



Meet your daily energy and nutrient needs by consuming adequate amounts of whole grain cereals.

**T**HE body needs energy for various vital body processes, including maintaining body temperature, metabolic activity, supporting growth, and for daily physical activities. This energy need is met by the foods we consume daily.

The required energy is derived from metabolising ("burning") carbohydrates, fat, and protein contained in food. Nutritionists recommend that the bulk (55-70%) of the energy needs of a person is to be met by carbohydrates; 15-30% from fat; and the remaining 10-15% from protein.

We should thus consume adequate amounts of carbohydrate-rich foods to supply the energy we need. The main foods rich in carbohydrate are rice, other cereals, and tubers.

Let us therefore discuss the fourth key message of the Malaysian Dietary Guidelines (MDG) 2010: eat adequate amounts of rice, other cereal products (preferably whole grain), and tubers.

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 with in detail three of the key messages in previous write ups in this column.

This key message highlights the importance of consuming cereals and cereal products as well as tubers. These foods are the preferred source of energy and should be relied upon to supply most of our daily energy needs.

Whole grain cereals are particularly recommended as they contain numerous other needed nutrients. They form the base of the pyramid and should be consumed the most, relative to the other food groups.

### Cereals are important food sources

Cereals and cereal-based products are the most important source of food and provide the major source of energy and protein. The cereals most commonly consumed by the world population are wheat, maize, rice, barley, sorghum, oats, rye and millet.

Eating enough cereal foods help to ensure an adequate nutritional intake. Cereals are an excellent choice to provide more than 55% of total energy.

For billions of people, particularly those in developing countries, rice is the main source of calorie. In addition, rice, especially undermilled rice, is also a source of other nutrients such as fibre, several B vitamins and several minerals.

For these reasons, cereal whole grains form the basis of diets in many different cultures and cuisines for 3,000 to 4,000 years. Indeed, most current dietary guidelines have cereal foods as the largest component of the recommended daily food intake.

Unfortunately, within the past 100 years or so, a majority of the population has consumed refined grain products.

Recognising the nutritional value of cereal foods, the Food Pyramid of the MDG 2010 has placed cereals and cereal products at the base of the pyramid and recommends that these should be consumed the most, relative to other food groups. It certainly does not mean that these foods can be consumed in large amounts.

We need to remember that excessive intake of such food will result in too much carbohydrate intake and can lead to excessive energy intake. This, in turn, can lead to overweight and obesity. Consume just adequate amounts according to your age, gender, and daily activities.

# Focus on cereals and tubers



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### Whole grain cereals are more nutritious

The term whole grain is frequently used in connection with cereals, e.g. wheat, rice, maize, oats, rye. Whole grains, as well as foods made from them, consist of the entire grain seed (called the kernel). The kernel is made of three components: bran, germ, and endosperm.

Whole grains have a high content of carbohydrate and nutrients. The bran and germ are rich in dietary fibre; nutrients, e.g. several B vitamins (like thiamine, niacin, vitamin B6); minerals (like iron, zinc, magnesium and phosphorus); and beneficial phytochemicals (like phenolic compounds, phytoestrogens and plant sterols). The endosperm is rich in starch and is a good energy source.

During the grain-refining process, the bran and germ of the grain are removed and only the starchy inner part of the grain remains. The grain is now termed as refined-grain product, e.g. refined or white rice, refined wheat flour.

With the removal of the bran and germ, which contain the major amount of nutrients and dietary fibre, the nutritional value of the refined product is drastically reduced.

The MDG 2010 has therefore recommended that when cereals are consumed, the whole grain varieties are preferred to be eaten. The consumption of whole grains in the country is still very low. Consumers are encouraged to look for products containing whole grains, e.g. whole grain bread, biscuits, breakfast cereals.

When a label of such products claim they are made from whole grains, do look out for those that state the amount or percentage of whole grains that it contains. Select those with more whole grains in them.

### Main cereal foods of Malaysians

Rice is the staple food of this country. Almost the whole population consumes rice twice daily, sometimes as porridge. White rice is invariably the choice of the population.

Greater efforts should be made by the community to consume under-milled rice or brown rice as they are of much higher nutri-

tional value.

A variety of rice products are also consumed. These include a variety of products made from rice flour, and include several noodle-type products, such as mee-hoon, mee-sua, kueh-teow, lo-see-fun and mee-laksa. These are useful ingredients to prepare rather complete meals, after adding some meat or fish products plus plenty of vegetables.

You should prepare these meals with less oil and coconut milk. There are also several local "kuih" made from rice flour, e.g. *bidaran*, *kuih kasui*, *kuih bom*, *kuih buah Melaka*, *kuih karas*, *kuih koci*, and *kuih talam*. These foods should be consumed only in moderate amounts as many of these are high in sugar and contain coconut milk.

A variety of wheat flour products are consumed by wide segments of the community. Bread is certainly the most common one. The preference should be for the healthier alternatives of whole grain or wholemeal bread, as well as those with other grains added.

A number of products made from wheat flour is also commonly consumed, the most popular being noodle (*mee*). Cake is also made from wheat flour, but we should take note that it could be high in fat and sugar. Several local "kuih" are also made from wheat flour, e.g. dumpling, *kuih apam*, *apam balik*, and *kuih ketayap*.

As for rice flour products, we should opt for varieties of these that contain less sugar, coconut milk and fat.

### Tubers are also good sources of energy

Tubers are the fleshy underground swelling of stem or root strands that normally contain varying amounts of starch. Root and tuber crops are consumed as food in many countries in the world.

However, their contribution to the energy supply of the population varies within a large range, depending on the country.

Many species and varieties are consumed but three species such as cassava, potato, and sweet potato provide more than 90% of the root and tuber crops used for direct human

consumption.

Tubers are also sometimes consumed in this country. The common tubers include cassava, potato, sweet potato and yam. Tubers are also rich in carbohydrates, with similar protein levels compared to cereals. But their fat content is very low, resulting in slightly lower energy levels than that of cereals.

The MDG 2010 has grouped tubers together with cereals and cereal products, placed at the base of the food pyramid.

I would like to promote the consumption of red varieties of sweet potato and yam, in view of their interesting flavours and the carotenoids they contain.

### Changes in cereal and tuber consumption

The food balance sheet data of the Food and Agriculture Organisation (FAO) provides information on the trends of "consumption" of major food items in Malaysia. Examining the data over the past 45 years, the contribution of cereals to total daily energy was found to have declined dramatically, from an initial value of 60% in 1961, to about 46% in 2007.

The contribution of roots and tubers to daily total energy remained at a low level of around 2% over the last four decades. Further increase in the consumption of these food crops can be encouraged.

The decline in energy contribution by cereals over the years has been replaced by increase in consumption of meat, fish, and egg. This group of animal foods contributed to 6% of total daily energy in the 1960s and increased steadily to about 13% in 2007.

Increase in energy contribution was also from fats and oils (mostly plant oils), which increased from 12% to 15% over the same time period. There was also an increase in energy intake from sweeteners, from 10% to 13%.

Such changes in food consumption pattern have important impact to the nutrient intake of the population. The lowered intake of cereals is expected to give rise to a decrease in consumption of dietary fibre, some B vitamins and minerals, and several beneficial phytochemicals.

On the other hand, the increase in intake of animal foods and fats and oils is expected to result in increased intake of total daily energy, saturated fat, and cholesterol. These changes in nutrient intake have important implications and are believed to play an important role in the increase in obesity, heart disease, diabetes and cancers that we have witnessed in this country over the past four decades.

Let the MDG 2010 guide you and your family members in adopting healthy eating habits and an active lifestyle. The complete MDG is obtainable from the Ministry of Health 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 at [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.*