



# A rainbow of veggies

**Vitamins, minerals, dietary fibre, and bioactive substances in fruits and vegetables reduce the risk of several chronic diseases.**

**Y**ES, I know you have heard this before: fruits and vegetables are good for you. You have heard that these foods contain vitamins, minerals and dietary fibre.

But did you also know that fruits and vegetables contain a variety of healthful biologically active components? These bioactive substances also give the beautiful colours you see in fruits and vegetables.

I feel that people may know about the goodness of fruits and vegetables, but they do not take the necessary steps to consume these every day.

We must make greater efforts to encourage our children to eat fruits and vegetables in various colours and forms, from a young age. We want our children to grow up accepting vegetables and other plant foods and benefit from these healthy foods.

I would therefore like to highlight the fourth key message of the Malaysian Dietary Guidelines (MDG) 2010: eat plenty of fruits and vegetables everyday. This message in the MDG explains the nutritional goodness of fruits and vegetables and provide scientific evidence for the beneficial effects of these foods on various diseases.

The message provides tips on how to achieve the recommendation of consuming plenty of fruits and vegetables everyday.

The MDG 2010 is a set of advisory statements aimed at promoting appropriate dietary patterns and active living. I have summarised the 14 key messages contained in the MDG 2010 and dealt in detail four of the key messages in previous write ups in this column.

## The goodness in fruits and vegetables

Nutritionists all over the world recommend the daily consumption of a variety of fruits and vegetables. This is because of the recognised nutritional value of these foods.

The benefit of fruits and vegetables cannot be attributed to a single nutrient or phytochemical in these foods. Indeed, fruits and vegetables supply a variety of nutrients, including vitamins, minerals, dietary fibre, and various bioactive substances.

Some fruits and vegetables are especially abundant in vitamin A and C. Some good sources of beta-carotene, which are precursors of vitamin A, are dark green leafy vegetables such as *sawi*, spinach, *cekor manis*, *kangkong*, *kai-lan*, and yellow and orange fruit and root vegetables such as tomatoes, bell peppers, sweet potatoes, and carrots. Fruits like mango, papaya and watermelon are also rich sources.

Some rich sources of vitamin C are guava, cashew apple, papaya, mango, starfruit and oranges. Many green leafy vegetables also contain folate.

Other sources of folate are peas, okra and sweet corn. Oranges, orange juice, pineapple juice, and plantain also contain folate.

These foods are also good sources of several important minerals that are vital for many metabolic processes. These include potassium, calcium, copper, iron, magnesium and manganese.

As an additional note, in many fruits and veggies, the vitamins and minerals are in their outer peel. Hence, if possible, eat the fruits

with the peels, after cleaning the fruits well before cutting. It is also important to note that vitamin C in fruits are rapidly lost after they are cut or juiced. The cut fruit or juice should therefore be consumed immediately after preparation.

Fruits and vegetables are also good sources of dietary fibre. Fibre is the indigestible polysaccharide portion of plants. The main fibre-rich foods are wholegrain cereals and legumes, and fruits and vegetables.

Fibres are now known to be able to bring about a variety of beneficial effects to health. For example, fibres help proper bowel function, reduce symptoms of chronic constipation, diverticular diseases, and haemorrhoids, and may lower the risk for heart disease and some forms of cancer.

Besides the above nutrients, fruits and vegetables also contain numerous naturally occurring components that possess physiological and health benefits.

Many of these chemicals in plants (phytochemicals) are not traditionally recognised as nutrients, but they are biologically active and have been shown to be capable of reducing the risk of chronic diseases such as diabetes, hypertension and coronary heart diseases.

These phytochemicals also give these foods their beautiful colours. The yellow or orange fruits and veggies contain several carotenoids such as beta-carotene and bioflavonoids, and are found in mango, papaya, pineapple, orange, maize and pumpkin.

Red colours seen in tomato, paprika, berries, and apples may be due to the presence of another carotenoid, lycopene.

The bioactive substances in green fruits and vegetables such as spinach, *sawi*, green paprika and green apples include chlorophyll and bioflavonoids.

Green leafy vegetables are also very high in beta-carotene, the orange colour of this pigment being masked by chlorophyll.

The blue and purple colours seen in brinjal, red/purple cabbage and dragon fruit are due to the presence of anthocyanins and phenolics.

Other healthful phytochemicals in fruits and vegetables are glucosinolates, found in vegetables of the *Brassicaca* family.

Known as cruciferous vegetables, these include cabbage, cauliflower, *kai-lan*, Chinese cabbage, *pak-choy* and brussel sprouts.

## Fruits and vegetables consumption reduce risk of chronic diseases

Sufficient scientific evidence has been accumulated to demonstrate that consumption of fruits and vegetables consumption reduce risk to several chronic diseases such as cardiovascular diseases, hypertension,

cancers, diabetes mellitus and obesity.

Fruits and vegetables contribute to cardiovascular (heart) health through a variety of phytochemicals (antioxidants, bioflavonoids), folic acid, potassium, and dietary fibre contained in them.

The World Health Organisation considers the evidence for fruits and vegetables as convincing for decreasing risk of developing cardiovascular disease (CVD).

It recommends intake of 400 to 500g of fresh fruits and vegetables a day to reduce risk of coronary heart disease, stroke, and high blood pressure.

Findings from large scale community studies have indicated that that a diet rich in fruits and vegetables, in combination with magnesium and fibre intake, may reduce blood pressure levels.

One of the most important outcomes from recent nutrition research is that a diet rich in fruits and vegetables protects against cancer.

There are many mechanisms by which fruits and vegetables are protective. Studies have shown that phytochemicals can prevent and interrupt the development of cancer.

Some phytochemicals protect the body by preventing carcinogens (cancer-causing substances) from becoming active. Other phytochemicals interfere with the cancer cell formation process.

Several other studies have indicated that increased consumption of fruits and vegetables may reduce the risk of progression of impaired glucose tolerance to type 2 diabetes. The protective effect from fruits and vegetables against diabetes is usually observed in the presence of dietary fibre, especially with whole grains.

A significant inverse association between fruit or vegetable consumption and weight gain has also been reported, i.e. greater fruit and veggie consumption is associated with lower weight gain.

The mechanism for this association is uncertain. It may be because dietary fibre induces greater satiety, and thereby reduces food intake.

## MDG Key Message 5: Eat plenty of fruits and vegetables everyday

MDG 2010 has highlighted the nutritional value of fruits and vegetables and the importance of consuming them.

These are placed at the second level of the food pyramid, and consumers are recommended to "eat more" of fruits and vegetables.

There are three key recommendations within this key message. Within each of the following key recommendations, the MDG has provided several tips on how to achieve these recommendations.



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### 1. Eat a variety of fruits everyday

a. Eat different types of fruits for every meal.

b. Fruits can be fresh, canned, naturally dried and unsweetened and 100% fruit juice without added sugar and preservatives.

### 2. Eat a variety of vegetables everyday

a. Eat dark green leafy vegetables such as *sawi* and *kai-lan* and their edible stems several times a week, preferably everyday.

b. Have different coloured vegetables for lunch and dinner.

c. Eat non-leafy vegetables such as capsicum, *peria* and *petola* several times a week.

d. Vegetables can be fresh green leafy vegetables, other fresh vegetables, including various coloured vegetables, fruit vegetables, bean vegetables, *ulam-ulam*, canned and frozen vegetables.

### 3. Eat at least five servings of fruits and vegetables everyday

a. Eat at least three servings of vegetables and at least two servings of fruits a day.

b. Eat at least one serving of fruit and one serving of vegetables at every meal.

c. Fruit juices may replace not more than one serving of fruit.

## Enjoy the colourful goodness

Fruits and vegetables are placed at level two of the Malaysian Food Pyramid. The MDG recommends "eating more" fruits and vegetables, with at least five servings of fruits and vegetables daily. The recommendation is to consume at least three servings of vegetables and at least two servings of fruits each day.

We call this the "Take 5-A-Day" recommendation. It should be noted that fruits and veggies are not interchangeable, which means that you cannot take four servings of fruits and only one serving of vegetables.

It is not difficult to understand the concept of "servings". A serving of fruit can be a small- to medium-sized orange or apple; a medium-sized banana (e.g. pisang berangan),

or ½ a medium-sized guava or pear; a slice of papaya, watermelon, or pineapple. A serving of vegetable equals ½ cup cooked dark green leafy vegetables with edible stems or ½ cup cooked fruit vegetable (eg tomato) or root vegetable (eg carrot).

Take note of the various tips provided in the MDG on how to achieve the recommended intake. Everyone in the family can consume fruits and vegetables in many ways to meet the recommendations.

I must emphasise that the recommendation to consume five servings of fruits and vegetables daily is what we must have, not something that is good to have. Pay close attention towards meeting the five-a-day recommendation. Enjoy the colourful goodness of fruits and vegetables. At the same time, load up our bodies with the essential nutrients to prevent deficiencies as well as various chronic diseases.

The complete MDG is obtainable from the Health Ministry website [www.moh.gov.my/v/diet](http://www.moh.gov.my/v/diet). The Nutrition Society of Malaysia has also made available leaflets of these MDG suitable for the public ([www.nutriweb.org.my](http://www.nutriweb.org.my)).

■ *NutriScene is a fortnightly column by Dr Tee E Siong, who pens his thoughts as a nutritionist with over 30 years of experience in the research and public health arena. For further information, e-mail [starhealth@thestar.com.my](mailto:starhealth@thestar.com.my). The information provided is for educational and communication purposes only and it should not be construed as personal medical advice. Information published in this article is not intended to replace, supplant or augment a consultation with a health professional regarding the reader's own medical care. The Star does not give any warranty on accuracy, completeness, functionality, usefulness or other assurances as to the content appearing in this column. The Star disclaims all responsibility for any losses, damage to property or personal injury suffered directly or indirectly from reliance on such information.*