National Nutrition Survey 2022

Singapore

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NATIONAL NUTRITION HEALTH SURVEY 2022

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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.

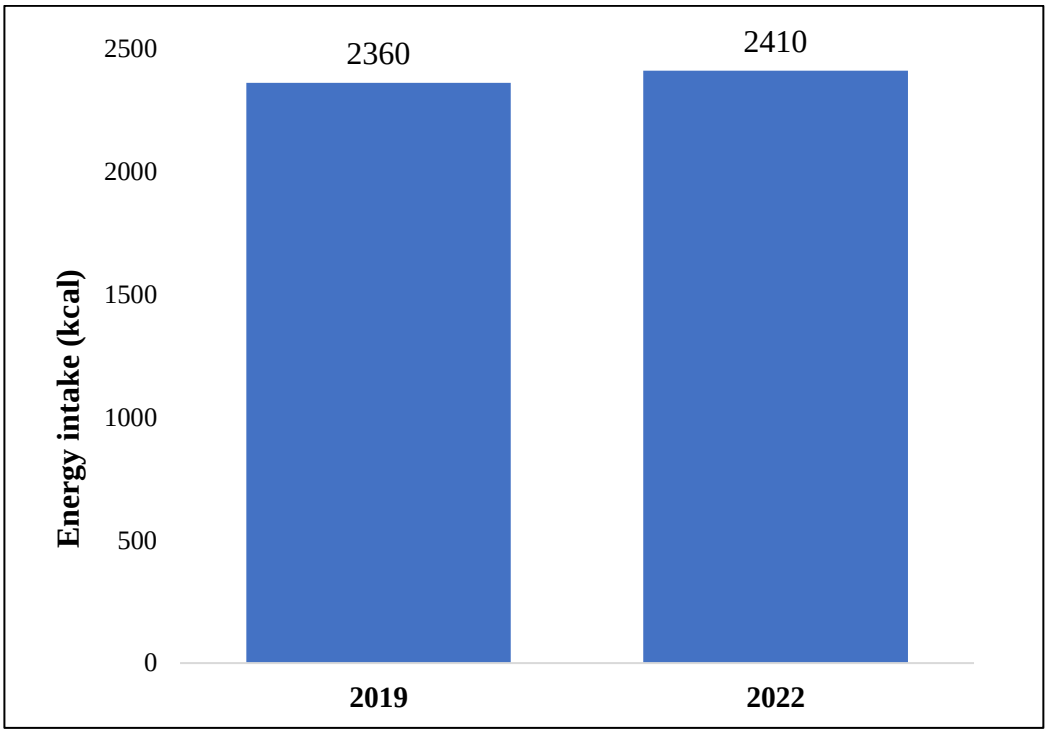
In Singapore, the nutritional quality of a diet is evaluated against Dietary Guidelines developed by the Health Promotion Board and where relevant, comparison is made against international recommendations.

The findings in this report provides information on energy and key nutrient intake of adult Singapore residents aged 18-69 years between 2019 and 2022.

Energy intake

The mean daily calorie intake of Singapore adult residents had increased from 2360 kcal to 2410 kcal between 2019 and 2022 (**Figure 1**). More individuals (61%) exceeded their recommended calorie intake in 2022, compared to 55% in 2019. This computation was done taking into consideration the individuals' age, gender, desirable weight and physical activity, thereby allowing for a more individual level estimate of the calorie requirements of Singapore residents (Henry, 2005).

Figure 1: Mean daily energy intake (kcal) between 2019 and 2022

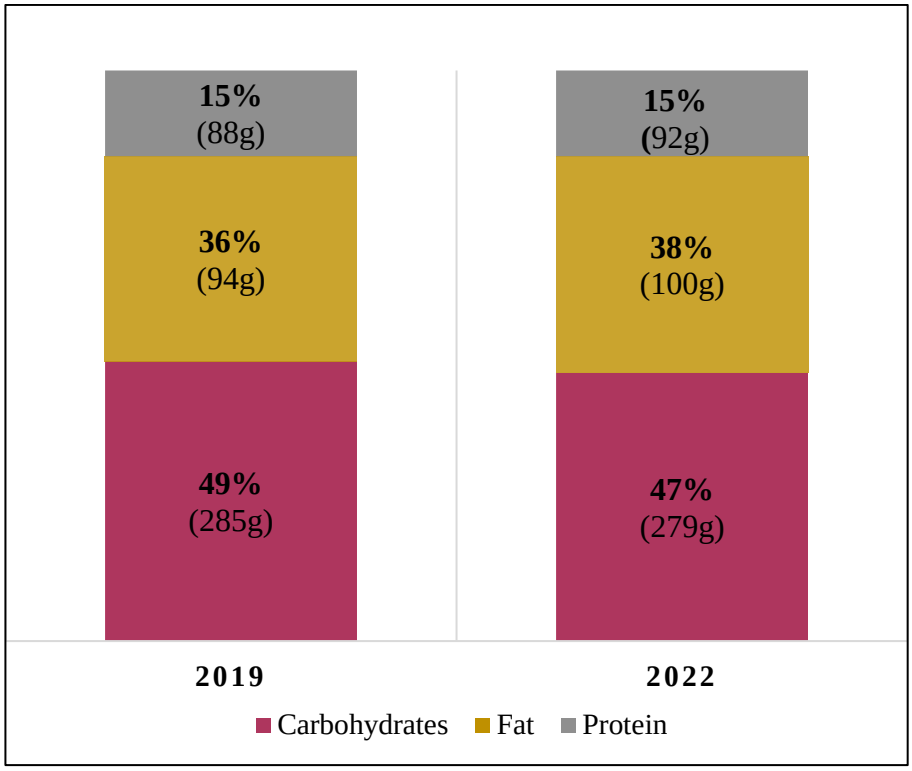


Contribution of macronutrients to total energy intake

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 2019 and 2022, while that of fat had correspondingly increased during this period (**Figure 2**) and exceeded the recommended range.

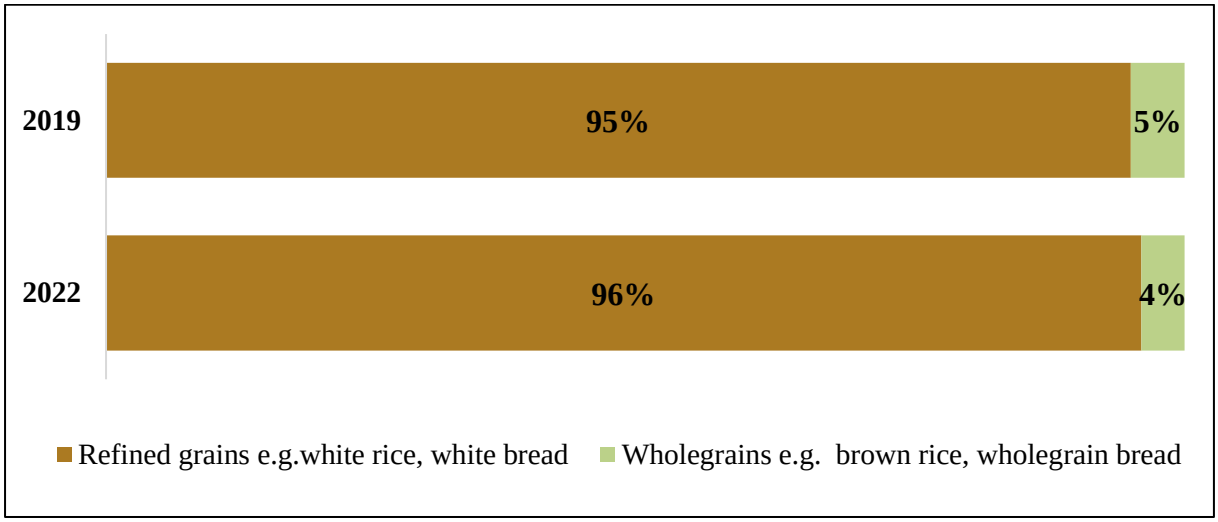
Figure 2: Percentage contribution of macronutrients to total energy, 2019 and 2022



Carbohydrates

The recommended proportion of wholegrains intake for adult Singapore residents is 30% of the total staples intake. The intake of wholegrains as a proportion of all staples had decreased from 5% to 4% between 2019 and 2022 (**Figure 3**) and remained significantly lower than the recommended 30%.

Figure 3: Percentage contribution of wholegrains to all staples, 2019 and 2022



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.

The average daily sugar intake was 56g in 2022, more than the recommended maximum sugar allowance. More Singapore adult residents (67%) were able to meet the recommended maximum sugar allowance of no more than 10% of daily total energy intake in 2022 compared to 2019 (61%) (**Figure 4)**.

In 2022, sugar sweetened beverages was the single biggest source of dietary sugar, a pattern observed also in 2019. Sugar sweetened beverages contributed 52% of total sugar intake, while food contributed the remaining 48% (**Figure 5).**

Figure 4: Proportion of population meeting recommended allowance for sugar intake, 2019 and 2022

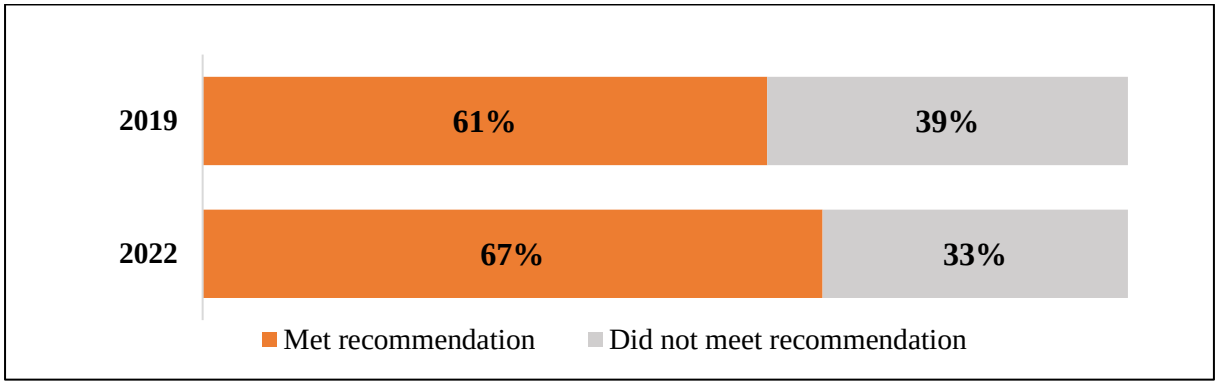
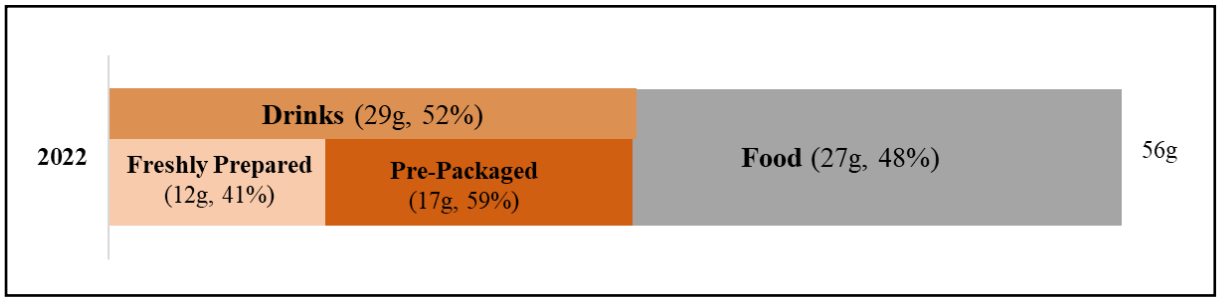


Figure 5: Total sugar intake and percentage contribution of drinks and food to total sugar, 2022



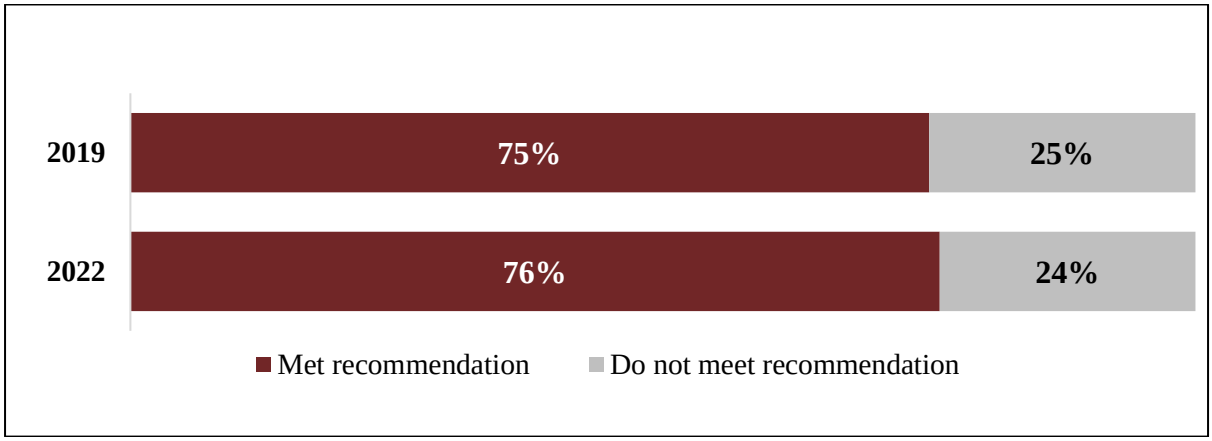
Protein

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 more than three-quarters of Singapore adult residents meeting their daily recommended protein intake in 2022 (**Figure 6)**.

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.

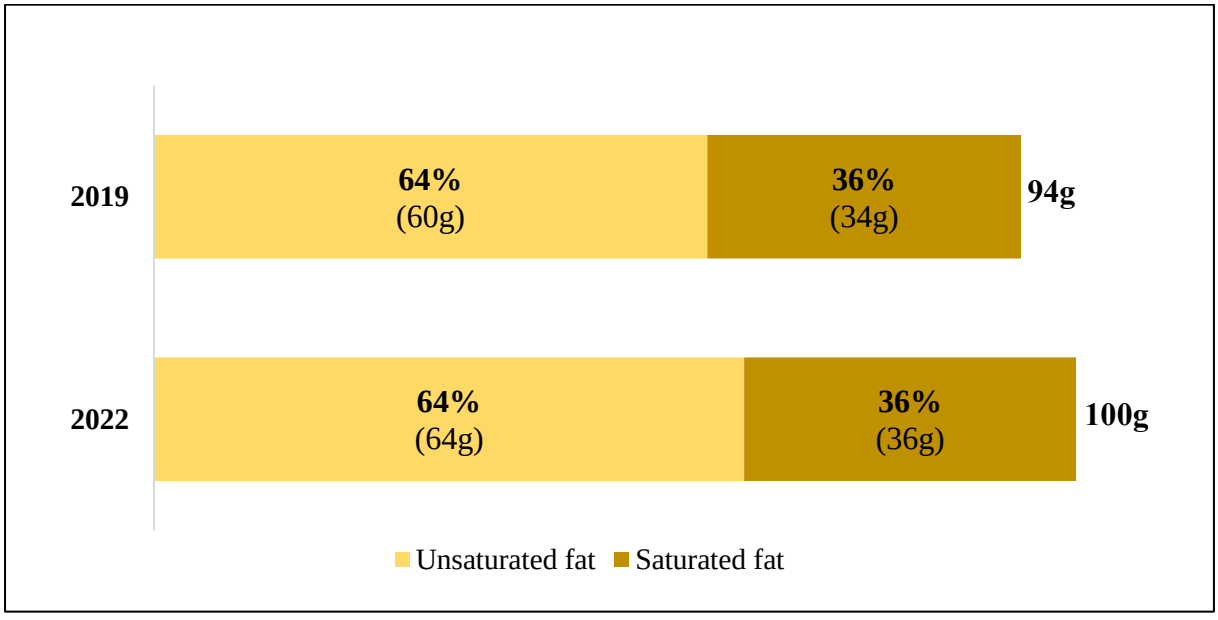
Figure 6: Proportion of population meeting recommended protein intake, 2019 and 2022



Fat

Total dietary fat intake had increased between 2019 and 2022 (**Figure 7**). The proportion of saturated fat to total fat has remained stable at 36% between 2019 and 2012, exceeding the recommendation of no more than 30% of dietary fat in the form of saturated fat. Key sources of saturated fat are cooking oil used in stir-fried dishes and deep-fried foods, especially in the food and beverage sector, coconut milk used in food preparation, and creamer added to drinks.

Figure 7: Total dietary fat intake and percentage contribution of saturated fat to total fat intake, 2019 and 2022

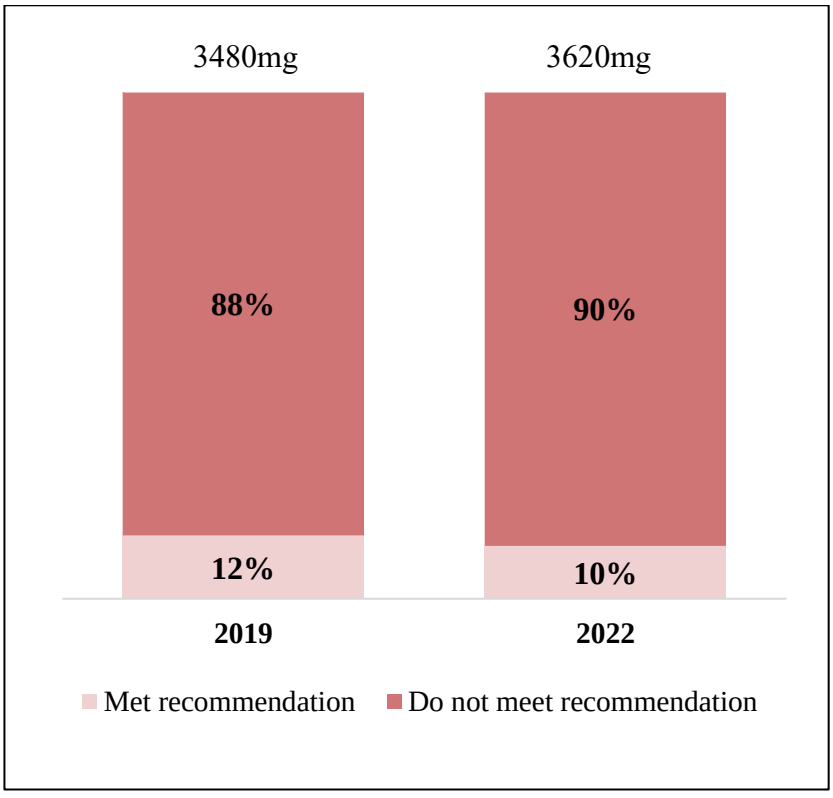


Sodium

The recommended sodium intake is to limit it to no more than 2000mg sodium per day. Sodium intake had increased and about 90% of Singaporeans exceeded the recommended amount of 2000mg sodium per day **(Figure 8)**.

This was contributed mostly by added salt, sauces and seasonings to cooking and food preparation, with key sources being soupy dishes, gravy and sauce-based dishes, flavoured rice and noodles. Another key source of dietary sodium is salt added as part of the manufacturing of bread and noodles.

Figure 8: Sodium intake levels and proportion of population meeting recommended sodium intake



Summary of key points

Key Points

- Singaporeans were eating more
  - More Singaporeans exceeded their recommended daily calorie intake
- Sugar intake had improved
  - Singaporeans were consuming less sugar from sugar-sweetened beverages
- Poor dietary quality remained of concern
  - Wholegrain intake remained low, making up less than 5% of staples consumed
  - Protein intake remained a concern among older adults
- Singaporeans had acquired a palate for increasingly rich & salty foods
  - Total fat intake had increased, and continued to be excessive in saturated fat
  - Majority of Singapore residents exceeded the recommended allowance for sodium intake

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 adult Singapore residents. The survey findings are used for tracking of progress towards national heath 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: 2021/00931).

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).

References

Henry CJ. *Basal metabolic rate studies in humans: measurement and development of new equations*. Public Health Nutr. 2005 Oct;8(7A):1133-52.

Whitton C, Ho JCY, Tay Z, Rebello SA, Lu Y, Ong CN, van Dam RM. R*elative 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.

Annex A: Project Team

HEALTH PROMOTION BOARD

Survey Planning, Preparation & Fieldwork	Survey Report (Writers)
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