

## Review Article

# Food consumption and expenditures in Singapore: implications to Malaysia's agricultural exports

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**Abstract:** Imports are the only source of food supply to Singapore. Such condition offers a very attractive proposition for agricultural oriented countries. The dependence on type of food imports is determined by consumer demand. This study intends to do an exploratory study on the current conditions of Singaporean food consumption and expenditures with implications on Malaysia as an important agricultural exporting country to Singapore. It is identified that Singaporean consumers tend to demand for high quality poultry, pork, seafood, vegetables, and fruits in future, particularly in response to income growth. At the mean time, Malaysia is seemingly rich in the production of these food commodities and commits to exports for the excess of the supplies. While facing competition from various countries, Malaysia still possesses various competitive advantages over the other countries.

**Keywords:** Food consumption, expenditure, exports

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### Introduction

Singapore has experienced strong economic growth over the past few decades, averaging around 7.5 percent from 1970 to 2006. Similarly, Singapore's per capita GDP has also increased from USD\$914 in 1970 to USD\$4,853 in 1980 and reached USD\$12,234 in 1990 with further increase to USD\$23,079 in 2000 and approached a record high at USD\$30,159 in 2006 (United Nations, 2008). The economic growth is mostly attributed to economic contribution from manufacturing and services industries. Looking at the opportunity cost, it is reasonable for the small island country with scarcity of land to use about one per cent of Singapore's land area for agricultural purposes (Singapore Department of Statistics, 2008a).

The agricultural sector of Singapore is dominated by production of eggs, fish and vegetables for local consumption and orchids and ornamental fish for exports. In terms of vegetables, intensive and modern farming methods are adopted to maximize production for bean sprouts, bayam, cai xin, kai lan, bai cai and xiao bai cai. While the land area is limited, ocean is another rich natural resource

to Singapore. Though its local fish production is small, the Jurong Fishery Port (the main spot for fish landing and distribution in Singapore) has 99 floating fish farms covering 59 hectares of coastal waters, culturing high-valued fish like groupers and seabass (Singapore Department of Statistics, 2008a).

Because of relatively limited production of all agricultural products, imports are the only source of food supply to Singapore. In fact, it is a total reliance on imports for food supplies. Such condition offers a very attractive proposition for agricultural oriented countries. As its nearest neighboring country, Malaysia is seen as possessing strategic geographical advantage to provide agricultural supplies to Singapore. Malaysian agricultural exports sector can further benefit from the currency exchange rate, which means imports from Malaysia are indeed cheaper than other countries. Though so, the dependence on type of food imports is determined by consumer demand. This study intends to do exploratory study on the current conditions of Singaporean food consumption and expenditures with implications for Malaysia as an important agricultural exporting country to Singapore.

*Food consumption in Singapore*

Singaporean food consumption delivers some interesting matrix information. Table 1 presents per capita consumption of food commodities in Singapore from 1997 to 2007. In the meat segment, Singaporean distinctively preferred healthier white meat than red meat. Statistically, per capita consumption of white meat, namely poultry, pork, and fish was 33kg, 20.6kg, and 19.5kg in 2007 respectively. On another hand, per capita consumption of red meat was rather low, per capita consumption of beef and mutton only recorded at 4.3kg and 2kg in 2007 respectively.

However, nearly all meat products (except beef) have experienced decreasing trend in their per capita consumption over the years. This was a result of the change in the form of demand. It is no longer a simple supply of quantity to meet demand. It has moved from quantity to quality. Brewish-Weston and Lewis (1996) attributed this significant change to the high per capita incomes that have empowered Singaporean consumers with stronger buying power to demand for high quality food products.

Having said that there is growing demand for quality food products, it also means that Singaporean consumers are increasingly health conscious as well. It is obvious that vegetables and fruits are dominant in their diet, though per capita consumption of fruits has decreased from 82.5kg in 1997 to 72.3kg in 2007. The decrease in fruits is compensated with an increase from 71.7kg in 1997 to 85.7kg in 2007 in per capita consumption of vegetables.

*Household Expenditures on food at home in Singapore*

Agriculture is never a central focus in Singapore's economy. Similarly, there are limited studies focused on Singaporean demand for agricultural and food products. Common basis for identifying demand is to estimate demand elasticities from either time-series or cross-sectional data. Notable is Arief (1980) that used Singaporean Household Expenditure Survey 1977/78 data to estimate expenditure elasticities for aggregated food products. It was found that the estimates of expenditure elasticity for fruits, meat, fish, and vegetables were 0.9457, 0.7156, 0.6083, and 0.5551 respectively. With such sequence, it can be interpreted that Singaporeans were likely to increase their expenditures on fruits, meat, fish, and vegetables more than other food products in response to income growth.

However, current days see unavailability of Singaporean time-series data in Food and Agricultural Organization (FAO) and law protected household data in Household Expenditure Survey (HES). Hence, this study can only rely on the latest HES 2002/03 report. From the report, in line with Singapore economic growth, household monthly income has increased from SG\$2,127 in 1988 to SG\$3,458 in 1993 and reached SG\$4,867 in 2003. Likewise, household monthly expenditure has also increased from SG\$1,461 in 1988 to SG\$2,662 in 1993 and hit SG\$3,684 in 2003.

**Table 1.** Per capita consumption of food commodities in Singapore, 1997-2007

Item	Chicken (kg)	Pork (kg)	Beef (kg)	Duck (kg)	Mutton (kg)	Fish (kg)	Vegetables (kg)	Fruits (kg)	Eggs (pcs)
1997	33.5	23.8	3.5	3.3	2.4	27.4	71.7	82.5	277.8
1998	31.4	22.7	2.9	2.9	2.5	25.3	75.8	80.3	272.2
1999	38.4	*15.2	3.7	3.7	2.4	25.3	79.4	88.6	279.8
2000	36.9	18.0	3.4	3.3	2.4	24.3	79.9	84.2	271.9
2001	34.7	17.3	3.3	2.8	2.3	23.3	82.3	81.8	277.0
2002	35.8	18.1	3.7	4.0	2.0	23.9	83.6	86.8	281.6
2003	38.0	20.1	4.7	3.8	2.1	23.4	84.8	83.7	307.5
2004	31.8	20.8	4.3	2.6	2.0	23.0	85.5	80.9	267.8
2005	32.3	19.3	3.7	3.5	1.8	21.2	84.1	79.3	285.3
2006	29.2	20.1	3.8	2.9	1.9	20.8	84.2	75.6	291.4
2007	33.0	20.6	4.3	3.2	2.0	19.5	85.7	72.3	301.6

Source: Agri-Food and Veterinary Authority of Singapore, 2008

Note: \*Decrease in intake of pork due to Nipah Virus Scare

**Table 2.** Household budget share for expenditure on food at home, 2002/03

<b>Food products</b>	<b>Share (%)</b>
Rice & other cereals	18.30
Meat	16.53
Seafood	18.18
Dairy & eggs	10.10
Oils & fats	1.94
Vegetables	12.91
Fruits	9.57
Sugar, preserves & confectionery	2.99
Beverage	5.68
Other food	3.80
<b>Total</b>	<b>100</b>

Source: Singapore Department of Statistics, 2008b

A zoom-in observes Engel's law in household monthly expenditure on food (included both food at home and food away from home). Engel's law defines that with rising incomes, the share of expenditures for food declines. The budget share for food expenditure has gone down from 36.7 percent in 1988 to 23.3 percent in 2003. Further observation provides a prudent insight that Singaporeans are shifting food consumption at home to food consumption away from home, where the budget shares for expenditures on food at home and food away from home were 19.7 percent and 16.9 percent in 1988 and became equal at 13.2 percent in 1993 then 9.1 percent and 12.2 percent in 2003 respectively.

Table 2 presents the distribution of household budget share for expenditure on food at home in Singapore. It is apparent that Singaporean households allocated most of their budget to rice & other cereals, seafood, meat, vegetables, dairy & eggs, and fruits, accounting for more than 85 percent of total expenditure on food at home. This shows the importance of these food products that constituted majority in their diet. Though per capita consumption of vegetables and fruits in 2002 and 2003 were significantly higher than meat and seafood, Singaporean household allocated more of their budget for meat and seafood than vegetables and fruits. This was mainly a result of relatively higher retail prices of meat and seafood relative to vegetables and fruits during the period.

#### *Budget shares of important food product in food category in Singapore*

In order to identify food preference of Singaporeans, table 3 depicts the distribution of household budget share for selected food products in

their own category. In meat category, pork and poultry were the two most important types of meat consumed in Singapore. Pork is a major dietary component of the Chinese who make up 75 percent of the 3.58 million populations (Singapore Department of Statistics, 2008a). Other majority of ethnic in Singapore are Malay and Indian. Hence, poultry-a homogeneous to all ethnics is also a popular dietary component in Singapore. It is noteworthy that Singaporean households are increasingly demanding for processed meat products. This is evident as sum of processed meat products, canned meat, and prepared meat made up a big proportion in the meat budget.

In seafood category, Singaporean consumers obviously prefer fresh fish over processed fish products. This may be because of the consciousness of benefit in acquiring protein and Omega-3 from fresh fish. Similar observations in vegetables and fruits categories suggest that Singaporean consumers favor fresh vegetables and fruits over processed vegetables and fruits respectively.

#### *Singapore's agricultural and food imports*

Both demand and consumption are made possible by supplies via trade with other nations. Singapore's open economy system that participates in world trade has long seen her trade liberalization in agricultural trade. It means that any countries can export agricultural and food products to Singapore as long as they meet the requirements set by Agri-food and Veterinary Authority (AVA). In that sense, Malaysia is like other countries that do have privilege to export agricultural and food products into Singapore.

In meat category, Singapore relies heavily on Australia and New Zealand for beef and mutton products. Though the Nipah virus was treated,

**Table 3.** Household budget share for selected food products in each category, 2002/03

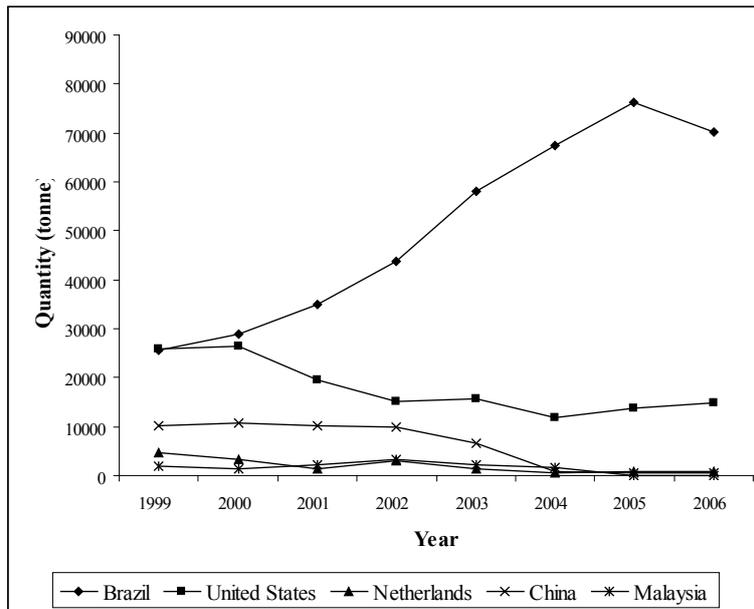
<b>Food products</b>	<b>Share (%)</b>
Meat (Total)	100
Fresh pork	36.17
Frozen pork	0.36
Fresh beef	5.06
Frozen beef	0.18
Fresh mutton	2.89
Frozen mutton	0.00
Fresh poultry	27.67
Frozen poultry	3.44
Other fresh & frozen meat	0.36
Processed meat products	7.59
Canned meat	3.44
Prepared meat	12.84
Seafood (Total)	100
Fresh fish	56.58
Frozen fish	0.33
Dried & salted fish	2.30
Canned fish	2.63
Other fresh & frozen sea products	25.00
Other dried & salted sea products	2.63
Other canned sea products	2.96
Other seafood preparations	7.40
Vegetables (Total)	100
Fresh leafy vegetables	37.50
Fresh fruit vegetables	18.29
Fresh root vegetables	18.52
Frozen vegetables	1.62
Preserved vegetables	5.56
Canned & packeted vegetables	5.79
Beans, peas & nuts	5.79
Soya bean products	7.18
Fruits (Total)	100
Fresh tropical fruits	33.44
Fresh non-tropical fruits	56.88
Canned & bottled fruits & juices	5.94
Dried & preserved fruits	3.75

Source: Singapore Department of Statistics, 2008b

Singapore has totally banned Malaysian pork products since 1999. This is mainly because the standard of the quality and safety in pork products from Malaysia is still very much far behind in meeting the AVA requirements. Currently, pork products in Singapore are largely from Australia, China, France, Netherlands, Canada, and Denmark. Overall, Singapore imports poultry meat from Malaysia.

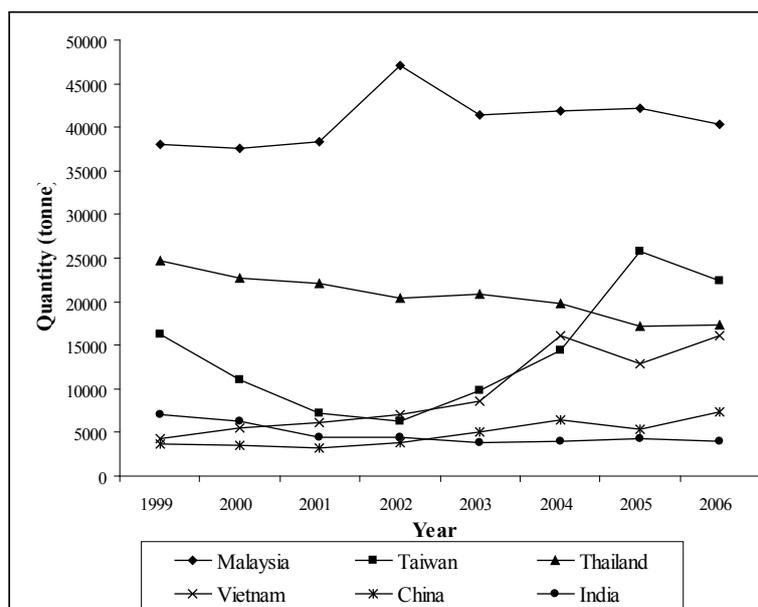
It is very significant that imports from Brazil have experienced tremendous growth from 25,715 tonnes in 1999 to 70,125 tonnes in 2006 while Singapore has reduced the imports from other countries. The reduction is mainly caused by precautionary action taken by AVA in concern with Avian Influenza or its subtype- H5N1 that is the worst pandemic threat currently. Imports from Malaysia have decreased as much as 98% from 2,035 tonnes in 1999 and recorded 50 tonnes in 2006.

Figure 1 presents the quantity of Singapore's imports for poultry meat from various countries.



Source: Global Trade Atlas, 2008

Figure 1. Quantity (in tonne) of Singapore's imports for poultry meat

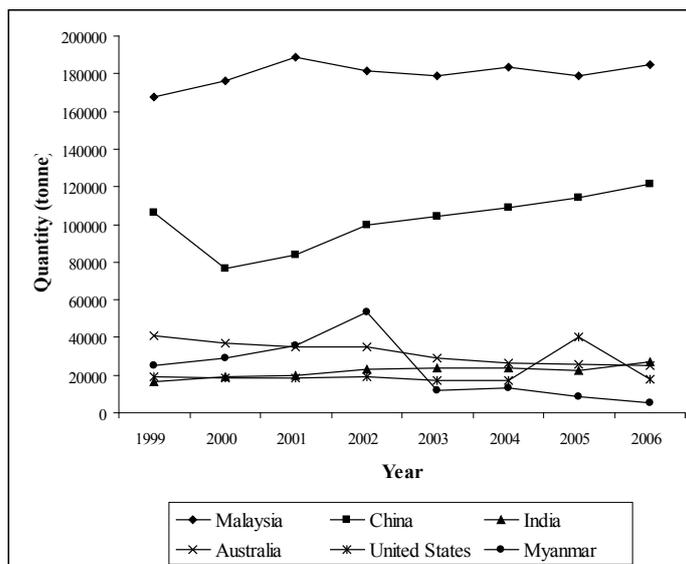


Source: Global Trade Atlas, 2008

Figure 2. Quantity (in tonne) of Singapore's imports for seafood

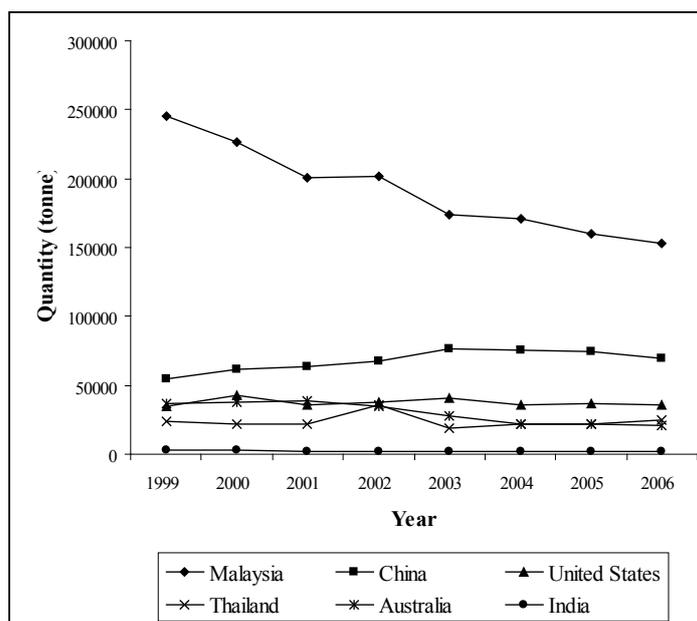
Despite of her own-effort in aquaculture production, Singapore still depends on imports for local consumption and re-exports purposes. Figure 2 presents the quantity of Singapore’s imports for seafood. It is very clear that Malaysia was the main source for her imports. However, the trend has diminished slowly with imports from Taiwan, Vietnam, and China catching up gradually in recent years. Statistically, imports from Taiwan, Vietnam, and China have increased from 16,187 tonnes, 4,371 tonnes, and 3,664 tonnes in 1999 to 22,430 tonnes, 16,076 tonnes, and 7,309 tonnes in 2006 respectively.

Figure 3 is an illustration of Singapore’s imports for vegetables. It is very obvious that imports from Malaysia are the main supply to Singapore. It is worth to take note that imports from China and India have experienced positive growth, especially of India that have increased nearly 64 percent within the period of 1999-2006. While imports from Australia, United States, and Myanmar have begun to decline after 2001, imports from China and India have started to increase. Some economists suggest that this is a substitution effect.



Source: Global Trade Atlas, 2008

Figure 3. Quantity (in tonne) of Singapore’s imports for vegetables



Source: Global Trade Atlas, 2008

Figure 4. Quantity (in tonne) of Singapore’s imports for fruits

Singapore does not only import enormous quantity of vegetables but also import more fruits vastly for her health conscious society. Figure 4 depicts Singapore's imports for fruits from 1999 to 2006. Though imports from Malaysia were still significantly leading, the imports quantity has decreased drastically from 245,110 tonnes in 1999 to 153,107 tonnes in 2006. The decrease was accompanied by higher imports from China, United States, and Thailand over the years. This can be extended to a conservative observation where the gap of imports between Malaysia and China is expected to become shorter in near future.

#### *Implications to Malaysia's agricultural exports*

Both discussions about food consumption and food expenditures in previous sections have identified that poultry, pork, seafood, vegetables, and fruits are the most prevailing components in Singaporean diet. Singaporean households are also increasingly demanding for fresh and quality food products. The substantial change in the demand is mainly attributed to the increasing health consciousness, higher levels of education, ageing population, government policies on health and food issues and finally realized by rising per capita income levels among the whole population.

Malaysia is expected to have excess for these food commodities under the Ninth Malaysian Plan (2006-2010). Agriculture, as the third engine for economic growth is ambited to increase productivity of major food commodities in Malaysia. It is targeted that Malaysia will be more than self-sufficient in poultry, pork, seafood, vegetables, and fruits by 2010. Specifically, self-sufficiency levels in poultry, pork, seafood, vegetables, and fruits are expected to attain 122 percent, 132 percent, 104 percent, 108 percent, and 138 percent by 2010 respectively. By achieving that, there will be excess of supplies for domestic consumption. Hence, the excess of the food commodities mentioned above will only become valuable if they are meant for exports.

Geographically, Malaysia possesses natural advantage due to the close proximity between Singapore and Peninsular Malaysia. This is enhanced by better developed infrastructure in the country than other agricultural oriented neighboring countries, mainly Indonesia, Thailand, Myanmar, Laos, and Vietnam. The ease of mobility and delivery is seen as a major characteristic in the commitment of supply chain management in supplying fresh produces, meats, and seafood. Financially, it means lower transportation costs for the exports from Malaysia into Singapore.

However, the low transportation costs are offset

by higher currency value of Malaysian Ringgit in view with currency exchange rate between Singapore and other neighboring countries comparatively. This offset is compensated by a skeptical whether these countries are able to commit and sustain in the supply of high quality food products and also doubts in food safety issues in these countries. These countries mainly suffer due to its country's image as 'under-developed' countries. Hence, a better developed country like Malaysia can capitalize on the country-of-origin effect in promising quality and safety in food products.

In fact, the strategy of country-of-origin effect has been long applied by Australian food products in Singapore. This leaves the competition for poultry, pork, vegetables, and fruit segments between Malaysia and Australia at backdoor, as Malaysia and Australia are the main sources of these food commodities. Australia is probably a step ahead of Malaysia through its Free Trade Agreement (FTA) with Singapore, mainly for beef, mutton, pork, fruits, and vegetables product. At this stage, Malaysia is still in the process of negotiation for FTA with Singapore.

The common need for exports into Singapore is to meet food quality and safety standards regulated by AVA but the competition has become more intense when there is no import duty for agricultural and food products in Singapore. Growing imports from rapid developing countries like China and India are perceived to be more economic, probably cheap. This convergence in the trade increases pressure on Malaysian producers to become more productive, in order to generate more output at a lower cost.

Though it is increasingly clear that agricultural and food products from China and India are cheap, the widening imports from the countries have alarmed the food industry and the government to acknowledge the increasing risk of food safety problems. Counting food safety related cases, the cancer-causing anti-fungal agent malachite green in Chinese eels and processed seafood products in 2005, poisoned Chinese dumpling in Japan in 2007, and recent Melamine outbreak in Chinese food products implied that there is ignorance of many of the real production costs.

By taking that into consideration, FTA negotiation between Malaysia and Singapore should result in harmonization of standard for food products. Differences in technical standards can be a barrier to international trade (Kerr, 2006). The harmonization of standards for food products will standardize food quality and safety requirements for all food imports, regardless the imports are from Malaysia or China or other countries.

An important emergence is in meeting the requirement of AVA, particularly for meat products, is cultural or religious restrictions on meat imports. This is because 14.8 percent of 3.58 million populations in Singapore are Malays and Muslims. This additional import restriction may continue to cause some uncertainties for Australia in handling religious pressure on food standards and engaging in *halal* certification. This drawback facing by Australia can be advantage to Malaysia. Malaysia via its strict *halal* certification with the upcoming international *halal* hub is self-explanatory in consumer confidence of the *halalness*.

## Conclusions

This study extracts information from food consumption and household food expenditures in Singapore to identify opportunities for Malaysian agricultural exports. It is identified that Singaporean consumers tend to demand for high quality poultry, pork, seafood, vegetables, and fruits in future, particularly in response to income growth. At the mean time, Malaysia is seemingly rich in the production of these food commodities and commits to exports for the excess of the supplies. While facing competition from various countries, Malaysia still possesses various competitive advantages over the other countries, in terms of commitment in consistent supply of high quality and safe food products, lower transportation costs, country-of-origin effect, and *halal* issues.

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