

Fruit and Vegetables: Essentials for a Healthy Diet

Key Messages

- ※ The Department of Health (DH) of the Hong Kong Special Administrative Region urges adults and adolescents aged 12–17 years to consume at least 2 servings of fruit and at least 3 servings of vegetables per day (which is in line with the World Health Organization’s recommendation of at least 5 servings of about 80 grams each a day).
- ※ Adequate consumption of fruit and vegetables are associated with lower mortality and reduced risk of cardiovascular diseases (including heart disease and stroke), several common cancers (such as colorectal cancer, liver cancer and lung cancer), type 2 diabetes and chronic respiratory diseases (including asthma and chronic obstructive pulmonary disease).
- ※ Despite the many health benefits of eating fruit and vegetables, the Population Health Survey 2020–22 observed that less than half (49.4%) of persons aged 15 or above reported daily fruit consumption, with an estimated mean of 1.2 servings per day on the days they ate fruit. While 78.0% of persons aged 15 or above reported consuming vegetables daily, the estimated mean number of servings was 1.3 per day on the days they ate vegetables.
- ※ Members of the public should make “2 Plus 3 Every Day” (i.e. eating at least 2 servings of fruit and at least 3 servings of vegetables a day) a habit. They are also urged to eat a wide variety of produce from different colour groups in order to obtain the maximum health benefits from fruit and vegetables.
- ※ DH will continue organising health promotional campaigns using a variety of strategies to increase people’s health literacy and awareness about the importance of healthy eating including eating a lot of fruit and vegetables in prevention of malnutrition and non-communicable diseases.

Fruit and Vegetables : Essentials for a Healthy Diet

A healthy diet is crucial for good health. It helps to protect against malnutrition and noncommunicable diseases (NCDs). Apart from less fat, salt and sugar, fruit and vegetables are an essential component of a healthy diet^{1, 2}. While the optimum amounts of fruit and vegetables for individuals depend on various factors (such as age, health status and level of physical activity), the World Health Organization (WHO) recommends adults to consume at least 400 grams (g) of fruit and vegetables (i.e. 5 servings of about 80 g each) a day, excluding potatoes, sweet potatoes and other starchy roots².

In line with the WHO recommendation, the Department of Health (DH) of the Hong Kong Special Administrative Region (SAR) urges adults and adolescents aged 12–17 years to consume at least 2 servings of fruit and at least 3 servings of vegetables per day (Box 1)³. This article addresses the role of habitual consumption of fruit and vegetables in protecting against major NCDs, reviews global and local consumption levels, and suggests ways to increase consumption of as well as to get the most nutrients from fruit and vegetables.

Box 1: Examples of one serving of fruit or vegetables³

1 serving of FRUIT is approximately equal to:

- 2 pieces of small-size fruit (such as plum, kiwifruit)
- 1 piece of medium-size fruit (such as orange, apple)
- ½ piece of large-size fruit (such as banana, grapefruit)
- ½ bowl of fruit cuts (such as watermelon, honeydew melon, cantaloupe)
- ½ bowl of mini-size fruit (such as grapes, lychees, cherries, strawberries)
- 1 tablespoon of dried fruit without added sugar or salt (such as raisin, pitted prune)
- ¾ cup of pure fruit juice without added sugar* (such as fresh orange juice with pulp)

1 serving of VEGETABLES is approximately equal to:

- 1 bowl of raw leafy vegetables (such as lettuce, purple cabbage)
- ½ bowl of cooked vegetables, including leafy vegetables, sprouts, gourds, beans, mushrooms (such as Chinese flowering cabbage, Chinese kale, white cabbage, spinach, bean sprouts, eggplant, carrot, snow pea, enoki mushroom)
- ¾ cup of fresh vegetables juice without added sugar or salt* (such as fresh tomato juice with pulp)

Remarks: 1 bowl is equal to 250–300 milliliters (ml); 1 cup is approximately equal to 240 ml; 1 tablespoon is approximately equal to 15 ml.

*Compare to whole fruit and seasonal fresh vegetables, pure fruit juice and pure vegetable juice contain less dietary fibre. Fruit juice also contains higher content of sugar than whole fruit. Thus, consuming pure fruit or vegetable juice in excess to ¾ cup (180 ml) would still be counted as only taking 1 serving of fruit or vegetables on the same day.

Health Benefits of Eating Fruit and Vegetables

While most fruit and vegetables are naturally low in sodium and fat, they contain a wide range of nutrients, such as disease-preventing antioxidants, vitamins, minerals, phytochemicals, plant proteins and dietary fibre^{4, 5}. These natural bioactive compounds are able to act synergistically to reduce damage to cells caused by free radicals, lessen chronic inflammation, inhibit platelet aggregation and thrombus formation, reduce blood pressure, modulate the levels of blood lipids, improve insulin sensitivity and regulation of blood glucose, regulate hormone metabolism and concentrations, boost the immune system, constrain certain bacterial and fungal activities, improve gut microbiota composition and diversity, promote bowel movement and aid in the removal of faecal carcinogens^{4, 5}.

There is consistent evidence from epidemiological studies that adequate consumption of fruit and vegetables are associated with lower mortality and reduced risk of cardiovascular diseases (including heart disease and stroke), several common cancers (such as colorectal cancer, liver cancer and lung cancer), type 2 diabetes and chronic respiratory diseases (including asthma and chronic obstructive pulmonary disease)^{1, 5}. Compared to people who consumed 2 servings of fruit and vegetables per day, people who consumed 5 daily servings (specifically 2 servings of fruit and 3 servings of vegetables)

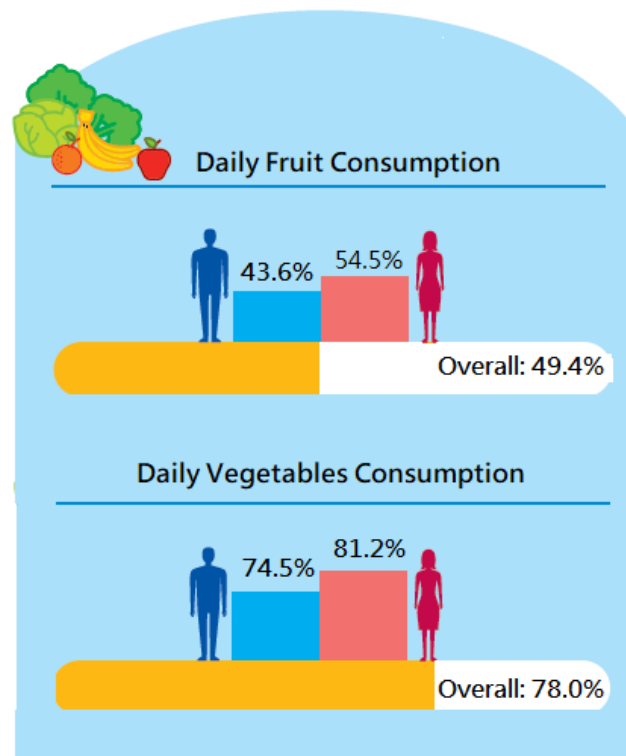
on average would have 10%, 12% and 35% lower risk of death from cancer, cardiovascular diseases and respiratory diseases respectively⁶. High versus low intakes of fruit and vegetables combined was also associated with a 7% reduction in risk of type 2 diabetes⁷. Furthermore, eating more certain groups of fruit and vegetables might lower obesity risk, keep eyes healthy, and promote brain health^{1, 5}.

Consumption Levels of Fruit and Vegetables

Despite the many health benefits of eating fruit and vegetables, people across the globe consume too few fruit and vegetables — on average only about two-thirds of the WHO recommended daily minimum total of 400 g a day¹. Barriers to eating more fruit and vegetables include poor nutrition literacy (i.e. unable to find accurate nutrition information, understand and use it to make healthy food choices), insufficient food skills (such as preparation and cooking skills), low availability (including in the markets, at home, in schools or at restaurants) or affordability^{1, 8}. As the Global Burden of Disease Study estimated, diets low in fruit and vegetables were responsible for 1.05 million and over 520 000 deaths in 2019 respectively^{9, 10}.

Although various kinds of fruits and vegetables are in year round available in Hong Kong SAR, fruit and vegetable consumption among local people is also well below the recommended levels. The Population Health Survey 2020–22¹¹ observed that less than half (49.4%) of persons aged 15 or above reported daily fruit consumption (Figure 1), with an estimated mean of 1.2 servings per day on the days they ate fruit. While 78.0% of persons aged 15 or above reported consuming vegetables daily (Figure 1), the estimated mean number of servings was 1.3 per day on the days they ate vegetables. Overall, merely 1.5% of persons aged 15 or above (1.4% for males; 1.6% for females) reported consuming at least 2 servings of fruit and at least 3 servings of vegetables daily¹¹.

Figure 1: Proportion of persons aged 15 or above reported daily fruit consumption and daily vegetables consumption by gender



Source: Population Health Survey 2020-22.

Eat More Fruit and Vegetables

Members of the public are urged to make “2 Plus 3 Every Day” (i.e. eating at least 2 servings of fruit and at least 3 servings of vegetables a day) a habit. Such recommendation can be met from eating fresh (whenever possible), frozen and canned fruit and vegetables (except preserved vegetables, such as salt-cured and pickled vegetables, and fruits with added sugar or naturally high in fat). Since fruit and vegetables of different colours contain unique and specific combinations of nutrients and phytochemicals, eat a wide variety of produce from different colour groups is as important as quantity in order to obtain the maximum health benefits from fruit and vegetables. Box 2 sug-

gests some ways to increase consumption of fruit and vegetables and preserve or reduce the loss of nutrients when handling, preparing and cooking fruit and vegetables.

Of note, fruits naturally high in fat content (such as durian, avocado and coconut) should not be counted towards the ‘2 servings a day’ recommendation. People with certain diseases should be alerted to avoid or limit consumption of certain kinds of fruit. For example, patients with kidney diseases should avoid star fruit as their weakened kidneys would not be able to process and pass out the ‘toxic substances’ (such as oxalate and caramboxin) present in star fruit¹².

While there is no need for diabetics to avoid certain kinds of fruit (such as banana, kiwi fruit and grapes) because of their sweeter taste, they should eat in moderation and keep a watchful eye on sugar intake to avoid

blood glucose spikes. Members of the public are encouraged to check their own consumption patterns, consult a doctor or dietitian and make improvements if indicated.

Box 2: Ways to increase consumption of fruit and vegetables and preserve or reduce the loss of nutrients

To increase fruit and vegetable consumption

- ◇ Keep fruit and vegetables around and in eye-catching areas.
- ◇ Serve fruit and vegetables as snacks.
- ◇ Have fruit for appetizer or dessert.
- ◇ Add vegetables to the majority of dishes, rice or noodles, soups or stews.
- ◇ Add vegetables to sandwiches.
- ◇ Add fresh or dried fruits (without sugar) to breakfast cereal, salad or plain low-fat yogurt.
- ◇ Fill at least one-third of the lunch box with vegetables when preparing own lunch.
- ◇ Try to include at least 2 kinds of vegetables as main dishes, opt for vegetable soups and eat the soup ingredients when eating out.
- ◇ Start with the salad bar first when visiting a buffet restaurant.

To preserve or reduce the loss of nutrients

- ◇ Limit peeling, where appropriate, to preserve dietary fibre content and other nutrients in the edibles skins.
- ◇ Wash fresh fruit and vegetables thoroughly under clean running water. Avoid soaking fresh fruit and vegetables to minimize the loss of water-soluble nutrients (such as vitamins B and C).
- ◇ Serve cut-up fruit and vegetables promptly. The longer they stand, the more nutrients would be lost. If indicated, store and refrigerate all cut, peeled, or cooked produce properly.
- ◇ Go for whole fruit and vegetables rather than juices.
- ◇ Cook fruit and vegetables whole if possible, or cut them into large pieces to reduce the loss of nutrients by limiting the surface area exposed to air and water.
- ◇ Do not overcook fruit and vegetables. To preserve water-soluble vitamins, steaming is a better option than boiling. If boiling is preferred, use as small amount of water as possible, or use the water to make stocks or gravies to recapture some of the leached nutrients.
- ◇ Be aware that some antioxidants are more available to the body when the fruit and vegetables are raw (such as carotene found in carrots) and others are more available when the fruit and vegetables are cooked (e.g. lycopene found in tomatoes).

DH will continue organising health promotional campaigns using a variety of strategies to increase people's health literacy and awareness about the importance of healthy eating including eating a lot of fruit and vegetables in prevention of malnutrition and NCDs. For more information about "2 Plus 3 Every Day" or healthy fruit and vegetables recipes, please visit the thematic webpage at <https://www.chp.gov.hk/en/static/100011.html>.

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Joyful Fruit Month 2023



The Department of Health had held the annual “Joyful Fruit Day” event since the 2006/07 school year to encourage an adequate daily intake of fruit among students, and subsequently upgraded the event to the “Joyful Fruit Month” in the 2012/13 school year. Since then, April has been designated as the “Joyful Fruit Month” every year.

The “Joyful Fruit Month” aims to create a favourable environment that encourages students to develop the habit of eating adequate fruit every day. All schools are encouraged to systematically organise year-round fruit promotion activities to boost students’ interest in eating fruit, and to lift the atmosphere of eating fruit to a climax throughout the “Joyful Fruit Month” in April. For “Joyful Fruit Month” 2023, the slogan “**Eat Fruits Every Day, Enjoy Benefits All the Way**” is being adopted as to promote the message that daily fruit intake is essential for good health.

For more details about the “Joyful Fruit Month” and relevant activities, please visit https://school.eatsmart.gov.hk/en/content_joyful.aspx.

Non-Communicable Diseases (NCD) WATCH is dedicated to promote public’s awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community. The Editorial Board welcomes your views and comments. Please send all comments and/or questions to so_dp3@dh.gov.hk.

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