

Editorial

Nowadays, we get information of various products, including "health food" or "health supplements" such as vitamins, fish oil, spirulina, etc., from different media. Some of them claim that they are good for our health. Every now and then, our friends or family members may also recommend us certain healthy food products, thinking that they may be beneficial to us.

In fact, everyone has different health condition, lifestyle and eating habit. We can maintain our health through regular exercise, healthy lifestyle and balanced diet. Do we really need these "health food" or "health supplements"? Can these products improve our health?

To know more, learn more and read more are the features of the new generation. In this issue of newsletter, dietitians of the Student Health Service will give us an introduction on these "dietary supplements".



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Introduction on Dietary Supplements

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Introduction People nowadays are more and more health conscious. Apart from being more aware of daily food choices, there are quite a number of people who consume dietary supplements. They may believe that these products not only help relieve different symptoms and sickness but also enhance their body wellness. Some parents choose these supplements carefully for their children, with the wish that their children shall have a better health and development. According to the 2005-06 Child Health Survey, among children and adolescents aged 2-14 years, over 20% had a habit of consuming vitamins or fish oil every week. This article will introduce several popular dietary supplements and discuss their health claims and effects on health. We shall see whether it is true that they are harmless to consume and the more we eat them, the better is our health.

What is dietary supplement?

There are different 'names' for dietary supplements around the world, such as nutritional supplements, health food products etc. Most of these products are intended for adding on to our usual diet. They include vitamins, minerals, protein/amino acid supplements and some herbal products. Products available on the market are usually manufactured as pills, capsules, powder or liquid for consumption. Several popular products are introduced in the following paragraphs.

Calcium supplements

Function: Calcium is the most abundant mineral in our body, which is an important element of our bones and teeth. Our bones contained 99% of our body calcium stores. The remaining 1% exists in our blood and cells, which help maintain normal functioning of our heart, muscle and nervous system and blood clotting.

Adequate calcium absorption is crucial to children and adolescents to support their growth and development, in particular their bone health and ideal bone density. When calcium absorption is inadequate, our bones will decompose to release calcium to maintain the blood calcium level. In the long run, this can affect bone health and increase the risk of osteoporosis. Therefore, adequate dietary calcium intake is important.

Recommended dietary intake: According to the recommendation by the Institute of Medicine of the United States (IOM), the calcium needs for children and adolescents are as follow:

4-8 years: 1000 mg; 9-18 years: 1300 mg

Food Source: Calcium can be found in a variety of food. Apart from milk and milk products (including cheese and yoghurt), dark green leafy vegetables, fish taken with bones together, bean curd and bean products, nuts are also rich in calcium. The calcium content of some common food is tabulated below:



Food	Portion	Calcium content (mg)
Low fat milk ¹	1 Cup (240 mL)	285
Low fat yoghurt ¹	1 Cup (227 g)	415
Low fat Cheese (Cheddar) ¹	1 Slice(28 g)	116
Pok Choi (Cooked) ¹	1 Bowl (170 g)	158
Chinese Kale (Cooked) ¹	1 Bowl (130 g)	94
Broccoli (Cooked) ¹	1 Bowl (180 g)	72
Canned Sardines (with bones) ²	100 g	240
Canned Salmon (with bones) ²	100 g	221
Black-eye beans (Cooked) ¹	1 Bowl (165 g)	211
Bean curd (hard) ²	100 g	320
Almond ²	100 g	264
Sesame ²	100 g	975

Source: 1. Bowes & Church's Food Values of Portion Commonly Used, 19th Ed., 2010
2. Nutrition Information Inquiry System, Centre for Food Safety

To support the growth and development of children and adolescents, having 1-2 servings of dairy products and dark green leafy vegetables can already consume adequate calcium for their needs. Furthermore, regular exercise and suitable amount of outdoor activities (skin produces vitamin D when it is exposed to sunlight) can help calcium absorption, strengthen bones and promote

growth. In contrast, diet with excessive amount of protein, salt and caffeine can increase the rate of calcium loss. Smoking and alcohol reduce calcium absorption.

Do I need calcium supplements? Because of the children's imbalanced diet and unhealthy lifestyle, some parents choose to give calcium supplements to their children. Sometimes, the dosage is far beyond the recommended intake levels. This can bring side effects to health in the long run. It is recommended that children and adolescents should not consume more than 2500 and 3000mg calcium daily. Consuming excessive calcium may lead to kidney stone formation and hinder iron and zinc absorption. In recent years, there were some cases reported that adolescents with long term calcium supplement intake has an increased risk of calcification of blood vessels, affecting their heart health. Therefore, consuming food rich in calcium regularly can be more beneficial to our health than having regular calcium supplements.



If there were difficulties in obtaining adequate calcium through diet, we can try to have calcium supplement of low dosage to replenish our needs, preferably with dosage of 500mg or below, or together with supplements of vitamin D. It is best to consume the supplements between meals. It is recommended that health care professionals' advice and assessment should be sought before commencing such supplementation.

Multi-Vitamins

Vitamins can be classified as **water-** or **fat-soluble**. Although our body do not need them in large amounts, we do need to obtain different vitamins through our diet to support our cell and organ functions in order to maintain our health.

Vitamin C

Vitamin C is a water soluble vitamin and can be passed out of the body through sweat and urine. It is also heat-labile. Therefore, we should avoid immerse or cook foods rich in vitamin C for prolonged period of time.

Function: Vitamin C can help iron absorption, increase our immunity, help collagen formation to promote cell, teeth, blood vessels and bone growth and repair. It is also an antioxidant. If our body is lacking of vitamin C, it may result in scurvy, gum inflammation, bleeding tendency, tiredness and bone pain, etc.

Recommended Intake: According to the IOM recommendation, vitamin C needs of children and adolescents are as follows:

4-8 years: 25mg; 9-13 years: 45mg; 14-18 years:65-75 mg

Food Source: Citrus fruits (e.g. mandarin, orange, grapefruit and lemon), strawberries, kiwifruit, tomato, green leafy vegetables and capsicum are all rich in vitamin C.

Do I need vitamin C supplements? The common dosage of vitamin C supplements available on the market ranged from 500-1000mg, which exceeds the recommendation by 10-20 times. Long-term consumption can lead to diarrhea and kidney stone formation. To support the normal growth and development of children and adolescents, 1-2 servings of fresh fruits and vegetables rich in vitamin C (as mentioned above) can already meet our body needs.

Vitamin B

Same as vitamin C, vitamin B is another member of water-soluble vitamin. Again, it can be passed out of body through sweat and urine. It is also heat-labile. Therefore we should avoid immerse or cook foods rich in vitamin B for prolonged period of time. Vitamin B also refers to vitamin B complex since it comprises several members including B1, B2, B3, B5, B6, folic acid (B9), B12 and biotin. Among them, B1, B2, B3, B6, folic acid and B12 are common supplements.

Function: Vitamin B1, B2 and B3 mainly help in the metabolism of carbohydrates, fat and protein so that we can obtain the energy from food. They enable the normal functioning of nervous system, heart, muscle and digestive system and promote the health of oral cavity, skin and hair. When there is insufficient amount of these vitamins in our body, problems like beri-beri and tiredness will be resulted, skin and mental wellness may be affected and growth may be hindered.

Vitamin B6, folic acid and vitamin B12 promote production of red blood cell, hormones, enzymes and antibodies. They help in protein metabolism in our body and promote growth. Lacking of these vitamins will lead to anemia, decreased immunity, lethargy, poor muscle health and memory.

Recommended Intake: According to the IOM recommendation, vitamin B needs of children and adolescents are as follows:

	4-8 years	9-13 years	14-18 years
B1 (mg)	0.6	0.9	1—1.2
B2 (mg)	0.6	0.9	1—1.3
B3 (mg)	8	12	14—16
B6 (mg)	0.6	1	1.2—1.3
B9 Folic acid (μg)	200	300	400
B12 (μg)	1.2	1.8	2.4

Food Source: Vitamin B complex can be found in a variety of food, including whole-grain cereals and grains, milk, meat, fish, vegetables, beans and yeast.

Do I need vitamin B complex supplements? As vitamin B complex exist in different food groups, it is rare to be lack of these vitamins if we follow the healthy eating principles and are not very picky. Excessive intake of vitamin B complex may cause gastrointestinal discomfort, vomiting, headache and may affect mental wellness. For those who follow a strict vegetarian diet (with no meat, milk or milk products and eggs consumption), they will need B12-fortified foods e.g. B12-fortified soy milk, whole-grain cereal products and vegetarian meat product to increase B12 intake.



Fat Soluble Vitamins-- Vitamin A, D, E, K

Vitamin A, D, E and K belong to the fat-soluble vitamins family. They are not soluble in water and require fat in our diet for its absorption. Compared with vitamin B and C, these fat-soluble vitamins are more heat stable, and are less likely to be destroyed during washing or cooking. Excess fat-soluble vitamins will be stored in our liver and they are more difficult to be passed out of our body.

Function: Vitamin A is not only an antioxidant, it can prevent eye diseases, promote bone health and growth, maintain skin, hair, nails, cells, respiratory tract and gastrointestinal health. When the body lacks vitamin A, night blindness, dry eyes, dry skin, and gastrointestinal discomfort may be resulted. Bone and teeth health would also be affected.

Vitamin D mainly helps the body for calcium and phosphorus absorption, strengthen bone and teeth health, maintain blood calcium level in normal range. Vitamin E has anti-oxidative properties, which help to maintain skin health, protect red blood cells and increase our immunity. Vitamin K helps in blood clotting, prevent excessive bleeding and maintain liver health. As our body can produce vitamin D with skin exposure to sunlight and our intestinal bacteria can produce vitamin K, it is rare to develop symptoms due to lack of these vitamins. Vitamin E exists in a variety of foods and again, it is rare to have vitamin E insufficiency.

Recommended Intake: According to the IOM recommendation, fat-soluble vitamin needs of children and adolescents are as follows:

	4-8 years	9-13 years	14-18 years
Vitamin A (μg)	400	600	700-900
Vitamin D (μg)	5	5	5
Vitamin E (mg)	7	11	15
Vitamin K (μg)	55	60	75



Food Source: Fat-soluble vitamins widely exist in different food items, including whole-grain cereals and grains, green leafy vegetables, yellowish fruits and vegetables, milk, liver, fish liver oil, egg yolk, nuts and beans etc.

Do I need fat-soluble vitamins supplements? Fat-soluble vitamins are present in different food groups and it is rare to be lack of these vitamins unless the children or adolescents are extreme picky eaters. Excessive intake of fat-soluble vitamins can damage liver health, induce gastrointestinal discomfort, cartilage calcification and skin problems and in long term, affect our growth and development. Therefore, children and adolescents should not consume fat-soluble vitamin supplements carelessly to prevent the possible side effects to their bodies.

Fish oil and Fish liver oil products

Fish oil and fish liver oil products are commonly confused. Quite a lot of people thought that they are the same but in fact they are not. Fish oil products (including fish oil capsules) originated from deep sea fish. The oil extracted from them contains omega-3 fatty acids (including EPA and DHA). On the other hand, fish liver oil is extracted from the liver of fish and thus is a rich source of vitamin A and D, on top of the omega-3 fatty acids.

Omega-3 fatty acid is a member of polyunsaturated fatty acids. It is an essential fatty acid to us because human body cannot manufacture this family of fatty acids by self and we need to consume it through our diet. Different large scale randomized control trials revealed that omega-3 fatty acids can lower blood triglyceride levels, reduce death due to coronary heart disease. There were some researches supporting the blood pressure lowering effect of the omega-3 fatty acids. According to the recommendation by the American Heart Association, healthy adults with no history of cardiovascular disease can consume at least 2 fish meals weekly (preferably fatty fish). Examples of seafood that are rich sources of omega-3 fatty acids include salmon, mackerel, tuna, herrings, sardines, trout, shrimps, crabs, oysters and scallops. The United States Food and Drug Administration recommends that children can consume a variety of fish and seafood to increase their omega-3 fatty acid consumption, but should limit to no more than 12 ounces weekly and avoid having fish with higher mercury levels, such as shark and swordfish. Similar to meat, fish and seafood are rich in protein. When we consume meat, fish, egg and beans groups according to the recommendation outlined in Healthy Food Pyramid (Children: 3-5 taels; Adolescent: 5-6 taels per day), with some fish or seafood meals replacing meat, we can already meet our needs of omega-3 fatty acids. There is no need to take extra supplements.

Vitamin A and D are fat-soluble vitamins, which are absorbed with dietary fat. Excess intake would be stored in our liver and would not be passed out of our body. It should be noted that fish liver oil is not the SOLE source of these vitamins. Vitamin A rich food sources include dairy products, liver, dark-green or yellow fruits and vegetables (the beta-carotene in these foods can be transformed to Vitamin A inside our body). Vitamin D is rich in egg yolks, liver and fish. Apart from these food sources, our skin can manufacture Vitamin D when exposed to sunlight. Therefore, we can already get enough vitamin A and D through a balanced diet and occasional exposure to sunlight. Taking extra fish liver oil can increase the risk of overdose. Excessive consumption of Vitamin A can lead to skin problems, hair loss, poor appetite, weakness, vomiting, gastrointestinal discomfort and liver damage. Excessive consumption of Vitamin D can induce not only calcification of soft bones, vomiting, diarrhea, eye tiredness and itchy skin, but also lead to higher concentration of blood calcium, causing kidney damage and irregular heartbeats.

Consuming large amount of fish oil could result in side effects such as fishy burping, belching, bad breath and heartburn. Omega-3 fatty acids can inhibit function of blood platelets and prevent normal blood clotting. People who are on Warfarin medication should avoid high dose of fish oil products. Fish oil products are extracted from deep sea fish, which is subject to environmental contamination and accumulation of heavy metals, dioxin and polychlorinated biphenyls (PCBs). As such, excessive consumption could affect our health.

Spirulina

Spirulina refers to the blue-green algae usually found in alkaline salt lakes, which are common in Africa and Mexico. Apart from having abundant protein, spirulina contains vitamin B complex, beta-carotene, vitamin E and iron too. In some under-developed areas, there are trial projects cultivating spirulina to improve the malnutrition issue.

Spirulina products commonly available are marketed to be able to enhance body wellness, help improve health problems like allergic rhinitis and diabetes, reduce blood cholesterol level, boost immune function, control body weight and improve attention. These claims are only supported by laboratory or animal studies but not any large scale human studies. In addition, there is currently a lack of scientific evidence to establish safety daily dosage of spirulina consumption for both adults and children.

During its cultivation process, spirulina is subject to contamination in the environment and water and thereby accumulates heavy metals. Excessive accumulation of heavy metals can harm our health, particularly for children, pregnant and lactating women. Some people reported side effects such as headache, flushing, muscle pain and sweating after spirulina consumption. Spirulina is not suitable for those with phenylketonuria, as it contains phenylalanine.

Based on healthy eating principles, it is recommended to limit our protein consumption to 10-15% of total energy intake. For children who need about 1900 Kcal daily, they need about 48-71g protein per day. For adolescents, they commonly need 2400-2650 Kcal and thus about 60-99g protein per day. According to the Healthy Food Pyramid, children aged 6-12 need 3-5 taels of meat, fish, egg and dried beans (1 tael = 40g) and 2 servings of dairy products (1 serving = 240mL), while adolescents aged 12-18 need 5-6 taels of meat, fish, egg and dried beans and 2 servings of dairy products. Meat, fish, eggs and dried beans and dairy products are rich in protein. Grains and cereals contain a little protein, too. Therefore, if we have a balanced diet, we can already get enough protein to support cell growth and repair (see table below for comparison of protein content of different foods) and there is no need to take spirulina as an extra supplement to meet the protein need. Some spirulina products available on the market recommends 2-3 capsules per day. It seems that such recommendation does not have enough evidence to support.

	Weight/ Volume	Protein (g)
Beef (lean)		20.2
Pork (lean)		20.3
Chicken breast (without skin)		19.4
Grass Carp		16.6
Butterfish, white, marine	100g	18.5
Mardarin fish, freshwater	(i.e.2.5 taels)	19.9
Scallop		15.7
Shrimps		18.6
Bean curd		12.2
Low fat milk	240ml	7.9
Spirulina (dried)	100g	57.5

Source: Nutrition Information Inquiry System, Centre for Food Safety

Conclusion : With the growing variety of dietary supplements available on the market and their marketing and celebrity effects, parents may fall in the pitfalls that children must rely on 'extra' dietary supplements to meet their body needs, promote health and development (e.g. brain development). Before considering consumption of these products, parents should first check if their children is attaining a balanced diet, which includes daily consumption of these 4 food groups--- 1) carbohydrates, 2) vegetables and fruits, 3) meat, fish, egg and dried beans and 4) milk. If there is special food preference or dislike, nutrients can be absorbed by choosing different food in the same food group. For example, those who do not drink milk can choose beans and bean products (e.g. high-calcium soy milk) to replace milk; those who dislike fish can choose other seafood to replace. Furthermore, parents can increase the attractiveness of various food by changing the shape and presentation of the food. For instance, cooked tomato with eggs to replace fresh tomato, stir-fried meat to replace steamed meat patties. Last but not least, we can encourage children to participate in food preparation and choosing ingredients to increase their interest in different foods and taste. Balanced diet and regular exercise are the two golden rules for good health. To promote normal growth and development, parents should help their children develop healthy eating habits (i.e. to eat from a variety of food) and lifestyle from young age. If there are diseases affecting nutrient consumption or absorption, or there is a real difficulty in adopting healthier eating habits, we should first consult doctor or dietitian before choosing dietary supplements.



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For 'Health Food' or 'Dietary Supplements' such as vitamins, fish oil and spirulina, my view is ...

I am very cautious about the spread-around messages concerning 'health food'.

Do not eat health food carelessly. One should consult health care professionals first.



If we have a balanced diet, we do not need 'Health Food'.

"Natural" is the best! I would rather eat more fruits such as orange, which is rich in vitamin C and strengthens our body defence, than take vitamin supplements or health food.

In my opinion, there is no need to take 'Health Food' or 'Dietary Supplements' if we have a balanced diet. Excessive intake may cause adverse effects.



I think it is better not to rely on vitamins or fish oil. To absorb enough nutrients, one should be aware of own diet habit. In addition, we should do more exercise to make ourselves healthy.

Most students know that to be healthy, we do not rely on 'Health Food' or "Dietary Supplements". A balanced diet, regular exercise, adequate sleep, good personal and environmental hygiene, staying away from smoking, drinking and drug abuse and being happy are the keys to good health.

Answer :
d In fact, keys to health and prevention of diseases are
* Balanced diet
* Adequate exercise
* Regular lifestyle
* Observe personal and environmental hygiene
* No smoking, alcohol or drug abuse
* Maintain a happy mood

There are many food products on the market being claimed to be health food and can help solve various bodily problems. In fact, healthy diet and lifestyle are the best ways to maintain good health.



Dear Health Box,

Hello! I hope you can help me solve the problem of my bowel habit.

Very often, I empty my bowel only once in more than three days and it is quite difficult for me to pass the stool. I would like to know what kinds of food are beneficial to bowels. Is high-fiber food good?. I heard that some health foods such as aloe vera helps clear the bowels. Is it effective? Do you know which brand of aloe vera is good and cheap?

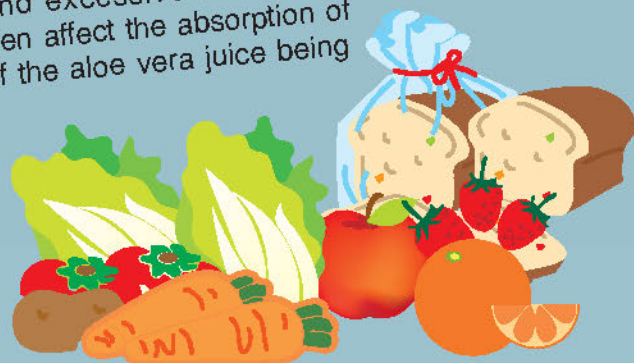
Thank you!
Sau-fong

Dear Sau-fong,

Thank you for your letter. You mentioned your bowel habit problem and you wanted to know the effectiveness of aloe vera. First of all, to relieve constipation, you have to eat more high-fiber food such as vegetables, fruits, whole grain products and drink plenty of water. Besides, you should do more exercise. I suggest you to maintain a well-balanced diet and ensure daily intake of at least two servings of fruits and three servings of vegetables ("2 plus 3 a day"). If you wish to know more information about "2 plus 3", please visit the website of the Central Health Education Unit of the Department of Health at <http://2plus3.cheu.gov.hk>. In addition, you are advised to accumulate at least sixty minutes of exercise everyday, such as rope skipping, jogging or various ball games. If your constipation persists, you should seek advice from medical professionals.

Aloe vera has laxative effect and excessive intake may cause diarrhoea, dehydration and even affect the absorption of nutrients. Sugar is added to some of the aloe vera juice being sold on the market. Consuming these products may increase calorie absorption, resulting in overweight or obesity. I hope that you can adopt a healthy lifestyle and improve your bowel habit.

Wish you good health!
Health Box



Interesting knowledge Q&A

Apple cider vinegar sold on the market is claimed to help lose weight and reduce blood cholesterol when consumed daily. Which of the following is correct about apple cider vinegar :

- a Apple cider vinegar is very often added with honey. We should pay attention to the calorie intake when taking this kind of drink. Excessive consumption may lead to obesity.
- b There is no adequate concrete scientific evidence to prove that apple cider vinegar helps reducing weight and blood cholesterol.
- c If you rely solely on apple cider vinegar to lose weight and do not improve your dietary habit nor increase your exercise level, you will not be able to control your weight. On the contrary, there is a risk of gaining weight instead.
- d All of the above



Young people are in a growing phase, should they take additional supplements such as vitamins, health drinks, etc., to meet the needs of rapid development ?



A balanced diet is enough to provide the nutrients that the body needs. There is no need to take extra supplements. Moreover, excessive consumption of certain supplements may lead to adverse health consequences. For example, too much vitamin A and vitamin C intake may cause damage to the liver and kidney stone respectively.

Health Tips



Health Box

For enquiries of student's health problem, please write to "Health Box"

Please write your name & address, contact tel. no. in the letter.

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