Trends and Market Development – Consumption Dynamics of Soymilk in Malaysia

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Introduction

Legumes are the earliest food crops cultivated by man. They belong to the large family of Leguminosae, comprising over 13,000 species. However, only about 20 species are eaten by human beings regularly and in appreciable quantities. Examples of legumes are groundnut, peas, dhal, lentils, green gram, black bean, etc. One of the most important in this family is soybean *(Glycine max)*. Soybean has been an important source of protein in China for over 2 millenia. Emperor Shen Nung, in 2838 BC described the five principal and sacred crops as rice, soybean, wheat, barley and millet. A thousand years later, it reached Japan and Southeast Asia, including Malaysia, and then much later in Europe and USA.

Soybean has become a widely consumed food item by all ethnic groups in Malaysia, especially among the Chinese community. This paper provides an overview of the consumption of soybeans and soybean products in the country. Focus is given to the trends in consumption of soybean milk as well as some insight into market development of this nutritious beverage. Some aspects of consumer perspective of soybean milk consumption are also provided.

Consumption of Soybean and Soybean Products

Soybean as part of a healthy diet

The high nutritional content of soybeans has long been recognized. It is a good source of protein (34 gm per 100 gm), higher than in meat and fish. Its fat content is not exceptionally high, although higher than in meat and fish, but lower than that of peanuts. The bean also contains fair amounts of certain vitamins and minerals and is a good source of fibre. The energy content of soybean is similar to other cereals (wheat, rice, etc). The protein quality of soybean is good, based on its amino acid composition. It is limiting in sulphur amino acids (methionine and cystine), but high in lysine which is low in cereals. Thus, mixing of different legumes and/or with cereals improves protein quality.

Legumes, therefore, form an important component of a healthy eating pattern, as recommended in the Healthy Eating Campaign of the Ministry of Health Malaysia. They are placed at level 3 of the food pyramid, along with fish, poultry and meat (and milk), and 2-3 servings per day are recommended. One of the prime messages of the Campaign is "choose a diet

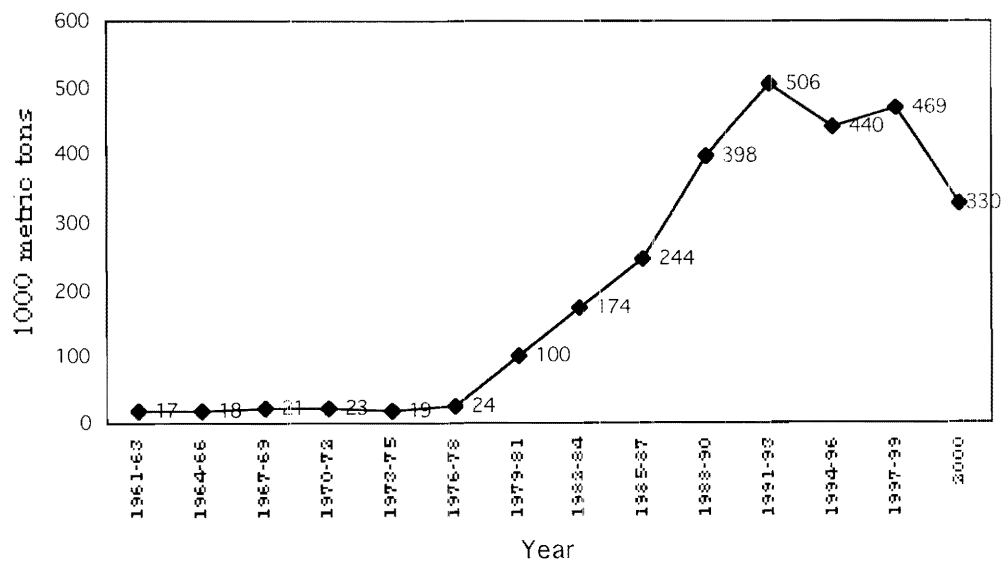
with plenty of cereals and legumes". Soybeans, for example, have been recognized as good alternatives to meat and relatively low in fat and are good sources of protein and fibre.

A wide range of soy products have become common food items in the diet of Malaysians, particularly among the Chinese. Nevertheless, the other ethnic groups are also fast adapting soy products into their cuisines. The most common of these products include soybean curd *(tau-hoo; tau-kua; tau-hoo pok, fu-cuk)*, soy sauce, soybean paste *(tau-ceo)*, tempeh, sprouted soybean *(tau-geh)*, *tau-hoo fa* (a sweetened soybean curd, usually consumed as a dessert) and, soymilk or soybean milk. Malaysians also have a variety of fascinating ways of preparing soy product dishes. They may be steamed, fried or cooked on a hot plate. They are frequently cooked with seafood or meat. In a popular dish known as *yong-tau-foo*, soy products are stuffed with minced fish meat. Vegetarian dishes in the country also rely largely on soy products in their formulations.

Trends in soybean availability

The amount of domestic supply of soybeans available in Malaysia over the last 40 years is given in Figure 1. These were extracted from food balance sheet (FBS) data of the Food and Agriculture Organisation (FAO, 2001). The total domestic supply of a food commodity in the FBS is calculated as the amount of the commodity produced plus imports and stock changes, minus any amount exported. Malaysia does not produce soybeans. Thus, the domestic supply data presented in the chart are based on imports.

Figure 1. Trend of domestic supply of soybeans in Malaysia.



Source: FAO (2001)

The chart shows that the amount of soybeans available in the country was low (around 20,000 metric tons) and did not change much from the 1960s till the end of 1970s. From the 1980s, the domestic supply of soybeans increased steadily over the years until it reached a high level of 400,000 metric tons. Such data are, of course, not consumption data as it includes usage for crushing industry and for animal feed use, but it does indicate that the amount of soybeans available to the population has increased tremendously over the years. The downtrend between 1998-2000 is probably a reflection of the economic slow down affecting all sectors.

Soymilk Consumption in Malaysia

Soymilk in the diet of Malaysians

Soymilk is probably the most widely consumed soy product. In Chinese, it is known variously as *tow cheong, tow cheong suei, tow nai* or *tow suei*. It is also now widely consumed by Malays and Indians. In the Malay language, it is known as *susu kacang soya*.

Soymilk has been recognised as a nutritious beverage. It is a good source of protein, does not contain lactose (thus of benefit to individuals allergic to this milk sugar), relatively lower in fat and, being a plant food, it does not contain cholesterol. The nutrient content of a 250 ml packet of soymilk is presented in Table 1. At up to 9.3 gm protein content, soymilk is comparable to and can be slightly higher in protein than that of fresh milk whereas its fat content (3.0 g) is only a third that of fresh milk. Consequently, the energy value of a pack of unsweetened soymilk (148 kcal) is slightly lower than that in fresh milk. The Food Regulations 1985 (Ministry of Health Malaysia, 1985) stipulates minimum protein content of soymilk to be not less than 2% w/v protein whereas that of soybean drink should contain not less than 1.5% w/v protein.

Soymilk has become a popular beverage amongst all communities, available in all parts of the country including in coffee shops and street vendors. Many of these outlets sometimes operate under rather unhygienic conditions. The composition or quality of such drinks can also differ considerably in the

Table 1. Nutritional value of 1 packet (250 ml) of soymilk.

Energy (Kcal)	148
Carbohydrate (gram)	21.0
Protein (gram)	9.3
Fat (gram)	3.0
Ash (gram)	1.8
Water (gram)	215.0

Source: Tee *et al.* (1997)
Nutrient Composition of Malasian Foods, 4th Edition.

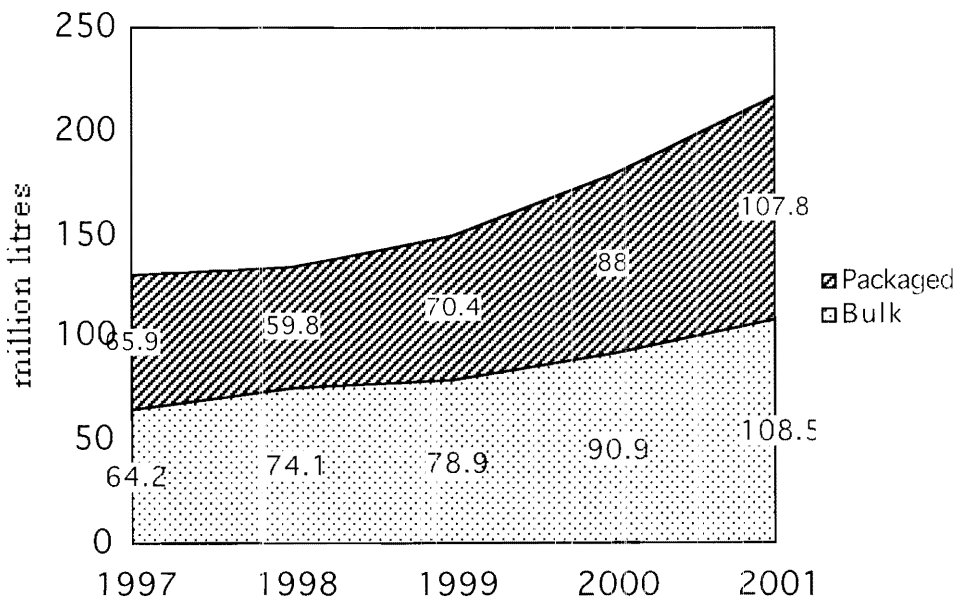
various outlets.The consumption of soymilk in packages may be better alternatives.The consumption of these soybean packs has been increasing over the past five years.The main reason for this wide acceptance of packet soybean milk is the introduction of aseptic packaging technology for packaged foods. Aseptic filling helps prevent product contamination, and protects against spoilage and deterioration of quality.This packaging technology has revolutionised handling of sensitive foodstuffs which now do not require refrigeration and yet are able to maintain quality for months with no added preservatives. This has brought about tremendous economic and environmental benefits.

Sterilised packaged soymilk has been promoted as a hygienically processed beverage, hygienically packed to retain its original nutrients and flavours and is free of preservatives. It stays fresh without refrigeration for several months and is able to provide better or more uniform quality of product. Another very important contributing factor to the success of packaged soymilk is its convenience.

Trends and market development of soymilk

Data obtained from the soymilk industry have indicated clearly that there has been an increasing trend of soymilk consumption in the country, both in the ready-to-drink (RTD) packaged forms as well as those sold in bulk (Figure 2).The latter are usually sold unbranded to hawker centres, coffee shops, restaurants, etc.The volume of RTD packaged forms increased from 64

Figure 2. Ready-to-drink packaged forms versus bulk.



Source: Tetra Pak (2001)

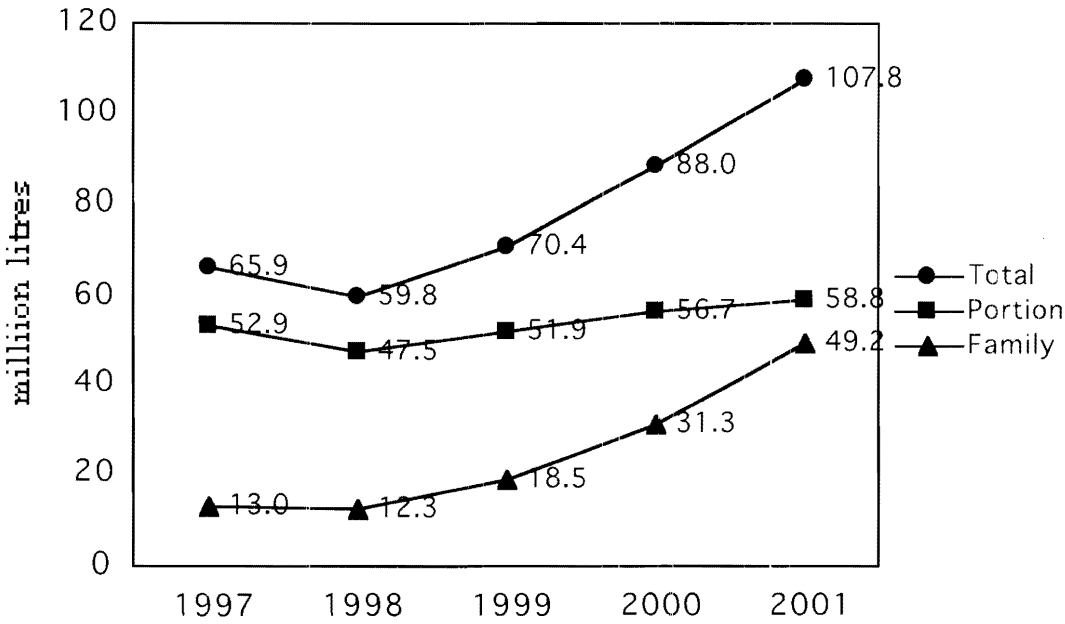
million litres in 1997 to 108.5 million litres in 2001, an increase of 69%. The increase in bulk soymilk was similar during this time period, from 65.9 to 107.8 million litres or an increase of 64%.

With regards to the RTD packaged soymilk, the breakdown according to "portion" (packets of 200 or 250 ml, often consumed by one individual) and "family" (usually 1 litre packs, shared with the family members) is given in Figure 3. It can be seen that the quantity according to portion is much larger than that for the family and the former remained relatively stable over the five-year period. The latter, however, increased markedly from 1999 till it reached a level close to that for the portion. Thus, it would appear that more families are purchasing large packets of soymilk for consumption by family members.

Taking the 2001 total RTD packaged soymilk, amounting to 107.8 million litres, for further examination, the various types of packaging are indicated in Figure 4. Slightly more than half (62%) of this was ambient cartons. The next most common packaging was the can (21%).

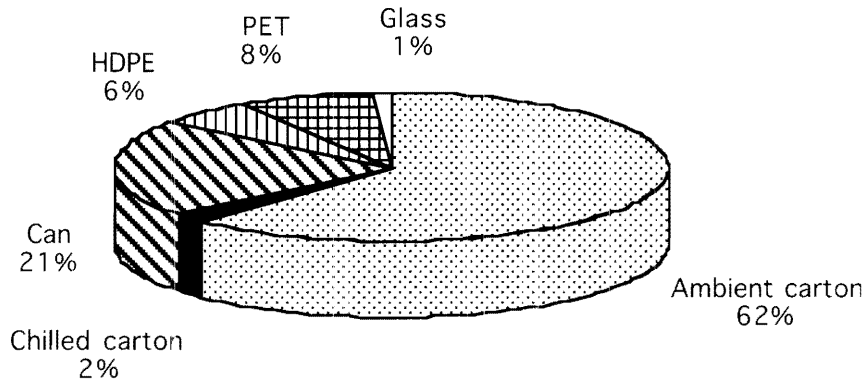
Of the various packaged RTD soymilk in the market, the UHT soymilk (also known as long life soymilk) made up the highest volume sold. In 1998, total volume sold was 33.7 million litres and doubled to 66.8 million litres in 2001 (Figure 5).

Figure 3. Total ready-to-drink packaged soymilk.



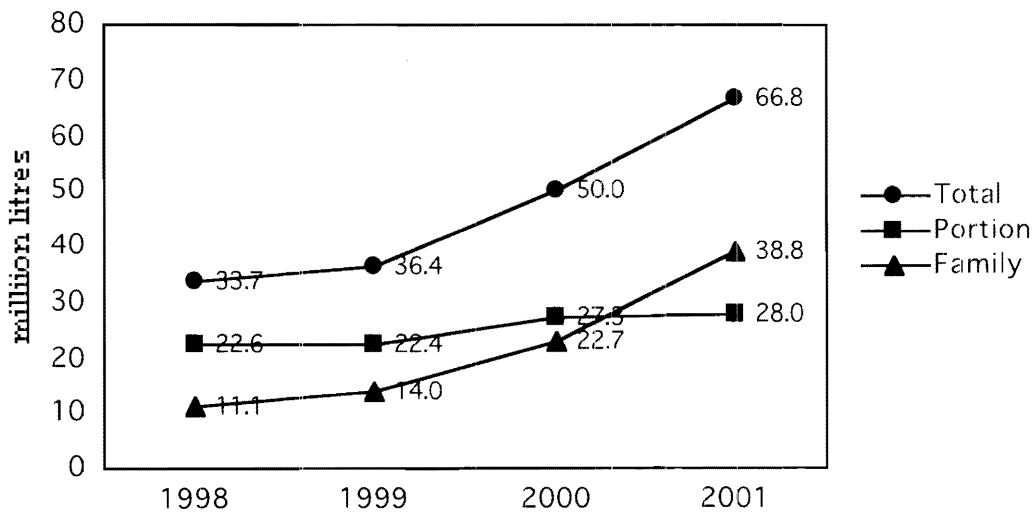
Source: Tetra Pak (2001)

Figure 4. Breakdown of total packaged RTD.



Source: Tetra Pak (2001)

Figure 5. UHT soymilk in cartons.



Source: Tetra Pak (2001)

Packaging for "portion" (individual consumption) was much lower (approximately half) of that for packaging for family consumption ("family"). But the former increased markedly especially after 1999, and in 2001, total volume has surpassed that for "family" packing. Thus, more families are purchasing UHT soymilk for consumption by family members.

Upon further examining the various types of UHT soymilk, it can be grouped into mainstream soymilk (or conventional soymilk) and various types of value-added soymilk. The latter include soymilk that have been modified to provide "added" benefits, including omega-3 enriched, low sugar and various flavoured soymilk. It can be seen from Figure 6 that since 1999, the volume of value-added soymilk increased significantly from 0.7 million litres in 1999 to 9.8 million litres in 2001. With greater interest among consumers for "healthier" beverages, the volume of value-added soymilk is expected to further increase in the years to come.

Consumption in primary school children

There is not much data on soymilk consumption from the various food consumption studies conducted in the country. A study of approximately 600 children, 8-10 years, in Kuala Lumpur, conducted in 1998 to determine the pattern of consumption of various food commodities (Tee *et al*, 1999) is quoted here to illustrate the consumption of soy products amongst primary school children. The study is part of a larger study of the body weight, physical activity and dietary pattern of primary school children in Kuala Lumpur (Tee *et al*, 2002). Weight and height measurements were obtained for 6,000 children, while 10% of the subjects were studied on the knowledge, attitude and practice on food and nutrition, food intake using a quantitated food frequency method and physical activity pattern. A summary of the frequency of consumption of several soy products are tabulated in Table 2. Only a small proportion of the children consume soy products daily, including soymilk. Weekly consumption of these products was fairly good, with soymilk being the most popular, followed by *tau-kua*. Table 2 shows that 50% of the children reported consuming soymilk and *tau-kua* weekly while another 20% consumed these two products monthly. Slightly lower frequencies of consumption were reported for consumption of *tau-boo*. It was observed that consumption of these three soybean products was more frequent than the other beans (e.g. red/green bean, baked bean.). Of all the soy products, soymilk was clearly the most popular among these children. Nevertheless, its consumption could still be much further increased. The frequency of consumption of *fu-cuk* was rather low.

Consumer Perspectives of Soymilk Consumption

Several surveys among consumers have clearly indicated that soybean products are

well accepted and liked by them. This is especially true for soymilk, which has become a more or less ubiquitous beverage in Malaysia.

The first survey cited in this paper was conducted in mid-1996 to provide a qualitative insight into the current purchasing and buying habits of the citizens of the Kuala Lumpur/Klang Valley in relation to the soybean and its products (Stanton, Emms & Sia, 1996). A total of 80 respondents from Kuala Lumpur, Petaling Jaya and Shah Alam participated in the survey. All three locations were said to have exhibited rapid personal income growth over the past ten years and are part of the most dynamic consumer market segment in Malaysia. There were more Malays and Chinese respondents and a smaller number of Indians. Interviews were conducted at locations where soybean and soybean products were being displayed, purchased and/or consumed, as well as at some of the respondents' homes.

- The respondents have a high awareness of soyfood products, particularly of soymilk/drink, local tofu products, soy sauce, mayonnaise, soy cooking oil and vegetarian food.
- Respondents generally learnt about soyfood products from constant usage by family members, advertisements, supermarket promotions and written articles about the products.
- The most common soyfood products consumed by the respondents and generally consumed by the whole family are soymilk/drink, local tofu products, soy sauce and mayonnaise.
- Soymilk/drink, soy sauce and local tofu products are consumed on a more regular basis than any other soy food product, with the majority of the respondents having consumed these products in the previous week.

Table 2. Frequency of consumption of selected soy products.

	Tau-kua	Soymilk	*Tau-hoo*	*Fu-cuk*
Daily	0.7	2.4	1.8	0
Weekly	47.5	53.3	38.3	9.5
Monthly 19.0	18.6	13.8	5.3	
Rarely	9.2	14.9	2.4	0.7
Never	23.6	10.8	43.7	84.4
Total	100.0	100.0	100.0	100.0

Source: Tee et al. (1999). Consumer Perspectives of Soymilk Consumption.

- Soymilk/drink and local tofu products are also purchased on a more regular basis than the other soyfood products. A majority of the respondents bought soymilk/drink and local tofu products once or more times a week. This may be due to the more frequent incidence of consumption of soymilk/drink and local tofu products.

- Soymilk/drink, soy sauce, fermented/salted soybeans, mayonnaise and soybean cooking oil, which are branded and packaged products, are more popularly purchased from supermarkets while the unbranded traditional soyfood products are commonly only purchased from traditional retail outlets, i.e. grocery stores, market stalls and traditional food service outlets, i.e. coffee shops and market stalls.

- The majority of the respondents do not have strong opinion as to what they consider as important when buying soyfood products although health benefits and the product's natural contents were the most important for some respondents.

- Overall, the respondents viewed soyfood products in a very positive light even though they are generally staid low key products. They are generally considered affordable, of high quality, healthy foods known to contain proteins and calcium, good value for money and a halal product. They are liked by the whole family and available from a broad range of retail outlets.

More recently, a study of consumer's perspective of soymilk was conducted in the Kuala Lumpur and Petaling Jaya area in October/November 2000 (Ng, 2001). It was conducted as interactive and in-depth group discussion sessions involving 7-9 respondents per group session. It adopted qualitative probing techniques to unearth and probe target consumers' perceptions of soymilk. There were three main target respondents for the study. The first group comprised Malay and Chinese women, aged between 25-40 years and with a household income of over RM2,000. They were all regular soymilk consumers. The other two groups of respondents were Malay and Chinese students 16-19 years old and young adults 20-29 years old.

There was general agreement among the respondents that they have a great deal of faith and trust in soybeans. They felt that it is packed with 'goodies' and is overall good for health and good for growth. Some of the beneficial effects reported included "contains natural protein", "good for pregnant women" and "may help menopause/hormone balance". There was also an emotional belief that soy is good for the skin, is 'cooling' and overall is simply good for health. The respondents felt that there is tremendous potential for soy-extensions both in beverage as well as food items. It was felt that street soymilk fulfils taste and organoleptic attributes, is cheap, easily available and fresh. Packaged soymilk, on the other hand, has its own set of assets that can further be exploited. It looks like the full potential of soy has yet to be unleashed.

Conclusion

Soybean products are widely consumed in

Malaysia, particularly among the Chinese community.A wide variety of soy products are consumed, in various dishes and recipes. Soymilk is probably the most widely consumed soy product.The consumption of soymilk has been increasing over the years. Even children accept this nutritious beverage. Malaysians are generally aware of the nutritional benefits of soymilk hence its wide acceptance.There is nevertheless a need to further promote the consumption of soymilk and other soy products among other ethnic groups in the country.

In recent years, there has been a great deal of interest in examining the other benefits of soybean products beyond classical nutrition.These other "nutritional" benefits include possible beneficial effects on certain cancers (e.g. breast cancer), reduce symptoms of menopause and reducing risk to coronary heart disease by lowering blood cholesterol levels. A great deal of research is being conducted on phytochemicals present in plant products, including soybean products. These chemicals include protease inhibitors, phytate, saponins and isoflavones (especially phytoestrogens, genistein).The latter is of particular importance to soybeans because of the high levels in these legumes. More work, however, is required to confirm the beneficial findings that have been reported as there is still considerable controversies. Local data on these aspects are also lacking. For example, there is a need to study the possible beneficial effects of soymilk on the health of Malaysians, taking into account the local dietary pattern. There is also a need to estimate the levels of isoflavones in local dishes ready for consumption.

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