2.7)
Yogurt/cheese	13.2 (1.3)	18.6 (2.1)	13.6 (1.7)	14.1 (3.0)	16.9 (4.2)	15.1 (1.0)

Table 4.3.8: Mean (SE) daily intake of the various food types (weight in grams) among adult Singapore residents, by age (years) groups

	Mean daily intake (grams)					
	18-29	30-39	40-49	50-59	60-69	Total
Miscellaneous	499.2 (16.7)	434.5 (16.9)	414.7 (16.6)	417.3 (20.7)	359.5 (24.7)	434.1 (8.3)
Bread spreads	4.3 (0.3)	4.3 (0.3)	4.7 (0.3)	5.1 (0.3)	5.1 (0.8)	4.6 (0.2)
Soup cream/broth/clear	57.1 (5.9)	61.9 (8.3)	49.8 (5.4)	54.6 (6.4)	53.3 (9.9)	55.6 (3.2)
Salad dressings	1.3 (0.1)	1.0 (0.1)	1.0 (0.2)	0.8 (0.2)	0.5 (0.1)	1.0 (0.1)
Desserts in soup	21.9 (2.1)	20.6 (1.9)	21.6 (2.0)	25.2 (2.8)	20.5 (2.8)	21.9 (1.0)
Local snacks – kueh kueh (steamed)	7.5 (1.0)	11.8 (1.5)	11.7 (1.3)	16.6 (1.8)	10.2 (1.7)	11.4 (0.6)
Other desserts/snacks (e.g. dim sum, goreng pisang, Indian rojak)	24.0 (2.4)	17.1 (1.3)	17.0 (1.7)	15.6 (1.4)	15.5 (2.2)	18.2 (0.8)
Biscuits, pastries and cakes	24.6 (1.5)	25.7 (2.0)	24.3 (1.6)	25.6 (2.0)	23.5 (2.1)	24.9 (0.8)
Fast food and soft drinks	238.4 (10.9)	160.5 (9.2)	104.6 (6.6)	82.5 (7.7)	64.8 (8.7)	141.5 (4.4)
Nuts	2.3 (0.3)	3.4 (0.3)	4.4 (0.4)	4.2 (0.6)	3.2 (0.8)	3.5 (0.2)
Titbits (e.g. fried salty snacks, ice-cream, chocolates)	21.5 (1.6)	13.4 (0.9)	10.4 (0.8)	7.9 (1.1)	6.3 (1.4)	12.9 (0.5)
Beverages with creamer or whitener	32.7 (4.9)	40.3 (6.3)	57.0 (7.6)	45.7 (7.4)	55.3 (12.0)	45.1 (3.2)
Beverages without milk or sugar	63.6 (6.9)	74.6 (8.0)	108.2 (10.6)	133.5 (13.8)	101.3 (13.6)	93.3 (4.6)
Soy products	66.4 (4.4)	66.8 (4.9)	66.6 (5.1)	60.1 (4.4)	55.6 (6.9)	64.4 (2.3)
Tofu/beancurd and dishes	12.4 (1.1)	12.2 (1.2)	13.7 (1.3)	12.3 (0.9)	13.3 (1.5)	12.7 (0.5)
Soy milk and beancurd	54.1 (4.2)	54.6 (4.7)	52.9 (4.6)	47.8 (4.1)	42.3 (6.6)	51.6 (2.1)
Alcohol	35.1 (9.2)	23.4 (5.3)	37.6 (9.6)	50.9 (11.2)	42.2 (14.8)	36.4 (4.3)

SE - standard error of mean

Table 5.1.1: Mean (SE) and percentile distribution of urinary sodium (mmol/24hr) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (mmol/day)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Gender									
Males	164.0	6.6	75.6	81.8	106.0	155.7	210.6	255.6	306.8
Females	123.1	4.4	48.0	63.6	84.5	115.3	155.5	201.9	226.3
Ethnic Group									
Chinese	143.2	5.0	62.4	71.7	95.5	135.4	173.1	233.0	255.6
Malay	130.0	6.1	39.7	44.3	84.3	123.5	169.8	213.2	233.0
Indian	148.5	5.5	51.3	62.7	92.0	135.6	196.0	252.8	270.4
Age Group (Years)									
18-29	134.4	9.1	41.2	49.3	72.3	122.4	189.7	214.7	235.2
30-39	151.4	8.0	63.7	78.8	102.5	149.9	173.3	234.4	272.2
40-49	153.4	7.2	63.0	82.6	103.0	144.5	192.9	241.6	247.1
50-59	133.4	10.1	74.8	75.1	86.7	118.0	149.9	227.6	260.8
60-69	131.6	7.9	49.9	63.4	88.8	131.7	163.6	188.2	234.3
Total	142.2	4.1	57.2	69.2	93.8	133.0	174.2	231.9	255.7

Table 5.1.2: Mean (SE) and percentile distribution of estimated salt intake[^] (g/day) among adult Singapore residents, by gender, ethnic and age (years) groups

	Mean (g/day)	SE	Percentile						
			5 th	10 th	25 th	50 th	75 th	90 th	95 th
Gender									
Males	9.6	0.4	4.4	4.8	6.2	9.1	12.3	14.9	17.9
Females	7.2	0.3	2.8	3.7	4.9	6.7	9.1	11.8	13.2
Ethnic Group									
Chinese	8.4	0.3	3.7	4.2	5.6	7.9	10.1	13.6	14.9
Malay	7.6	0.4	2.3	2.6	4.9	7.2	9.9	12.5	13.6
Indian	8.7	0.3	3.0	3.7	5.4	7.9	11.5	14.8	15.8
Age Group (Years)									
18-29	7.9	0.5	2.4	2.9	4.2	7.2	11.1	12.6	13.8
30-39	8.9	0.5	3.7	4.6	6.0	8.8	10.1	13.7	15.9
40-49	9.0	0.4	3.7	4.8	6.0	8.4	11.3	14.1	14.5
50-59	7.8	0.6	4.4	4.4	5.1	6.9	8.8	13.3	15.3
60-69	7.7	0.5	2.9	3.7	5.2	7.7	9.6	11.0	13.7
Total	8.3	0.2	3.3	4.0	5.5	7.8	10.2	13.6	15.0

[^] As in the standard conversion, 1g salt (sodium chloride) was estimated to be 17.1 mmol sodium or 393.4mg sodium.

Table 5.1.3: Distribution (%) of percentage of RDA met for salt among adult Singapore residents, by gender, ethnic and age (years) groups

	< 50%	< 70%	< 100%	≥ 100%	≥ 120%	≥ 150%	≥ 200%
Gender							
Males	1.0	3.3	13.4	86.6	76.7	66.4	38.7
Females	3.0	8.2	25.5	74.5	63.5	39.7	18.2
Ethnic Group							
Chinese	1.5	4.4	18.9	81.1	70.5	52.9	27.5
Malay	5.5	14.5	26.1	73.9	62.1	44.5	24.8
Indian	2.7	8.4	20.6	79.4	72.3	55.1	33.9
Age Group (Years)							
18-29	6.1	14.8	30.2	69.8	64.7	45.1	34.5
30-39	0.6	0.9	13.9	86.1	75.8	59.4	33.7
40-49	0.4	3.7	10.7	89.3	79.4	62.3	32.5
50-59	0.4	2.7	23.9	76.1	60.1	42.1	13.9
60-69	4.0	9.2	20.4	79.6	66.1	51.6	15.7
Total	2.1	5.9	19.8	80.2	69.7	52.1	27.7

Figure 6.1.1(a): Distribution of breakfast venues frequented by adult Singapore residents (%)

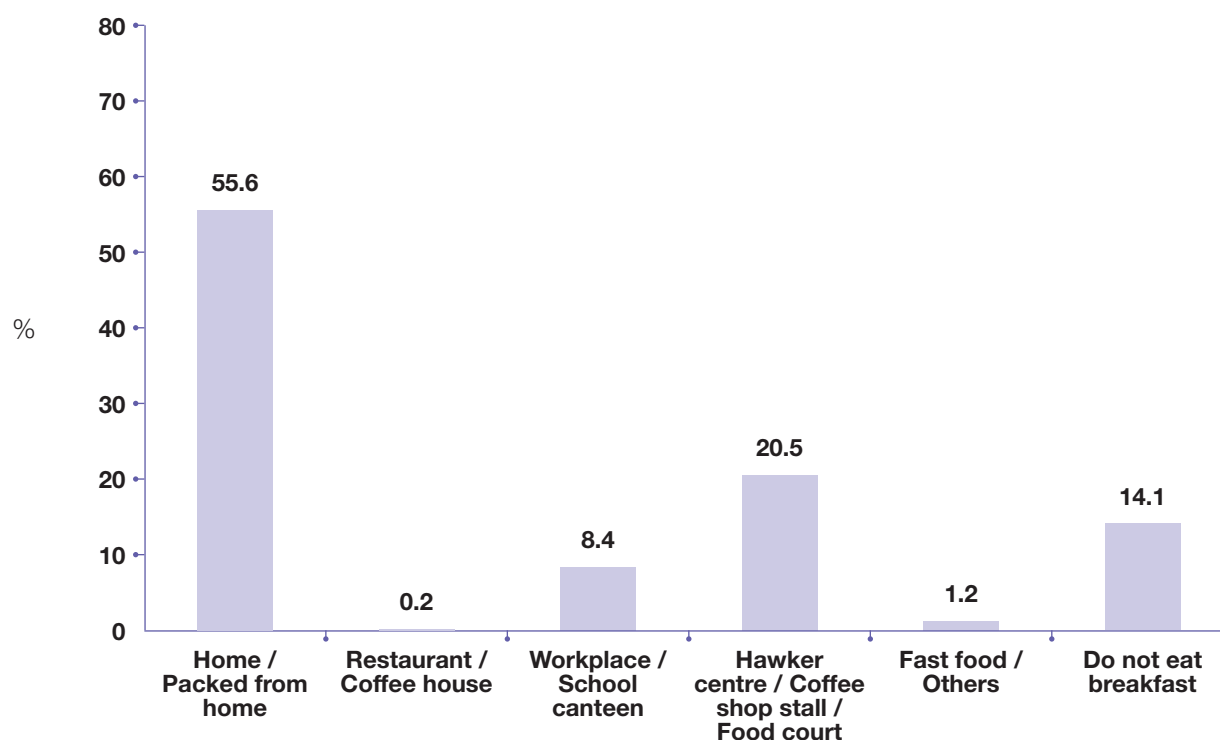
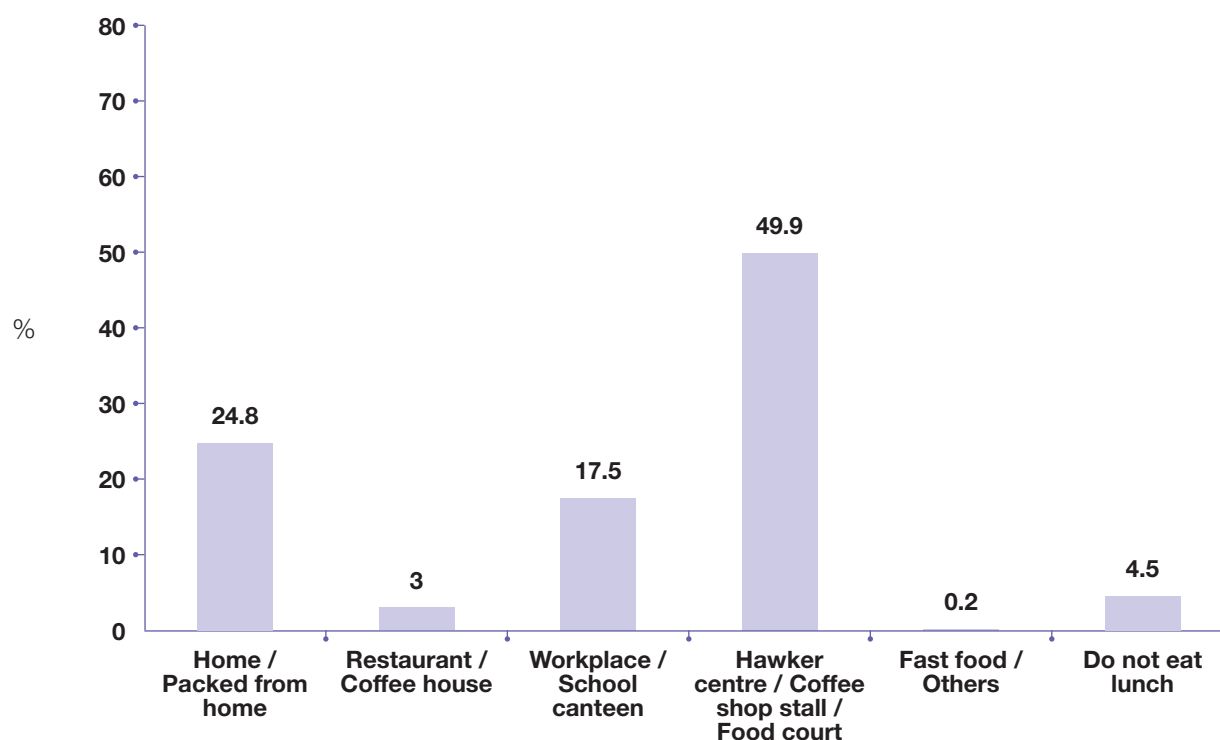


Table 6.1.1(a): Distribution of breakfast venues frequented by adult Singapore residents by gender, ethnic and age (years) groups (%)

	Home / Packed from home	Restaurant / Coffee house	Workplace / School canteen	Hawker centre / Coffee shop stall / Food court	Fast food / Others	Do not eat breakfast
Gender						
Males	50.0	0.4	8.4	26.3	1.1	13.8
Females	61.2	0.0	8.3	14.7	1.2	14.5
Ethnic Group						
Chinese	54.4	0.2	8.0	24.6	1.4	11.4
Malay	50.9	0.1	11.1	10.4	0.6	26.9
Indian	70.6	0.2	7.1	5.7	0.3	16.2
Age Group (Years)						
18-29	46.6	0.0	16.5	9.8	0.9	26.1
30-39	55.1	0.1	10.7	18.6	1.5	14.0
40-49	55.9	0.0	7.1	25.6	0.4	11.0
50-59	58.2	0.7	3.4	29.4	2.5	5.8
60-69	66.8	0.1	2.0	16.3	0.0	14.7
Total	55.6	0.2	8.4	20.5	1.2	14.1

Figure 6.1.1(b): Distribution of lunch venues frequented by adult Singapore residents (%)**Table 6.1.1(b): Distribution of lunch venues frequented by adult Singapore residents, by gender, ethnic and age (years) groups (%)**

	Home / Packed from home	Restaurant / Coffee house	Workplace / School canteen	Hawker centre / Coffee shop stall / Food court	Fast food / Others	Do not eat lunch
Gender						
Males	15.4	5.1	19.7	55.8	0.2	3.8
Females	34.2	1.0	15.2	44.1	0.3	5.2
Ethnic Group						
Chinese	17.2	3.7	16.2	58.5	0.0	4.4
Malay	42.7	1.0	23.5	24.8	1.5	6.5
Indian	53.7	1.4	18.0	23.9	0.2	2.8
Age Group (Years)						
18-29	14.8	1.3	35.7	43.6	0.8	3.7
30-39	20.3	4.1	19.9	51.7	0.2	3.7
40-49	26.6	2.5	11.2	54.1	0.0	5.6
50-59	25.7	0.4	10.8	58.9	0.0	4.2
60-69	45.1	10.0	5.7	33.6	0.0	5.6
Total	24.8	3.0	17.5	49.9	0.2	4.5

Figure 6.1.1(c): Distribution of dinner venues frequented by adult Singapore residents (%)

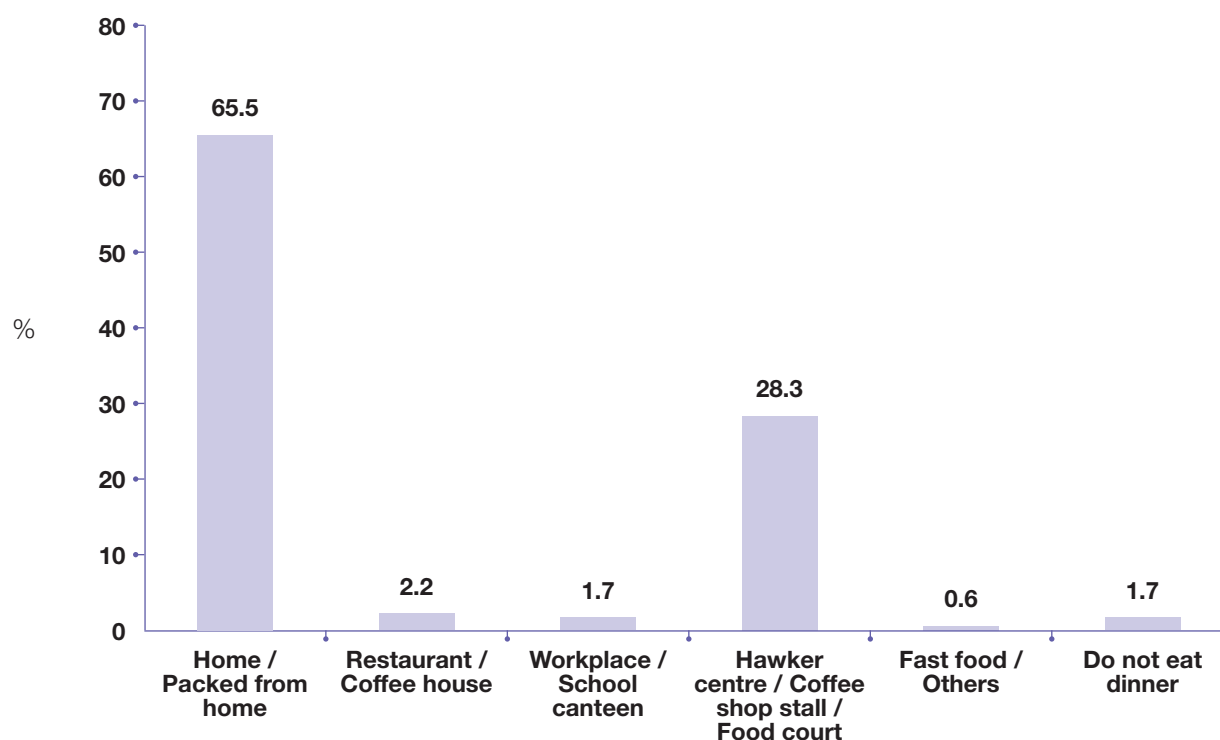


Table 6.1.1(c): Distribution of dinner venues frequented by adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Home / Packed from home	Restaurant / Coffee house	Workplace / School canteen	Hawker centre / Coffee shop stall / Food court	Fast food / Others	Do not eat dinner
Gender						
Males	61.7	2.1	2.3	32.5	0.2	1.2
Females	69.3	2.3	1.2	24.1	1.0	2.1
Ethnic Group						
Chinese	59.7	2.6	1.4	34.8	0.6	0.9
Malay	78.8	0.6	3.5	11.1	1.1	4.9
Indian	88.5	1.3	1.2	6.3	0.1	2.5
Age Group (Years)						
18-29	54.4	5.4	4.5	33.4	0.9	1.4
30-39	71.3	3.4	1.1	22.3	0.0	1.9
40-49	71.2	1.0	0.7	24.1	0.5	2.4
50-59	58.8	0.4	1.5	37.6	0.8	0.8
60-69	77.1	0.0	0.1	19.8	1.1	1.9
Total	65.5	2.2	1.7	28.3	0.6	1.7

Table 6.1.1.1: Comparison of usual meal venues among adult Singapore residents, 2004 and 2010 (%)

Usual meal venues	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Breakfast							
Home / Packed from home	58.0	58.7	(55.8, 61.6)	55.6	55.6	(51.9, 59.3)	-3.1
Restaurant / Coffee house	0.4	0.4	(0.1, 1.0)	0.2	0.2	(0.1, 0.7)	-0.2
Workplace / School canteen	13.1	12.8	(11.1, 14.8)	8.4	8.4	(6.8, 10.3)*	-4.4
Hawker centre / Coffee shop stall / Food court	21.1	21.0	(18.6, 23.6)	20.5	20.5	(17.5, 23.9)	-0.5
Others	0.2	0.2	(0.0, 0.7)	1.2	1.2	(0.7, 2.0)	+1.0
Do not eat breakfast	7.2	6.9	(5.7, 8.4)	14.1	14.1	(12.1, 16.5)*	+7.2
Lunch							
Home / Packed from home	27.7	28.9	(26.2, 31.7)	24.8	24.8	(22.1, 27.8)	-4.1
Restaurant / Coffee house	1.0	0.9	(0.5, 1.7)	3.0	3.0	(1.3, 6.9)	+2.1
Workplace / School canteen	26.2	25.9	(23.5, 28.6)	17.5	17.5	(15.1, 20.1)*	-8.4
Hawker centre / Coffee shop stall / Food court	41.9	41.0	(38.1, 44.0)	49.9	49.9	(46.1, 53.8)*	+8.9
Others	0.3	0.4	(0.1, 1.0)	0.2	0.2	(0.1, 0.5)	-0.2
Do not eat lunch	2.9	2.9	(2.1, 4.1)	4.5	4.5	(3.4, 6.0)	+1.6
Dinner							
Home / Packed from home	73.2	73.6	(70.9, 76.2)	65.5	65.5	(61.6, 69.3)*	-8.1
Restaurant / Coffee house	0.3	0.3	(0.1, 0.7)	2.2	2.2	(1.2, 3.9)*	+1.9
Workplace / School canteen	4.1	4.1	(3.2, 5.4)	1.7	1.7	(1.1, 2.7)*	-2.4
Hawker centre / Coffee shop stall / Food court	21.7	21.3	(19.0, 23.9)	28.3	28.3	(24.7, 32.2)*	+7.0
Others	0.1	0.0	(0.0, 0.3)	0.6	0.6	(0.3, 1.4)	+0.6
Do not eat dinner	0.6	0.6	(0.4, 1.0)	1.7	1.7	(1.1, 2.5)*	+1.1

* Significant differences between 2004 and 2010.

Table 6.1.1.2: Comparison of proportions of adult Singapore residents eating out for lunch and/or dinner, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Eating out at hawker centre / coffee shop stall / food court	47.7	46.7	(43.8, 49.7)	56.9	56.9	(53.2, 60.6)*	+10.2
Eating out at hawker centre / coffee shop stall / food court / restaurant / coffee house	48.8	47.8	(44.8, 50.8)	60.1	60.1	(56.5, 63.5)*	+12.3

* Significant differences between 2004 and 2010.

Figure 6.1.2(a): Distribution of frequency of adult Singapore residents dining at hawker centres/coffee shop stalls/food courts (%)

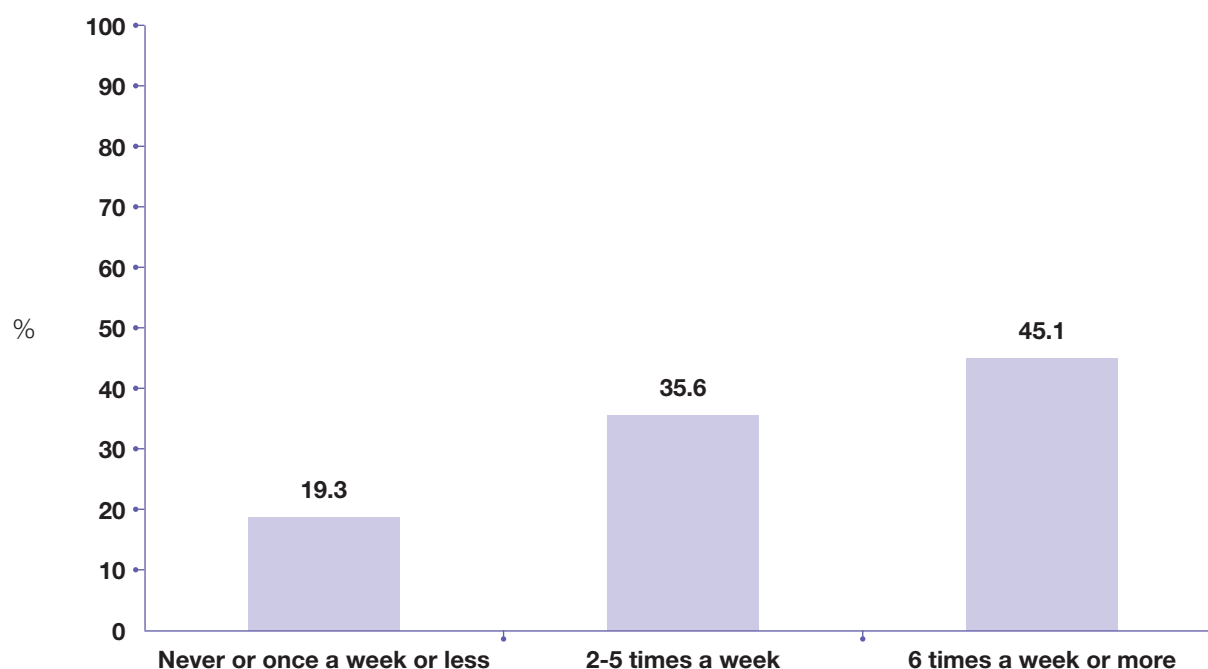


Table 6.1.2 (a): Distribution of frequency of adult Singapore residents dining at hawker centres/coffee shop stalls/food courts, by gender, ethnic and age (years) groups (%)

	Never or once a week or less	2-5 times a week	6 times a week or more
Gender			
Males	13.8	32.8	53.4
Females	24.7	38.4	36.9
Ethnic Group			
Chinese	10.8	34.6	54.6
Malay	38.2	43.1	18.7
Indian	52.9	32.2	14.9
Age Group (Years)			
18-29	16.8	46.9	36.3
30-39	18.6	34.1	47.3
40-49	17.3	35.0	47.7
50-59	19.9	22.6	57.5
60-69	27.3	43.4	29.4
Total	19.3	35.6	45.1

Figure 6.1.2(b): Distribution of frequency of adult Singapore residents dining at western fast food restaurants (%)

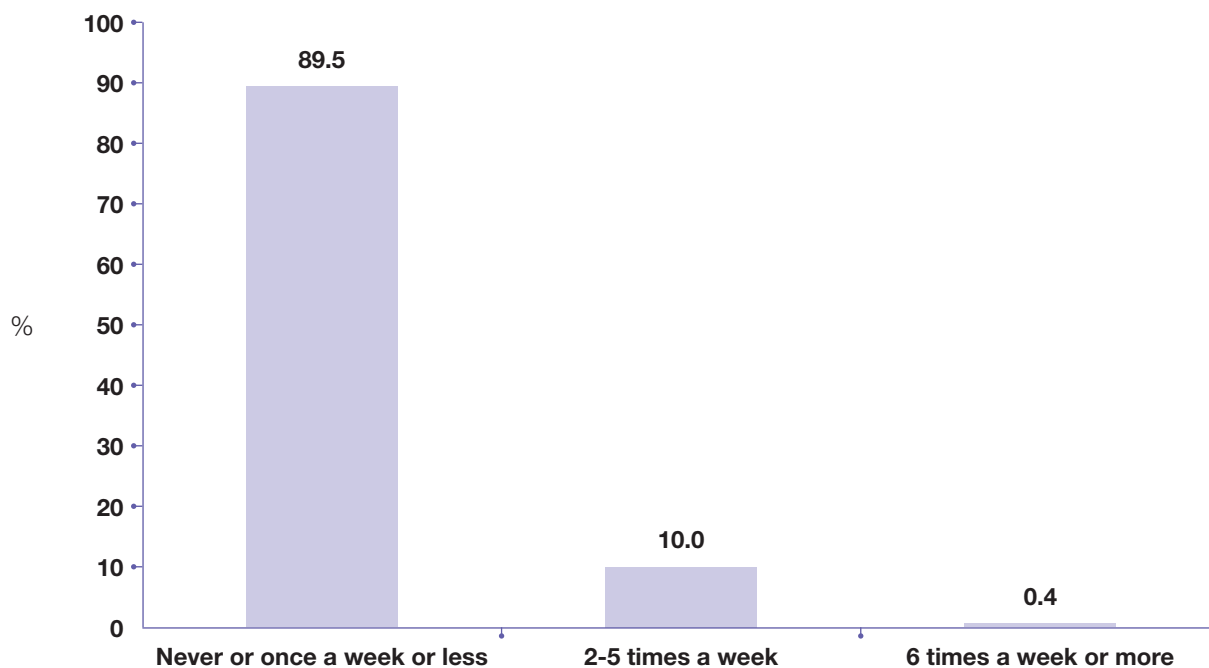


Table 6.1.2(b): Distribution of frequency of adult Singapore residents dining at western fast food restaurants, by gender, ethnic and age (years) groups (%)

	Never or once a week or less	2-5 times a week	6 times a week or more
Gender			
Males	88.9	10.7	0.4
Females	90.2	9.3	0.5
Ethnic Group			
Chinese	90.9	8.7	0.4
Malay	79.3	19.6	1.1
Indian	93.6	6.4	0.0
Age Group (Years)			
18-29	71.5	27.8	0.7
30-39	90.0	9.1	0.9
40-49	94.4	5.6	0.0
50-59	96.8	3.2	0.0
60-69	97.6	1.4	1.0
Total	89.5	10.0	0.4

Table 6.1.2.1: Comparison of frequency of dining at hawker centres/coffee shop stalls/ food courts among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Once a week or less (including never)	16.8	17.9	(15.8, 20.2)	19.3	19.3	(17.0, 21.9)	+1.4
2-5 times a week	33.9	33.6	(30.8, 36.4)	35.6	35.6	(32.0, 39.4)	+2.0
6 times a week or more	49.3	48.6	(45.6, 51.6)	45.1	45.1	(41.3, 49.0)	-3.5

Table 6.1.2.2: Comparison of frequency of dining at Western fast food restaurants among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Once a week or less (including never)	90.0	90.3	(88.6, 91.8)	89.5	89.5	(87.5, 91.2)	-0.8
2-5 times a week	9.7	9.4	(7.9, 11.1)	10.0	10.0	(8.4, 12.0)	+0.6
6 times a week or more	0.4	0.3	(0.1, 0.7)	0.4	0.4	(0.2, 1.1)	+0.1

Figure 6.2.1(a): Distribution of types of bread consumed among adult Singapore residents (%)

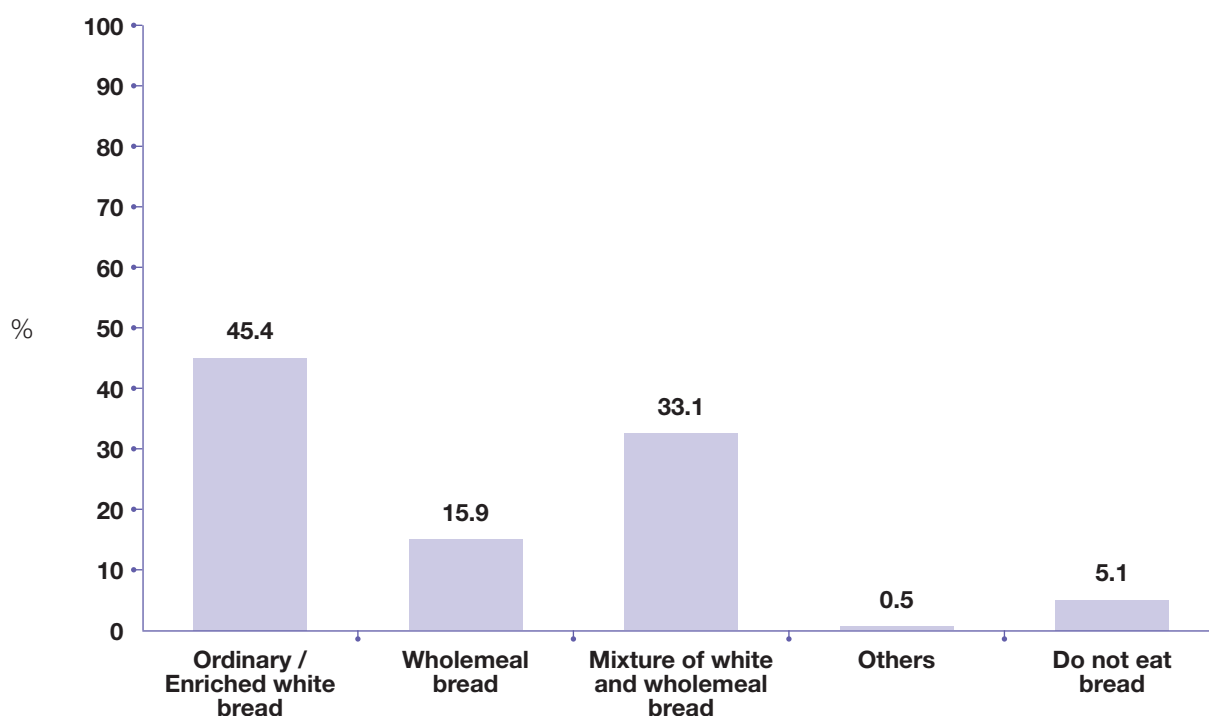


Table 6.2.1(a): Distribution of types of bread consumed among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Ordinary / Enriched white bread	Wholemeal bread	Mixture of white and wholemeal bread	Others	Do not eat bread
Gender					
Males	47.4	13.5	32.8	0.0	6.3
Females	43.4	18.3	33.4	1.0	3.8
Ethnic Group					
Chinese	44.7	16.2	32.4	0.7	6.0
Malay	51.0	10.9	37.5	0.0	0.5
Indian	42.2	21.1	32.2	0.2	4.4
Age Group (Years)					
18-29	48.2	14.8	30.9	0.3	5.8
30-39	44.3	16.8	32.8	0.1	6.1
40-49	46.7	13.3	34.5	1.3	4.3
50-59	43.2	16.2	36.4	0.0	4.1
60-69	43.9	20.8	28.8	1.0	5.3
Total	45.4	15.9	33.1	0.5	5.1

Figure 6.2.1(b): Distribution of types of rice consumed among adult Singapore residents (%)

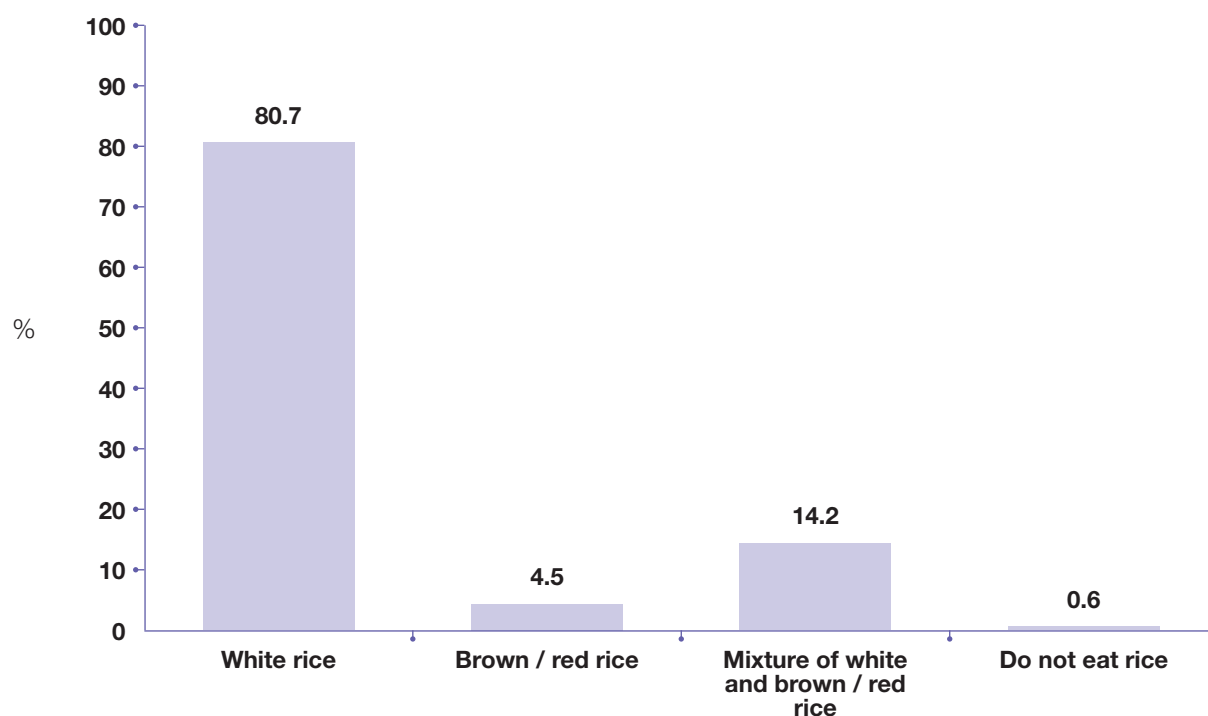


Table 6.2.1(b): Distribution of types of rice consumed among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	White rice	Brown / red rice	Mixture of white and brown / red rice	Do not eat rice
Gender				
Males	84.3	1.6	14.1	0.0
Females	77.2	7.3	14.4	1.1
Ethnic Group				
Chinese	76.2	5.6	17.5	0.7
Malay	95.8	0.9	3.2	0.1
Indian	92.0	1.9	6.1	0.0
Age Group (Years)				
18-29	83.4	3.0	11.9	1.7
30-39	81.8	4.7	12.5	1.0
40-49	80.4	4.6	15.0	0.0
50-59	75.8	7.9	16.3	0.0
60-69	84.1	0.1	15.8	0.0
Total	80.7	4.5	14.2	0.6

Table 6.2.1.1: Comparison of types of bread consumed among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Ordinary / Enriched white bread	64.2	63.8	(60.8, 66.7)	45.4	45.4	(41.6, 49.2)*	-18.4
Wholemeal bread**	17.9	18.3	(16.1, 20.9)	15.9	15.9	(13.1, 19.2)	-2.4
Mixture of white and wholemeal bread	10.5	10.5	(8.8, 12.5)	33.1	33.1	(29.8, 36.6)*	+22.6
Others	1.3	1.2	(0.7, 2.1)	0.5	0.5	(0.1, 1.8)	-0.7
Do not eat bread	6.1	6.1	(4.8, 7.8)	5.1	5.1	(3.8, 6.7)	-1.0
Eating any wholemeal bread**	28.4	28.9	(26.2, 31.7)	49.0	49.0	(45.2, 52.9)*	+20.1

* Significant differences between 2004 and 2010.

** Note the differences in questions between NNS 2004 and NNS 2010. In NNS 2004, the option 'wholemeal/softmeal bread' was used which included bread higher in fibre (e.g. softmeal bread with fruit). In NNS 2010, the more stringent definition 'wholemeal bread' was used. Also, NNS2010 had specific survey questions to capture the wholemeal cereals and wholegrain noodles.

Figure 6.2.2: Distribution of types of oil used for cooking at home among adult Singapore residents (%)

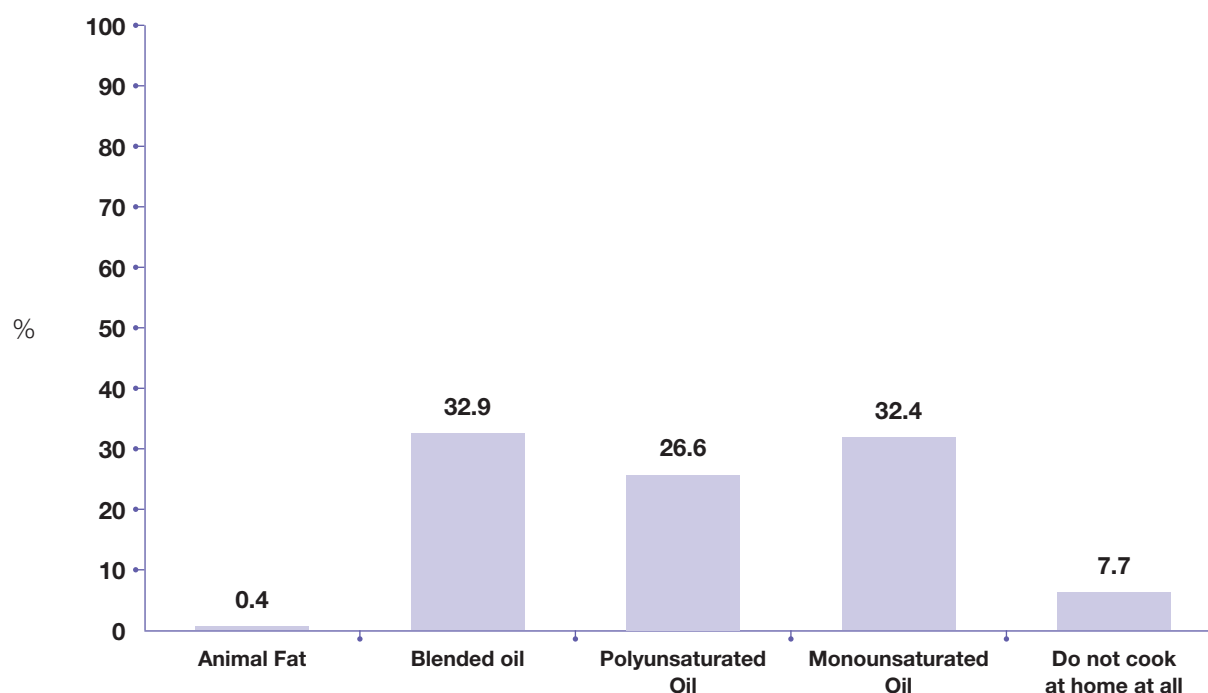


Table 6.2.2: Distribution of types of oil used for cooking at home among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Animal Fat	Blended oil	Polyunsaturated Oil	Monounsaturated Oil	Do not cook at home at all
Gender					
Males	0.4	35.5	24.5	30.1	9.5
Females	0.3	30.3	28.7	34.7	5.9
Ethnic Group					
Chinese	0.4	29.4	25.1	35.4	9.7
Malay	0.5	57.8	22.0	18.1	1.6
Indian	0.2	23.8	43.1	31.2	1.7
Age Group (Years)					
18-29	0.5	36.5	27.1	27.7	8.3
30-39	0.0	28.7	29.3	32.6	9.4
40-49	0.5	34.1	30.8	28.7	5.9
50-59	0.3	29.8	22.2	39.5	8.2
60-69	0.7	37.2	21.8	34.4	5.8
Total	0.4	32.9	26.6	32.4	7.7

Table 6.2.2.1: Comparison of types of oil used for cooking at home among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Animal Fat	0.1	0.1	(0.0, 0.6)	0.4	0.4	(0.2, 1.0)	+0.3
Blended oil	42.7	42.7	(39.8, 45.7)	32.9	32.9	(29.4, 36.7)*	-9.8
Polyunsaturated oil	31.4	31.3	(28.7, 34.2)	26.6	26.6	(23.7, 29.8)	-4.7
Monounsaturated oil	19.0	19.2	(16.9, 21.8)	32.4	32.4	(28.8, 36.3)*	+13.2
Do not cook at home at all	6.7	6.6	(5.3, 8.3)	7.7	7.7	(6.0, 9.8)	+1.1

* Significant differences between 2004 and 2010.

Figure 6.2.3: Distribution of types of fat spread used among adult Singapore residents (%)

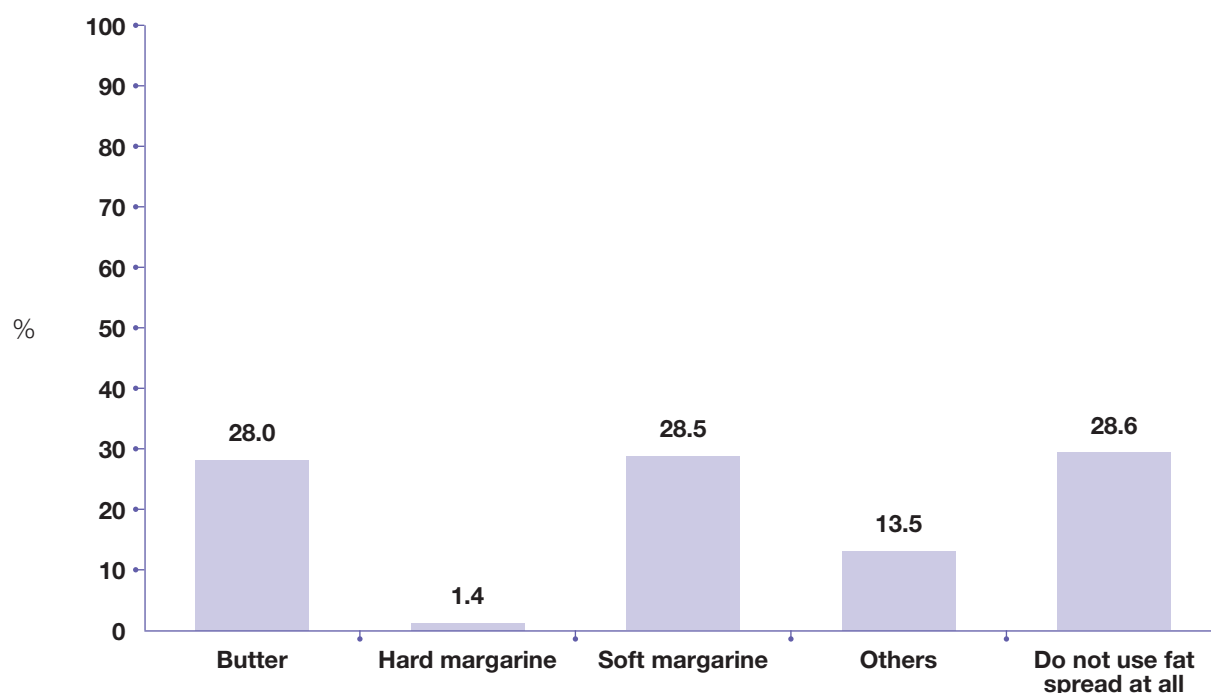


Table 6.2.3: Distribution of types of fat spread used among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Butter	Hard margarine	Soft margarine	Others	Do not use fat spread at all
Gender					
Males	32.1	1.9	24.8	13.5	27.8
Females	23.9	0.8	32.2	13.6	29.5
Ethnic Group					
Chinese	25.5	1.0	28.4	14.9	30.1
Malay	37.2	3.4	28.0	8.9	22.5
Indian	32.8	0.8	29.9	9.8	26.7
Age Group (Years)					
18-29	27.0	1.0	27.0	14.3	30.6
30-39	24.0	1.3	26.4	19.7	28.7
40-49	25.2	2.4	30.6	11.1	30.7
50-59	34.3	1.0	31.5	11.3	21.9
60-69	30.0	0.7	25.2	10.2	33.8
Total	28.0	1.4	28.5	13.5	28.6

Table 6.2.3.1: Comparison of types of fat spread used among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Butter	13.8	13.8	(11.9, 16.0)	28.0	28.0	(24.4, 31.9)*	+14.2
Hard margarine	1.4	1.4	(0.8, 2.3)	1.4	1.4	(0.9, 2.1)	+0.0
Soft margarine	46.5	46.4	(43.5, 49.4)	28.5	28.5	(25.3, 31.9)*	-17.9
Others	12.9	12.8	(10.9, 15.0)	13.5	13.5	(11.2, 16.3)	+0.7
Do not use fat spread at all	25.5	25.6	(23.1, 28.3)	28.6	28.6	(25.4, 32.1)	+3.0

* Significant differences between 2004 and 2010.

Figure 6.2.4(a): Distribution of types of milk consumed among adult Singapore residents (%)

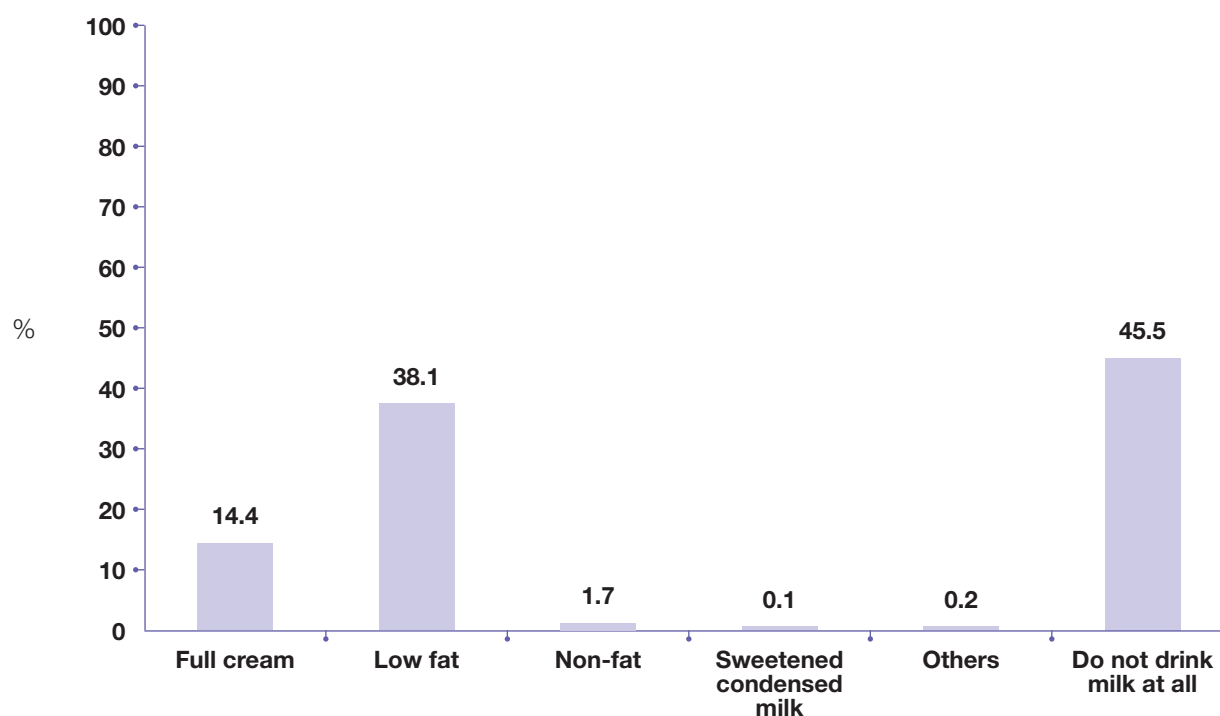


Table 6.2.4(a): Distribution of types of milk consumed among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Full cream	Low fat	Non-fat	Sweetened condensed milk	Others	Do not drink milk at all
Gender						
Males	16.5	36.4	1.6	0.0	0.0	45.5
Females	12.2	39.8	1.9	0.1	0.3	45.6
Ethnic Group						
Chinese	13.0	36.1	1.6	0.1	0.2	49.0
Malay	17.1	47.3	1.8	0.0	0.3	33.5
Indian	19.9	39.8	2.4	0.0	0.0	37.8
Age Group (Years)						
18-29	18.1	49.7	2.5	0.0	0.0	29.7
30-39	19.1	35.0	2.9	0.0	0.0	43.1
40-49	11.6	36.6	0.7	0.0	0.0	51.0
50-59	8.8	33.1	1.7	0.0	0.7	55.7
60-69	15.2	35.5	0.4	0.5	0.0	48.5
Total	14.4	38.1	1.7	0.1	0.2	45.5

Figure 6.2.4(b): Distribution of types of milk/milk substitutes added to beverages among adult Singapore residents (%)

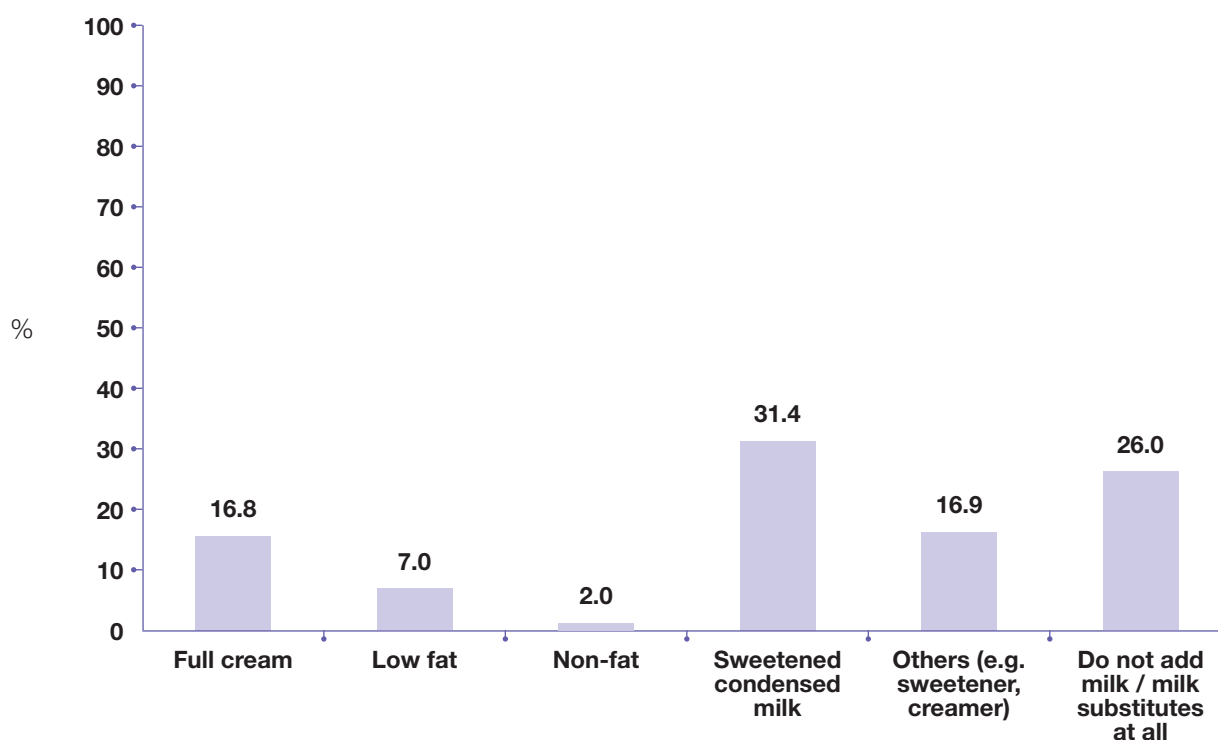


Table 6.2.4(b): Distribution of types of milk/milk substitutes added to beverages among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Full cream	Low fat	Non-fat	Sweetened condensed milk	Others (e.g. sweetener, creamer)	Do not add milk / milk substitutes at all
Gender						
Males	20.9	6.1	1.7	36.5	12.7	22.1
Females	12.7	7.9	2.3	26.2	21.1	29.8
Ethnic Group						
Chinese	16.7	5.6	1.3	29.7	17.7	28.9
Malay	9.2	4.9	4.1	44.5	17.4	19.8
Indian	27.4	19.6	3.9	25.4	10.3	13.5
Age Group (Years)						
18-29	14.7	4.7	4.6	36.1	16.9	23.0
30-39	16.3	8.2	1.5	31.6	13.5	28.9
40-49	19.4	5.1	1.8	31.9	16.6	25.3
50-59	12.7	9.0	1.0	31.2	17.3	28.7
60-69	24.0	8.8	0.5	22.1	22.4	22.3
Total	16.8	7.0	2.0	31.4	16.9	26.0

Table 6.2.4.1: Comparison of types of milk consumed and types of milk added to beverages among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Types of milk consumed							
Full cream	10.9	10.7	(9.1, 12.5)	14.4	14.4	(11.5, 17.7)	+3.7
Low fat	38.1	37.7	(34.9, 40.6)	38.1	38.1	(34.6, 41.8)	+0.4
Non-fat	5.0	5.4	(4.1, 7.1)	1.7	1.7	(0.9, 3.3)*	-3.7
Sweetened condensed milk	0.5	0.6	(0.3, 1.2)	0.1	0.1	(0.0, 0.5)	-0.5
Others	0.2	0.2	(0.1, 1.0)	0.2	0.2	(0.0, 0.7)	0.0
Do not drink milk / milk-based drinks at all	45.2	45.5	(42.5, 48.5)	45.5	45.5	(41.8, 49.4)	0.0
Types of milk added to beverages							
Full cream	9.0	9.0	(7.5, 10.8)	16.8	16.8	(13.4, 20.8)*	+7.8
Low fat	5.8	6.0	(4.7, 7.7)	7.0	7.0	(5.4, 9.0)	+1.0
Non-fat	4.4	4.4	(3.3, 5.7)	2.0	2.0	(1.2, 3.3)	-2.4
Sweetened condensed milk	35.1	35.0	(32.2, 37.8)	31.4	31.4	(28.1, 34.9)	-3.6
Others	18.7	18.7	(16.4, 21.2)	16.9	16.9	(14.5, 19.6)	-1.8
Do not add milk /milk substitutes at all	26.8	27.0	(24.4, 29.8)	26.0	26.0	(22.9, 29.3)	-1.0

* Significant differences between 2004 and 2010.

Figure 6.2.5: Distribution of types of sweetening agent added to beverages among adult Singapore residents (%)

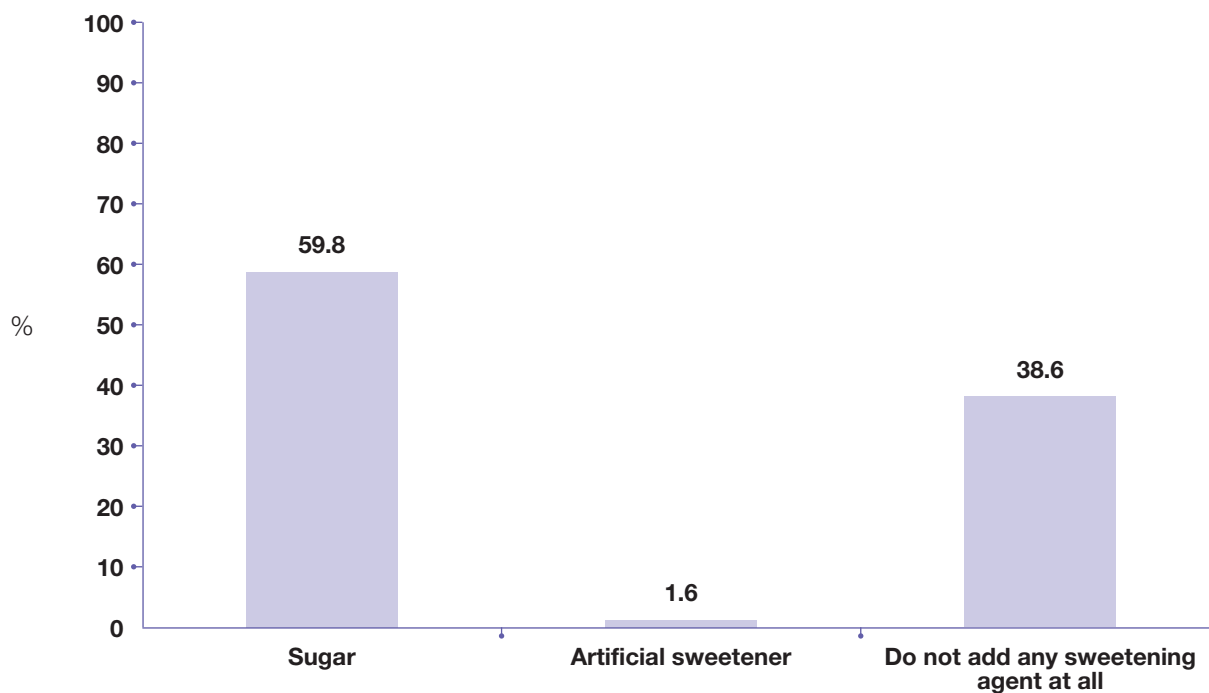


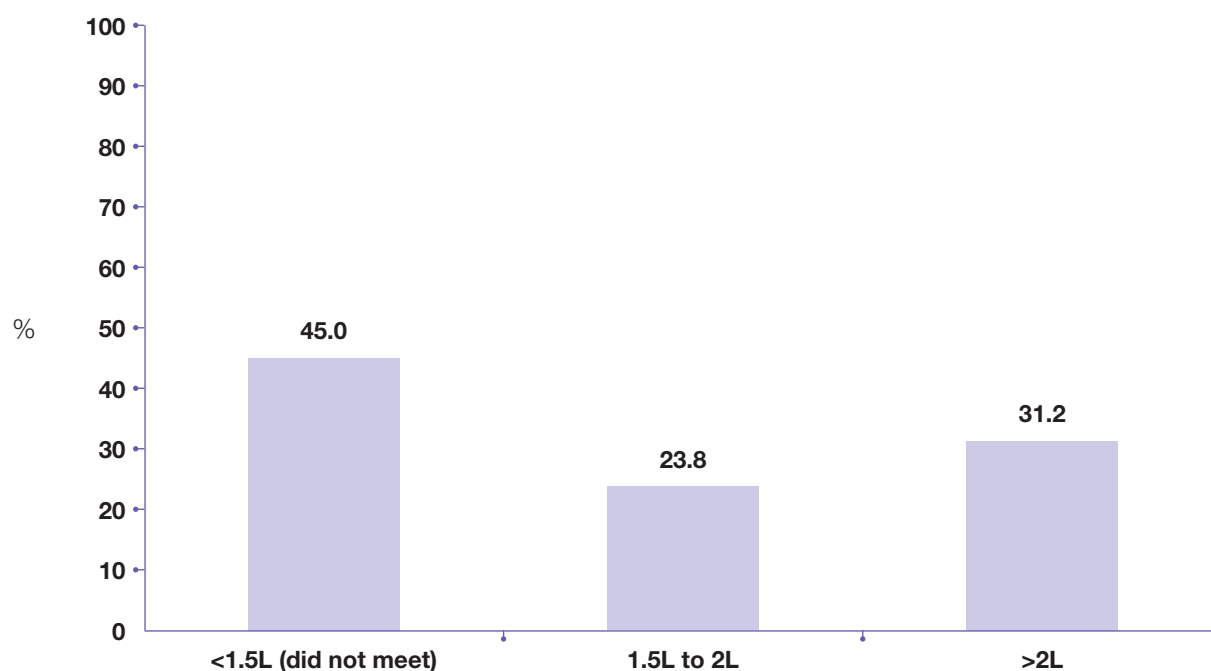
Table 6.2.5: Distribution of types of sweetening agent added to beverages among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Sugar	Artificial sweetener	Others (e.g. honey)	Do not add any sweetening agent at all
Gender				
Males	64.4	1.2	0.1	34.3
Females	55.1	2.0	0.0	42.9
Ethnic Group				
Chinese	58.9	0.9	0.0	40.2
Malay	59.1	4.2	0.0	36.7
Indian	66.6	3.3	0.3	29.8
Age Group (Years)				
18-29	61.9	1.0	0.0	37.1
30-39	54.2	0.7	0.0	45.0
40-49	59.9	2.6	0.1	37.4
50-59	61.4	2.0	0.0	36.6
60-69	61.9	1.6	0.0	36.5
Total	59.8	1.6	0.0	38.6

Table 6.2.5.1: Comparison of types of sweetening agent added to beverages among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Sugar	52.2	51.9	(49.0, 54.9)	59.8	59.8	(56.1, 63.4)*	+7.9
Artificial sweetener	0.8	0.8	(0.4, 1.7)	1.6	1.6	(1.0, 2.5)	+0.8
Others	0.3	0.3	(0.1, 1.1)	0.0	0.0	(0.0, 0.2)	-0.3
Do not add any sweetening agent at all	46.7	46.9	(44.0, 49.9)	38.6	38.6	(35.1, 42.3)*	-8.3

* Significant differences between 2004 and 2010.

Figure 6.3.1: Distribution of water intake per day among adult Singapore residents (%)**Table 6.3.1: Distribution of water intake per day among adult Singapore residents, by gender, ethnic and age (years) groups (%)**

	<1.5L (did not meet)	1.5L to 2L	>2L
Gender			
Males	44.7	22.4	32.9
Females	45.2	25.2	29.5
Ethnic Group			
Chinese	44.5	24.9	30.6
Malay	50.0	20.7	29.4
Indian	41.1	20.6	38.3
Age Group (Years)			
18-29	40.6	26.6	32.9
30-39	32.8	28.2	39.0
40-49	44.8	21.5	33.7
50-59	53.7	17.6	28.7
60-69	57.3	27.4	15.4
Total	45.0	23.8	31.2

Table 6.3.1.1: Comparison of water intake per day among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
<1.5L (did not meet)	51.7	52.2	(49.2, 55.1)	45.0	45.0	(41.2, 48.9)*	-7.2
1.5 to 2L	27.8	27.5	(24.9, 30.2)	23.8	23.8	(20.9, 27.1)	-3.7
>2L	20.6	20.4	(18.1, 22.8)	31.2	31.2	(27.9, 34.8)*	+10.8
Consuming 1.5L or more	48.3	47.8	(44.9, 50.8)	55.0	55.0	(51.2, 58.9)*	+7.2

* Significant differences between 2004 and 2010.

Figure 6.3.2: Distribution of weekly frequency of deep fried food consumption among adult Singapore residents (%)

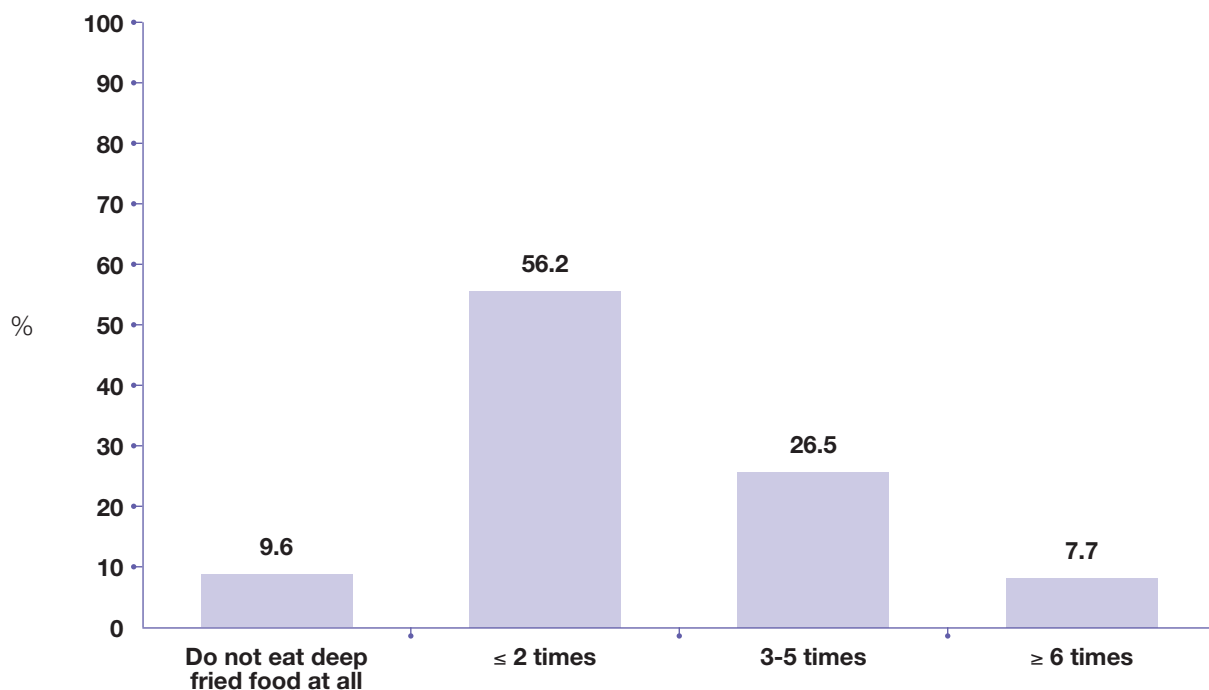


Table 6.3.2: Distribution of weekly frequency of deep fried food consumption among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Do not eat deep fried food at all	≤ 2 times	3-5 times	≥ 6 times
Gender				
Males	8.6	54.1	28.6	8.7
Females	10.6	58.4	24.4	6.7
Ethnic Group				
Chinese	10.3	58.5	25.2	6.1
Malay	5.1	43.9	34.1	16.9
Indian	10.5	57.4	25.5	6.5
Age Group (Years)				
18-29	3.3	47.1	38.0	11.5
30-39	5.5	52.0	33.8	8.7
40-49	10.9	59.1	22.1	7.9
50-59	15.3	65.3	16.7	2.7
60-69	14.2	57.2	20.5	8.1
Total	9.6	56.2	26.5	7.7

Table 6.3.2.1: Comparison of weekly frequency of deep fried food consumption among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Do not eat deep fried food	14.0	14.6	(12.5, 17.0)	9.6	9.6	(7.6, 11.9)*	-5.0
2 times a week or less	48.5	48.4	(45.4, 51.4)	56.2	56.2	(52.5, 60.0)*	+7.8
3-5 times a week	28.1	27.7	(25.2, 30.4)	26.5	26.5	(23.2, 30.0)	-1.2
6 times a week or more	9.4	9.2	(7.7, 11.0)	7.7	7.7	(6.3, 9.4)	-1.5
Consuming deep fried food more than 2 times per week	37.5	37.0	(34.2, 39.8)	34.2	34.2	(30.7, 37.8)	-2.8

* Significant differences between 2004 and 2010.

Figure 6.3.3: Distribution of weekly frequency of sweetened drinks consumption among adult Singapore residents (%)

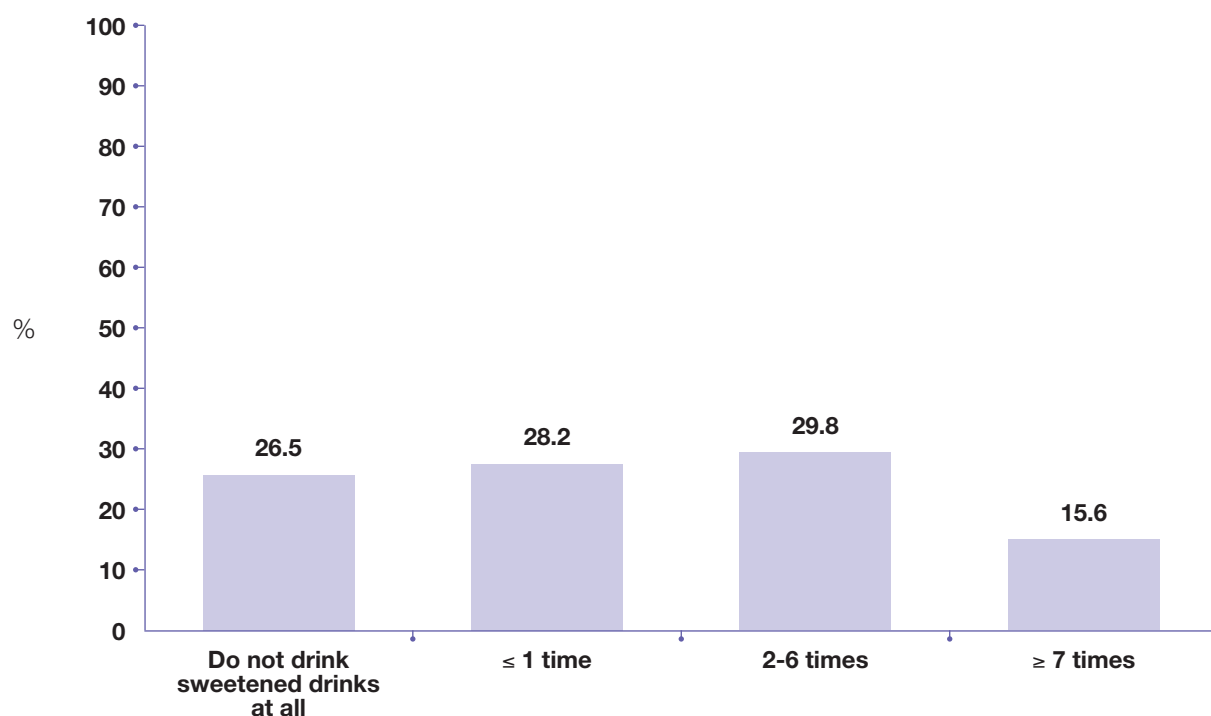


Table 6.3.3: Distribution of weekly frequency of sweetened drinks consumption among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Do not drink sweetened drinks at all	≤ 1 time	2-6 times	≥ 7 times
Gender				
Males	24.7	24.5	29.8	21.1
Females	28.3	31.9	29.8	10.1
Ethnic Group				
Chinese	28.4	29.8	28.5	13.4
Malay	16.0	23.0	33.9	27.1
Indian	27.4	23.8	33.4	15.4
Age Group (Years)				
18-29	5.4	19.0	46.4	29.3
30-39	14.5	30.6	38.2	16.7
40-49	31.7	34.0	26.1	8.3
50-59	45.8	27.7	20.2	6.3
60-69	38.0	30.2	11.1	20.6
Total	26.5	28.2	29.8	15.6

Table 6.3.3.1: Comparison of weekly frequency of sweetened drinks consumption among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Do not drink	38.1	39.4	(36.5, 42.4)	26.5	26.5	(22.8, 30.5)*	-12.9
Once a week or less	16.1	15.9	(13.8, 18.2)	28.2	28.2	(25.0, 31.6)*	+12.3
2-6 times a week	32.3	31.4	(28.8, 34.2)	29.8	29.8	(26.7, 33.0)	-1.6
7 times a week or more	13.5	13.3	(11.5, 15.3)	15.6	15.6	(12.8, 18.8)	+2.3
Consuming sweetened drinks more than 1 time per week	45.9	44.7	(41.8, 47.7)	45.4	45.4	(41.6, 49.1)	+0.7

* Significant differences between 2004 and 2010.

Figure 6.3.4: Distribution of weekly frequency of sweet desserts and snacks consumption among adult Singapore residents (%)

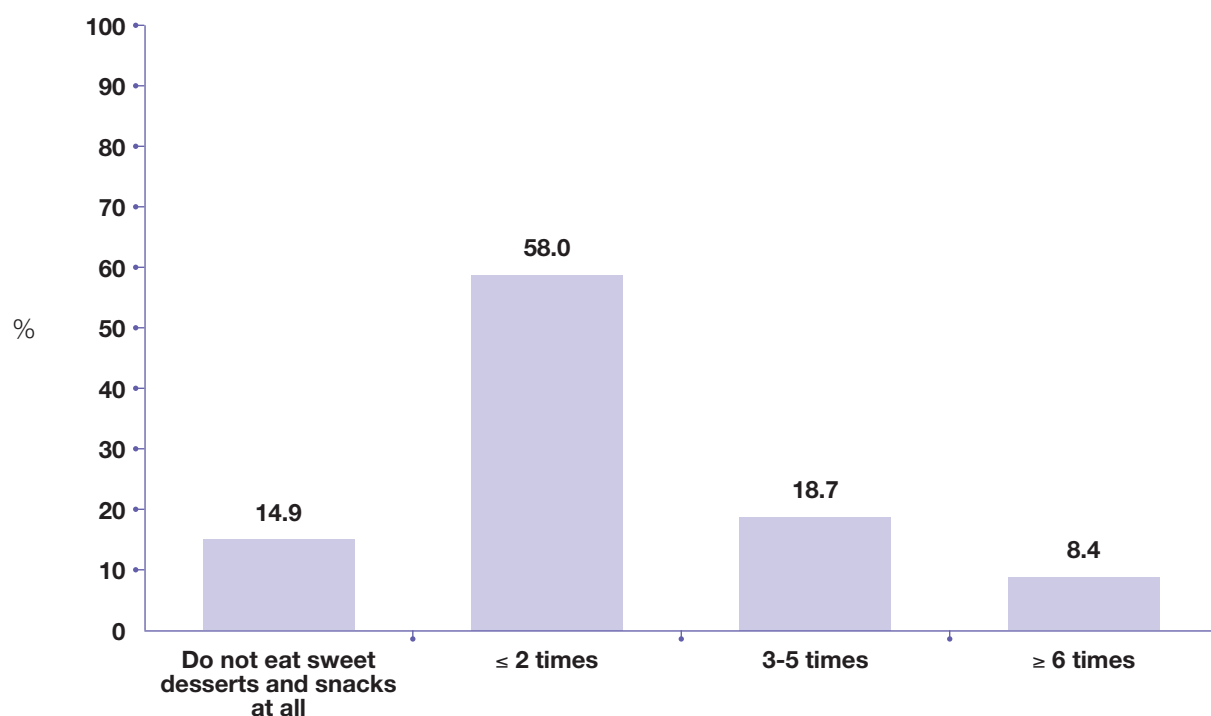


Table 6.3.4: Distribution of weekly frequency of sweet desserts and snacks consumption among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Do not eat sweet desserts and snacks at all	≤ 2 times	3-5 times	≥ 6 times
Gender				
Males	13.7	61.7	15.4	9.3
Females	16.1	54.3	22.0	7.6
Ethnic Group				
Chinese	14.4	58.3	19.1	8.2
Malay	16.7	55.3	17.3	10.7
Indian	16.0	59.6	17.2	7.1
Age Group (Years)				
18-29	6.5	54.1	26.1	13.3
30-39	9.0	59.2	26.7	5.0
40-49	19.0	59.8	15.9	5.2
50-59	17.4	59.5	16.1	7.0
60-69	27.3	56.6	2.1	14.0
Total	14.9	58.0	18.7	8.4

Table 6.3.4.1: Comparison by weekly frequency of sweet desserts and snacks consumption among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Do not eat sweet desserts and snacks	37.9	38.1	(35.2, 41.1)	14.9	14.9	(12.7, 17.5)*	-23.2
Twice a week or less	42.8	42.9	(40.0, 45.9)	58.0	58.0	(54.1, 61.8)*	+15.1
3-5 times a week	13.6	13.3	(11.5, 15.4)	18.7	18.7	(16.0, 21.6)*	+5.4
6 times a week or more	5.6	5.6	(4.4, 7.1)	8.4	8.4	(5.6, 12.4)	+2.8
Consuming sweet desserts and snacks more than 2 times per week	19.3	18.9	(16.8, 21.3)	27.1	27.1	(23.4, 31.1)*	+8.2

* Significant differences between 2004 and 2010.

Figure 6.4.1: Distribution of salt and sauces added at the table among adult Singapore residents (%)

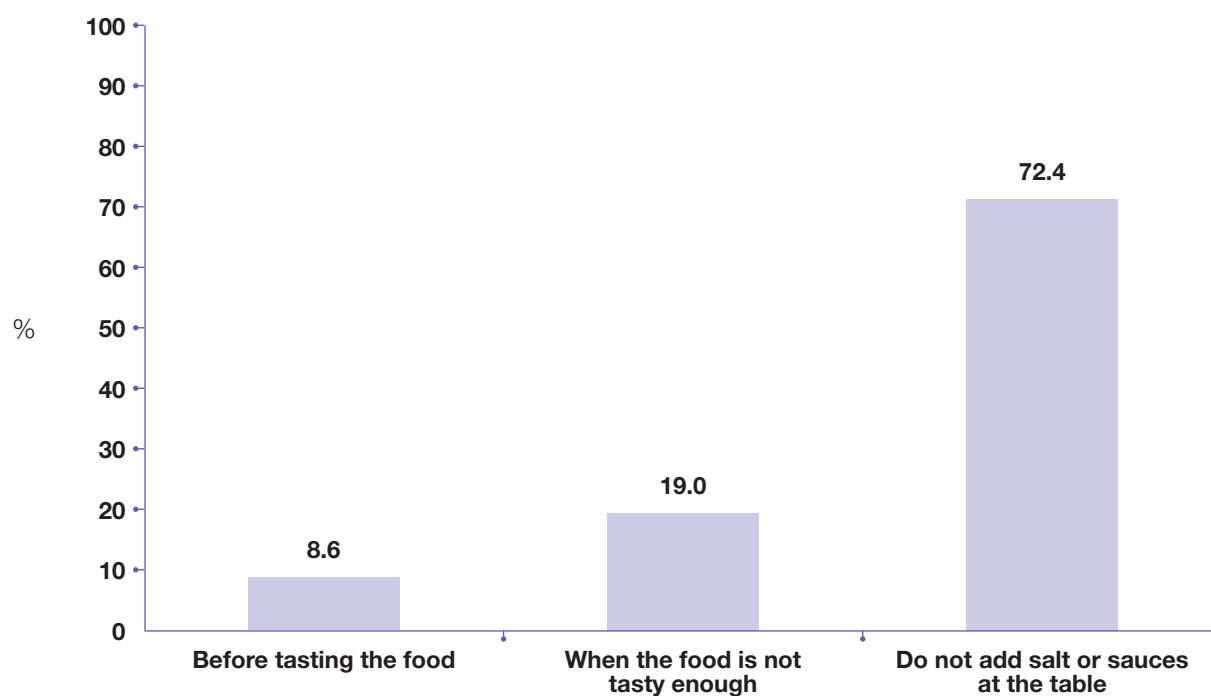


Table 6.4.1: Distribution of salt and sauces added at the table among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Before tasting the food	When the food is not tasty enough	Do not add salt or sauces at the table
Gender			
Males	8.8	17.5	73.7
Females	8.4	20.4	71.2
Ethnic Group			
Chinese	9.3	19.9	70.9
Malay	6.8	16.9	76.3
Indian	6.1	15.5	78.4
Age Group (Years)			
18-29	10.7	24.5	64.9
30-39	8.7	21.3	70.0
40-49	9.3	14.5	76.2
50-59	5.3	18.4	76.3
60-69	9.4	14.9	75.7
Total	8.6	19.0	72.4

Table 6.4.1.1: Comparison of salt and sauces added at the table among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Before tasting food	8.6	8.7	(7.1, 10.7)	8.6	8.6	(6.8, 10.8)	-0.1
When the food is not tasty enough	27.7	27.5	(24.9, 30.3)	19.0	19.0	(16.2, 22.1)*	-8.5
Do not add salt or sauces to my food at the table	63.7	63.8	(60.8, 66.6)	72.4	72.4	(69.0, 75.7)*	+8.6

* Significant differences between 2004 and 2010.

Figure 6.4.2(a): Distribution of amount of visible fat trimmed from meat among adult Singapore residents (%)

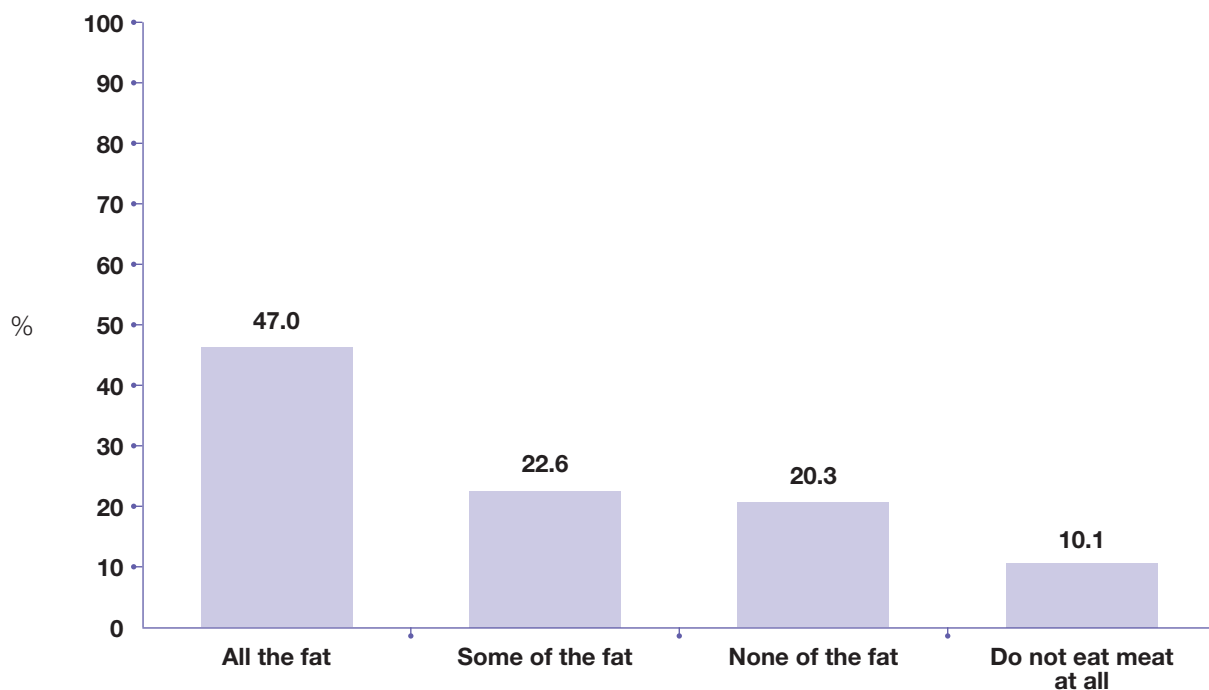


Table 6.4.2(a): Distribution of amount of visible fat trimmed from meat among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	All the fat	Some of the fat	None of the fat	Do not eat meat at all
Gender				
Males	40.5	26.0	26.2	7.3
Females	53.4	19.3	14.4	12.9
Ethnic Group				
Chinese	45.6	25.2	22.3	6.9
Malay	52.1	17.5	18.7	11.7
Indian	49.6	12.0	8.4	30.0
Age Group (Years)				
18-29	41.2	28.7	23.0	7.1
30-39	42.4	24.9	20.3	12.4
40-49	52.5	17.3	21.7	8.5
50-59	50.5	18.2	16.9	14.4
60-69	47.8	26.4	19.4	6.5
Total	47.0	22.6	20.3	10.1

Figure 6.4.2(b): Distribution of amount of skin trimmed from poultry among adult Singapore residents (%)

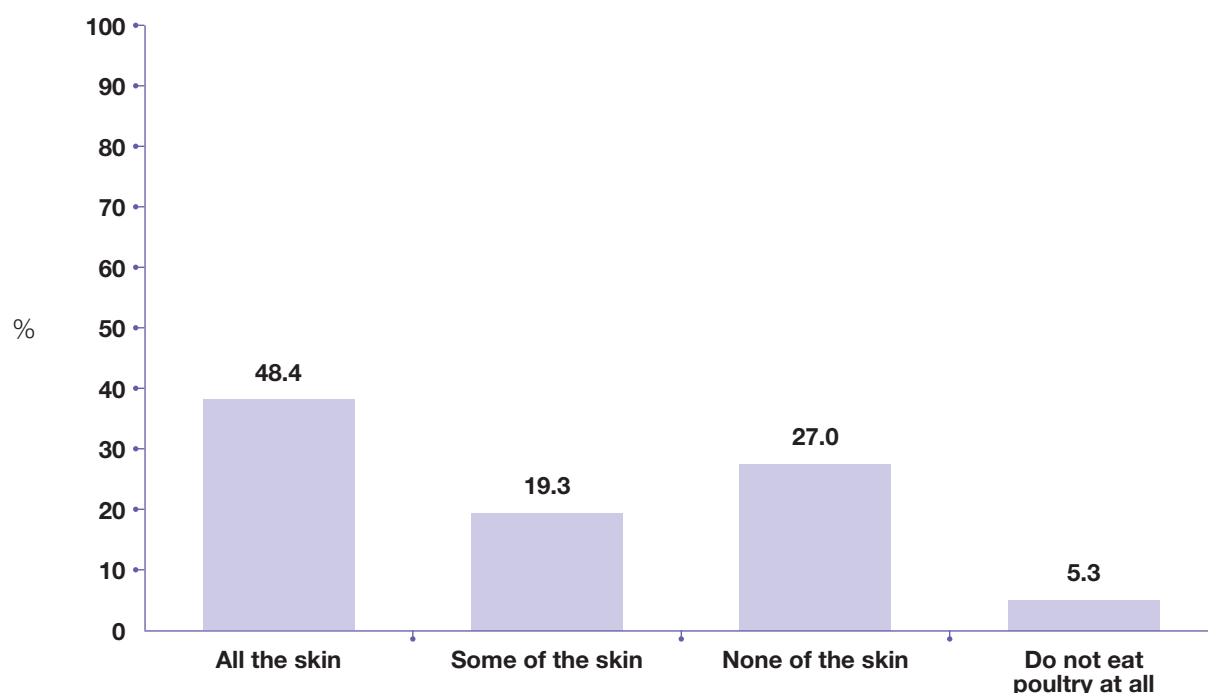


Table 6.4.2(b): Distribution of amount of skin trimmed from poultry among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	All the skin	Some of the skin	None of the skin	Do not eat poultry at all
Gender				
Males	42.0	19.8	34.9	3.3
Females	54.8	18.7	19.1	7.4
Ethnic Group				
Chinese	46.6	21.1	27.8	4.4
Malay	43.7	19.2	34.1	3.0
Indian	67.1	6.7	11.3	14.9
Age Group (Years)				
18-29	34.2	29.0	34.8	1.9
30-39	42.9	23.7	27.8	5.6
40-49	51.0	15.0	29.4	4.6
50-59	54.4	15.3	19.4	10.9
60-69	66.6	10.0	21.5	1.9
Total	48.4	19.3	27.0	5.3

Table 6.4.2.1: Comparison of amount of visible fat trimmed from meat and skin trimmed from poultry among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Amount of fat trimmed from meat							
All the fat	47.4	47.5	(44.5, 50.4)	47.0	47.0	(43.2, 50.8)	-0.5
Some of the fat	24.3	24.2	(21.7, 26.8)	22.6	22.6	(19.3, 26.4)	-1.6
None of the fat	20.5	20.5	(18.2, 23.0)	20.3	20.3	(17.6, 23.3)	-0.2
Do not eat meat at all	7.8	7.8	(6.4, 9.5)	10.1	10.1	(8.1, 12.6)	+2.3
Amount of skin trimmed from poultry							
All the skin	43.4	43.9	(41.0, 46.9)	48.4	48.4	(44.6, 52.3)	+4.5
Some of the skin	20.8	20.6	(18.3, 23.1)	19.3	19.3	(16.5, 22.5)	-1.3
None of the skin	31.4	31.0	(28.3, 33.8)	27.0	27.0	(24.1, 30.1)	-4.0
Do not eat poultry at all	4.4	4.5	(3.5, 5.9)	5.3	5.3	(3.7, 7.6)	+0.8

Figure 6.4.3: Distribution of history of dieting for weight loss among adult Singapore residents (%)

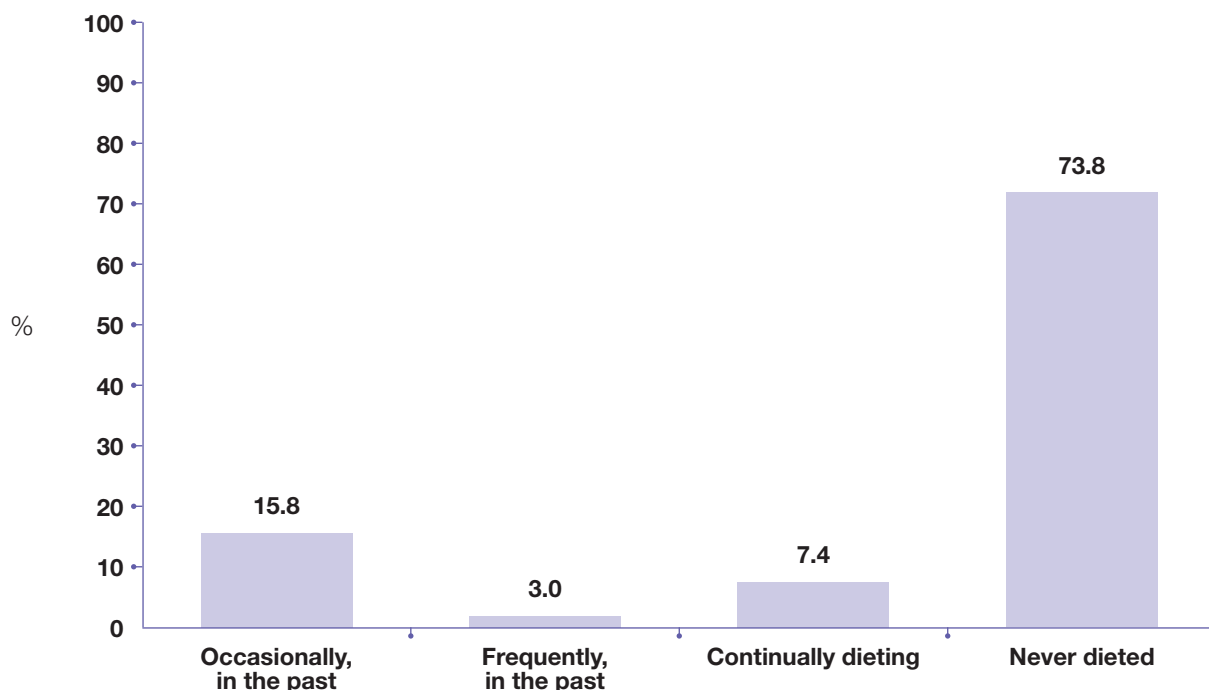


Table 6.4.3: Distribution of history of dieting for weight loss among adult Singapore residents, by gender, ethnic and age (years) groups (%)

	Occasionally, in the past	Frequently, in the past	Continually dieting	Never dieted
Gender				
Males	12.8	1.9	4.2	81.1
Females	18.7	4.1	10.6	66.6
Ethnic Group				
Chinese	14.7	2.9	5.7	76.7
Malay	19.6	3.3	15.3	61.7
Indian	17.6	3.5	8.6	70.3
Age Group (Years)				
18-29	19.9	6.0	8.9	65.2
30-39	25.6	3.6	6.8	64.1
40-49	15.4	2.0	8.0	74.6
50-59	8.8	1.0	7.9	82.3
60-69	5.3	2.4	3.8	88.4
Total	15.8	3.0	7.4	73.8

Table 6.4.3.1: Comparison of history of dieting for weight loss among adult Singapore residents, 2004 and 2010 (%)

	2004			2010			2010 vs 2004
	Crude	Age-Std	(95% CI)	Crude	Age-Std	(95% CI)	
Have dieted occasionally, in the past	15.0	14.6	(12.7, 16.7)	15.8	15.8	(13.2, 18.8)	+1.2
Have dieted frequently, in the past	4.5	4.4	(3.4, 5.7)	3.0	3.0	(2.0, 4.4)	-1.4
Continually dieting to lose weight	7.7	7.7	(6.3, 9.4)	7.4	7.4	(5.8, 9.4)	-0.3
Never dieted	72.8	73.3	(70.7, 75.8)	73.8	73.8	(70.5, 77.0)	+0.5

dietary practices questionnaire (DPQ)

For Official Use Only

Respondent ID:

Name:

Age: _____

Interviewed:

Race: C / M / I

Gender: M / F

Coded:

Interviewer ID:

Reviewed:

Coder ID:

**Health Promotion Board
Singapore**

Please circle **ONE** most appropriate answer

1. Where do you USUALLY eat breakfast?

- 1 Home
- 2 Packed from home
- 3 Restaurant / coffee house
- 4 Workplace / polytechnic/ university canteen
- 5 School / JC canteen
- 6 Hawker centre / coffee shop stall / food court
- 7 Fast food restaurant
- 8 Others (please specify _____)
- 9 Do not eat breakfast at all

2. Where do you USUALLY eat lunch?

- 1 Home
- 2 Packed from home
- 3 Restaurant / coffee house
- 4 Workplace / polytechnic/ university canteen
- 5 School / JC canteen
- 6 Hawker centre / coffee shop stall / food court
- 7 Fast food restaurant
- 8 Others (please specify _____)
- 9 Do not eat lunch at all

3. Where do you USUALLY eat dinner?

- 1 Home
- 2 Packed from home
- 3 Restaurant / coffee house
- 4 Workplace / polytechnic/ university canteen
- 5 School / JC canteen
- 6 Hawker centre / coffee shop stall / food court
- 7 Fast food restaurant
- 8 Others (please specify _____)
- 9 Do not eat dinner at all

4. How often do you eat at hawker centres, food courts or coffee shops?

_____ per week

5. How often do you eat at western fast food restaurants (e.g. KFC, McDonald's, Burger King, etc.)?

_____ per week

6. What type of bread or bread roll do you USUALLY eat?

- 1 White bread (ordinary/enriched)
- 2 Wholemeal bread
- 3 A mixture of white and wholemeal bread
- 4 Others (please specify _____)
- 9 Do not eat bread or bread roll at all

7. What type of rice do you USUALLY eat?

1. White rice
2. Brown or red rice
3. Mixture of white and brown or red rice
4. Others (please specify _____)
9. Do not eat rice at all

8. What kind of fat spread do you USUALLY use on bread or crackers?

- 1 Butter
- 2 Hard margarine (does not require refrigeration)
(please state brand _____)
- 3 Soft margarine (requires refrigeration)
(please state brand _____)
- 4 Others (please specify _____)
- 9 Do not use fat spread at all

9. What types of milk or milk-based drinks (e.g. hot chocolate) do you USUALLY drink?

- 1 Whole milk/full cream
- 2 Low fat
- 3 Skimmed/non-fat
- 4 Sweetened condensed milk
- 5 Others (please specify _____)
- 9 Do not drink milk or milk-based drinks at all

10. What types of milk/milk substitutes do you USUALLY add to tea, coffee or other beverages?

- 1 Whole milk/full cream
- 2 Low fat
- 3 Skimmed/non-fat
- 4 Sweetened condensed milk
- 5 Creamer
- 6 Others (please specify _____)
- 9 Do not add milk/milk substitutes at all

11. What type of sweetening agent do you USUALLY add to tea, coffee or other beverages?

- 1 Sugar
- 2 Artificial sweeteners e.g. NutraSweet/Equal/Saccharin-based syrups
- 3 Others (please specify _____)
- 9 Do not add any sweetening agent at all

12. How many eggs (including salted or century egg) do you USUALLY eat per week?

_____ number

13. Excluding juices, how many servings of fruit do you USUALLY eat?

(Use showcard & explain what constitutes 1 serving)

- Daily → How many servings a day? _____
- Weekly → How many servings a week? _____
- Monthly → How many servings a month? _____
- Less than one serving a month (e.g. once every two months, almost never)

14. How many servings of fruit juices do you USUALLY drink?

(Use showcard & explain what constitutes 1 serving)

- Daily → How many servings a day? _____
- Weekly → How many servings a week? _____
- Monthly → How many servings a month? _____
- Less than one serving a month (e.g. once every two months, almost never)

15. How many servings of vegetables do you USUALLY eat?

(Use showcard & explain what constitutes 1 serving)

- Daily → How many servings a day? _____
- Weekly → How many servings a week? _____
- Monthly → How many servings a month? _____
- Less than one serving a month (e.g. once every two months, almost never)

**16. How often do you drink sweetened drinks?
(e.g. soft drinks, fruit drinks, packet drinks, cordials, yoghurt-based drinks and cultured milk drinks, etc.)**

_____ per week

17. How often do you eat sweet desserts and snacks?

(e.g. cakes, kuehs, jellies, candies, chocolates, cookies, ice-cream, etc.)

_____ per week

18. How often do you eat deep fried foods?

_____ per week

19. When you eat meat with visible fat, how much visible fat will you trim off?

- 1 All the fat
- 2 Some of the fat
- 3 None of the fat
- 9 Do not eat meat at all

20. When you eat poultry (e.g. chicken, duck, turkey, pigeon, etc.), how much skin do you remove?

- 1 All the skin
- 2 Some of the skin
- 3 None of the skin
- 9 Do not eat poultry at all

21. What kind of fat or oil is USUALLY used FOR COOKING at home?

- 1 Butter, dripping, ghee, lard or any other animal fat
- 2 Hard margarine, vegetable oil, blended oil, palm oil or coconut oil
- 3 Soft margarine, corn oil, soya bean oil, sunflower oil or safflower oil
- 4 Peanut oil, canola oil, olive oil
- 5 Others (please specify _____)
- 9 Do not cook at home at all

22. AT THE TABLE, when do you USUALLY add salt or sauces to your food?

- 1 Before tasting food
- 2 When the food is not tasty enough
- 9 Do not add salt or sauces to my food at the table

23. How many glasses of plain water do you USUALLY drink per day?

_____ glasses (G2)

24. Have you ever been on a diet to lose weight?

- 1 Have dieted occasionally, in the past
- 2 Have dieted frequently, in the past
- 3 Continually dieting to lose weight
- 9 Never dieted

25. Do you USUALLY take health supplements?

- 1 Yes (Go to Q26)
- 2 No (End of questionnaire)

26. Please state what supplements, how often and how much you take.

		Number of times taken (e.g. once a day, 3 times a week)			Quantity taken each time (e.g. 2 tablets)	How long have you been taking the supplement?
		Per day	Per week	Per month		
a	Multi-vitamins and minerals (e.g. Centrum™)					
b	Calcium, alone					
c	Vitamin D, alone					
d	Calcium combined with vitamin D					
e	Omega-3 fatty acids (fish oil)					
f	Others (please specify)					

Food Frequency Questionnaire

Part A

1. Have you changed your diet in the past one month? Yes / No*
2. If yes, why did you do so?

3. What were the changes you made?

** Please delete whichever is not applicable.*

Food Frequency Questionnaire

Part B

A. What type of oil/fat do you/your family use for cooking (pan frying, deep frying, stewing)?

Choose from the list.

0. Blended vegetable oil (cooking oil)
1. Polyunsaturated oil (corn, soya, sunflower, safflower, grapeseed, flaxseed)
2. Monounsaturated oil (olive, peanut, canola, rice bran, sesame, mustard)
3. Saturated fat (lard, ghee, tallow, hard margarine, butter, shortening, coconut oil, palm oil)
4. Do not pan fry, deep fry or stew.

B. What type of oil/fat do you/your family use for cooking (stir frying)?

Choose from list.

0. Blended vegetable oil (cooking oil)
1. Polyunsaturated oil (corn, soya, sunflower, safflower, grapeseed, flaxseed)
2. Monounsaturated oil (olive, peanut, canola, rice bran, sesame, mustard)
3. Saturated fat (lard, ghee, tallow, hard margarine, butter, shortening, coconut oil, palm oil)
4. Do not stir fry

C. What type of oil/fat do you/your family use for baking/roasting?

Choose from list.

0. Blended vegetable oil (cooking oil)
1. Polyunsaturated oil (corn, soya, sunflower, safflower, grapeseed, flaxseed)
2. Monounsaturated oil (olive, peanut, canola, rice bran, sesame, mustard)
3. Saturated fat (lard, ghee, tallow, hard margarine, butter, shortening, coconut oil, palm oil)
4. Do not bake or roast

D. What type of milk do you use with your coffee?

Choose from the list.

0. Creamer
1. Sweetened condensed milk
2. Evaporated milk
3. Full cream milk/powder
4. Low fat milk/powder
5. Skimmed milk/powder
6. No added milk
7. Whitener
8. Do not drink coffee

E. What type of milk do you use with your tea?**Choose from the list.**

0. Creamer
1. Sweetened condensed milk
2. Evaporated milk
3. Full cream milk/powder
4. Low fat milk/powder
5. Skimmed milk/powder
6. No added milk
7. Whitener
8. Do not drink tea

F. What type of milk do you use with malt beverages?**Choose from the list.**

0. Creamer
1. Sweetened condensed milk
2. Evaporated milk
3. Full cream milk/powder
4. Low fat milk/powder
5. Skimmed milk/powder
6. No added milk
7. Whitener
8. Do not drink malt beverages

G. Do you usually ask for less sugar/“less sweet” when ordering beverages?

0. No
1. Yes

H. Do you usually ask for less sugar/“less sweet” when ordering desserts?

0. No
1. Yes

Breads and Cereals

Food Item	Portion	Number of times eaten				
		Per day	Per week	Per month	Rarely/ Never	
How often do you eat the following:						
Bread						
1	White bread, including naan	1 slice or 1 piece				
2	Wholemeal bread	1 slice or 1 piece				
3	Bread with fruits and nuts	1 slice or 1 piece				
Bread spreads used						
4	Butter	1 tsp (D2)				
5	Margarine	1 tsp (D2)				
6	Peanut butter	1 tsp (D2)				
7	Jams/honey	1 tsp (D2)				
8	Kaya	1 tsp (D2)				
Other types of breads						
9	Roti prata/murtabak	1 piece				
10	Chapati/thosai	1 piece				
11	French toast/roti telur/roti john	1 piece				
12	Bread buns with coconut/curry/meat fillings	1 piece				
Cereals						
13	Plain/flavoured breakfast cereals	4 dsp (D1)				
14	Mixed (with fruit/nuts) breakfast cereals	4 dsp (D1)				
For participants who consume breakfast cereals (#13, 14):						
4001	<i>You have indicated that you eat breakfast cereals. How often do you have breakfast cereals made from whole-grains?</i>	4 dsp (D1)				
3001	Oats/oatmeal (raw)	4 dsp (D1)				

Rice and Porridge

Food Item		Portion	Number of times eaten			
How often do you eat the following:			Per day	Per week	Per month	Rarely/ Never
15	Plain rice	1 B1				
For participants who consume plain rice (#15):						
4002	<i>You have indicated that you eat plain rice. How often do you have rice prepared using brown or red rice?</i>	1 B1				
16	Plain porridge	1 B1				
For participants who consume plain porridge (#16):						
4003	<i>You have indicated that you eat plain porridge. How often do you have porridge prepared using brown or red rice?</i>	1 B1				
Flavoured rice/porridge						
17	Fried rice	1 B1				
18	Chicken/duck rice	1 portion				
19	Mui fan	1 portion				
20	Nasi bryani	1 portion				
21	Nasi lemak	1 portion				
22	Claypot rice	1 portion				
23	Glutinous rice	1 portion				
24	Flavoured porridge (e.g. chicken, pork, duck, fish)	1 portion				

Noodles (rice noodles, wheat noodles, bean noodles, pasta)

Food Item		Portion	Number of times eaten			
How often do you eat the following:			Per day	Per week	Per month	Rarely/ Never
Soup noodles						
25	Fishball/yong tau foo/wanton/prawn/ beef/chicken/ fish slice	1 portion				
For participants who consume soup noodles (#25):						
4004	<i>You have indicated that you eat noodles in soup. How often do you have soup noodles prepared using brown rice beehoon?</i>	1 portion				
26	Penang laksa	1 portion				
Dry noodles						
27	Fishball/yong tau foo/wanton/ minced meat & mushrooms/prawn/ beef/chicken	1 portion				
Fried noodles						
29	Fried kway teow with cockles	1 portion				
30	Fried hor fun	1 portion				
31	Fried noodles (incl. Hokkien mee, mee goreng)	1 portion				
32	Fried beehoon	1 portion				
For participants who consume fried beehoon (#32):						
4005	<i>You have indicated that you eat fried beehoon. How often do you have fried beehoon prepared using brown rice beehoon?</i>	1 portion				
Noodles in gravy						
28	Lor mee/mee rebus	1 portion				
33	Laksa lemak	1 portion				
34	Mee siam (with coconut milk)	1 portion				
Other noodles						
35	Instant noodles	1 portion				
905	Boiled noodles / spaghetti / pasta (plain)	1 portion				
906	Boiled noodles / spaghetti / pasta with tomato sauce	1 portion				
907	Boiled noodles / spaghetti / pasta with cream white sauce	1 portion				
For participants who consume boiled spaghetti/pasta:						
4006	<i>You have indicated that you eat boiled spaghetti/pasta. How often do you have spaghetti/pasta prepared using wholemeal spaghetti/pasta?</i>	1 portion				

Soups

Food Item		Portion	Number of times eaten			
How often do you eat the following:			Per day	Per week	Per month	Rarely/ Never
600	Cream soup	1 B2				
601	Clear soup/broth	1 B2				

Vegetables and Beancurd

Food Item		Venue	Portion	Number of times eaten			
How often do you eat the following:				Per day	Per week	Per month	Rarely/ Never
<i>Pale green leafy vegetables (cabbage, pak choy, lettuce, beansprouts, cauliflower etc)</i>							
36	Stir fried, plain		½ cup				
40	Stir fried, with meat/ seafood		½ cup				
44	Stir fried in oyster sauce		½ cup				
48	Curry/lemak		½ cup				
52	Raw/steamed/in soup	-----	1 cup				
<i>Dark green leafy vegetables (spinach, kai lan, chye sim, kangkong, broccoli etc)</i>							
53	Stir fried, plain		½ cup				
57	Stir fried, with meat/ seafood		½ cup				
61	Stir fried in oyster sauce		½ cup				
65	Stir fried in sambal belacan/dried prawns		½ cup				
69	Raw/steamed/in soup	-----	1 cup				
<i>Tomatoes, carrots, red/yellow peppers</i>							
70	Stir fried, plain		½ cup				
74	Stir fried, with meat/ seafood		½ cup				
78	Curry/lemak		½ cup				
82	Raw/steamed/in soup	-----	1 cup				
<i>Legumes/pulses, e.g. beans, peas</i>							
83	Stir fried, plain		½ cup				
87	Stir fried in oyster sauce		½ cup				
91	Stir fried in sambal belacan		½ cup				
95	Dried legumes (e.g.dhal, dried beans) in gravy		½ cup				
354	Raw/steamed/boiled	-----	½ cup				
<i>Mixed vegetables</i>							
99	Stir fried, plain		½ cup				
103	Stir fried, with meat/ seafood		½ cup				
107	Stir fried in oyster sauce		½ cup				

Food Item		Venue	Portion	Number of times eaten			
How often do you eat the following:				Per day	Per week	Per month	Rarely/ Never
700	Vegetables battered deep- fried (e.g. tempura)		1 serving				
111	Curry/lemak		½ cup				
115	Raw/steamed/in soup/ Chinese rojak	-----	1 cup or 1 serving				
Tofu/beancurd							
116	Fried		½ square				
120	Steamed/ in soups	-----	½ square				
Roots/stems (potatoes, sweet potatoes, corn etc)							
349	Stir fried potatoes		1 cup				
121	Curry lemak		1 cup				
125	Soups with meat stock	-----	1 cup				
126	Stews		1 cup				
Preserved vegetables							
704	Preserved vegetables (chye sim, olives etc)	-----	1 D1				

Salad dressings

Food Item		Portion	Number of times eaten			
How often do you have the following:			Per day	Per week	Per month	Rarely/ Never
130	Creamy dressing – regular (thousand island, mayonnaise, salad cream etc)	2 dsp (D1)				
131	Creamy dressing – light/low fat	2 dsp (D1)				
132	Oil-based dressing	2 dsp (D1)				

Fruits

Food Item		Portion	Number of times eaten			
How often do you eat the following:			Per day	Per week	Per month	Rarely/ Never
133	Orange/red/yellow fresh fruits	1 serving*				
134	Other fresh fruits	1 serving*				
3002	Fresh fruit juice	1 cup				
135	Bananas	1 medium*				
136	Durians	5 seeds				
137	Canned fruits	½ cup (M1)				
800	Mixed fruits (dried)	1 serving*				

Poultry

Food Item		Venue	Portion	Number of times eaten			
How often do you eat the following:				Per day	Per week	Per month	Rarely/ Never
Poultry - without skin							
138	Stir fried		1 serving				
142	Pan/deep fried		1 serving				
146	Coconut curry		1 serving				
150	Curry without coconut		1 serving				
154	Stew/braised/roasted		1 serving				
158	Steamed	-----	1 serving				
Poultry - with skin							
159	Stir fried		1 serving				
163	Pan/deep fried		1 serving				
167	Coconut curry		1 serving				
171	Curry without coconut		1 serving				
175	Stew/braised/roasted		1 serving				
179	Steamed	-----	1 serving				

Meat

Food Item	Venue	Portion	Number of times eaten			
			Per day	Per week	Per month	Rarely/ Never
How often do you eat the following:						
Meat - lean						
180	Stir fried		1 serving			
184	Pan/deep fried		1 serving			
188	Coconut curry/rendang		1 serving			
192	Curry without coconut		1 serving			
196	Stewed/braised		1 serving			
200	Roast/grilled/BBQ		1 serving			
204	Steamed/soup	-----	1 serving			
Meat - lean and fat						
205	Stir fried		1 serving			
209	Pan/deep fried		1 serving			
213	Coconut curry/rendang		1 serving			
217	Curry without coconut		1 serving			
221	Stewed/braised		1 serving			
225	Roast/grilled/BBQ		1 serving			
229	Steamed/soup	-----	1 serving			
Meat – preserved/cured						
230	Sausages		One			
231	Ham		1 slice			
232	Bacon		1 slice			
233	Canned (e.g. luncheon meat, corned beef)		Size of 4 square of chocolate			
234	Liver and other innards		Size of 4 square of chocolate			

Fish/Seafood

Food Item		Venue	Portion	Number of times eaten			
How often do you eat the following:				Per day	Per week	Per month	Rarely/ Never
Fish							
3003	Raw (e.g. sashimi)	-----	1 serving				
235	Stir fried/pan fried/deep fried		1 serving				
239	Deep fried with batter		1 serving				
243	Steamed		1 serving				
247	Assam pedas		1 serving				
251	Coconut curry		1 serving				
255	Curry without coconut		1 serving				
259	Grilled		1 serving				
3004	Canned (e.g. tuna)	-----	1 dsp (D1)				
Other seafood							
263	Stir fried/pan fried/deep fried		1 serving				
267	Deep fried with batter		1 serving				
271	Steamed		1 serving				
275	Assam pedas		1 serving				
279	Coconut curry		1 serving				
283	Curry without coconut		1 serving				
287	Grilled		1 serving				

Eggs

Food Item		Venue	Portion	Number of times eaten			
How often do you eat the following:				Per day	Per week	Per month	Rarely/ Never
Whole eggs (including salted and century eggs)							
291	Boiled/poached/in soup/steamed	-----	1 egg				
292	Fried/scrambled		1 egg				
Egg whites, only							
751	Boiled/poached/in soup/steamed	-----	1				
752	Fried/scrambled		1				

Desserts/Local Snacks

Food Item		Portion	Number of times eaten			
How often do you eat the following:			Per day	Per week	Per month	Rarely/ Never
Desserts in soup						
296	With coconut milk/cream (e.g. pulot hitam, bubor cha cha)	1B1				
297	Without coconut milk (e.g. cheng tng, green bean soup, tau suan)	1B1				
Kueh kueh - steamed						
298	With coconut/coconut milk /coconut cream (e.g. kueh sarlat, kueh dadar, putu mayam, idli)	1 piece				
299	Without coconut milk (kueh tutu, soon kway)	1 piece				
Others						
300	Fried snacks (e.g. you tiao, goreng pisang, Indian rojak)	1 piece				
301	Dim sum – steamed (e.g. chee cheong fun, dumplings, rice dumplings)	1 serving				
302	Dim sum – fried/deep fried (e.g. fried carrot cake, wanton, char siew puff)	1 piece				
303	Sweet Indian snacks (e.g. burfi, halwa)	1 piece				

Biscuits, Pastries and Cakes

Food Item		Portion	Number of times eaten			
How often do you eat the following:			Per day	Per week	Per month	Rarely/ Never
304	Plain biscuits	2 pieces				
305	Cream filled biscuits/shortbread	2 pieces				
306	Puff/flaky pastries (croissants, baked curry puffs etc)	1 piece				
307	Plain butter cake/fruit cake	1 piece				
308	Sponge cakes	1 piece				
309	Cream cakes	1 piece				

Fast Foods

Food Item		Portion	Number of times eaten			
How often do you eat the following:			Per day	Per week	Per month	Rarely/ Never
310	Burgers, with beef or chicken	1 serving				
311	Burgers, fish	1 serving				
312	French fries	1 small serving				
313	Pizza	2 slices				
1100	Mashed potato with gravy	1 regular				

Sweetened beverages

Food Item		Portion	Number of times eaten			
How often do you have the following:			Per day	Per week	Per month	Rarely/ Never
314	Sweetened beverages (e.g. soft drinks, packet drinks, yoghurt drinks)	1 G2				

Nuts

Food Item		Portion	Number of times eaten			
How often do you eat the following:			Per day	Per week	Per month	Rarely/ Never
	All types of nuts					
315	Dry roasted	½ M1 or 1 small pkt				
316	Fried	½ M1 or 1 small pkt				

Titbits/Snacks

Food Item		Portion	Number of times eaten			
How often do you eat the following:			Per day	Per week	Per month	Rarely/ Never
317	Fried salty snacks (crisps, prawn crackers, keropok, salted biscuits etc)	1 small packet or equivalent				
318	Ice cream	1 scoop				
319	Chocolate	4 squares				

Milk Beverages

Food Item		Portion	Number of times eaten			
How often do you have the following:			Per day	Per week	Per month	Rarely/ Never
1300	Coffee*	1 M1 –D/2 tsp				
1310	Tea*	1 M1 –D/2 tsp				
1320	Malt beverages (e.g. hot chocolate, Horlicks®, Milo®, Ovaltine®)	1 M1 –D/2 tsp				

Food Item		Portion	Number of times eaten			
How often do you have the following:			Per day	Per week	Per month	Rarely/ Never
353	Sugar	1 tsp (D2)				

* Assume no sugar added

Milk & Dairy Products

Food Item		Portion	Number of times eaten			
How often do you have the following:			Per day	Per week	Per month	Rarely/ Never
	Milk (as a drink)					
341	Full cream milk* (fresh, UHT, powder)	1 G2*				
342	Low fat milk* (fresh, UHT, powder)	1 G2*				
343	Skimmed milk* (fresh, UHT, powder)	1 G2*				
	Yoghurt					
344	Regular	1 G1				
345	Low fat (including frozen yoghurt)	1 G1				
	Cheese					
346	Cheese/cheese spread	1 slice/4dsp				
347	Low fat cheese	1 slice				

* This could be liquid milk or powdered milk made up to the same amount using instructions on tin.

Soya Products

Food Item		Portion	Number of times eaten			
How often do you have the following:			Per day	Per week	Per month	Rarely/ Never
1200	Soya milk (fresh/packet/can)	1 G2				
1201	Soya beancurd (tau huay)	1 B1				

Vegetarian (Chinese)

Food Item		Portion	Number of times eaten			
How often do you have the following:			Per day	Per week	Per month	Rarely/ Never
400	Fried vegetarian kway teow/ beehoon/mee/rice	1 portion				
401	Gluten (char siew/duck)	1 piece				
402	Fried beancurd sheet	1 piece				

Alcoholic drinks

Food Item		Portion	Number of times eaten			
How often do you have the following:			Per day	Per week	Per month	Rarely/ Never
500	Alcohol (beer/stout/wine/hard liquor)	1 serving				

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