



National Nutrition Survey 2019 Singapore

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NATIONAL NUTRITION HEALTH SURVEY 2019

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Source Citation

Research & Development,
Health Promotion Board, Singapore

Introduction

The National Nutrition Survey is part of Health Promotion Board's ongoing surveillance of the diet of Singapore adult residents. The survey informs how the population's eating habits have evolved over time and highlights areas of public health concern which require action and drives the development of health promoting nutrition policies, strategies and programmes.

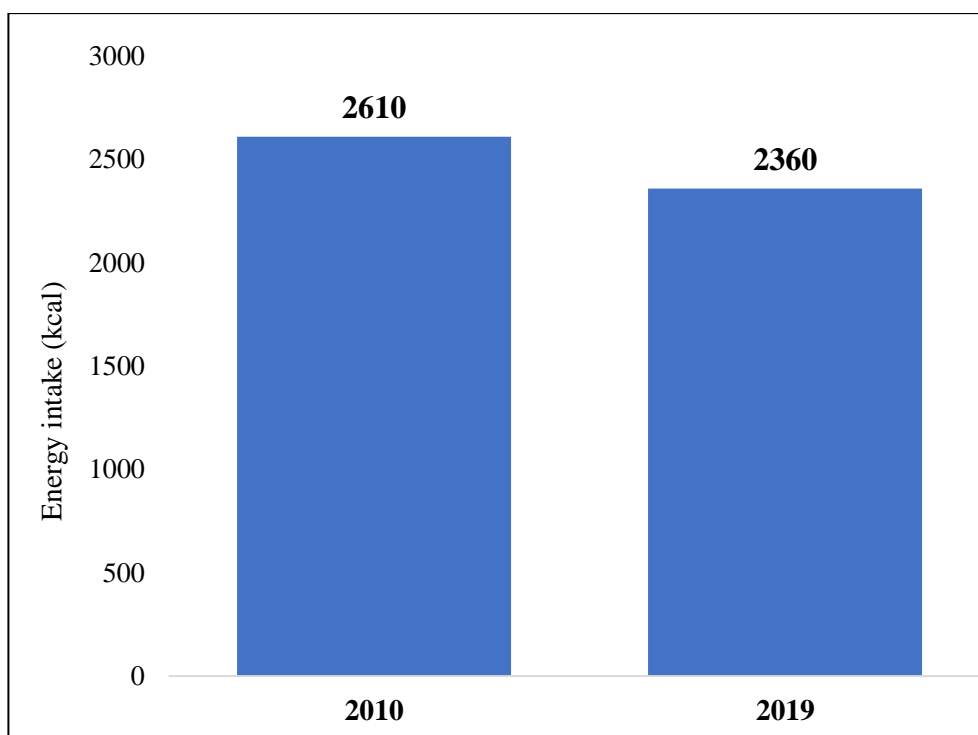
In Singapore, the nutritional quality of a diet is evaluated against Dietary Guidelines developed by the Health Promotion Board and where relevant, comparison is made against international recommendations.

The findings in this report provides information on energy and key nutrient intake of adult Singapore residents aged 18-69 years between 2010 and 2019.

Energy intake

The average Recommended Dietary Allowances (RDAs) for energy are 2200 kcal for males and 1800 kcal for females respectively (Ministry of Health, 2012). Among adult Singapore residents, the daily energy intake had declined from 2610 kcal in 2010 to 2360 kcal in 2019 (**Figure 1**). The mean energy intake per day (2400 kcal) in 2019 remained higher than the recommended 2200 kcal for men and 1800 kcal for women.

Figure 1: Mean daily energy intake (kcal), 2010 and 2019

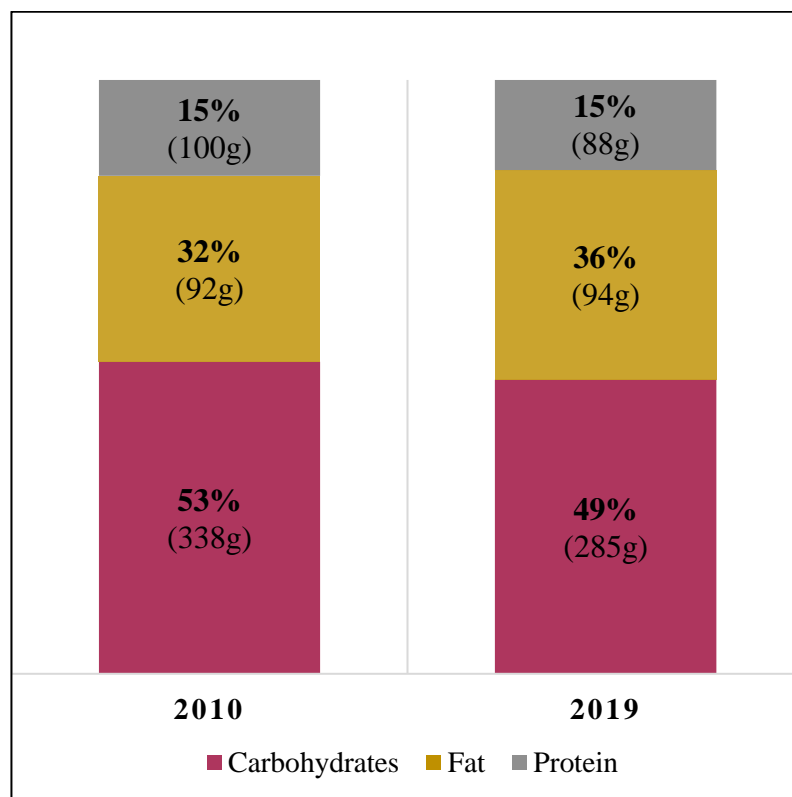


Contribution of macronutrients to total energy intake

The recommended contributions of macronutrients for carbohydrates, fat and protein to energy intake are 45%-50%, 30%-35% and 15%-20% respectively.

In terms of the overall dietary pattern of Singapore residents, the contribution of carbohydrates to energy intake had decreased between 2010 and 2019 while that of fat has correspondingly increased during this period (**Figure 2**).

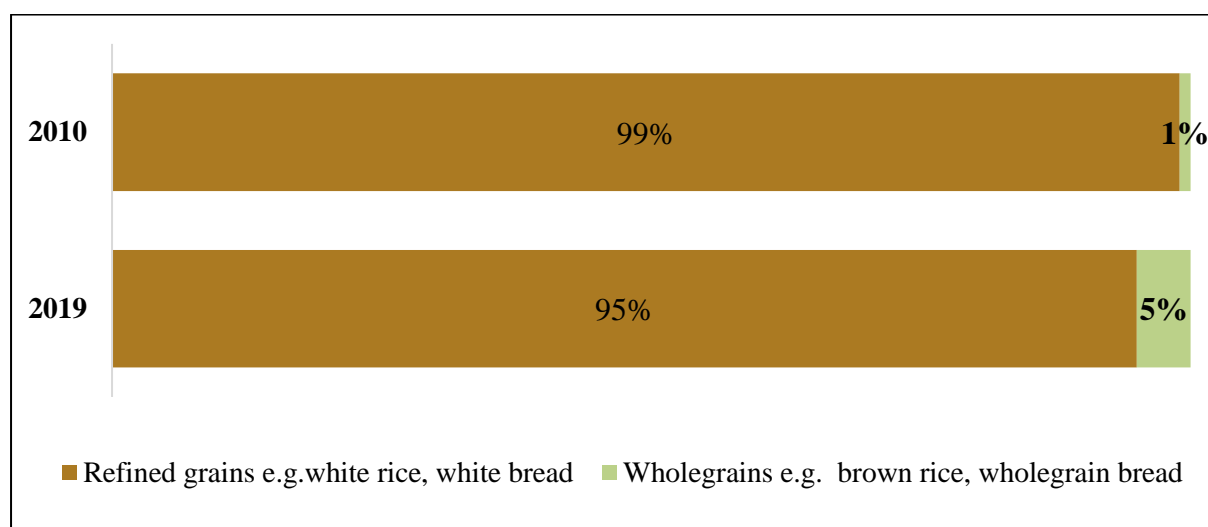
Figure 2: Percentage contribution of macronutrients to total energy, 2010 and 2019



Carbohydrates

The recommended proportion of wholegrains intake for an adult Singapore resident is 30% of the total staples intake. The intake of wholegrains as a proportion of all staples had increased from 1% to 5% between 2010 and 2019 (**Figure 3**), though this remained significantly lower than the recommended 30%.

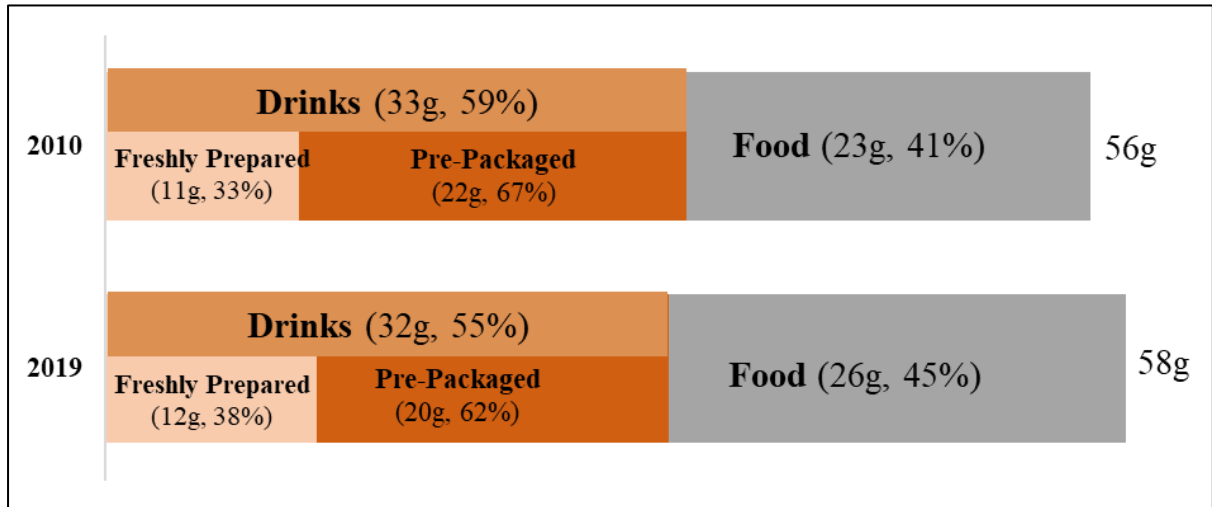
Figure 3: Percentage contribution of wholegrains to all staples, 2010 and 2019



For sugar, the recommendation is to limit intake to no more than 10% of total daily energy intake, which is 50g of sugar based on a 2000 calories diet.

Daily sugar intake has increased to 58g in 2019 from 56g in 2010, more than the recommendation. There had been a shift in key sources of sugar in adult Singapore resident's diet. In 2019, food contributed 45% of total sugar intake, an increase from 41% in 2010. Correspondingly, the contribution of drinks to total sugar intake was 55% in 2019, a decrease from 59% in 2010. For both time periods, sugar sweetened beverages was the single biggest source of dietary sugar for Singapore residents (**Figure 4**).

Figure 4: Total sugar intake and percentage contribution of drinks and food to total sugar, 2010 and 2019



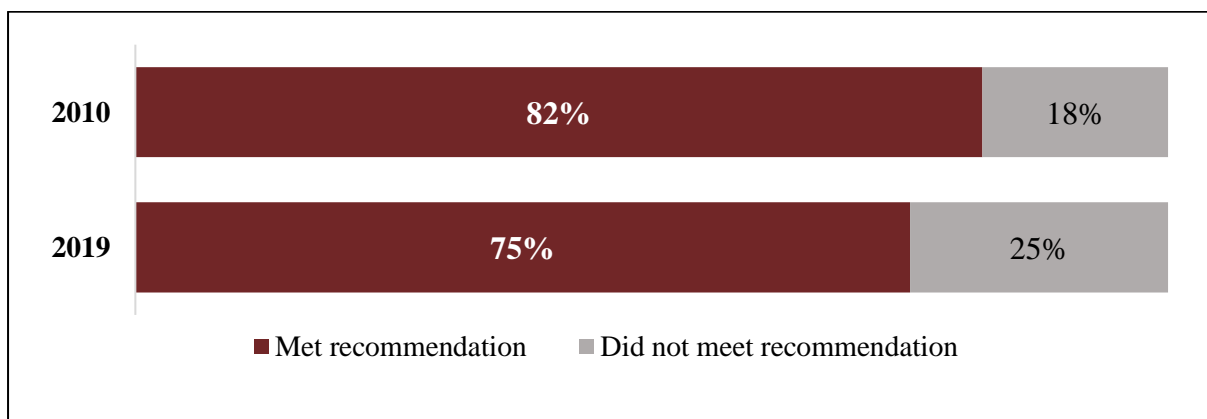
Protein

The recommended protein intake is 0.8g/kg body weight/day for adults aged below 50 years and 1.2g/kg body weight/day for those aged 50 years and above.

Protein intake was largely adequate for the population, with three-quarters of adult Singapore residents meeting their daily recommended protein intake in 2019 (**Figure 5**).

However, 1 in 2 older adults aged 50 to 69 years did not meet the recommended protein intake due to their lower protein intake compounded by higher protein requirements with age.

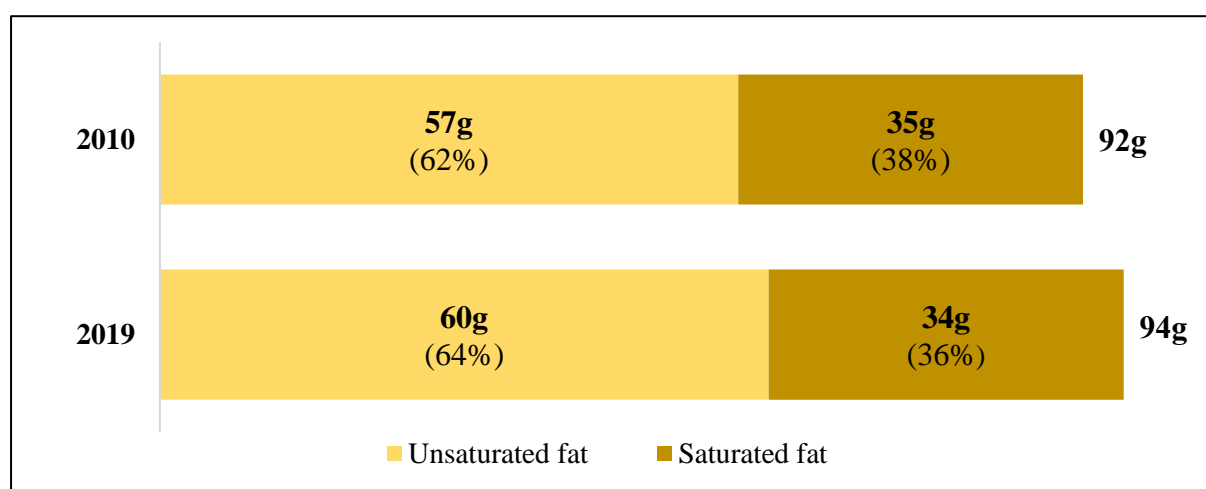
Figure 5: Proportion of population meeting recommended protein intake, 2010 and 2019



Fat

Total dietary fat intake had increased between 2010 and 2019 (**Figure 6**). The proportion of saturated fat to total fat had decreased from 38% in 2010 to 36% in 2019. It remained higher than the recommendation of no more than 30% of dietary fat in the form of saturated fat.

Figure 6: Total dietary fat intake and percentage contribution of saturated fat to total fat intake, 2010 and 2019



Sodium

The recommended sodium intake is to limit it to no more than 2000mg sodium per day. About 90% of Singaporeans exceeded the recommended amount of 2000mg sodium per day in 2019.

The average daily sodium intake was 3480mg in 2019¹, about 1.5 times higher than the level recommended by WHO. This was contributed mostly by seasonings, salt and sauces added during food preparation (i.e., during stir-frying or marinating, or the addition of soya sauce and/ or stock powder when cooking).

¹ Food-based assessment of sodium was done for this study and in subsequent years. A different method (based on 24-hour urine collection) was used to measure sodium in 2010. Hence no comparative results are cited here.

Annex B: Methodology of National Nutrition Survey

Background

The National Nutrition Survey (NNS) is a cross-sectional survey carried out by the Health Promotion Board to monitor the diet and nutritional status of the Singapore residents. The survey findings are used for tracking of progress towards national health targets, and planning and evaluation of health programmes.

The NNS was conducted among the participants of the National Population Health Survey who agreed to participate in the NNS. Sample weights were applied to the analyses to facilitate extrapolation of the survey findings to the adult resident population.

Ethics approval

The NNS study methodology and protocol were approved by National Healthcare Group (NHG) Domain Specific Review Board (DSRB Reference Number: 2015/00956; 2019/00528).

Questionnaire

Food and beverage intakes were assessed using interviewer-administered questionnaire which captured the information on habitual dietary intake. The food and beverage intakes were converted into energy and nutrients using a food composition database of commonly eaten foods and beverages in Singapore.

The questionnaire was adapted from a validated food frequency questionnaire (Whitton et al. 2017) and modified to capture intake of items such as sugar sweetened beverages.

Training

All survey interviewers were given an overview of the survey background and briefed extensively on the fieldwork procedures such as procurement of appointments, consent taking for survey participation, protocols and questionnaire administration as well as training in

administrating the electronic questionnaire on a tablet. These trainings helped to ensure compliance to standards and protocols of the survey, and consistency in data collection.

Data Quality Control

Informed consent forms validation

All the informed consent forms were checked for completeness and accuracy of information captured. This included checks for missing information, consistency of information and any data-entry errors in the datasets.

Data verification and consistency check

The electronic survey questionnaire had built-in features that prompt data entry for fields that required a response or prompt data re-entry if data entered was outside the logical or valid field range.

The database on the questionnaire records with the complete survey responses was subjected to a series of checks for missing values, valid field range and cross-field relational consistency. Missing values were obtained from respondents and data anomalies were clarified through direct verification with the respondents whenever necessary.

The built-in features and checks ensured that missing values, data-entry errors and inconsistent responses were eradicated or kept to the minimum where possible.

Data Confidentiality

Throughout all stages of the survey, strict confidentiality on individual respondent information was maintained. All information collected for this survey are kept strictly confidential, and stored in a secure, password-protected environment. All reporting of findings were done on an aggregated basis such that no individual survey respondents can be identified. The identity of the respondents would remain confidential in publications (e.g., in national reports).

Annex B: Project team

HEALTH PROMOTION BOARD

Survey Planning, Preparation & Fieldwork	Survey Report (Writers)
Dr Annie Ling Dr Karen Cheong Dr Rani Sarmugam Ms Amanda Lim Ms Ngoi Qi Yin	Dr Rani Sarmugam

References

How much calories do I need a day? Singapore: Ministry of Health; 2012. Available at: <https://www.healthhub.sg/live-healthy/1341/how-much-to-eat-at-each-meal>

Whitton C, Ho JCY, Tay Z, Rebello SA, Lu Y, Ong CN, van Dam RM. *Relative Validity and Reproducibility of a Food Frequency Questionnaire for Assessing Dietary Intakes in a Multi-Ethnic Asian Population Using 24-h Dietary Recalls and Biomarkers*. *Nutrients*. 2017; 25;9(10):1059.