

PROMOTING TROPICAL AND SUBTROPICAL FRUITS FOR HUMAN HEALTH

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ABSTRACT

*F*ruits have a special place in the diet of humans. They are recognized as nutritious because of the variety of nutrients they contain, in particular several vitamins and minerals. Worthy of special mention is the variety of carotenoids and other phytochemicals in fruits, especially tropical and subtropical fruits. Other vitamins such as vitamin C are also recognized as synonymous with fruits. Fibre is another important component of fruits. Thus nutritionists have always emphasized the importance of consuming more fruits for the promotion of human health. Almost all dietary guidelines of health authorities of the world emphasize the importance of consuming more fruits. The consumption of fruits in developing countries has not increased significantly over the years. It is thus important to continue to adopt various strategies to promote their consumption amongst all levels of the community. The Ministries of Health and Agriculture should continue to aggressively promote this. There should be more sustainable efforts and with greater reach to all levels of the community. The professional bodies such as the Nutrition Societies can also play vital roles in this effort, including collaborative efforts with the Ministries. The Nutrition Society of Malaysia has been conducting various activities to promote healthy eating amongst the communities. These include conducting talks, nutrition road shows amongst various community groups, publication of recipe book and leaflets, and dissemination of messages through the newspapers and magazines. A major project for this purpose was the setting up of its own web site, <http://nutriweb.org.my>, to disseminate messages widely to the public. Another dedicated nutrition education programme, targeted to young children, is the Bright Start Nutrition project. The importance of fruit consumption is of course mentioned in all these educational efforts. The Society will consider giving greater attention to consumption of fruits in all these strategies and programmes. At the same time, there should also be efforts to further improve the production of fruits and to make them more easily available and more affordable to the communities.

Introduction

Fruits play an important role in human diet. They have been looked upon as the "food of the gods" because of their nutritional and medicinal values. They not only supply the various vital nutrients essential to a healthy and well balanced diet but also satisfaction and enjoyment after consumption.

Fruits are an exciting and delicious way for health conscious consumers to get their daily intake of nutrients into their diet. A well balanced diet which include recommended amount of fruits, coupled with proper exercise can keep us on the road to good health. Fruits are excellent sources of traditional nutrients such as fibre, vitamins and nutrients as well as the components of great concern i.e. phytochemicals.

Nutritional value

Fruits provide readily available energy in the form of sugars as well as some vitamin A, vitamin C and minerals depending on the fruits. The carotenoid (precursor of vitamin A) content of papaya (4,125mg/100g edible portion), starfruit (1,710mg/100g edible portion) and mango (615mg/100g edible portion) were found to be relatively high (Figure 1) (Tee *et al.*, 1997). Guava (152mg/100g edible portion), longan (72.1mg/100g edible portion) and papaya (71.0mg/100g edible portion) are good sources of vitamin C (Figure 2). Edible portions of some fruits such as banana (Mas variety), pomelo and jackfruit contained appreciable amount of potassium ranging from 310 to 342mg/100g (Figure 3).

Most fruits are easy to digest. Generally, they are good sources of fibre. Sapodilla (8.1g/100g edible portion), jackfruit (4.4g/100g edible portion) and durian (3.6g/100g edible portion) have comparatively high amount of dietary fibre (Figure 4) (Puwastien *et al.*, 2000). Unripe fruits are often high in starch and organic acids, thus making them taste very sour. The starch is converted to sugars only when the fruits ripen. Most fruits contain relatively very low amounts of fat except for avocado (19g/100g edible portion) and durian (3.4g/100g edible portion) (Figure 5). The protein content in fruits is also relatively low i.e. less than 3g/100g edible portion. Fruits are generally low in calories but avocado (180kcal/100g edible portion) and durian (153kcal/100g edible portion) had appreciable amounts of calories (Figure 6).

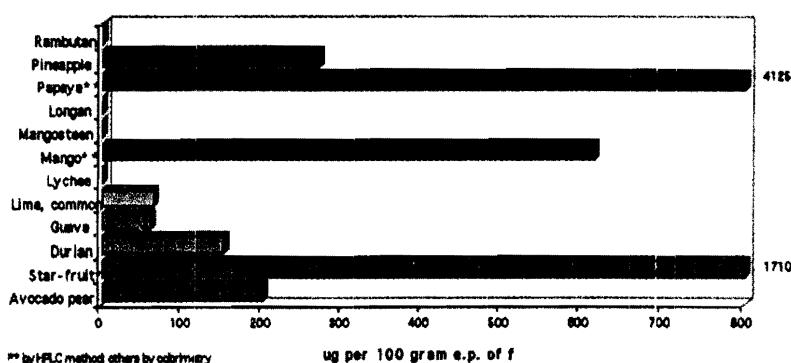


Figure 1. Carotenoid content of selected tropical fruits

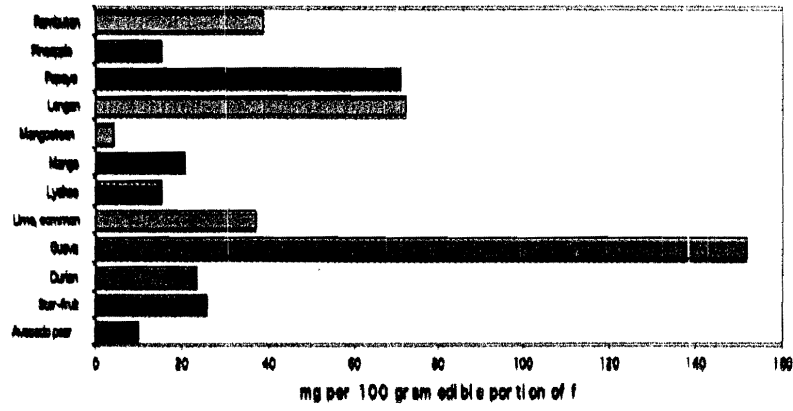


Figure 2. Vitamin C content

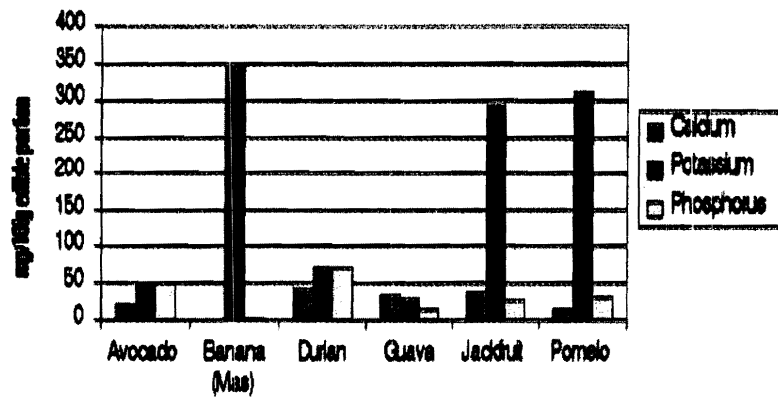


Figure 3. Mineral content

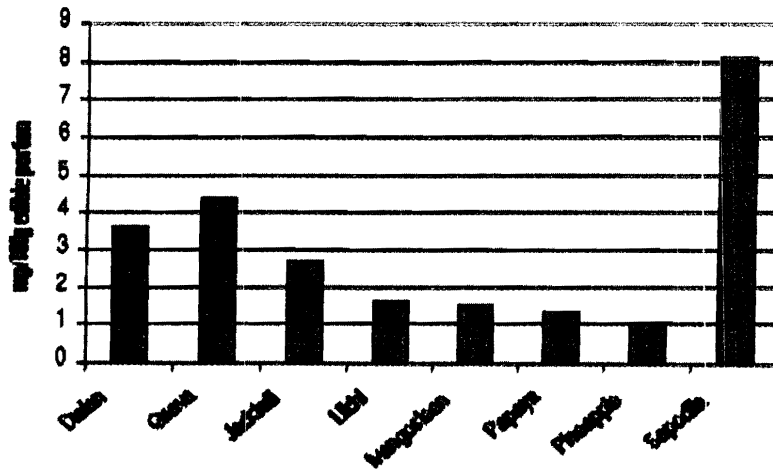


Figure 4. Dietary fibre content

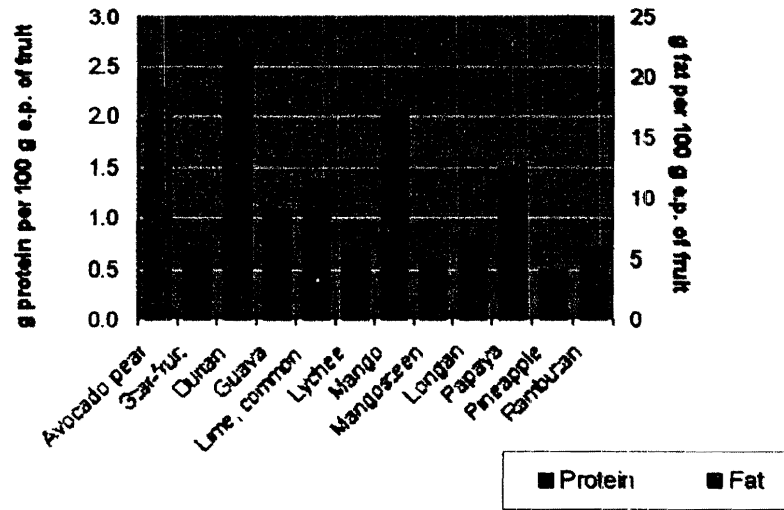


Figure 5. Protein and Fat content of selected tropical fruits

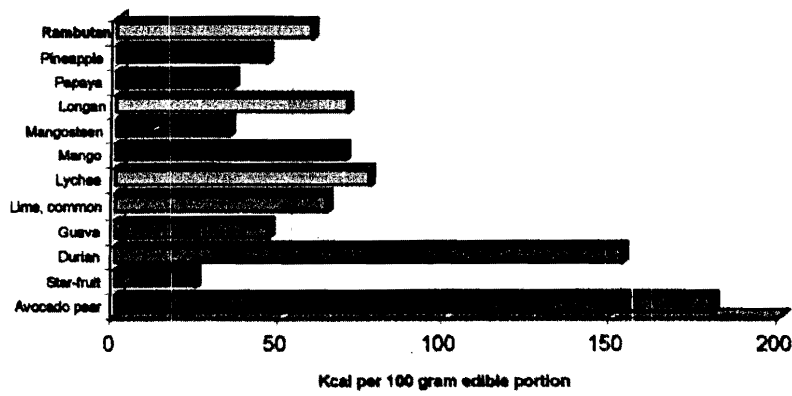
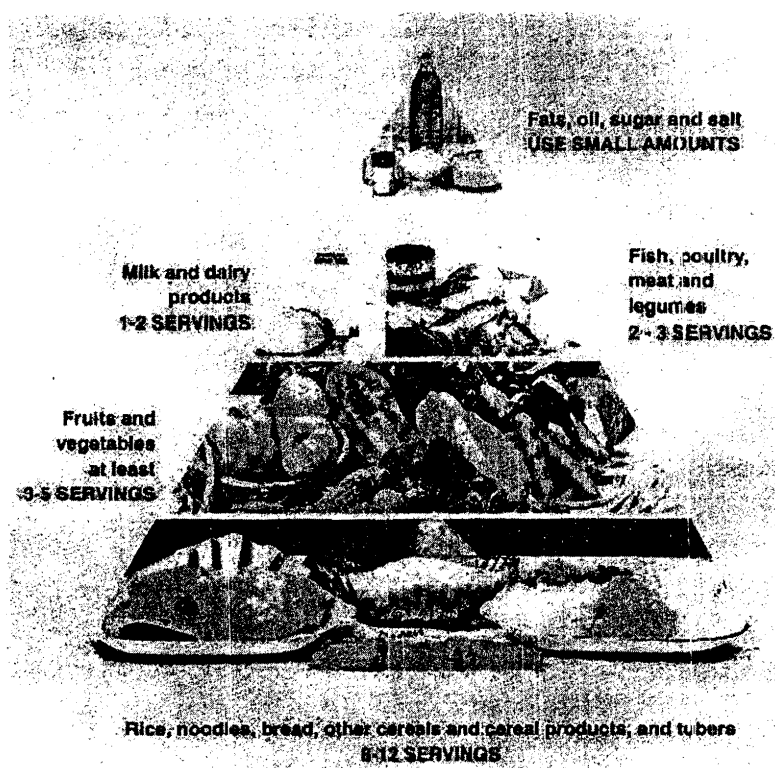


Figure 6. Energy content

Nutritionists and dieticians have often reminded the importance of consuming fruits as one of the ways to good health. The dietary guidelines developed in many countries have emphasized eating fruits (and vegetables) (Table 1). The "eat more" of these foods appears at level two of the food pyramid. The Malaysian dietary guidelines recommend consumption of 3–5 servings of fruits (and vegetables) (Figure 7).

Table 1: Fruits and the dietary guidelines developed by the authorities in several countries

Countries	Fruits and the dietary guidelines
Australia	Eat plenty of bread, cereals, vegetables (including legumes) and fruits
Bangladesh	Eat plenty of vegetables and fruits everyday
Brunei	Increase intake of fruits, vegetables and whole grain cereal products
China	Eat plenty of vegetables, fruits and tubers
Malaysia	Eat more rice and other cereal products, legumes, fruits and vegetables
Singapore	Increase intake of fruits, vegetables and whole grain cereal products
Thailand	Eat plenty of vegetables and fruits regularly
U.S.A.	Choose a diet with plenty of grain products, vegetables and fruits

**Figure 7: The Malaysian food pyramid**

Consumption levels

The consumption of fruits in the developing countries including Malaysia has not increased significantly in the last three decades. The per capita apparent consumption of fresh fruits in the developing countries was reported to be relatively stable with a growth rate of 0.38% (1986–95) (Segre *et. al.*, 1998). China has registered the highest growth rate (6.43%), while African and Near East Asian countries have shown a decrease (Table 2).

Hence, there should be greater awareness amongst consumers including the lower income groups of nutritional value of fruits. Various strategies are required to promote fruit consumption. Some of them can be carried out through joint efforts between the Ministries of Health and Agriculture or through quasi-government bodies such as Federal Agricultural Marketing Authority (FAMA) in Malaysia.

Table 2: Summary of per capita fruit consumption (apparent)* in developing countries

Developing countries	Average 1986–90	Average 1991–95	Annual growth rate 1986-95
	Kg per capita	Kg per capita	%
North Africa	90.56	91.78	-0.13
Sub-Saharan Africa	72.36	69.77	-0.83
Central America	137.25	133.21	0.08
South America	170.59	179.65	1.47
China	31.72	43.63	6.43
Near East in Asia	176.39	171.70	-0.73
East & South East Asia	59.71	60.82	0.10
South Asia	32.95	37.63	1.72
Oceania developing	200.08	195.93	-0.05
Average developing	107.96	109.35	0.38

Source: World tables on fruits and vegetable development (derived from FAO database)

*[Production + (Import – Export)]/Population]

Promotional Efforts

The promotional efforts have to be more sustainable in nature and lasting longer periods of time rather than having impressive launches but unsustainable programmes. The contribution of professional bodies and non-government organisations in the promotion programmes can be significant.

Healthy Lifestyle Programme

The *healthy lifestyle* campaign by the Ministry of Health aims to create awareness among the public on lifestyle related diseases and to promote a healthy lifestyle

among the Malaysian public. It is still in progress. The first phase (1991–96) emphasised mainly on diseases while the second phase (1997–2002) on behaviour modification with regards to major lifestyle diseases. This campaign is encouraged to continue and provide emphasis to promoting fruit consumption.

Healthy Eating Messages

Healthy eating messages which had been developed and widely disseminated throughout the country via various means including media frequently stressed on fruit consumption. The Nutrition Society of Malaysia (NSM) had published and sold 70,000 copies of a recipe book entitled "Healthful recipes, the wise choice" at minimal price. The book was written by a team of professional nutritionists and dietitians from authoritative organisations.

Another major achievement by the NSM which aids in dissemination of healthy eating messages was the establishment of a nutrition based e-community web page (<http://nutriweb.org.my>) in the year 2000. The NSM hopes to:

- Empower the public to make wiser choices in the selection and preparation of foods;
- Facilitate more effective communication among nutritionists and related health professionals;
- Promote greater awareness of trends in healthy food processing and handling; and
- Provide the media with access to the right information for dissemination to the public.

Reaching Out To The Community

The NSM being a professional non-government organisation is committed to promote healthy nutrition amongst Malaysians. We anticipate to reach out to the various levels of the community with series of nutrition road shows so as to inform and acquaint the public with matters related to food, nutrition and health. Through these road shows the NSM hopes to contribute towards inculcating a culture of healthy eating amongst Malaysians. One of the popular activities conducted during the road shows includes health screening for risk of cardiovascular diseases and diabetes. The screened risk factors are weight, height, body mass index (BMI), body fat, blood pressure, blood cholesterol and glucose. At the end of the screening process participants will be advised by professional nutritionists and dietitians. Participants with high risk will be encouraged to seek professional medical advice.

In the year 2000, the NSM managed to screen 5,143 participants. These road shows started in 1997 and were mainly conducted in the Klang Valley. However, we plan to carry out more of these activities outside the Klang Valley in future.

Bright Start Nutrition Programme

Bright start nutrition is an educational programme on nutrition of children during their formative years. It was launched by the Nutrition Society of Malaysia to commemorate the World Children Day on 25th October, 2000. The programme dedicated to the nutritional needs of toddlers and pre-schoolers, is the first of its kind in Malaysia. It is supported by the Dutch Lady Nutrition Centre, the nutrition education arm of the Dutch Lady Milk Industries Berhad.

An advisory panel comprising of nutritionists, dieticians, paediatricians, educationists, a psychologist and healthcare consultants is involved in developing related guidelines and activities. The first Malaysian nutrition guidelines developed for young children stressed on taking more than two servings of fruits daily. The activities include:–

- compiling and dissemination of various educational materials including booklets to children, teachers, caretakers and parents;
- educational activities through the mass media and dissemination of information via the web site, <http://nutriweb.org.my>; and
- workshops, seminars, counselling and training on child nutrition and kindergarten visits.

This programme will help to further educate parents and relevant adults to ensure that children are provided with nutritionally appropriate foods from an early age. Meanwhile the young children will acquire the foundation for making healthier food choices through life.

Conclusion

Greater efforts are required in the promotion of fruit consumption for nutritional benefits. All parties including professional bodies can play an important role in the promotion. Consequent efforts to further improve the production of tropical and subtropical fruits and making them more easily available as well as more affordable should be more effectively carried out.

The nutritional quality of fruits can be further improved, such as increasing the nutrient contents of vitamins, minerals and soluble fibre, without compromising on the other desirable characteristics e.g. taste and yield. Nutritionists and agronomists should work hand in hand to achieve the desirable targets. Nutritionists, dieticians and food technologists can also look into more and interesting ways of consuming fruits by creatively formulating novel recipes.

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