Chapter 2

PRESENT SITUATION OF THE INDUSTRY

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2.1 Economic Background

Malaysia is a developing country with a population of 23.3 million and has achieved an average annual economic growth rate of approximately eight percent over the last 10 years. Malaysia, like other Southeast Asian countries, was affected by the Asian financial turmoil in 1997. It is believed that the country has recovered from the crisis and is steadily on the recovery path. Real Gross Domestic Products (GDP) growth in 2000 is expected to be at 7.5 percent.

Table 2.1 Key Economic Indicators

Key Economic Data	1995	1996	1997	1998	1999	2000[e]
Total population (million)	20.7	21.0	21.7	22.2	22.7	23.3
Real GDP growth (%)	9.8	10.0	7.3	-7.4	5.8	7.5
Consumer Price Index (CPI) (%)	3.4	3.5	2.7	5.3	2.8	1.6
Total Exports (RM million)	184,987	197,026	220,890	286,563	321,181	337.307
Total Imports (RM million)	194,345	197,280	220,935	228,125	248,870	312,427
Trade Balance (RM million)	(9,358)	(254)	(45)	58,439	72,311	60,881

Source: Year Book of Statistics 1999, Bank Negara Malaysia Quarter Reports
[e] Forecast

Unemployment rate in Malaysia is also relatively low, estimated at 2.9% in 2000, due mainly to structural unemployment.

According to the Malaysia Statistics Report, more than half of the population lives in urban areas. Mean Monthly Gross Household Income by Ethnic Group 1995-1997 show that most Malaysian households are in the middle income group. The GAIN Report of 10 March 2000 show 61 percent of the population are in the middle to upper income category and 6.8 percent of the population live in poverty[1]. Malaysians' mean monthly gross household income is estimated at RM2,607 in 1997.

Further, a significant proportion of the population consists of youngsters and middle-aged groups. About 35 percent of the population comprise people below 15 years and 28.2 percent are in the age group between 15-29 years.

According to the report on the Household Expenditure Survey Malaysia (1993-1994), Malaysians spend 23.4 percent of their income on food, 3.6 percent on clothing and 18.2 percent on other goods and services.

The country's overall population is well educated with a 90 percent literacy rate.

The number of women in the workforce is growing and was estimated at 34 percent of the total workforce in 1999.

[1] GAIN Report; Malaysia HRI Food Service Sector: Malaysian Food Service Sector Study 2000, USDA.

2.2 History of the Chilled and Frozen Food Industry

Table 2.2 below summarises the history of the chilled and frozen food industry in Malaysia.

Table 2.2 Summary: History of Chilled and Frozen Food Industry in Malaysia

1960's	• The frozen food industry has its beginnings in early 1960's. There were only a few factories set up and the export volume was low. • In the late 1960's more seafood companies entered the industry and the competition increased.
1970's	• The Malaysian Frozen Foods Processors Association (MFFPA) was formed in 1970. • More frozen products were launched by local producers in the market. Chilled and frozen foods were sold through supermarket outlets. Food freezing processes were adopted.
1980's	• Local frozen food producers started to import some machinery from Japan and Taiwan. • Some new frozen products were introduced, including curry puffs, *samosa, roti canai,* meat-based products and seafood products. Foil packaging was used for frozen products. • The Government gave increasing attention to industry.
1990's	• The Ministry of Health gave increasing attention to industry practices and began to establish standards for frozen products. Support from Malaysian Government helped the industry expand rapidly since the early 1990's. • The Malaysian Meat Importers Association was established in 1995. The main products imported by members of the association were chilled and frozen meat and meat-based products as well as chilled and frozen vegetables. • Frozen vegetable mixes became popular. Frozen ethnic cuisine rose in popularity. • Frozen food sales (local & export) exceeded RM2 billion. Export of frozen seafood and seafood-based products maintained its strong presence in Europe, Australia, and Japan. Malaysia supplied approximately 1.5% to 2% of the world's seafood. • Most of the supermarket have chilled and frozen food cabinets and showcase. Supermarkets began to compete with traditional grocery outlets. • The introduction of pre-cooked or prepared frozen foods opens up an entire new field for industry growth. • TV dinner concept was introduced. • Frozen products were the primary products for fast food service. Frozen foods entered the airline catering services. • National uniformity became an issue for the first time such as halal logo on the packaging. • Usage of microwave oven increased.
2000's	• The frozen food industry is limited by capital investment, human resource and some materials shortage.

2.3 Industry Players

There are 64 major manufacturers and 35 importers of chilled and frozen food in Malaysia who are listed in official publications.

2.3.1 Manufacturers

a) Ready-to-serve Meals

There are hardly any local players in the ready-to-serve meals category.

b) Snacks

The snacks category is dominated by a handful of companies, i.e., KG Pastry Sdn Bhd, Kart Food Sdn Bhd, Ben Fortune Sdn Bhd, and P.A. Food Sdn Bhd. KG Pastry Sdn Bhd is the biggest local producer with approximately 65 percent of the local market share.

c) Food Ingredients

There are about eight food ingredient manufacturers but only one of them, Sensori Food Industry (produces frozen coconut milk), has a more establishment market.

d) Meat, seafood, and vegetables

Manufacturers of chilled and frozen meat are the major producers of chilled and frozen food in Malaysia. More than 80 percent of the further processed poultry products are marketed in the frozen state. Examples of the major players are KFC Holding Bhd., Dinding Poultry Sdn Bhd, Sinmah Holding and Leong Hup. The survey has also indicated that most of the raw meat (except for poultry) and vegetables are imported.

The further processed chilled and frozen meat, poultry and seafood products manufactured locally have outplaced similar imported products over the last few years. There are about 19 manufacturers in the seafood segment and their productions are mainly for the export markets.

2.3.2 Importers

Importers of chilled and frozen food plays an important role in the industry especially in supplying food ingredients and western food.

Examples of imported chilled and frozen food include ready-to-eat apple pies, waffles, pizzas, puffs, chilled and frozen Japanese ingredients. The local beef product manufacturers import beef mainly from India via Port Klang or Penang Port.

Other industry players are discussed in Chapter 4.

2.4 Production Facilities, Equipment, and Capacities

a) Chilled and Frozen Ready-to-Serve Meals

There is no local producer of chilled or frozen ready-to-serve meals.

b) Chilled and Frozen Snacks

Currently, most manufacturing facilities are housed in shop lots, and are rather manual and labour intensive. Majority of the manufacturers are SMIs.

The production equipment used are usually basic, and many of them were bought before 1990s. The key equipment in ensuring quality of products in the cold chain is the shock freezers and spiral freezers. Other equipment required are mixers, moulding machines, belt conveyors, packaging machine.

While the larger manufacturers usually have at least one unit each of shock freezer and spiral freezer, most likely purchased before 1990 and before 1995 respectively, smaller manufacturers use normal rented freezers. Most of the larger manufacturers own cold trucks, while the smaller manufacturers outsource their delivery to third parties.

In all cases, loading and unloading of finished products for dispatch are done at ambient temperature without the facilities of the "anterior-room" which would safeguard the loss of cold air and to preserve quality.

Most of the snack manufacturers are currently operating at plant utilisation of about 70 percent of their capacity, and are planning for expansion and upgrading of their manufacturing facilities.

c) Chilled and Frozen Meat and Seafood

The following lists the main facility and processing equipment used in the meat sector:

- Further processing air-conditioned ventilated room in order to meet hygiene, sanitary and plant-engineering requirements set up by the Government.
- Waste disposal system infrastructure attached to the building in order to meet the minimum standards set by the DOE under the Ministry of Science, Technology and the Environment.
- Plant design and materials specifications built to meet the MOH and the MOA requirements, under the HACCP or Veterinary Inspection Systems.

Production capacity for the small and large scale food manufacturers differs largely. Fully integrated poultry manufacturers like KFC (Ayamas) are able to produce as high as 1200-1500 metric tons per month of value chilled and frozen added products (VAP) while smaller producers such as Leong Hup can produce about 300-500 tons per month. Small SMI factories like Tonsjung Burger, Perusahaan Megah, and Sri Rasah produce about 30-100 tons of VAP per month.

Taking into account the production volumes of KFC Ayamas at 1,200 tons per month, Dindings at 600 tons per month, Farms Best at 500 tons per month, and Ayam A1 at 300 tons per month (totaling to 31,200 tons per year, for poultry chilled and frozen products), the 4 major manufacturers accounted for about 85.5 percent of the 1999 production volume for poultry products.

The production of value-added meat-based products for 1999 is summarised below:

Table 2.3 Production of Value-Added Meat-Based Products 1999

Value Added Products (1999)	Volume (metric tons)
Poultry products	36,485
Beef products	6,848
Pork products	14,610
Total	57,943

For the poultry segment, machinery cost for the nugget, burger, frankfurters, roast chickens and cured products can vary widely. A small factory producing about 50 tons per month of nuggets, 25 ton per month of burgers, and 25 ton per month of meat balls may need a minimum investment of RM 1 million. This is just for basic equipment cost and do not include the costs of fixing of piping, hot water system, sewage facilities, and raw materials.

A sophisticated, high capacity nugget or frankfurter line alone may cost at least RM6-8 millions while hamburgers and meat balls lines are less costly with initial costs of about RM1 million. A small-scale producer of sausages (1-2 tons per day) may require an initial investment cost of RM0.5 million.

d) Chilled and Frozen Food Ingredients and Vegetables

Among the food ingredients are tofu, which are mostly manufactured by backyard industries and distributed chilled or at ambient temperature to wet markets. Coconut milk or *santan* is another food ingredient distributed chilled or at ambient temperature.

The players involved are many and almost all are SMIs though very little information is available on their plant capacity and production volume.

2.5 Raw Materials

2.5.1 Raw Materials for Frozen Snacks

The main raw material for frozen snacks are sourced locally and overseas, and include wheat flour, vegetable oil, margarine, glutinous rice, spring onion, potatoes, peas, onions, chicken fillets, and vegetables.

Table 2.4 Examples of Source of Main Raw Materials for Frozen Snacks

Main Raw Material	Sourced from	Company / country
Wheat flour	Local	United Malayan Flour
Vegetable Oil	Local	Edible Oil
Margarine	Local	Felda Refinery
Glutinous Rice	Overseas	Thailand
Spring Onion	Overseas	Germany
Potatos	Overseas	USA

The main reason for importing raw materials, especially vegetables, is consistent supplies, cheaper prices, and better quality. There is little understanding by local farmers of the manufacturers' commercial requirements.

2.5.2 Raw Materials for Chilled and Frozen Meat and Seafood

Malaysia is self sufficient in poultry, pork, and eggs, but imports close to 80 percent of its beef requirements. Almost 90 percent of the red meat comes from India (in the form of frozen Indian buffalo meat) and almost all manufacturers of value-added meat-based products such as beef burgers, frankfurters, balls and nuggets, use Indian meat because of its low price.

2.6 Technology and Technical Know-how

In the frozen snacks segment, the level of technology is low to medium, employing essentially basic processing and packaging machinery. Their operations are normally labour intensive. While bigger key players have blast and spiral freezers, which are essential in maintaining quality and safety of the products, the smaller ones employ third party cold room facilities.

Many of the main players are entrepreneurs who have started small and involved in hawking. As such, their knowledge lacks sophistication and is based on their previous hands-on and practical experience. Some of these entrepreneurs have since participated in international exhibitions and, therefore, have acquired some fresh ideas for their factories.

Currently, there is a wide variation in the adoption of technology by the industry which comprises both SMIs and multinationals. Table 2.5 summaries various types of equipment and their use among local chilled and frozen food producers. Generally, large-scale manufacturers only use high-end equipment such as cryogenic, spiral and contact freezers. Lower end blast freezers and still freezers are widely used by SMIs.

Most manufacturers use locally fabricated machinery as imported machines are expensive, although most of them find the locally fabricated machines inferior in performance to imported ones.

Within each market segment, the level of technology uptake is different. Companies producing ready-to-serve meals and snacks tend to use locally fabricated machinery while the seafood and meat companies use reasonably sophisticated machinery and employ proper production systems.

Table 2.5 Usage of Chilling and Freezing Technology in Malaysia

Technology & Equipment	SMIs	Larger scale manufacturers
1. Freezing		
Cryogenic freezers	• Not available in all SMI's	• Available to a few, e.g. Mac Food
Belt / spiral freezers	• Not available in most SMI's	• Available and used by some, e.g. Selangor Food Industry, Mac Food, KFC
Fluidized belt freezers	• Not available in most SMI's	• Not adopted by manufacturers under survey
Blast freezers	• Adopted by larger SMI's, e.g. Lucky Frozen, K.G. Pastry. Not available in most SMI's	• Available and widely utilized
Contact freezers	• Not available in most SMI's	• Commonly used in seafood processors, e.g. Oceanpack
Cook freeze system	• The fully integrated system is not adopted by SMI's, eg. production of roti pratha is using cook and chill system, but not the integrated system	• Adopted by Mac Foods
Still freezers	• Adopted by most SMI's, some via 3rd party; processes using this system, e.g. Roti pratha, pau, murtabak.	• Adopt a variety of techniques including still freezers for less critical steps.
2. Chilling		
Cryogenic chiller	• Not available in most small food service sectors	• Not adopted by manufacturers under survey
Blast chiller	• Not available in most small food service sectors	• Used by bigger Food Service Establishments, e.g. MAS Catering, KLAS, Sajibumi.
Cook-chill system	• Not available in most small food service sectors	• Used by some hotels and food caterers, e.g. Hilton, MAS Catering, KLAS
Still chiller	• Widely used by Food Service establishments & retailers.	• Widely used by retail chains, e.g. Makro, Carrefour, and complete with temperature monitoring devices

The level of chilling and freezing technology used in the manufacturing of chilled and frozen food has a major influence on product quality in terms of eating quality, food safety, and nutritional quality.

The following list the effects of chilling and freezing technology on quality parameters:

a) Eating Quality

Chilling and freezing will affect eating quality of food including the texture, colour, appearances, juiciness, taste, aroma and mouth feel (i.e. eating quality). The extent of the changes are dependent on the pre-treatment used on the food as well as the conditions during cold storage, transportation, and display. Table 2.6 summarises a general relationship between the various chilling and freezing equipment and eating quality.

Table 2.6 Relationship between Chilling and Freezing Equipment and Eating Quality

Equipment	Very Poor	Poor	Satisfactory	Good	Very Good
(a) Freezer					
Cryogenic					
Spiral					
Fluidized					
Blast					
Contact					
Still					
(b) Chiller					
Cryogenic					
Blast chiller					
Cook-chill					
Still chiller					

b) Food Safety

Chilling and freezing do not kill pathogens. Therefore, if improperly carried it out, pathogens may grow and some may produce toxins. The key factor here is the rate the processes are carried out. Rapid freezing and chilling will quickly arrest the growth of pathogens making products safer.

Table 2.7 Relationship between Chilling and Freezing Equipment and Food Safety

Equipment	Very Poor	Poor	Satisfactory	Good	Very Good
(a) Freezer					
Cryogenic					
Spiral					
Fluidized					
Blast					
Contact					
Still					
(b) Chiller					
Cryogenic					
Blast chiller					
Cook-chill					
Still Chiller					

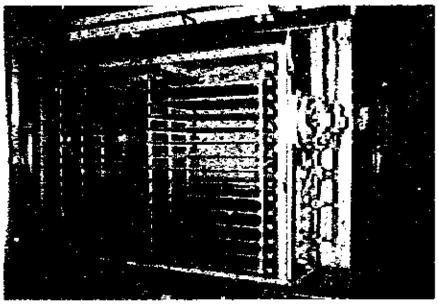
c) **Nutritional Quality**

Chilling and freezing do not have major impact on the nutritional value of the products, as they do not destroy nutrients. However, in cases where freezing is carried out too slowly, vitamins and other nutrients may be lost through leaching, resulting from physical injury to the food (see Table 2.8).

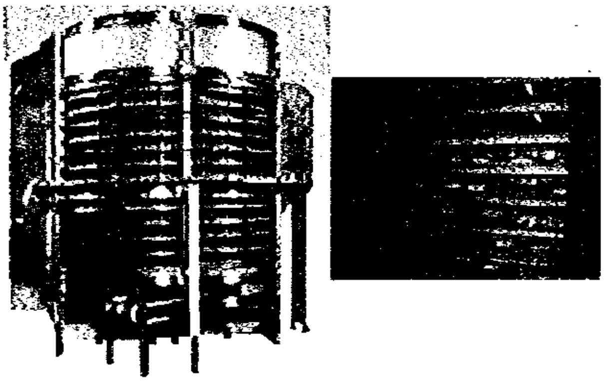
Table 2.8 Relationship between Chilling and Freezing Equipment and Nutritional Value

Equipment	Very Poor Retention	Poor Retention	Satisfactory Retention	Good Retention	Very Good Retention
(a) Freezer					
Cryogenic					
Spiral					
Fluidized					
Blast					
Contact					
Still					
(b) Chiller					
Cryogenic					
Blast chiller					
Cook-chill					
Still chiller					

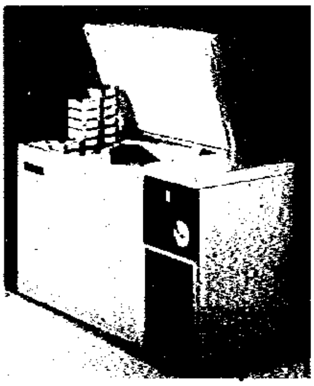
Air Blast freezer



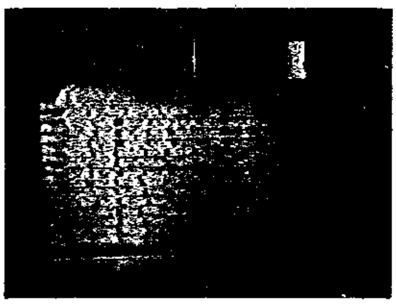
Spiral freezer



Cryogenic freezer



Contact Freezer



Chapter 3

EXISTING MARKET SIZE AND CHARACTERISTICS

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3.1 Existing Market Size

The total market size of chilled and frozen food for Malaysia was estimated at RM2 billion (including exports) in 1999, registering a nine percent growth.

Table 3.1 Estimated Chilled and Frozen Food Market Size in Malaysia

RM (million)	1996	1997	1998	1999			
				Market size	Export	Local Consumption	
						Total	Per capita (RM)
Ready meals	6.25	7.19	8.27	9.51	NS	9.51	0.42
Snacks	NA	NA	NA	62.95	20.16	42.79	1.89
Food Ingredients	NA	NA	NA	5.62	NS	5.62	0.25
Meat-based value-added products	NA	NA	303.28	318.44	NS	318.44	14.03
Beef	326.22	357.15	342.56	359.69	NS	359.69	15.84
Mutton	64.97	70.84	73.53	77.21	NS	77.21	3.40
Pork	8.85	7.20	4.43	4.65	NS	4.65	0.21
Chicken	61.71	82.01	89.21	93.67	NS	93.67	4.13
Sub-total (beef, mutton, pork and chicken)	461.75	517.20	509.73	535.22	NS	535.22	23.58
Sub-total for meat	NA	NA	813.01	853.66	NS	853.66	37.61
Frozen crustacean	293.85	361.38	412.39	421.91	417.69	4.22	0.18
Chilled and frozen fish fillet	23.84	30.49	38.54	47.65	1.21	46.44	2.05
Frozen fish	121.32	127.39	133.76	140.44	49.16	91.28	4.02
Sub-total for seafood	439.01	519.26	584.69	610.00	468.06	141.94	6.25
Vegetables	NA	413.99	476.49	506.65	NS	506.65	22.32
Total	NA	NA	1,882.46	2,048.39	488.22	1,560.17	68.73

Notes: N/A – not available, NS – not significant.
Figures are obtained from Euro monitor, ROC, and the industry players. Some involve projection based on experts' opinions

a) **Ready-to-Serve Meals**

This category is at its infancy stage but growing as Malaysians become more exposed to new eating alternatives such as Home Meal Replacement. The products in this food category are *nasi lemak*, prawn fried rice, chicken fried rice and noodle-based meals and steak.

About 95% of ready-to-serve meals are imported (RM9.03 million). Approximately 5% (RM0.48 million) of ready-to-serve meals are produced by local retailers or small manufacturers who pack the meals chilled, without branding such as chilled *nasi lemak*.

The-ready-to-serve meals, commonly available now, are distributed in a ready-to-eat form at normal ambient temperatures. Currently, there are no significant players in this category.

b) **Snacks**

The snacks category offers more products as it comprises both the western and oriental varieties. This category is the fastest growing one in the industry and high growth rate is expected to continue as demand for the products from Europe, US, Australia and New Zealand increases.

c) **Food Ingredients**

Chilled and frozen food ingredients segment is very small and fragmented. This situation is quite normal, as some developed countries do not even consider the chilled and frozen food ingredients a segment by itself.

The survey did not reveal any significant presence of chilled and frozen food ingredients in the local market. Only a small quantity of processed coconut products (liquid milk and grated) in chilled and frozen forms with and without labels, and some small quantities of soy-based products were found. The estimated market size for food ingredient in 1999 comprises local food ingredient (coconut milk) of about RM3 million and Japanese ingredients of about RM2 million.

d) **Meat, Meat-Based Products, Seafood, and Vegetables**

This category makes up the largest segment of the industry. Poultry products are the major component of this segment followed by seafood. Frozen crustacean is the most important segment in the seafood category.

The **meat and meat-based products** are mainly produced and consumed locally. Malaysia imports over 85 percent of its meats requirement. However, an insignificant quantity of poultry meat is exported to Sabah, Sarawak, and Singapore. More than 80 percent of the further processed poultry products are marketed in the frozen form.

Domestic **seafood** supplies are insufficient to meet the increasing local demand as almost 77 percent of the local seafood production is exported. Hence, local demand for seafood especially shrimps, is met by importing from India, Bangladesh, and Myanmar.

It is estimated that approximately 60 percent of the imported **vegetables** are in chilled or frozen condition.

3.2 Market Characteristics By Categories

a) Chilled and Frozen Ready-To-Serve Meals

Chilled and frozen ready-to-serve meals are divided into two segments namely, western meals and eastern meals. Malaysia does not export ready meat. The local consumption of frozen meals is mainly supplied from imports. Some chilled ready-to-serve meals such as chilled *nasi lemak* and fried noodles produced by small local producers are available in some retail outlets such as convenience store in the petrol station (e.g. "Select Store"). However, the demand for this type of food is extremely low as consumers are able to access the traditional home cooked *nasi lemak* in various hawker stalls. Western ready-to-serve meals such as steak and fish based meals may have higher demand.

Only a small range of complete meal products was found in the survey, and all of them were in the frozen form. They included several varieties of rice-based meals such as prawn-fried rice, chicken fried rice, mushroom and chicken mushroom rice, and noodle-based meals. All of these are imported from Japan and are packaged for single servings (150 – 250g) using flexible packaging materials, some of which are transparent. There were no halal markings on these products. Toyo Suisan and Nissin are main brand names of ready-to-serve meals imported from Japan. There was also hardly any significant Western type complete meals.

The ready-to-serve meals are usually packed using non-transparent plastic bag. As consumer can not see the ingredients, they may not buy it. Consumers would prefer transparent packaging where they can see the contents.

Product size and retail price of the chilled and frozen ready-to-serve meals in the available market are shown in Table 3.2.

Table 3.2 Product Size and Retail Price of Chilled and Frozen Ready-to-Serve Meals

Product	Size	Retail Price (RM)
Chilled		
Fried noodles	225g	10.90
Frozen		
Prawn fried rice	250g	12.90
Chicken fried rice	250g	22.90
Chicken rice	150g	7.50
Mushroom rice	150g	7.50
Chicken mushroom rice	150g	6.90
Beef lunch	120g	13.90

b) Chilled and Frozen Snacks

Snacks available in the local market are mainly of the frozen varieties and consist of Western snacks (pizza and pie) and the local varieties such as curry puffs, *samosa*, spring rolls, *roti canai*, *roti pratha*, *mantau*, *dim sum* and *naan/capati*. The biggest local producer is K.G. Pastry with about 65% of the local market share. The Company produces spring roll pastry and spring rolls, *roti pratha*, *samosa*, mini buns, and *mantau*. The famous brand names in this segment are K.G., Pau Ahmad and Kart's. According to K.G. Pastry, the top selling products are *roti paratha*, spring roll and *samosa*, spring roll pastry, mini bun, and *mantau*.

Frozen snacks sub-segment is one of the highly competitive segments. With the trend towards snacking, the demand for various types of snacks may increase significantly. Western and oriental snacks have attracted market attention. Western snacks are mainly imported with the exception of a few, like pizzas and pies. Generally, imported varieties cost about two to five times higher than the local ones. For example, the imported 300g Hawaiian pizza costs RM19.50 against the local pizza at RM7.14. This is about 2.7 times higher than the local product. Comparison of imported frozen snacks and local snacks is shown in Table 3.3.

Table 3.3 Product Size and Retail Price of Frozen Ready-to-Serve Snacks

Imported			Local		
Product	**Size**	**Retail Price (RM)**	**Product**	**Size**	**Retail Price (RM)**
Spring rolls	220g	14.50	Spring rolls (plain/egg)	250g	3.30
Sambal chicken pizzas	300g	19.80	Chicken mushroom pizzas	280g	8.00
Hawaiian pizzas	300g	19.50	Hawaiian pizzas	250g	5.95
Supreme pizzas	340g	14.50	Beef supreme	250g	5.80
Apple pies	400g	12.50	Strawberry pies	3pcs	5.30
Lemon Meringue pies	624g	36.90	Sepherds pie/Lasagne	400g	5.90
Red bean *pau*	4pcs	15.90	Red beans *pau*	360g	3.50
Meat *pau*	4pcs	15.90	*Kari ayam pau*	360g	3.50
Puffy pastry	300g	6.50	Shell sardine	280g	2.99
Dumplings	140g	11.90	*Mantau* (plain)	375g	3.15
Shrimp *Shuimai*	225g	10.90	*Mantau* (pandan)	375g	2.50
Pizza base	280g	8.70	*Roti canai*	630g	4.20

c) Chilled and Frozen Food Ingredients

As most of the local food ingredients are sold in fresh, dried or preserved form, chilled and frozen food ingredients are relatively less attractive. In addition, chilled food ingredients may require a complete chilled chain to maintain the temperature of the food for safety and quality.

There were very little chilled and frozen food ingredients and those found were mainly in the chilled form. This product, however, generally have not undergone chilling or freezing as part of the manufacturing process. They were produced at ambient temperature and stored cold in refrigerators to prolong shelf life. A small quantity of processed coconut products was observed (liquid milk and grated) in chilled and frozen forms with and without labels. The content of a typical packaging size is equivalent to that of one coconut. There were also some small quantities of oriental ingredient items, such as soy-based products, which are used in the preparation of Japanese type food found in the retail survey.

There are no equivalent products that allow us to do a direct price comparison. Among the closest is the chilled Tofu where three pieces of imported Ganmodok is RM2.40 against the local Japanese Tofu at RM1.99. The locally produced chilled and frozen food ingredients are very limited.

Table 3.4 Product Size and Retail Price of Chilled and frozen Food Ingredients

Imported			Local		
Product	Size	Retail Price (RM)	Product	Size	Retail Price (RM)
Seasoned seaweed	100g	10.50	Pickled leaf mustard	250g	8.90
Momen tofu/Tose tofu	1pc	3.50	Tofu pudding	1pc	0.78
Ganmodok Tofu	3pcs	2.40	JapaneseTofu	3pcs	1.99
Sour Ginger	170g	4.40	Sour Plum	220g	5.15
Plain white noodles	440g	10.90	Hokkein Mee	400g	0.85
Japanese fried noodles	300g	5.25	Wanton noodles	450g	2.60

d) Chilled and Frozen Meat, Seafood and Vegetables

(1) Poultry, Beef and Mutton

These products make up a large proportion of the chilled and frozen items in supermarkets. Meat products consist mainly of poultry, seafood, and beef and to certain extent pork. Poultry sub-sector is probably the most commercially developed food sector in Malaysia. Of all the major livestock sub-sector, the ruminant industry is the least developed. Local production of beef and mutton cater less than 20 percent of the local demand.

For beef and pork value-added products (VAPs), the price differences are significant. For example, imported frozen beef burgers costs RM9.25 for 700g against the equivalent size of local variety at RM4.50. The price differences may be attributed to the quality and the raw materials used, such as Australian beef versus Indian beef.

There is no price regulating mechanism for beef and mutton and prices are determined by supply and demand. As imports form large portions of the market supply, imported meats are subjected to exporting countries' production and prices, as well as exchange rates fluctuations and freight related charges. Despite these factors, imported meat is still cheaper than local meat.

(2) Frozen Seafood and Seafood Products

These products are mainly exported. Malaysia exports high quality seafood and seafood-based products. These chilled and frozen products are branded and vacuum-packed with colourful and attractive packaging.

For seafood VAPs, there were only minor price differences, with the imported varieties priced slightly higher. This could again be attributed to different recipes or quality of the raw materials used. For example, imported prawn balls cost RM3.70 (200g) against RM3.20 (200g) for local ones.

(3) Chilled and Frozen Vegetables

Most of the vegetables are imported in chilled form including french fries, peas, corn kernels, carrots, beans, and mixed vegetables. Imported and some local leafy vegetables are displayed in chilled cabinets.

For the frozen vegetable sub-segment, there is no local variety equivalent to the imported ones. The prices of imported chilled and frozen vegetables range from RM0.62 per 100g (cut green beans and peas) to RM3.00 per 100g (niblets, and corn and butter).

Table 3.5 **Product Size and Retail Price of Chilled and Frozen Meat, Seafood, and Vegetables**

Imported			**Local**		
Product	**Size**	**Retail Price (RM)**	**Product**	**Size**	**Retail Price (RM)**
Frozen beef burgers	1200g	15.85	Frozen burger *daging lembu*	700g	4.50
Frozen chicken franks	340g	2.99	Frozen chicken frank	340g	2.59
Frozen Fish fingers	250g	5.50	Frozen fillet fish fingers	245g	4.70
Prawn balls	200g	3.70	Prawn meat balls	200g	3.20
Cod fillet	380g	5.80	Fish patties (cod fillet)	380g	4.95
Fish 'O' vegetable nuggets	500g	8.90	Fish nuggets	500g	5.80
Crab sticks	250g	6.49	Crab flavored balls	250g	4.85
Turkey sandwich squares (sliced)	4pcs	6.00	Turkey sandwich rolls (sliced)	5pcs	5.40
Non-Halal					
Pork sausages	340g	21.70	Pork chestnut stuffing	400g	7.50
Canadian style bacon	6 oz	16.90	Mack bacon	150g	5.10
Frozen broccoli spears & butter	383g	6.55	NA		
Cut green beans	500g	3.10	NA		
Mix vegetables	250g	1.90	NA		
Sweet corn	500g	4.10	NA		
Spinach whole leaf	450g	6.75	NA		
Peas	500g	3.10	NA		
Niblets corn & butter	283g	8.55	NA		

Note: NA=Not Available

3.3 Marketing Analysis

3.3.1 Marketing Practices

There are very limited marketing activities for the **ready-to-serve** meals category. Most of the products available have no brand names, except a few famous imported ready-to-serve meals. Ready-to-serve meals are usually distributed directly to major retail outlets by importers or local producers.

Chilled and frozen **snacks** producers generally emphasise on high product quality and convenience to consume as their selling points. However, in local market, low product price is an additional critical selling point, as compared to export markets. Currently, there are a number of well-known local chilled and frozen snack brands. Frozen snacks are usually distributed directly to their main customers (hypermarket/supermarket) and also through distributors to other retail outlets. Small aggressive producers are trying to set-up their selling point at the retail outlet by sponsoring display rack.

The chilled and frozen food **ingredients** category is very small and fragmented. There are hardly any marketing activities carry out by importers or local producers. Imported chilled and frozen food ingredients are sold to local food service operators or large-scale retailers through importers, agents or distributors. Local ingredients are usually sold using traditional middleman channel.

The chilled and frozen meat and seafood products category is very established. There are many well-know brand names and are heavily promoted by the producers. The distribution channel for meat and seafood products is relatively more extensive as compared to other food categories in this study. Traditional marketing outlets for fresh meat at wet markets, farmer's markets and grocery shops are still popular. They tend to offer meat freshly slaughtered on the same morning, although many retailers are using ice water to chill the products.

There has been a growing trend of more specialised poultry retail shops by poultry integrators and retailers which offer chilled carcasses and chicken parts as well as other processed poultry products such as chicken frankfurters, nuggets, and burgers. It is foreseeable that such poultry 'supermarkets' shall gain prominence at the expense of traditional meat stalls as consumers develops greater product awareness and purchasing sophistication. The sale of live chicken to consumers even in smaller towns is slowly diminishing.

Poultry producers' entry into poultry retailing and processing may be their effort to survive the competitive industry amidst thinning profit margin by bypassing middlemen and retailers. Diversifying their product is one of their other ways to boost demand. At present the more prominent special retail shops are those operated by poultry integrators such as Ayamas, Dindings Poultry, and Ayam A1.

Chilled and frozen vegetables are mainly imported and are minimally processed, packed and sold by large supermarkets or hypermarkets.

3.3.2 Promotional Tools

Unlike markets in developed countries, competition in the domestic market does not involve much advertising and promotion. Producers, instead, compete with one another by reducing price and offering discounts.

According to local industry players, the most effective promotional tools are advertising (TV and radio advertisements), sales promotions (sampling, discount) and personal selling (using their own sale force) (see Table 3.6). The effectiveness of each promotional tool sometimes depends on the particular product and industry. Most of them have their own sales force to promote their products.

Table 3.6 Use of Promotional Tools in the Chilled and Frozen Industry in Malaysia

Industry Player	Advertising	Personal sales force	Sales promotion	Publicity	Direct marketing	Most effective promotional tool
Sensori Food Ind S/B	Brochure Catalogue Trade magazine Product listing	Company sales force	-	-	Catalogue selling	**Advertising** **Company sales force**
Tricious Food S/B	-	Company sales force	Discounts Incentives Higher margin for distributors Credit facilities Join trade shows & Food seminars	-	Catalogue selling	**Sample**
PA Food S/B	-	-	-	-	Consignment	

Table 3.6 Use of Promotional Tools in the Chilled and Frozen Industry in Malaysia (continued)

Industry Player	Advertising	Personal sales force	Sales promotion	Publicity	Direct marketing	Most effective promotional tool
Pillsbury (M) S/B	Radio	Company sales force	Samplings Trade shows	Orphanage & shelter home fund	Company website	Sampling Aggressive promotion through TV and radio
Focal Marketing S/B	Pamphlets brochures	-	-	-	-	TV and radio
Daisho (M) S/B	-	-	Testing/ instruction counter in supermarket	-	-	TV & Radio
Saudi Cold Storage	Brochure Catalogue Product listing	-	Discounts Incentives Food seminar	Product launching	-	Food testing (give-away samples)
Burger Tanjung	Brochure	-	-	-	-	Sample testing Sticker
HSH Sdn. Bhd	Most of the advertising tool such as newspaper, TV and radio ad	-	-	-	Company website	Advertising in newspaper
Lucky Frozen	Newspaper Promotion for hotel and restaurant buyers	-	-	-	Trade promotion	-
OL Foods	Product listing Leaflets Brochures Radio 5	-	Discounts	-	Company website	Product listing Leaflets
UB Food S/B	-	Company sales force	-	-	-	Company sales force
Seapack	Most of the advertising tools	-	-	-	-	Trade promotion for export purposes Supermarket promotion for local markets
Selangor Food Industry	Brochure Catalogue	-	Promoter to promote product	Sponsor football team	-	-

3.3.3 Market Positioning Analysis of Chilled and Frozen Food

The market standing of the four categories of chilled and frozen food are as shown in Chart 3.1. International penetration stage refers to the ability of local manufacturers to market their products to regional or international market. The local market standing refers to the market segment, from niche market to mass market.

Chilled and frozen **ready-to-serve meals** category serves a niche market and the supplies are mainly imported. There are no significant local producers in this category and the products are mainly sold in super- and hypermarkets and high-end retail outlets located in urban areas.

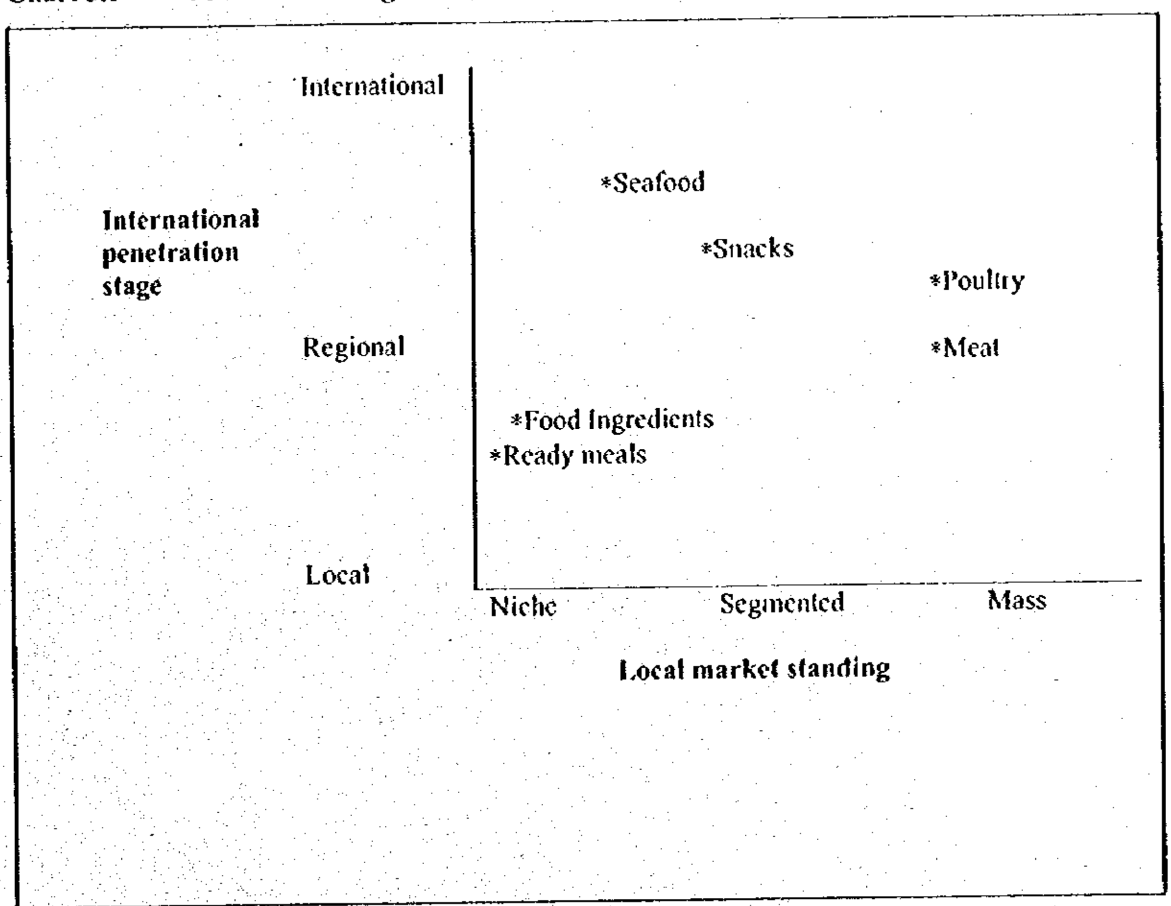
Chilled and frozen **snacks** category has achieved considerable success in the local and overseas market. In the local market, their products are still confined to urban areas, and sold mainly in hypermarkets, supermarkets and some mini markets.

Currently the local market for chilled and frozen **food ingredients** is still undeveloped.

Valued-added processed meat products are readily available in the local market. Poultry products, presently, have limited success in the regional markets such as Singapore, Brunei and Hong Kong. The products are not able to penetrate the European markets due to regulatory barriers and are still struggling to meet international standards.

Substantial chilled and frozen seafood products are exported overseas. There are about 30 seafood producers who have obtained E.U. No which enable them to export to Europe. Fresh seafood suppliers mainly meet the demand for seafood in the local market.

Chart 3.1 Market Standing of Chilled and Frozen Food



3.4 Consumer Characteristics

The following sections list the characteristics of the consumers:

a) Product Awareness and Perception

- 72 percent of the respondents were able to differentiate between chilled & frozen food. Respondents perceive chilled food as being a higher quality food compared to frozen and canned food.

- About 56 percent of the respondents perceive frozen food as unhealthy compared to 28 percent for chilled food. The respondents may have felt that the freezing process reduces the food's nutritional value.

- 55 percent of the respondents rely on the halal logo as an indicator of halal status. Out of this, only 60 percent insist on the official logo issued by JAKIM. 38 percent of the respondents will check both the halal logo and ingredients to make sure the food is halal. In the absence of the halal logo, majority of the respondents will check the ingredients of the food to determine the halal status. Almost all of the respondents (98 percent) agree that the Malaysian Government should standardize the halal logo.

b) Chilled and Frozen Food Consumption Pattern

- 89 percent of the respondents consume chilled and frozen food.

- The main reasons of choosing chilled and frozen food are "convenience", "easy to get", "time saving", "easy to serve/cook", "delicious" and "reasonable pricing".

- Reasons for not consuming chilled and frozen food are "expensive", "not healthy", "not fresh" and "not tasty". In general, chilled and frozen foods are consumed by all family members (63 percent).

- The most popular meals and snacks are roti canai, pizza, curry puff, pau and spring roll. They are consumed as breakfast, snack and anytime when needed. Consumption frequency is about 2-3 times a month with an average consumption quantity of 1.5 to 2 packages per month. 86 percent of the respondents indicated that they will continue to consume chilled and frozen meals and snacks.

- Types of food ingredients that are mostly used are chilled fruits and vegetables. About 30 percent of the respondents use frozen vegetables, chilled noodles and tofu, in the preparation of normal meals. Consumption frequency is more than once a week for chilled fruits and vegetables and 2-3 times a month for other chilled and frozen food ingredients. The consumption quantity is about 2-5 packages per month. 94 percent of the respondents indicated that they would continue to use chilled and frozen food ingredients.

- Types of meat and seafood products that are mostly consumed are nuggets, burgers, chicken and sausages. They are consumed as a component to prepare normal meals or snacks. They are eaten 2-3 times a month and on average, respondents consumed 2-3 packages per month depending on the package size. 94 percent of the respondents indicated that they would continue to consume chilled and frozen meat and seafood products.

c) **Purchasing Pattern and Consumer Preferences**

- Hypermarkets and supermarkets are the popular places to buy chilled and frozen food products.

- Quality of chilled and frozen food products are considered as the most important factor influencing food purchases except for Malay respondents where the halal status is the major concern. Other important criteria, in descending order, are hygiene, nutritious/healthy, price, taste, convenience, brand, outlet, and packaging.

- Largest respondent groups normally purchase once a week, followed by once a month. They usually buy one to three packages of chilled and frozen food products per purchase.

- In terms of price, about 82 percent of the respondents feel that the price of chilled and frozen food is reasonable. 58 percent of the respondents spend less than RM100 per month on chilled and frozen food and about 29 percent spend RM101-200 on these types of food. Respondents hardly spend more than RM300 per month on chilled and frozen food. About 64 percent of the respondents indicate that they are willing to pay more for chilled and frozen food that are properly handled, stored, and displayed.

- In terms of preference, the respondents prefer chilled and frozen food ingredients, followed by chilled and frozen meals and snacks, and meat and seafood products. They also prefer Malay varieties, followed by Western and Chinese. Hot and spicy foods are the most favoured.

- Respondents indicated most of the people around them are consumers of chilled and frozen food. They will consume more of these types of food in future and it will form a significant proportion of their total food consumption.

d) **Influence of Socio-Demographic Characteristics**

- The result of the survey shows that Malays as a whole are the main consumers of chilled and frozen food. They mostly consume curry puffs, *murtabak*, *roti canai*, *nasi lemak*, coconut milk, *cendol / cincau*, frozen vegetables, *satay / kebab*, burgers, and nuggets.

- Chinese respondents mostly consume chilled and frozen mantau, dim sum, Japanese ingredients, tofu, noodles, Japanese type meats and marinated meats. They are willing to pay more for quality food compared to Malays and Indians.

- Indian respondents mostly consume chilled and frozen naan/capati, spice pastes and limited amount of chilled and frozen meat and seafood products. They are more sensitive to price.

- Chinese respondents' monthly spending is slightly higher than Malays, and the least are Indians. The middle/upper middle-income group of respondents are the major consumers of chilled and frozen food.

- There is a relationship between high-income level and positive perception towards chilled and frozen food. Consumption of chilled and frozen food tends to be higher for higher income group. As the household income increases, factors such as quality, hygiene, nutritional value, and convenience become more important compared to price. Besides, the higher the household income the higher the potential of continuity buying.

- The result of the survey shows that educated respondents (secondary school education and above) are major consumers of chilled and frozen food. As the level of education increase, factors such as quality, hygiene, nutritional value and taste become more important. There is a positive association between education level and future buying intention as well as willingness to pay more for quality food.

Chapter 4

DISTRIBUTION SYSTEM

CHAPTER 4

DISTRIBUTION SYSTEM

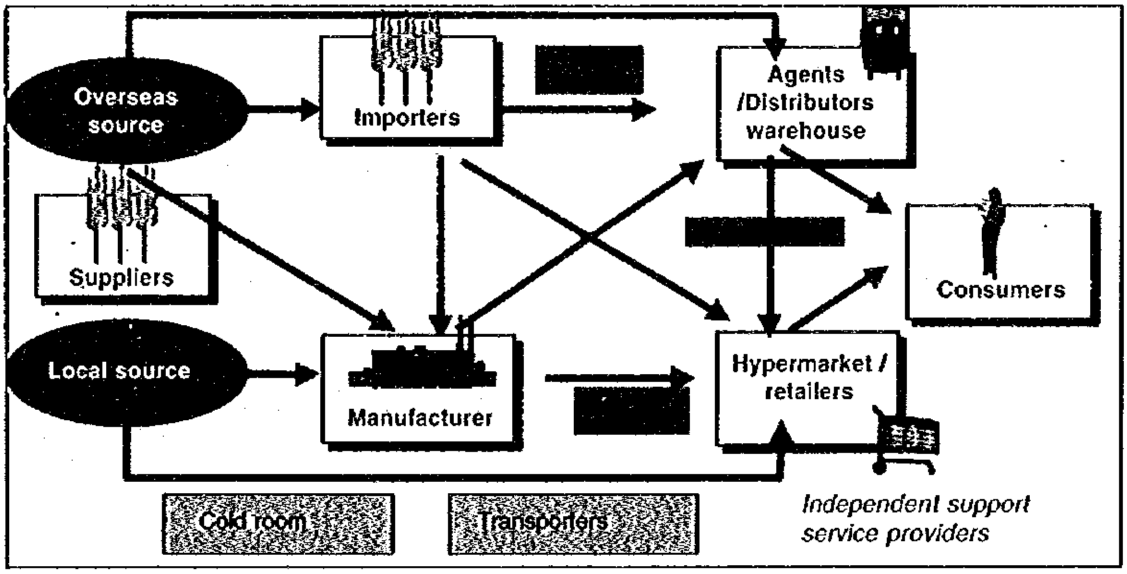
4.1 Supply Chain of the Industry

The following are major components of the chilled and frozen food supply chain (i.e. Cold Chain):

- Equipment Suppliers
- Value Added Food Processor/Manufacturers
- Freight Forwarding Agents (i.e. importers / exporters)
- Support Service Providers (mainly comprising transporters and cold storage providers)
- Food Service Providers (mainly fast food chain operators and caterers)
- Retailers and Distributors

The chart below illustrates the supply chain flow of the chilled and frozen food industry:

Chart 4.1 Industry Supply Chain



4.2 Cold Chain in Perspective

The cold chain is basically in place with all necessary components of the chain. Although there are not many recorded incidents of economic losses due to the breakage of the cold chain, the functioning of the chain is suspect. Currently, most of the bigger companies in the industry employ their own cold trucks and cold rooms. Despite this, the survey revealed that the cold chain in Malaysia breaks very often as product handling is still poor. Transporters, cold room operators, retailers and even consumers generally lack knowledge in handling chilled and frozen food.

CHAPTER 4

DISTRIBUTION SYSTEM

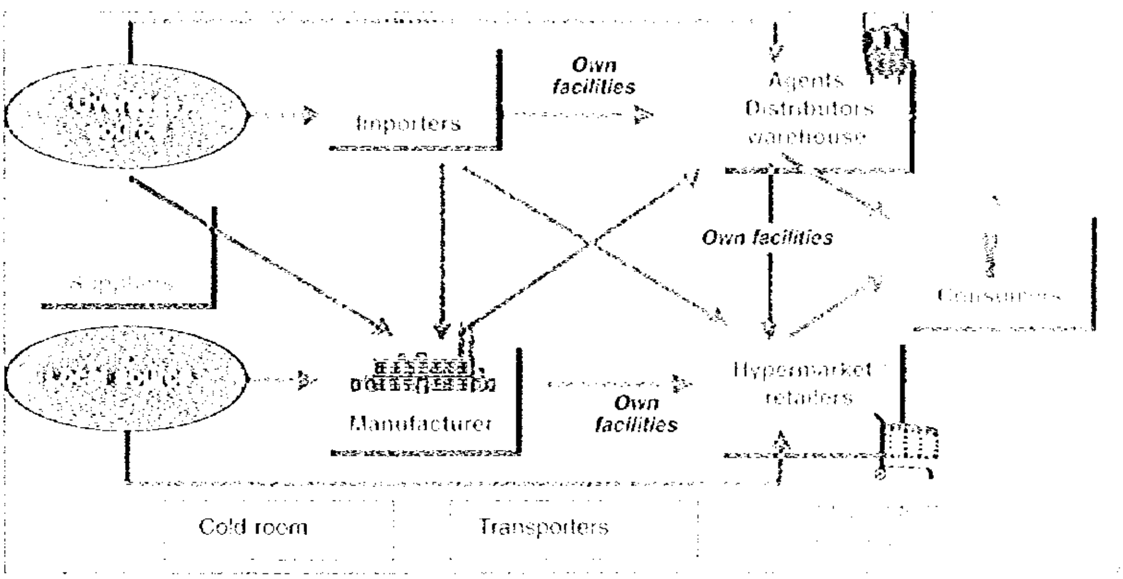
4.1 Supply Chain of the Industry

The following are major components of the chilled and frozen food supply chain [illegible]

- Equipment Suppliers
- Value Added Food Processor Manufacturers
- Freight Forwarding Agents (i.e. importers / exporters)
- Support Service Providers (mainly comprising transporters and cold [illegible])
- Food Service Providers (mainly fast food chain operators and caterers)
- Retailers and Distributors

The chart below illustrates the supply chain flow of the chilled and frozen food [illegible]

Chart 4.1 Industry Supply Chain



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The following are the points of possible breaks in the cold chain:

- When food gets transferred in and out of the cold store
- When food is in the possession of the transporter (distributors), while in transit
- When food is being transferred from the transporter to the store at retailers
- When packed food products are moved onto the shelves of the retail outlets
- After consumer purchased the food at retail outlets and before consuming

4.3 Components of Cold Chain

4.3.1 Equipment Suppliers

The equipment suppliers' refers to those involve in:

- Construction of cold room (Cold Room Builders)
- Cold truck cabinet building (Cold Truck Cabinet Builders)

The following are key players identified in this segment:

Table 4.1 Selected Major Equipment Suppliers

Company	Location	Annual Turnover for 1999 RM '000
MS Cooling Sdn Bhd	Balakong	5,678
NKR Perkasa Continental Sdn Bhd	Selayang	4,210
Risha Sdn Bhd	Ampang Jaya	2,050
Rigidfoam Industries (M) Sdn Bhd	Sungai Buluh	4,798
Wong Brothers Electrical & Refrigeration Industry	Jalan Ipoh	6,786
Thermal Insulation Sdn Bhd	Desa Pandan	5,100
TM Cooling Technology Sdn Bhd	Kepong	3,780

Source: Turnover figures are from Registrar of Companies

4.3.2 Value-Added Food Processors / Manufacturers

This business segment is the mover of the entire industry. The value-added food processors depend heavily on the support of the entire supply chain. It needs the suppliers to constantly provide raw materials and services to it, and also needs forwarding agents to distribute its value-added food products to the appropriate destinations (e.g., local retailers, foreign markets). Some of the major value-added food processors are shown in Table 4.2.

Table 4.2 Selected Major Value-Added Food Processors

Company	Location	Annual Turnover for 1999
		RM '000
Prima Agri-Products Sdn Bhd	Bangi	27,802
Ben Fortune Pastry Mfg (M) Sdn Bhd	Sunway	4,500
Ayamas Food Corporation Berhad	Port Kelang	201,086
De-Luxe Food Services Sdn Bhd	Glenmarie	6,700
KG Pasteries (M) Sdn Bhd	Shah Alam	20,000
Mas Catering Sdn Bhd	Sepang	197,037

Source: Annual Turnover Figures from Registrar of Companies

4.3.3 Freight Forwarding Agents

The following are services provided by forwarding agents:

- International Air/Sea Freight Forwarding
- Container stuffing/Unpacking according to specification
- Custom Forwarding / Documentation (Air/Sea - Import and Export)
- Chilled and frozen warehousing and transportation
- Project Management with haulage services

Local forwarding agents have close ties or partnerships with foreign freight forwarders who can take over the movement of the consignment overseas. This also covers custom clearance at the port, transportation, and warehouse.

There are about 700 freight forwarding agents in Malaysia. The following table lists the main companies servicing the chilled and frozen food industry:

Table 4.3 Freight Forwarding Agents in the Chilled and Frozen Food Industry

Company	Location
Pok Brothers	Glenmarie
United Logistics	Subang Jaya
Selamat Supplies	Sunway
Bina Kon	Port Klang
Ben Food	Kuala Lumpur

Source: DKMC Industry Survey

4.3.4 Support Service Providers

The support service providers could be categorised into 2 groups:

- Transporters – includes Container haulers and In-Land transporters
- Cold Storage Providers

The trasnporters and cold storage service segments are explained below:

a) Transporters

Ideally chilled and frozen food should be transported and distributed using thermally insulated vehicles or containers that are equipped with appropriate refrigeration systems for maintaining desired temperatures. However, due to economic or logical reasons, the local distribution network generally uses less costly methods to transport chilled and frozen foods. For example, when delivering within Klang Valley, chilled vegetables are sometime transported in ambient temperature vehicles or at best, vehicles with air conditioning facilities.

Vulnerability of chilled and frozen product to temperature rise depends on the mode of transportation of the food item. In the local distribution network, road transportation is one of the major transportation mode. Local transporters normally do not practice temperature measurement system as it is not required by the local consumer or regulators.

(I) Container Haulers

Container haulers are controlled and licensed by the Transport Ministry. These haulers service the links between the international shipping liners who bring cargo in and out of Malaysia at the three main ports (Pasir Gudang, Port Klang, Penang).

Only five companies are licensed to operate as container haulers in Malaysia (refer Table 4.4).

Table 4.4 Container Haulers in Malaysia

Company	Location (Head Office)
Kontainer Nasional	Petaling Jaya
Konsortium Logistik Bhd	Petaling Jaya
Multimodel Freight Sdn Bhd	Petaling Jaya
Diperdana Corporation Bhd	Port Klang
MISC Haulage Services Sdn Bhd	Port Klang

Source: DKMC Industry Survey

All of these container haulers operate throughout the country. The forwarding agents (who play the role as project shippers) do bookings for these hauliers to haul the cargo (container) to and from the ports to specified locations.

(2) In-Land Transporters

Transportation providers are trading partners with trailers and prime movers that move chilled and frozen food from point A to B. According to statistics from *Lembaga Pelesenan Kenderaan Perdagangan Semenanjung Malaysia*, a total of 248 licences were issued for operating refrigerated trucks during the period of 1990 to 1999.

The key players in this segment and their capacity are listed in Table 4.5 and Table 4.6 respectively.

Table 4.5 In-land Transporters

Company	Location
Sanjungan Sekata Sdn Bhd	Balakong
Sin Kang Sdn Bhd	Cheras
Sit Tatt Sdn Bhd	Kuala Lumpur
G-Force Sdn Bhd	Shah Alam
Aman Freight Sdn Bhd	Port Klang

Source: DKMC Industry Survey

Table 4.6 Types of Cold Trucks Owned by the Transporters

	3-5	8-10	20	40	Total trucks	Total capacity
	Metric ton				Units	Metric ton
Sanjungan Sekata Sdn Bhd		20	6		26	290
G-Force Sdn Bhd		8	22	10	40	920
Sin Kang Sdn Bhd	10	40	25	25	100	945
Aman Freight Sdn Bhd	5	16	5	4	30	440
Total	**15**	**84**	**58**	**39**	**196**	**2,595**

Source: Information attained from Logistic Managers from the respective companies

According to the General Manager of one of the companies identified above, the four transporters above command approximately 60 percent of market share of business in the chilled and frozen food industry.

b) Cold Storage Providers

These service providers are sought after when food processors run out of cold storage space. Other occasions when these stores are used are when forwarding agents import goods from foreign suppliers.

Most local operators can vary the temperature according to the needs and specifications of the food products stored. They are able to achieve temperatures ranging from +20°C to -30°C at their cold store facilities.

The following are major cold storage providers:

Table 4.7 Cold Storage Providers

Company	Location
G-Force Sdn Bhd	Shah Alam
Sitt Tatt Logistics Sdn Bhd	Kuala Lumpur
Tamadam Bonded Warehouse Sdn Bhd	Port Klang
Iglo (M) Sdn Bhd	Port Klang
Ng Kee Cold Store	Klang
Folin Food Processing Sdn Bhd	Petaling Jaya
Forever Fresh Coldstore Technology Sdn Bhd	Shah Alam
Subang Coldrooms Sdn Bhd	Subang
Selayang Cold Storage	Selayang

Source: DKMC Industry Survey

The following are the average price structure of a cold store provider:

Table 4.8 Average Price Structure of a Cold Storage Provider

Size (in feet)	Freezing (RM per Calendar Month)	Chilling (RM per Calendar Month)
Large:		
30' x 15' x 14'	5,355.00	4,725.00
30' x 15' x 12'	4,590.00	4,050.00
25.5'x 15' x 12'	3,401.00	Not available
Medium:		
21' x 15' x 12'	3,913.00	2,835.00
25.5' x 12' x 12'	3,021.00	2,754.00
Small:		
15' x 13' x 12'	2,006.00	1,872.00

Cold storage

Cold truck

Cold room

The following is the estimated cold room space available for commercial rental in Klang Valley:

Table 4.9 Estimated Cold Room Space Available in Klang Valley

Cold room operators	Cold room space Sq. ft.
Konsortium Logistik Bhd	110,000
G-Force Sdn Bhd	80,000
Sitt Tatt Logistics Sdn Bhd	60,000
Tamadam Bonded Warehouse Sdn Bhd	50,000
Iglo (M) Sdn Bhd	40,000
Ng Kee Cold Store	40,000
Folin Food Processing Sdn Bhd	40,000
Forever Fresh Coldstore Technology Sdn Bhd	30,000
Subang Coldrooms Sdn Bhd	25,000
Selayang Cold Storage	20,000
Others*	96,250
Total	**591,250**

Note: * Extrapolated. The industry survey indicated that the 10 cold room operators' combined cold room space is estimated to be approximately 80% of the overall market size in Klang Valley.
Source: Information attained from Logistic Managers from the respective companies

4.3.5 Food Service Providers

The food service providers mainly comprise fast food chain operators and caterers and are described below:

a) Fast-Food Chain

According to secondary sources, the fast-food industry in Malaysia is now worth approximately RM 900 million a year and expanding (Malaysian Business, July 16, 1998). As shown in Table 4.10 there are about 716 fast food outlets in Malaysia.

Table 4.10 Number of Fast Food Outlets in Malaysia 2000

Companies	Number of Outlets
KFC	277
Pizza Hut	74
Ayamas (under KFC)	52
McDonald's	140
Burger King	7
A&W	47
TAZA	6
Marry Brown	75
Kenny Rogers	18
Shakey's Pizza	20
Total	**716**

Source: Industry Survey

The fast food industry is dominated by KFC Holdings, which together with its other food services subsidiaries, cover approximately 50 percent of the market share, followed by McDonald's at 30 percent.

b) Caterers

Caterers are another key player in the food service sector. Airline caterers such as MAS Catering and KLAS are the big consumers of chilled and frozen food. Turnover of the major airline caterers are about RM6 million per month. The main items purchased by these airlines caterers are processed meat, frozen snacks, frozen food ingredients and vegetables, and frozen seafood.

Potential institutional buyers of chilled and frozen food are hotels, schools, hospitals, and Government Agencies.

The hotel sector consumes only a small portion of chilled and frozen food. The catering activities in other institutions such as schools and hospitals are usually tendered to independent caterers. These caterers normally use a lot of "fresh" or unprocessed foods to prepare the required meals. There is presently no centralised caterer to support the institutional buyers.

4.3.6 Retailers and Distributors

Chilled and frozen foods are normally distributed through the hypermarket and supermarket chains. The growth of this retail sector serves as an indicator of the growth of the chilled and frozen food industry. There were 22 hypermarkets and more than 100 supermarkets in Malaysia in year 2000, excluding small retailers.

Table 4.11 Number of Hypermarkets / Supermarkets in Malaysia, 2000

Companies	Number of Outlets
Makro	8
Carrefour	6
Giant	8
Tops	39
Jaya Jusco	7
Hock Choon	15
Ocean	8
Econsave	7
Billion	20
X-tra	4
Total	**122**

Source: Industry Survey

According to the retailers interviewed, fresh vegetables and fruits (local fruits), chilled vegetables and fruits, frozen vegetables (mix vegetables, french fries, potatoes) and processed meat and seafood (chicken, beef, nugget, sausages) are among the high potential products. Haram food products are not as popular and their shelf space allocation is minimal.

Retailers normally buy in big quantities and some retail price is pre-set by the suppliers. The gross profit margin of retail sales is between 10-30 percent. The gross profit margin for the various segments are 15-30 percent for local products, 15-25 percent for imported products, 15 percent for fresh vegetables and fruits, 20-30 percent for processed meat, 30 percent for chicken or meat cut and 15-20 percent for value-added processed food.

Chapter 5

INSTITUTIONAL SITUATION

CHAPTER 5

INSTITUTIONAL SITUATION

The chilled and frozen food industry in Malaysia is at an infancy stage and most of the players actively involved in the industry are mainly small and medium size companies (SMIs) except those in the frozen seafood, poultry and meat industries. The Government, therefore, provides various support programmes for SMIs including those in the chilled and frozen food and food related industries.

5.1 Related Agencies and Their Major Roles

There are several Government agencies that play significant roles and have direct or indirect impact on the chilled and frozen food industry. The following are the main roles of the relevant Government agencies in relation to chilled and frozen food:

a) Ministry of Agriculture (MOA)

This agency is responsible for the development of the agricultural sector in Malaysia. The following are the relevant agencies under MOA:

(1) Federal Agricultural Marketing Authority (FAMA)

FAMA, as a marketing arm for Malaysian agriculture-based products, has been actively involved in planning and promoting agricultural products in the domestic and overseas markets through campaigns, organising exhibitions, and consulting services.

(2) Department of Fisheries

Department of Fisheries responsible for the development and management of the national fishery sector.

(3) Malaysian Agriculture Research and Development Institute (MARDI)

MARDI is a statutory body mandated to undertake research services in tropical crops (except oil palm and rubber), livestock, and food. They also provide related technical, commercialisation, and entrepreneurial development services.

(4) Federal Land Development Authority (FELDA)

FELDA responsible for improving the quality of livelihood of land settlers with dedicated and efficient management of land, while contributing towards the accomplishment of the nation's vision through increased productivity.

b) Ministry of International Trade and Industry (MITI)

This agency is responsible for the country's industry development and to formulate industrial development plans such as the Industrial Master Plan. These plans include the improvement of agriculture and food sectors.

The following are the agencies under MITI:

(1) The Malaysian Industrial Development Authority (MIDA)

This is the Malaysian government's principal agency for the promotion and co-ordination of industrial development in Malaysia.

(2) Malaysian External Trade Development Corporation (MATRADE)

This is the external trade promotion arm of MITI that functions as a focal point for Malaysian exporters and foreign importers to source trade related information.

(3) The Small and Medium Industries Development Corporation (SMIDEC)

SMIDEC promotes the development of small and medium industries through by providing advisory services, financial assistance, infrastructure facilities, market access, and other support programs.

(4) Royal Customs and Excise Department

This department issues licenses for import / export of items listed in the Custom Prohibition of Import / Export Orders under the Customs Act 1967 including those related to chilled and frozen food.

c) Bank Pertanian Malaysia (BPM)

Plays a key role in funding agricultural projects in Malaysia by providing a range of banking and financial services to the agricultural sector.

d) Central Bank of Malaysia (BNM)

The Central Bank is responsible for promoting monetary and financial stability, and fostering a sound and progressive financial sector.

The Central Bank also facilitates the growth of industries in Malaysia by providing the necessary financial supports such as Fund for Food and Export Credit Refinancing Scheme (ECR). These are aimed to make Malaysian products more competitive in overseas markets.

e) Road Transport Department

Responsible for enforcing the Road Transportation Act 1987 to ensure competent drivers and safe vehicles. This includes issuing licenses to transport companies, which use cold trucks to carry chilled and frozen food.

5.2 Trade Associations in Malaysia

Broadly, the food manufacturers in Malaysia belong to one or more of the many umbrella associations where common issues, especially commercial and legislative issues of the industries, are brought up for discussion.

The association with the biggest representation is the **Federation of Malaysian Manufacturers (FMM)** with a membership of about 240 food-based companies. Other organizations are **the Malaysian Frozen Food Processors Association** for the seafood industries and **the Meat Importers' Association** for importers of frozen meat.

5.3 Related Government Policies

The following government policies related to the chilled and frozen food industry:

a) 3rd National Agricultural Policy (1998 – 2010)

The 3rd National Agricultural Policy (NAP3) aims to increase the pace of development of the agriculture and manufacturing sectors, to deepen linkages with other economic sectors. The food industry will achieve greater depth with the integration of the sectors. The NAP3 also aims to promote Malaysia as a halal food centre for processing, producing and certifying of halal food.

b) Steps Planned by the Malaysian Government to Increase Food Production (2000-2005)

Steps taken by the Ministry of Agriculture to increase agricultural production are as follows:

(1) Fishery Sector

- Develop and manage sustainable fishery alone shoreline via licensing fishing vessels, fishing zone, sea parks, introduce new fishing technology, encourage new investment in fishing industry and etc
- Encourage large-scale deep-sea fishing and develop fish landing infrastructure
- Encourage large-scale private sector participation in aquaculture and develop aquaculture infrastructure and research facilities

(2) Livestock Sector

- Develop integrated beef production and provide the related supporting services
- Zoning of disease free areas
- Develop incubation centre for the processing of halal products

(3) Crop Sector

- To increase production of rice, fruits, vegetables, coconuts, sago, pepper and other potential crops i.e. "ratus roselle", spice, cocoa, coffee, mushroom and honey.
- Create permanent food production zone and encourage private sector to participate

c) Second Industrial Master Plan (1996 – 2005)

The Second Industrial Master Plan (IMP2) like the NAP3, focuses on improving competitiveness through strengthening industrial linkages, both forward and backward, enhancing value-added activities, and increasing the productivity of the manufacturing sector. It also outlines initiatives to exploit the potential synergy between the agricultural and the manufacturing sector. The key agricultural sub-sectors identified for development under this plan include fisheries, livestock, fruits and vegetables, and floriculture.

The following are the IMP2's three broad objectives:

- Ensure the continued rapid expansion of the economy through the accelerated growth of the manufacturing sector to meet the objectives of the New Economic Policy (NEP)
- Promote the optimum and efficient utilisation of the nation's natural resources through value-added manufacturing activities
- Lay the foundation for the development of indigenous technological capability

d) Seventh Malaysian Plan (1996 – 2000)

The main thrust for agricultural development during the 7th Malaysian Plan (SMP) period was to modernize the agriculture sector so that it can become a high value-added producer of food and industrial raw materials. In meeting this challenge, agricultural development strategies continued to be directed at improving productivity and enhancing competitiveness by encouraging greater private sector involvement in large-scale commercial agriculture.

Under this broad policy framework, the role of the public sector is focused more on supporting the private sector, particularly smallholders, through extension services and R&D. In order to reduce imports, specific measures were identified under the National Economic Recovery Plan (NERP) to increase domestic food production. These measures also formed an integral part of the agricultural development effort.

5.4 Other International Policies

The followings are other policies relevant to the chilled and frozen food industry:

a) ASEAN Free Trade Area – AFTA

The main objectives of AFTA are to attract investments into the regional economies, to enable growth and development to be accelerated and sustained, to synergise ASEAN complementarities, and optimise the collaborative economic strengths of member countries.

With the introduction of the Common Effective Preferential Tariffs (CEPT) intra-regional trade tariffs will be brought down to a maximum of five percent over a 15 period year effective 1993 i.e., by 2008 (2003 for the six original members of ASEAN, i.e., Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand). To date, almost 97% of manufactured, processed, and unprocessed agricultural products have been included in the Common Effective Preferential Tariffs (CEPT) Scheme.

b) Asia Pacific Economic Co-operation (APEC)

The main objectives of APEC are to narrow the disparities in the economic development among member countries. It hopes to implement and review the Individual Action Plan (IAP) which requires the member countries to dismantle tariffs from 1.1.97 to achieve free trade and investment by 2020.

c) The Generalised System of Preferences (GSP)

The GSP is where Developed Countries grant preferential treatment to eligible products from Developing Countries. Preferential treatment is in the form of Reduced Import Duty granted without reciprocal obligation on the part of the developing countries. With GSP, Malaysia will enjoy a preferential treatment in exporting its goods to certain developed countries. For e.g., Malaysia's export of fish-based products enjoy a 'zero' import duty in the Japanese market.

d) World Trade Organisation – WTO

The following are general information on WTO:

- Established in 1995 following the Uruguay Round of General Agreement on Tariffs and Trade (GATT)
- Empowered to enforce global commerce rules with the imposition of economic sanctions
- WTO rules are much broader (than GATT), covering food and environmental standards, regulation of services, copyright and patent law, and farm policy

e) International Policy Council on Agriculture, Food and Trade (IPC)

The following are general information on IPC:

- Founded in 1987 as an independent group in food and agriculture from 20 developed and developing countries
- Hopes to establish a market-oriented agricultural trading system

5.5 Availability of Funds

The main funding schemes, incentives, and allowance currently available to the chilled and frozen food industry and other supporting industries are summarised as follows:

a) Funds For Food

The Central Bank of Malaysia has set up a RM700 million Fund for Food to promote investment in new productive capacity in food production. The scheme provides finance at a reasonable cost where the maximum lending rate is set at 4% per annum with a maximum tenure of eight years.

b) SMI Funds

SMI funds are aimed at promoting new investments of SMIs in selected sectors (manufacturing sector, agro-based industry and services) and also to assist SMIs which need more funds to improve their productivity and capacity for both domestic and export market. This SMI fund programme has attracted participation of about 50 banks and financial institutions. The amount of fund allocated for a project can range between RM50,000 to RM5 million with a maximum interest rate of five percent and maximum repayment period of seven years.

c) Special Loan Schemes

Some of the loan schemes available to chilled and frozen food industry are as follows:

(1) Bank Pertanian Malaysia

Term loans, Pembiayaan Perdagangan and Niagancka tani offered by Bank Pertanian are available to interested parties in carrying out agriculture-based activities including processing and marketing.

(2) SMIDEC

SMIDEC also offers several schemes to SMIs in the chilled and frozen food industry. The following are examples of funds available:

(i) Financial Package for SMI's (PAKSI)

This financial package provides soft loan scheme for project and working capital financing, ranging from RM50,000 to RM3 million with an interest of up to five percent. The maximum repayment period is normally seven years.

(ii) Industrial Technical Assistance Funds (ITAF)

ITAF is a matching grant set up by the government in 1990. The fund is aimed at enhancing the development of SMIs into a cost efficient and competitive industrial sector. Assistance is given in the form of a matching grant where 50 percent of the project cost is borne by the government and the reminder by the applicant.

(iii) Quality Enhancement Scheme

This scheme is aimed at assisting Bumiputra SMIs involved in the manufacturing sector to modernise and automate in order to increase quality and productivity.

5.6 Tax Incentives

To facilitate the growth and development of the agriculture and agriculture-based industries, several incentives have been offered by the Government. The following lists some of the incentives:

a) Pioneer Status

Companies granted Pioneer Status are either fully or partially exempted from paying corporate tax for periods raging from five to 10 years. This incentive is suited for investments that involve relatively small capital outlay and business which start to make profits within a short time and remain profitable during the incentive period.

b) Investment Tax Allowances (ITA)

Companies granted with the ITA incentive are given allowances up to 100 percent of the qualifying capital expenditure (mainly expenditure incurred on plant and machinery excluding land) incurred over a five-year period. The tax credit can be used to offset against taxable income indefinitely into the future until the tax credit is completely used up. The ITA incentive is suitable for capital intensive projects which may not be profitable in the initial years.

c) Reinvestment Allowances

This incentive is given to encourage investment manufacturing companies that do not enjoy the Pioneer Status or ITA incentives. Manufacturing companies that are in operation for at least 12 months can apply for this incentive. Companies that incur qualifying capital expenditure for expansion of production capacity and modernisation are eligible for this allowance. 60% of the qualifying capital expenditure is given as an allowance to offset against 70% of the taxable income.

d) Agricultural Allowances (by MIDA)

A company implementing agricultural activities can claim capital allowances or agricultural allowances under schedule 3 of the Income Tax Act 1967.

e) Deduction for Capital Expenditure on Approved Agricultural Project

Tax deduction for capital expenditure on Approved Agricultural Projects is provided for under schedule 4A of Income Tax Act 1967.

f) Incentive for Food Production

The Malaysian Budget 2001 proposed that tax incentives be given to both the company that invests in the subsidiary company engaged in food production and the subsidiary company itself.

g) **Incentives for Research and Development (by MIDA)**

This incentive is given to companies that perform any systematic or intensive study carried out in the field of science or technology with the object of using the result of the study for the production or improvement of materials, devices, products, produce or processes. This, however, does not include the following:

- Quality control or routine testing of products or materials
- Research in social science or humanities
- Routine data collection
- Efficiency surveys and management studies
- Market research or sales promotion

5.7 Food Legislation

The following are the principal legislation governing the Malaysian chilled and frozen food industry:

- Food Act 1983
- Food Regulations 1985
- Import regulations and restriction on meats and meat-based products such as Animal Ordinance 1953, Animal Rules, 1962, Animal (Importation) Order 1962

General food items are covered under Food Act 1983 and Food Regulations 1985 while imports of meat and meat products into the country are covered under the Animal Ordinance 1953.

For chilled and frozen products that do not contain meat, milk or eggs, the manufacture and sale of these products do not need to undergo any registration process as long as they comply with the Food Act and the Food Regulations. For import of these products, the consignment must be accompanied by Health Certificates.

The specific sections of the Food Regulations 1985 covering the four main categories of chilled and frozen food under this study are as follows:

- **Complete meals and snacks** category falls under the Cereal, Cereal Product, Starch and Bread category, Regulations 42 to 75.
- **Food Ingredients** category falls under the respective spice category (Regulations 283 to 333A).
- **Meat, seafood and vegetables** category fall under the following categories:

(i)	Meat	Regulations 141 to 155
(ii)	Seafood	Regulations 156 to 170 for Fish and Fish Products
(iii)	Vegetables	Regulations 209 to 222 for Vegetable and Vegetable Products.

The following are the temperature requirements specifically spelled out by the Food Regulations 1985:

Table 5.1 Temperature Requirements by the Food Regulation 1985

Meat	
Chilled Meat	• Regulation 142: between minus 1° C to 10° C and includes frozen meat that has been thawed at a temperature of not more than 10°C.
Frozen Meat	• Regulation 143: below minus 18°C and shall not have been thawed before sale.
Seafood	
Chilled Fish	• Regulation 156: between minus 1°C to 10°C and includes frozen fish that has been thawed at a temperature of not more than 10°C.
Frozen Fish	• Regulation 156: below minus 18°C and that has not been thawed before use.
Vegetables*	
Frozen Vegetables	• Regulation 212: below minus 18 C and has not been thawed before sale.

*Note: The Food Regulations 1985 does not classify chilled vegetables specifically.

For products containing meat, manufacturing premises are under the supervision of the Department of Veterinary Services, while seafood products are under the supervision of the Department of Fisheries. The Department of Veterinary Services makes it mandatory for exporters (including to East Malaysia) to have the Veterinary Logo if Veterinary Certificates are required by the importing country.

The Application for Veterinary Logo requires the company to have Hazards Analysis Critical Control Point (HACCP) in place. At the same time, export of seafood requires HACCP Certification, which is under the jurisdiction of the Ministry of Health. Table 5.2 lists the legislative requirements relating to the chilled and frozen food businesses.

With the exception of a few food products, e.g., mineral water and packaged water, food products do not require pre-registration prior to sale unlike ASEAN neighbours (e.g., Thailand, Philippines, and Indonesia) where any new product would have to be registered with and approved by relevant authorities prior to sale. There is no restriction to the import of chilled and frozen foods into Malaysia as long as the products are accompanied by relevant Health Certificates.

Table 5.2 Summary of Legislative Requirements

Food Item	Food Regulations	Animal Ordinance 1953	HACCP Certification	HALAL	ISO 9000 & ISO 14000
General Food Import & Export	Mandatory. No prior registration needed for manufacture, import or export	Not Applicable	Voluntary	For competitive advantage	For competitive advantage
Seafood Import & Export	Mandatory	Not Applicable	Mandatory for export. EU No. to be given by MOH, pending HACCP Certification	For competitive advantage	For competitive advantage
Meat, Processing, import and export	Mandatory	Mandatory. Permit to given by DVS	Mandatory, and part of Veterinary Logo Requirement	For competitive advantage	For competitive advantage
General food containing meat products	Mandatory		If Veterinary Certificate is required for export, mandatory to have HACCP in place, under the DVS Veterinary Logo scheme.	For competitive advantage	For competitive advantage

5.8 International Regulatory Aspects

Codex Alimentarius is the reference standard for International Trade under WTO. WTO is the only international organisation dealing with global rules of trade between nations. Codex Alimentarius comprises standards and technical regulations related to hygiene practices, food safety systems, including Hazard Analysis of Critical Control Points (HACCP), HALAL, and standards on commodity products such as milk, cocoa, and mineral water.

5.9 Quality and Safety Standards

5.9.1 Definition of Quality

Currently, there is no well-defined quality standard for locally chilled and frozen food, except for meat and meat-based products. To the Government, quality means meeting the regulatory requirements such as product definition, specifications as well as hygiene and safety aspects. Generally, consumers use fresh product as a benchmark for standards. To the industry, quality means meeting the requirements of both the authorities and consumers.

5.9.2 Availability of Standards

For the four segments of products under study, there is a wide variation of product standards, from that of fully developed to no established standards. For example, in the seafood and meat category, the authorities and industry have established well-defined food safety and hygiene standards. At the same time, products such as burgers and sausages have well-established standards on composition, texture, colour and general appearance. On the other hand, there are no standards available for products such as *murtabak, pau, roti pratha, mantou,* and other ethnic food. This aspect must be addressed for the sector to progress.

Table 5.3 Availability of Standards for Chilled and Frozen Food

Product Category	Industry	Consumer	
		Local	Overseas
1. Ready Meals	• No specific product standards • MOH established guidelines on hygiene and safety on operations, e.g., guidelines on mass catering and Cook-Chill System.	• Tends to identify product quality through comparison with fresh varieties, e.g., chilled *nasi lemak* against freshly prepared ones.	• No opportunity to compare with fresh products. • Rely on retailer's standards.
2. Snacks	• As per Ready Meals	• As per Ready Meals	• As per Ready Meals
3. Ingredients	• Standards exist for common products, e.g., *santan*, tofu, spices. For spices, there are international players providing full specs, e.g. McCormick, Food Ingredients Specialty (FIS)	• As in Ready Meals, consumers uses fresh product as benchmark for standards.	• No knowledge of ethnic food standards generally. • For spices, standards are known.
4. Meat & seafood	• Regulatory and industry standards are well established. • Additional standards and guidelines provided by DVS.	• Discerning consumers are knowledgeable about quality parameters, e.g. Composition of meat, origin of meat, including sensory profile. • General public are driven by price factor.	• More discerning on product standards due to long history.
Vegetables	• Generally cover under the Food Regulations. • No specific product standards.	• Tends to compare with fresh variety	• Tends to compare with fresh variety

5.9.3 Quality and Food Safety Certification

Table 5.4 shows the number of manufacturers in each category and the various quality and safety certification that they have achieved. Considering that the number of food companies in Malaysia is around 5,000, only a small percentage (<0.5 percent) obtained some form of certification. Only 21 companies have obtained HACCP certification from MOH, out of which 18 companies are from meat and seafood sub-sector due mainly to importing countries' requirements.

A total of 36 companies, 30 of which are in the seafood sector, have obtained EU No. This certification enables them to export their products to Europe. Currently, there is not a single chilled and frozen food manufacturer who has obtained ISO 14000 certification.

Table 5.4 Quality and Food Safety Certification among Chilled and Frozen Food Manufacturers in Malaysia

Product Category	EU No.	Vet. Logo	HACCP	ISO 9000	ISO 14000	Total number of manufacturers
Ready Meals [1]	-	2	1	2	-	5 [3]
Snacks [2]	-	1	-	-	-	4 [3]
Food Ingredients[2]	-	-	-	-	-	2 [3]
Meats and seafood[2]	30 (seafood)	30	18	3	-	69 [3]
Others[2]	6	24	2	7	-	52 [3]
Total number of certified companies	36	57	21	12	-	132 [3]

Notes:

1. Ready meals category includes catering and food service providers
2. Others category consists of non chilled and frozen food manufacturers
3. The total number of manufacturers is not equal to the total number of certified companies because some companies may not receive the certification and some companies may receive more than one certifications.

Source: EU No and HACCP listing are from MOH, Vet Logo listing is from DVS and ISO listing is from SIRIM.

By comparison, a total of 155 out of 12,080 food manufacturing factories in Thailand (1.3 percent) are HACCP certified. Similar to Malaysia, a high percentage (58 percent) of these Thai factories are in the fishery category due to the requirement imposed by importing countries.

5.9.4 Food Safety and Incidence of Outbreak from Consumption of Chilled and Frozen Food

The manufacturing and distribution of chilled and frozen food if improperly carried out may lead to health risks to consumers. There is limited information on local incidences and food poisoning as a result of consuming chilled and frozen foods. It is generally accepted that the incidences are low, occur in private homes and are not reported.

In Malaysia, there is no information available on product recall, partly due to the reluctance of companies to report such incidents.

5.10 Research and Development

Very little systematic R&D is conducted on chilled and frozen foods in Malaysia and where R&D is carried out, it is limited mainly to public research institutions. Work carried out outside the public research institutions are more product development type and are done during formulation trials in conjunction with the machinery and ingredient suppliers. Private companies find it difficult to assess materials at public research institutions, as there appears to be a lack of communication between industry users and public research institution.

In the frozen snack category, product R&D is usually undertaken on a "trial and error" basis by the owner himself who tightly controls the business. In larger set-ups where food technologists are employed, there is trend towards carrying out product development and process improvement. Management generally keeps up-to-date with technology and R&D initiatives via trade publications.

5.11 Human Resource Development

The industry has yet to fully use trained manpower such as qualified food technologists, mainly because the producers/entrepreneurs are fearful of sharing their experience and knowledge with others. Currently, about 450 qualified Food Science and Technology students are graduating every year but only a handful of them are employed in the chilled and frozen food businesses. Those that are employed are mainly in meat and seafood sector.

There is a shortage of semi-skilled and unskilled workers in this sector due to the special nature of the chilled and frozen food operation.

Investments to develop human resource vary greatly among the four categories of chilled and frozen food. Many of the meat and seafood manufacturers send staffs to attend basic food hygiene, GMP and HACCP courses conducted by Government agencies and by several private consultancy firms. Average spending for technical training in the companies surveyed is less than RM10,000 a year. In the other food categories, the development of human resource is minimal.

5.12 Barrier to Entry

Generally, the major barriers to entry is R&D and cost of freezing equipment. Substantial investment in R&D is required to under the behaviour of the food and materials used under the chilled and frozen conditions. This is particular crucial for local ethnic foods as there is very little published knowledge and R&D findings on these foods.

Generally, good freezing equipment such as the cryogenic and spiral freezer is very expensive and required high volume for economical production. This may be a major obstacle for local food producers as they are usually small or medium size.