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Health Tips

To maintain optimal health, adults should eat at least 400 g fruit and vegetables a day. This equals 5 or more servings of about 80 g each.

Besides, fruit and vegetables of different colours contain different unique and specific combinations of nutrients and phyto-chemicals, so be sure to eat a variety of fruit and vegetables from different colour groups.

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The True Colours of Fruit and Vegetables

Fruit and vegetables, which come in a wide variety of colours, flavours and textures, offer a wide range of health benefits. Research suggests that eating adequate amounts of fruit and vegetables can reduce the risk of developing various chronic diseases. Although the exact mechanisms are not precisely known, the beneficial impact is thought to be attributed to, at least in part, the additive or synergistic effects of several substances present in fruit and vegetables, including antioxidants (such as vitamins A, C and E, carotenoids, flavonoids and other phytochemicals) (Table 1) as well as other vitamins and minerals (such as vitamin B and folate, potassium, selenium, magnesium, and zinc).[1] These natural bioactive compounds can prevent oxidative damage to cells and DNA caused by free radicals; increase the activity of enzymes that detoxify toxins or carcinogens; modulate cholesterol synthesis and hormone metabolism; reduce platelet aggregation and blood pressure; stimulate the immune system and act as antibacterial and antiviral agents.[2] Besides, fruit and vegetables are a rich source of soluble and insoluble fibres, which help to keep the digestive system healthy, stabilise blood sugar level and lower serum cholesterol level.

Table 1: Antioxidant content* of selected fresh fruit and vegetables

Fruit	TE/100 grams	Vegetable	TE/100 grams
Blackberry	5500	Red cabbage	1400
Blueberry	3300	Garlic	1300
Strawberry	3100	Mushroom	700
Red plum	2200	Broccoli	600
Red grape	1700	Spinach	500
Red apple	1400	Sweet corn	500
Green grape	1200	White potato	400
Nectarine	1200	Peas	300
Banana	1100	Cauliflower	200
Kiwi fruit	1000	Carrot	200
Pineapple	1000	Green bean	200
Cherry	800	Yellow onion	200
Orange	600	Tomato	200
Pear	600	Green cabbage	150
Watermelon	100	Cucumber	100

Note: * In µmoles Trolox Equivalents (TE) per 100 grams sample.
Source: Miller et al, 2000.

Fruit, Vegetables, and Disease Prevention

Epidemiological studies have shown that when consumed in adequate amounts on a regular basis, the various micronutrients and phytochemicals contained in fruit and vegetables can probably lower the risk of obesity and ward off many oxidative stress-related chronic diseases, including cardiovascular diseases, certain cancers, type 2 diabetes, chronic respiratory diseases, age-related cognitive decline or dementia, age-related eye diseases as well as rheumatoid arthritis.[3]

Obesity

Fruit and non-starchy vegetables can play an important role in weight management. With a high content of water and fibre and a relatively low amount of fat and calories, fruit and non-starchy vegetables can increase satiety and reduce the feeling of hunger. As they are less energy dense (for non-starchy vegetables in particular), a relatively larger amount can be consumed without gaining much weight. Furthermore, the flavonoids found in fruit and vegetables may fend off obesity through stimulating release of certain hormones that regulate lipid metabolism (such as adiponectin and adipokine), reverse insulin resistance or modulate appetite and energy expenditure.[4, 5]

A review of various prospective and intervention studies asserted that in adults, consuming more fruit and vegetables could possibly contribute to a stable weight, and probably lead to weight loss if the fruit and vegetables consumed were to replace foods rich in fat or high in energy density.[1] Studies have also shown that eating more fruit and vegetables may help the middle-aged, who tend to gain weight as they age, to fight off the extra pounds. A prospective cohort study of over 74 000 women aged 38 - 63 at baseline in the United States (U.S.) found that during a 12-year follow-up, those who were in the quintile with the largest increase in fruit and vegetable consumption had a 24% lower risk of becoming obese compared with those who were in the quintile with the largest decrease in consumption.[6] Another prospective study of over 89 000 men and women (with a mean age of about 53 years) from 5 European countries also found that those who consumed greater amounts of fruit and vegetables had less weight gain than those who consumed lesser amounts. For every 100 g fruit and vegetables consumed per day, there was a 14 g less weight gain per year.[7] Although the beneficial effect of fruit and vegetables on reducing weight gain from this study seems small, they still have public health significance as the prevalence of obesity is high.

Cardiovascular diseases (hypertension, coronary heart disease and stroke)

Epidemiological studies consistently showed that a diet rich in fruit and vegetables could lower the risk of hypertension, coronary heart disease (CHD) and stroke.[3] A prospective study examined the relation of food intake to blood pressure in a cohort of over 1 700 middle-aged working men in Chicago. Results showed that while the blood pressure of men who ate more fruit and vegetables and that of men who ate less both rose over the 7 years of follow-up, those with a higher intake had less of an *increase in blood pressure* over time. The systolic blood pressure (SBP) of men who consumed 14 - 42 cups of fruit a month (0.5 - 1.5 cups a day) was estimated to rise 2.2 mmHg less in 7 years than those who consumed less than 14 cups per month (less than 0.5 cup per day). The SBP of men who consumed 14 - 42 cups of vegetables a month was estimated to rise 2.8 mmHg less in 7 years than men who consumed less than 14 cups a month.[8] Another cohort study of over 28 000 middle-aged and older women in the U.S. with a mean of 12.9 years of

follow-up also found an inverse dose-response relationship between total fruit and vegetable consumption and the risk of hypertension: compared with the women who consumed less than 2 servings of fruit and vegetables a day, women who consumed 2 to less than 4 servings, 4 to less than 6 servings, 6 to less than 8 servings, and 8 or more servings of total fruit and vegetables a day had a 3%, 7%, 11%, and 14% lower risk of hypertension respectively.[9]

For *CHD*, a meta-analysis of 13 independent cohort studies indicated that individuals who had 3 to 5 servings and more than 5 servings of fruit and vegetables a day had a respective 7% and 17% lower risk of CHD when compared with those who had less than 3 servings of fruit and vegetables a day.[10] Another meta-analysis of 9 cohort studies also found that the risk of CHD would decrease by 7% for each additional daily serving of fruit consumption, and by 4% for fruit plus vegetable consumption.[11]

Similarly, pooled analyses of cohort studies reported that people who consumed fruit and vegetables 3 to 5 servings and more than 5 servings a day had a respective 11% and 26% reduced risk of *stroke* when compared with those who consumed less than 3 servings a day.[12] Another meta-analysis showed that for each additional daily serving of fruit, fruit and vegetables, and vegetables, the risk of stroke decreased by 11%, 5%, and 3% respectively.[13]

Cancer

Considerable laboratory evidence from chemical, cell culture, animal studies as well as clinical trials indicated that antioxidants might slow or possibly prevent the development of cancer.[14] The World Cancer Research Fund (WCRF) and the American Institute for Cancer Research (AICR) estimated that diets high in fruit and vegetables (more than 400 g per day) could prevent at least 20% of all cancer incidences. A higher consumption of fruit and non-starchy vegetables probably protects against cancers of the mouth, pharynx, larynx, oesophagus, and stomach.[15] For example, a meta-analysis of 16 studies that examined the effects of fruit and vegetable consumption on the occurrence of *oral cancer* reported that each serving of fruit and each serving of vegetables consumed per day significantly reduced the risk of oral cancer by 49% and 50% respectively.[16] Pooled analyses of case-control studies showed that for each 100 g of fruit consumed per day, there were respectively 27% reduced risk of *laryngeal cancer* and 28% reduced risk of *oesophageal cancer*; for each 100 g of vegetables consumed per day, there was 11% lower risk of oesophageal cancer.[17] A special type of vegetables, Allium vegetables (such as garlic, leeks, onions, shallots or chives), may protect against cancer of the stomach and colorectum in particular. A pooled analysis of 21 studies reported that people with the highest consumption of allium vegetables had a 46% reduction in *gastric cancer* risk as compared to those with the lowest consumption. For each increment of 20 g of allium vegetables consumption per day, the risk of gastric cancer would be reduced by 9%.[18] Another meta-analysis of 43 human and animal studies also indicated a protective effect of garlic against *colorectal cancer*. Compared to people with no garlic intake, people with a high intake of garlic had a 30% lower risk of colorectal cancer.[19]

While a meta-analysis of 14 cohort studies found that per 80 g serving of fruit per day was associated with a 6% decreased risk of *lung cancer*, there was only scanty epidemiological evidence suggesting that non-starchy vegetables could protect against lung cancer. Fruit and vegetables containing lycopene, such as tomatoes, are thought to be

effective in fighting and preventing cancer, particularly *prostate cancer* in men.[15] As observed in a meta-analysis of 21 cohort and case-control studies, consumers of high amounts of raw tomato and cooked tomato products (5th quintile of intake) had a respective 11% and 19% reduced risk of prostate cancer compared with non-frequent users of tomato products.[20] Increased consumption of cruciferous vegetables, such as cauliflower, broccoli and cabbage, might also modify *bladder cancer* risk. A meta-analysis of 10 cohort and case-control studies observed a significant 20% reduced risk of bladder cancer in the group with the highest cruciferous vegetables consumption compared with the group with the lowest consumption.[21] While the role of fruit and vegetables in relation to *breast cancer* risk had long been debated, an updated systematic review and meta-analysis of 15 prospective studies found a small but significant protective effect of fruit or fruit and vegetables combined against breast cancer. A dose-response was also observed: for each increment of 200 g of fruit consumed per day, there was 6% reduction in breast cancer risk; for fruit and vegetables combined, there was a 4% reduction in risk.[22] For the effect of cruciferous vegetables on the prevention of breast cancer, a newly published meta-analysis of 11 case-control studies and 2 cohort studies observed that the group with the highest consumption of cruciferous vegetables had a significant 15% reduced risk of breast cancer, compared with the group with the lowest consumption.[23]

Type 2 diabetes

Most of the epidemiological studies showed no significant risk relation between diabetes and consumption of fruit and vegetables as a whole, as well as consumption of either fruit or vegetables alone.[3] However, one meta-analysis released in 2010 of six prospective cohort studies with over 220 000 participants aged 30 - 74 years showed that the risk of type 2 diabetes was significantly lower in persons who consumed relatively large amount of green leafy vegetables. Compared with individuals who consumed 0.2 servings (lowest intake) of green leafy vegetables a day, persons with a consumption of 1.35 servings a day (highest intake) would have a 14% reduction in risk of type 2 diabetes.[24]

Chronic respiratory diseases (asthma and chronic obstructive pulmonary disease)

Considerable epidemiological and clinical evidence supported an association between higher consumption of fruit and vegetables and a lower risk of asthma or asthma-related symptoms as well as chronic obstructive pulmonary disease (COPD).[3] A prospective birth cohort study that investigated associations between childhood diet and *asthma* and atopy outcomes at 8 years of age reported that one day per week of fresh fruit consumption at early age was associated with a 7% reduced risk of asthma symptoms; long-term consumption of fresh fruit from 2 to 8 years of age was also associated with a 10% reduction in risk. For cooked vegetables, the study observed no reduction in asthma risk.[25] Similarly, pooled analyses of 4 cross-sectional studies showed that high consumption of fruit (but not vegetables) by children aged 10 - 14 years was associated with a 25% reduced risk of wheezing.[26] In addition, one prospective study of over 68 000 adult women observed that those in the highest quartile of carrot, leafy vegetable and tomato consumption had a 19%, 18% and 15% reduced risk of asthma respectively as compared to their peers in the lowest quartile.[27]

A diet rich in fruit and vegetables may also have beneficial effects in the prevention of *COPD*. A prospective study of 5 population-based cohorts from 3 European countries followed about

3 000 men aged 50 - 69 at baseline for 20 years and found that a 100 g increase in fruit consumption was associated with a 24% lower COPD mortality risk. However, no association was observed for consumption of vegetables.[28] On the other hand, one large prospective cohort study on over 72 000 women in the U.S. also found a negative association between a 'prudent diet' loaded with fruit and vegetables and COPD risk. Compared with women in the lowest quintile of consumption, women in the highest quintile of consumption had a 25% reduced risk of newly diagnosed COPD.[29]

Cognitive decline or dementia

Research showed that higher fruit and vegetable consumption might protect against age-related cognitive decline or dementia. A systematic review of 9 cohort studies with a total of about 44 000 participants found that frequent consumption of vegetables, but not fruit, was associated with slower rates of cognitive decline and a lower risk of dementia in older age.[30] On the other hand, a co-twin control analysis of 3 779 members of the Swedish Twin Registry showed that higher consumption of fruit and vegetables combined during midlife was associated with a reduced risk of all types of dementia and Alzheimer's disease (a common form of dementia) in later life. Compared with those reported having no or small proportion of fruit and vegetables in the diet, those whose diet consisted of a medium or large amount of fruit and vegetables had a 27% reduced risk of dementia and 40% reduced risk of Alzheimer's disease.[31] Similarly, another prospective 7-year cohort study of over 1 400 people in the elderly aged over 65 observed a 26% increased risk of mild cognitive impairment or dementia among those reporting daily consumption of less than 2 servings of fruit and vegetables when compared with those consuming 2 or more servings of fruit and vegetables a day.[32] Studies also found that better cognitive function was associated with high intakes of certain subgroups of fruit and vegetables, including citrus fruit, berry fruit, green leafy vegetables, cruciferous vegetables, legumes, carrots, or vitamin C-rich fruit and vegetables.[30, 33-37]

Eye diseases (macular degeneration and cataract)

While there was insufficient evidence to support a protective role for fruit or vegetables in preventing diabetic retinopathy and glaucoma,[3] some studies observed that generous consumption of fruit and green leafy or cruciferous vegetables rich in carotenoids, lutein and zeaxanthin might reduce the risk of age-related macular degeneration (AMD) or age-related nuclear cataract.[38, 39] One prospective study that followed over 110 000 men and women aged 50 and above for about 18 years showed that people who consumed 3 or more servings of fruit per day had a 36% reduced risk of *AMD* compared to those who consumed less than 1.5 servings per day. No significant protective effect was observed for vegetables.[40] However, one case-control study observed an inverse association between AMD risk and consumption of spinach or collard greens. Compared with those who consumed 0.5 cup of spinach or collard greens (raw or cooked) less than once a month, those who consumed once a week, 2 to 4 times a week, 5 or more times a week had a 39%, 46% and 86% reduced risk of AMD respectively.[41] For *cataract*, a study on 1 802 women aged 50 - 79 years in the U.S. showed that women in the highest tertile of fruit or vegetable consumption were approximately 30% less likely to have age-related nuclear cataract than those in the lowest tertile of consumption.[42]

Rheumatoid arthritis

Systematic reviews of literature on the role of fruit and vegetables in susceptibility to rheumatoid arthritis found that high intake of fruit and vegetables possibly cut rheumatoid arthritis risk

or relieve inflammatory rheumatoid symptoms.[3, 43] To examine any association between consumption of fruit and vegetables and the risk of inflammatory polyarthritis like rheumatoid arthritis, a study followed over 25 000 men and women aged 45 - 74 years for 9 years and analysed their dietary patterns. Results showed that people who consumed the lowest amounts of fruit and vegetables combined (less than 167 g a day), fruit (78 g or less a day), and vegetables (less than 64.6 g a day) had a respective 90%, 60%, and 30% higher risk of developing inflammatory polyarthritis than those who consumed the highest amounts of fruit and vegetables combined (more than 275 g a day), fruit (more than 176 g a day), and vegetables (more than 113 g a day).[44] In addition, a case-control study also revealed that increased consumption of cooked vegetables might reduce the risk of rheumatoid arthritis. Compared to the people with a mean daily consumption of 0.85 servings of cooked vegetables, those with a mean daily consumption of 1.5, 2 and 2.9 servings of cooked vegetables had a respective 45%, 59% and 76% lower risk of developing rheumatoid arthritis.[45]

Patterns of Fruit and Vegetable Consumption

Depending on age, gender, level of physical activity and physical health status, people need different amounts of fruit and vegetables. The World Health Organization (WHO) Panel on Diet, Nutrition and Prevention of Chronic Diseases recommends that a person should eat at least 400 g fruit and vegetables a day to maintain optimal health. This equals 5 or more servings of about 80 g each (Box 1).[46] However, surveys showed that both worldwide and in Hong Kong, people consumed well below the recommended level.

Box 1: Examples of fruit and vegetable serving sizes

One serving of **fruit** is approximately equal to:

- 2 pieces of small-sized fruit (e.g. plum, kiwifruit)
- 1 piece of medium-sized fruit (e.g. orange, apple)
- 1/2 piece of large-sized fruit (e.g. banana, grapefruit, star fruit)
- 1/2 bowl of fruit cuts (e.g. watermelon, cantaloupe, honeydew melon)
- 1/2 bowl of mini-sized fruit (e.g. grapes, lychees, cherries, strawberries)
- 1/4 bowl of dried fruit without added sugar or salt (e.g. raisins, prune)

One serving of **vegetables** is approximately equal to:

- 1 bowl of raw leafy vegetables (e.g. lettuce, purple cabbage)
- 1/2 bowl of cooked vegetables, sprouts, gourds or mushrooms (e.g. Chinese flowering cabbage, Chinese kale, spinach, white cabbage, bean sprouts, eggplant, carrot)
- 1/2 bowl of cooked beans (e.g. snow peas, red kidney beans)

Remark: 1 cup = 240 ml; 1 bowl = 250-300 ml

Source: Central Health Education Unit website, Department of Health

Global Perspective

The WHO conducted the World Health Survey in 2002-2003 to assess, among other risk factors, the patterns of fruit and vegetable consumption in 52 mainly low- and middle-income countries. A total of over 196 000 participants aged 18 and above participated in the study. Results showed that 78.0% of the participants (77.6% of men and 78.4% women) consumed less than the recommended level of at least 5 daily servings of fruit and vegetables a day. The prevalence of low fruit and vegetable consumption increased with age from 75.9% among people aged 18 - 29 to 82.1% among people aged 70 and above, but decreased with increasing income from 81.6% among people in the poorest quintile to 73.4% among people in the richest quintile.[47]

Among the high-income countries, consumption level of fruit and vegetables was far from satisfactory as well. For example, the National Diet and Nutrition Survey (2008/09 - 2010/11) in the U.K. reported that 31% of adults aged 19 - 64 met the '5-a-day' recommendation.[48] On average, British people consumed 258 g of fruit and vegetables a day that was lower than their European counterparts with an average of 386 g.[49] In 2009, an estimated 32.5% of the U.S. adults aged 18 and above consumed fruit 2 or more times per day; 26.3% consumed vegetables 3 or more times per day. Overall, females, people aged 65 and above, college graduates, persons with annual household income US$50 000 or above and persons with a body mass index less than 25.0 were more likely than their respective counterparts to have daily consumption of fruit 2 or more times and vegetables 3 or more times.[50] While the Australian Government urged people to "go for 2 & 5" (i.e. consumption of two servings of fruit and 5 servings of vegetables each day), the 2007-08 National Health Survey found that only 6% of people aged 19 and above did so; around 9% usually ate one or more servings of fruit and 5 or more servings of vegetables a day; a further 11% usually ate one or more servings of fruit and 4 servings of vegetables a day; and 23% usually ate one or more servings of fruit and 3 servings of vegetables a day.[51]

Local Situation

In Hong Kong, the Food and Environmental Hygiene Department conducted the first territory-wide food consumption survey in 2005-2007 to investigate the food consumption pattern of Hong Kong adults aged 20 - 84, including fruit and vegetables. Using two non-consecutive days of 24-hour dietary intake questionnaires to obtain food consumption estimates, the survey found that fruit was consumed in the amount of 146.8 g (or about 1.8 serving) per day, with oranges (55.5 g per day) and apples (21.5 g per day) found to be the most popular. For vegetables group (including tubers such as potato and taro), they were consumed in an amount of about 177.0 g per day (or about 2.2 servings per day). The leafy/stalk/shoot vegetables and brassica subgroup made up two-thirds (68.4%) of the total amount of the vegetables group consumed.[52]

In addition, a telephone-survey conducted by the Department of Health (DH) in 2012 on over 2 000 community-dwelling people aged 18 - 64 found that 18.4% and 26.6% of respondents reported daily consumption of 2 or more servings of fruit and 3 or more servings of vegetables respectively. Overall, only 17.1% met the WHO's recommended consumption level of at least 5 servings of fruit and vegetables a day. As shown in Table 2, males (87.7%), never married respondents (87.2%) and clerks (88.7%) were more likely than their respective counterparts to consume less than 5 servings of fruit and vegetables a day. Besides, the younger the respondents, the more likely that less than 5 servings of fruit and vegetables a day were consumed.[53]

Table 2: Rates of community-dwelling people aged 18 - 64 who consumed less than 5 servings of fruit and vegetables a day by demographic characteristics, 2012

	Rate*
Sex:	
Male	87.7%
Female	78.6%
Age group:	
18-24	88.7%
25-34	86.0%
35-44	83.3%
45-54	81.3%
55-64	76.8%
Marital status:	
Never married	87.2%
Married	80.6%
Divorced/Separated/Widowed	79.2%
Occupation:	
Managerial/Professional worker	83.4%
Clerk	88.7%
Service worker	82.3%
Blue collar worker	83.1%
Non-working person (including home-keeper, retiree and student)	80.0%

Note: * Rate per 100 persons in respective group.

Source: Behavioural Risk Factor Survey, April 2012 (provisional).

Go for a Variety of Fruit and Vegetables of Different Colours

Clearly fruit and vegetables are an important part of a good diet, and almost everyone can benefit from eating more of them. To obtain the maximum health benefits from fruit and vegetables, variety is as important as quantity, because no single fruit or vegetable can provide all the nutrients we need. Besides, fruit and vegetables of different colours contain different unique and specific combinations of nutrients and phytochemicals, so be sure to eat a variety of fruit and vegetables from different colour groups (Box 2).

Box 2: Examples of fruit and vegetables within 5 basic colour groups [54]

RED fruit and vegetables (contain lycopene or anthocyanins)

* cherry, strawberry, red grape, watermelon, pink grapefruit
* tomato, beetroot, red pepper

ORANGE / YELLOW fruit and vegetables (contain carotenoids)

* orange, mango, pineapple, papaya, melon, lemon
* carrot, yellow tomato, yellow maize, yellow pepper, pumpkin, sweet potato

GREEN fruit and vegetables (contain chlorophyll)

* kiwifruit, green grape, avocado, lime
* kale, Chinese cabbage, spinach, broccoli, lettuce, cucumber, celery, green pepper, green pea

PURPLE / BLUE fruit and vegetables (contain anthocyanins)

* blueberry, black current, plum, purple fig
* eggplant, purple onion, purple cabbage, black olive

WHITE fruit and vegetables (contain anthoxanthins)

* banana, pear, pomelo, white peach
* cauliflower, cabbage, potato, white turnip, bean sprout, mushroom, onion, garlic, leek

Here are some general tips to introduce more fruit and vegetables in our diet, to preserve nutrients when handling, preparing and cooking fruit and vegetables, as well as to keep produce safe for reducing the risk of food-borne illnesses -

To increase fruit and vegetable consumption

* Keep fruit and vegetables around and 'in sight'.
* Always include fruit and vegetables in main meals.
* Snack on fresh or dried fruit and vegetables without added salt/sugar, e.g. an apple or a banana, cherry tomatoes or baby carrots, dried and unsweetened apricots or dates.
* Have fruit for dessert or include fruit in dessert selections, e.g. chopped fruit topped with light ice-cream or fat-free yogurt.
* Add vegetables into rice, noodles or pasta, as well as to soups or stews.
* Add vegetables to sandwiches, such as lettuce, sliced cucumbers or tomato.
* Choose a side salad made with a variety of leafy greens.

To preserve or reduce the loss of some nutrients

* Avoid soaking fresh fruit and vegetables for long duration to minimise the loss of water-soluble vitamins B and C.
* Limit peeling, where appropriate, to preserve fibre content. Besides, the edible skins of many fruit and vegetables tend to be loaded with anti-oxidants like carotenoids and flavonoids.
* Be aware that some antioxidants are more available to the body when the fruit and vegetables are raw (e.g. beta carotene found in carrots), and others are more available when the fruit and vegetables are cooked (e.g. lycopene found in tomatoes).
* Choose steaming, microwaving or stir-frying. Avoid boiling because prolonged exposure to heat can break down chemicals unstable in high temperature. If boiling is preferred, use the water to make stocks or gravies as to recapture some of the leached nutrients.
* Cook fruit and vegetables whole if possible, or cut them into large pieces to reduce the loss of nutrients by limiting the surface area.
* Serve cut-up fruit and vegetables promptly. The longer they stand, the more nutrients would be lost.

To reduce the risk of food-borne illnesses

* Select fresh fruit and vegetables carefully. When shopping, look for fruit and vegetables that are not damaged or bruised. Make sure that pre-cut produce is properly packed and refrigerated.
* Wash hands thoroughly before handling and preparing fruit and vegetables.
* Rinse fresh fruit and vegetables (including those with skins and rinds) with running water to remove any bacteria, pesticides or insects before eating, cutting or cooking.
* Throw away the outer leaves of leafy vegetables, such as lettuce and cabbage.
* Store and refrigerate all cut, peeled, or cooked produce properly.
* Keep fresh fruit and vegetables separate from raw meat, poultry and seafood. Use separate cutting board for cutting up fresh fruit and vegetables. Do not use the same cutting board for cutting raw meat.

For some parents and carers, getting children to eat fruit and vegetables may be a challenge. However, fruit and vegetables contain essential nutrients that are important for children's health, growth and development, and preventing chronic diseases later in life. For example, consuming fruit and vegetables in childhood is associated with increased arterial elasticity, thereby reducing cardiovascular risk in later life.[55] High intake of vegetables in childhood may have a protective effect on metabolic syndrome in adulthood.[56] To encourage children to eat fruit and vegetables, parents and carers should act as a good role model by eating fruit and vegetables every day themselves. Never assume children do not eat or dislike a particular fruit or vegetable as their taste do change with age. Involve children in shopping and choosing the fruit or vegetables they like. Encourage and let them try fruit and vegetables in different colours, shapes and textures. Keep offering even when children avoid eating them. While fresh is ideal, tinned or dried fruits can be used when the fresh varieties are out of season. Remember to praise children for healthy eating. It is also noteworthy that fruit juice is high in natural sugars but low in fibre. Drinking too much fruit juice may lead to weight gain and obesity in children. It has also been reported as a contributing factor in some children with failure to thrive and short stature.[57] Therefore, parents and carers should not allow children to drink too much juice. For more tips on healthy eating or some easy and tasty recipes of fruit and vegetables, please visit the DH's Central Health Education Unit website at http://www.cheu.gov.hk.

Wishing you the best of health in 2013!

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News Bites

Legumes, including soybeans, green peas and string beans, are a class of vegetables that are rich in dietary fibre, protein and antioxidants, but contain little fat and no cholesterol. Moreover, legumes are low glycaemic index foods, which will cause a slower rise in blood sugar levels than starchy vegetables (such as potatoes, taros or sweet potatoes) after ingestion. A study showed that eating more legumes might help people with type 2 diabetes better control their blood sugar and possibly reduce their heart disease risk.

The study followed up 121 people with diabetes who were randomly assigned into two groups: one group was instructed to increase legume intake by at least 1 cup per day (legume group); the other group was told to eat more whole wheat products to boost their insoluble fibre intake (whole wheat group). After 3 months, the study found that haemoglobin A1c levels among the subjects in the legume group dropped 0.5% (from 7.4% to 6.9%), a decrease that is larger than the 0.3% drop among those in the whole wheat group (from 7.2% to 6.9%). The legume group also showed greater reduction in systolic blood pressure (by 4.5 mmHg) and coronary heart risk (by 0.8%) compared with the whole wheat group.

In conclusion, incorporation of legumes as part of a low glycaemic index diet may improve glycaemic control and reduce coronary heart disease risk in people with type 2 diabetes. However, it is noteworthy that sudden increase in the intake of legumes, which are high in fibre, can cause flatulence and abdominal bloating. So be sure to increase legume intake gradually to allow the gut to adapt. Increasing physical activity can also help release gas from the digestive tract and relieve bloating.

[Source: Jenkins DJA, Kendall CWC, Augustin LSA, et al. Effect of legumes as part of a low glycemic index diet on glycemic control and cardiovascular risk factors in type 2 diabetes mellitus. Arch Int med 2012; doi:10.1001/2013.jamainternmed.70.]

Data Brief

A telephone-survey conducted by the Department of Health in April 2012 on over 2 000 community-dwelling people aged 18 - 64 found that 18.5% of respondents drank fruit or vegetable juices (freshly squeezed or those labeled 100% or pure) at least once a week. In fact, eating whole fruit and vegetables is a better choice than drinking juice, as the latter contains only little dietary fibre. Moreover, once juiced, some vitamins present in fruit and vegetables will be lost, with vitamin C in particular, which is easily destroyed by light and air. Fruit juice also elevates blood sugar more quickly than whole fruit. For these reasons, the WHO's 'at least 5 servings a day' recommendation counts any amount of juice consumed in a day as only one serving. So from now on, if you want to be healthier, eat fruit and vegetables in whole form instead of drink their juice.

Frequency of drinking fruit or vegetable juice each week among community-dwelling people aged 18 - 64, 2012

Frequency	Proportion
None	81.5%
1 - 3 days a week	15.1%
4 - 6 days a week	1.6%
Daily	1.8%
Total	100.0%

Base: All respondents excluding refusal.
Source: Behavioural Risk Factor Survey, April 2012 (provisional).

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.