Development and Constraints of Food Industries in Taiwan

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Abstract

The food industry in Taiwan has been conspicuous for its significant contribution to the post-war economic development. During the 1950s to 1980s, it earned a large amount of foreign exchange critically needed for industrial development. The most typical was the canned food sector, which reached the apex in the 1970s when Taiwan became the world's number one exporter of canned pineapple, canned mushroom, canned asparagus and canned bamboo shoot. But starting from the 1980s, the international competitiveness of the food industry in Taiwan was faced with a sharp increase in the production cost. Fortunately, the contemporary upsurge in domestic demand for processed food has provided a suitable environment for the industry to grow steadily. In terms of production value, the food industry is still one of the largest in twenty-two manufacturing industries, and it ranked fourth in 1997. As one of the main components of the economy, it contributed to 6.1% of the GNP in 1997. Within the food industry, the top five categories are slaughtering, feed, frozen food, rice husking and non-alcoholic beverages. The single largest export category is frozen food, accounting for more than 60% of total food export in 1997. On the other hand, the three largest import categories are alcoholic beverages, frozen food and tobacco, which altogether accounted for 44% of the total food import in 1997.

The food industry in Taiwan has been confronted with a number of constraints, such as labor issues, raw material acquisition, foreign competition, environmental protection and distribution. In addition, the outbreak of foot-and-mouth disease which occurred in early 1997 has interrupted the stable growth of the industry achieved over the past fifteen years. Nevertheless, food manufacturers in Taiwan are used to struggle for survival. Many of them have adopted strategies of diversification, channel integration, strategic alliance and international cooperation, so that they can stand firm and compete in the market.

Contribution to the economy

The food industry played a very important role in the early stage of economic development in Taiwan. Before the 1960s, a limited amount of farm produce such as rice, sugar, banana and pineapple was available for export. In the early 1960s, mushroom and asparagus were introduced into Taiwan. These, together with the indigenous produce, such as pineapple and bamboo shoot, contributed to the development of a sizeable canned food sector which has dominated the international market for almost twenty years. It reached a peak in the 1970s when Taiwan became the world's first exporter of canned pineapple, canned mushroom, canned

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asparagus and canned bamboo shoot. In 1980, the quantity of canned food exported by Taiwan amounted to 22 million standard cases with an export value in excess of US$ 500 million. As a whole, the export of agricultural produce and processed agricultural products during the 1960s to the 1980s not only markedly increased farmers' income, but also brought in a considerable amount of foreign exchange critically needed for industrial development.

The export of agricultural produce and processed agricultural products accounted for as much as 69.5% of the total exports in 1952 and 55.7% in 1960. It gradually decreased to 12.8% in 1970, 5.6% in 1980, 3.8% in 1990 and 3.5% in 1996. These figures indicate that the food industry was playing a decreasing role in total exports. Its competitiveness had been hurt by the escalating cost of land, labor and raw materials, and had been greatly challenged by other developing countries in the international market.

Fortunately, as a consequence of the stable growth of Taiwan's economy, domestic demand for processed food has markedly increased in recent years. Therefore, the role of the food industry has been shifting from earning foreign exchange to satisfying the ever increasing demand of the people in Taiwan.

During the period from 1991 to 1997, the production value of the food industry in Taiwan was US$ 19.19 billion on the average, contributing to 6.1% of the GNP in 1997. Although the food industry is generally considered to be a traditional industry, it is still one of the largest among twenty-two manufacturing industries, and it ranked fourth in 1997. The largest manufacturing industry is the electrical / electronic machinery and equipment industry, followed by the chemical materials industry and the basic metals industry (Table 1).

Table 1 Production value of the food industry in Taiwan in terms of both gross national product (GNP) and manufacturing industries

Unit : US $ billion

Item	1991	1992	1993	1994	1995	1996	1997
Production value (including tobacco)	18.83	19.57	19.11	19.74	19.66	20.23	17.17
% of GNP	9.8	9.1	8.5	8.0	7.7	7.4	6.1
% of manufacturing industries	10.1	10.3	10.3	9.7	8.8	9.2	7.8
Rank within manufacturing industries	2	2	2	2	3	3	4

Sourth : Ministry of Economic Affairs (1998) : Industry Production Statistics Monthly, No.342.
Directorate-General of Budget, Accounting and Stastistics(1997) : Statistical Abstract on National Income in Taiwan Area.

Development of production

There are altogether twenty-two sectors within the food industry in Taiwan. In terms of production value, the top twelve include slaughtering (accounting for 12.74% of the total production value in 1997), feed (10.81%), frozen food (9.58%), rice husking (8.25%), non-alcoholic beverages (7.94%), miscellaneous foods (7.58%), tobacco (6.31%), grain milling (5.86%), liquor (5.02%), beer (4.12%), dairy products (3.86%), and edible oil and fat (3.67%) (Table 2).

The total production value of the food industry in 1997 was US$ 17.17 billion, down by 15% compared to 1996. The stable growth of the food industry over the past fifteen years has been

Table 2 Production value of the food industry in Taiwan in 1997
Unit : US$ billion

Sector	Production value	% of total
Slaughtering	2.19	12.74
Feed	1.86	10.81
Frozen food	1.65	9.58
Rice husking	1.42	8.25
Non-alcoholic	1.36	7.94
Miscellaneous foods	1.30	7.58
Tobacco	1.08	6.31
Grain milling	1.01	5.86
Liquor	0.86	5.02
Beer	0.71	4.12
Dairy products	0.66	3.86
Edible oil and fat	0.63	3.67
Bakery products	0.51	2.99
Noodle	0.42	2.42
Canned food	0.34	1.95
Sugar production	0.29	1.69
Sugar confectionery	0.24	1.39
Other seasonings	0.23	1.36
Monosodium glutamate	0.18	1.05
Tea	0.09	0.51
Pickled food	0.08	0.45
Dehydrated food	0.07	0.44
Total	17.17	100

Source : Ministry of Economic Affairs (1998) : Industry Production Statistics Monthly, No.342.

interrupted. The categories witnessing the most serious setbacks were frozen food, slaughtering and feed, mainly due to the outbreak of foot-and-mouth disease in early 1997.

Although the disease has had a large impact on many food industry sectors, some sectors requiring more sophisticated production processes, such as non-alcoholic beverages, dairy products, bakery products, noodle and seasonings, still achieved positive growth in 1997.

The current development of the top five food industry sectors is outlined as follows.

1 Tobacco, liquor and beer

Tobacco, liquor and beer are officially classified as three different food industry sectors. They rank as the seventh, ninth and tenth largest sectors, respectively, and therefore play an important role in the food industry. Since all these three sectors have the same producer and cater significantly to habitual consumption, they are grouped here for convenience. After summing up their respective production values, they become the largest food industry sector in

Taiwan.

Production of tobacco, liquor and beer has been monopolized by the government for many years. In recent years, economic liberalization has compelled the government to privatize the production and sales of these products. Import of tobacco, liquor and beer was allowed a few years ago. Production of liquor and beer, followed by tobacco, will be permitted in the near future, which will provide great business opportunities and has attracted the attention of many enterprises.

During the ten-year period from 1988 to 1997, the production value of tobacco, liquor and beer increased by 10%, 11% and 4%, respectively. In comparison, during the four-year period from 1994 to 1997, import value of tobacco skyrocketed by 105% and the import value of liquor and beer also rose drastically by 78%. Foreign competition is intense and will be fiercer in the future.

2 Slaughtering

In the past two decades, the slaughtering sector, notably hog slaughtering, was significantly improved in terms of raising of species, illness prevention, feeding efficiency, feeding management, and slaughtering technology. As the manufacturers searched for and expanded the export market, the slaughtering sector witnessed tremendous growth during the past twenty years. Even the advanced hog-producing countries, such as Denmark, Japan and the US, wanted to learn from the successful experiences in Taiwan.

Due to the outbreak of foot-and-mouth disease in 1997 which curtailed pork export and decreased domestic pork consumption, and the forthcoming membership in WTO which will likely lead to an increase in meat import, the slaughtering sector has encountered a very difficult period. Taiwan must take measures to reduce the hog production cost and improve the image of domestically grown pork.

3 Feed

To cater to the demand from the slaughtering sector, the feed sector started to develop in the late 1960s. It reached a high growth stage in the 1980s mainly due to the sharp increase in the feeding number of hogs and chickens. At present, there are approximately 200 feed manufacturers. They produce some 9 million metric tons of formula feed annually, which is overwhelmingly used for feeding hogs and poultry.

The outbreak of foot-and-mouth disease was a disaster for hog feeders, who then reduced their demand for hog feed. In addition, the catch amount of eel is decreasing each year due to sea pollution. The shrimp feeders have not yet been successful in eradicating widespread shrimp diseases which started to occur in the late 1980s. Therefore, it is likely that the demand for feed will decrease in the future.

4 Frozen food

The frozen food sector began to develop overwhelmingly for the export market. A large foreign demand for frozen pork, frozen shrimps and frozen prepared eel has contributed to the development of a sound foundation of the sector.

During the last decade, the Taiwanese government had been very active in developing the domestic frozen food market. In 1988, the Council of Agriculture started to promote CAS (Chinese Agricultural Standard) quality mark for the frozen food sector. On the one hand, it encourages manufacturers to produce frozen food meeting the qualifications for CAS mark accreditation. On the other hand, it educates the general public to purchase CAS frozen food for the sake of health. In 1991, the government supported the establishment of the Chinese Frozen Food Institute whose primary function is to promote the development of the frozen food sector. Furthermore, the government has taken measures to help setting up the cold chain. Through the efforts of the government and frozen food manufacturers, the domestic frozen food market markedly expanded by 5.5 times during the period from 1988 to 1995, which increased the production value of the sector by approximately one half from 1988 to 1996.

Unfortunately, in 1997, the outbreak of foot-and-mouth disease curtailed the growth of the sector and it may take several years for the sector to recover gradually.

5 Rice husking

Rice is the most important crop in Taiwan, accounting for more than 20% of the total crop production value. It contributes to a sizeable rice husking sector, involving more than 1,500 factories with an annual production value of approximately US$ 1.4 billion. The finished product from the sector is either consumed directly or used for making a wide variety of processed rice products.

Primarily due to the people's gradual attraction to westernized diet and diminishing consumption of staple food, rice consumption fell drastically. In 1961, daily rice consumption per person was 383.7 g. In 1995, it decreased to 161.9 g. The future of the rice husking sector is hardly optimistic.

Development of trade

The export development of the food industry has been sluggish in recent years and the export value decreased in 1997 mainly due to the outbreak of foot-and-mouth disease. Table 3 lists the ten largest export categories. The largest decline was recorded for fresh and chilled meat, which decreased by 76% in 1997, followed by frozen food and husked food, which decreased by 40% in the same year.

Notwithstanding the decline of the total food export, several categories still recorded export growth in 1997. Export of seasonings, approximately 80% of which consists of sodium glutamate, increased by 12%. Export of "other miscellaneous foods" also rose by 5%. The two largest items of this category are royal jelly and pollen as well as instant noodles, which accounted each for about 10% of the total. Besides, export of feed, mainly fish feed, increased by 8%.

Although the export of frozen food decreased in 1997, it was still the largest export category, accounting for 63% of the total food export. Meat and seafood account for an overwhelming share of exported frozen food. Pickled food and dehydrated food, though commonly regarded as small food industry sectors in terms of production value, ranked fifth and sixth in the export category, respectively, in 1997. Most of the pickled food and dehydrated food for export are fruits and vegetables. Fruit and vegetable juice accounts for most of the

Table 3 Export value of Taiwanese food industry

Unit : US $ thousand

Gategory	1994	1995	1996	1997
Frozen food	2,059,944	2,249,558	2,191,236	1,335,574
Seasonings	107,401	126,574	144,911	162,032
Other miscellaneous foods	115,998	123,675	122,280	128,512
Fresh and chilled meat	436,859	495,277	485,482	116,707
Pickled food	92,966	76,288	74,376	64,012
Dehydrated food	74,481	71,134	60,577	54,887
Feed	43,745	43,883	47,013	50,613
Husked food	53,222	68,073	62,160	38,091
Non-alcoholic beverages	59,366	64,260	37,054	36,775
Tea	24,508	21,545	28,271	27,791
Others	129,198	122,791	144,891	120,235
Total	3,197,688	3,463,058	3,398,251	2,135,229

Source : Food Industry Research and Development Institute (1997) : Food Industry Statistics Yearbook.

Table 4 Export value of Taiwanese food industry

Unit : US $ thousand

Gategory	1994	1995	1996	1997
Alcoholic beverages	392,762	516,053	485,161	633,082
Frozen food	424,396	426,429	433,394	523,505
Tobacco	225,460	303,918	332,589	419,644
Food residues and wastes	319,656	304,431	350,082	319,447
Other miscellaneous foods	267,976	254,520	289,057	313,337
Oil and fat	128,705	170,701	151,098	190,750
Dairy products	342,071	371,907	376,444	166,528
Feed	118,043	135,907	161,128	149,368
Dehydrated food	108,970	106,357	122,578	135,852
Husked food	96,246	106,563	132,839	128,144
Others	481,764	498,566	537,441	594,537
Total	2,906,048	3,195,352	3,371,812	3,574,194

Source : Food Industry Research and Development Institute (1997) : Food Industry Statistics Yearbook.

non-alcoholic beverages for export.

The import development of the food industry has been steady and conspicuous in recent years (Table 4). The average import growth rate was 7% from 1994 to 1997. During this period, eight of the ten largest import categories exhibited positive import growth. Although in 1994, frozen food was still the largest import category, from 1995 onwards, alcoholic beverages surpassed frozen food and rose to the top. Approximately half of imported alcoholic beverages is represented by whiskey and brandy, and about 30% by beer. As for imported frozen food, the largest item is meat, followed by seafood and prepared food. Approximately 70% of imported frozen meat is represented by beef, and imported seafood comprises mainly peeled shrimp, grass shrimp and lobster. As in the case of food export, "other miscellaneous foods" accounts for one of the top five categories in the food import. However, the composition of the categories for export is very different from that for import. More than 30% of "other miscellaneous foods" for import is represented by infant milk powder. On the other hand, fruits account for approximately 60% of imported dehydrated food. Lastly, imported husked food consists mainly of starch, which accounted for about 80% of the category in 1997.

As a whole, food exports exceeded food imports during all the years before 1996. However, starting from 1997, the reverse occurred. It is likely that the food industry in Taiwan will encounter a trade deficit in the future.

Constraints

The food industry in Taiwan played a pioneer role in the post-war economic development. Although such a role gradually decreased from the 1980s onwards, the food industry is still one of the main components of the economy and it developed steadily until 1996. Undeniably, the outbreak of foot-and-mouth disease in early 1997 has been very harmful to the industry. Approximately four million hogs, valued at about US$ 700 million, were killed. Besides the slaughtering sector, other food industry sectors, notably feed and frozen food, have also been severely affected. The production value of Taiwanese food industry was reduced by approximately US$ 2,000 millions in 1997. In addition, many other constraints hamper domestic food manufacturers.

1 Decreasing supply and increasing cost of labor

Taiwanese food industry depended much on abundant and cheap supply of labor for its early development. However, due to the continuous development and structural change of the economy, labor supply for traditional industries, including the food industry, is gradually becoming inadequate. Moreover, the labor cost has increased continuously. During the past ten years, the number of workers employed in the food industry decreased by 0.76% annually, but real wage rate increased by 4.68% each year on the average.

2 High labor turnover

Even though the food industry can acquire labor at one time, the labor turnover rate is high, mainly because labor is attracted by the high growth of service industries and high technology industries. As a result, the workers in traditional industries frequently quit their jobs and move to service or high technology industries.

In 1996, the labor turnover rate in the food industry was 2.37%, which was higher than the average of manufacturing industries as a whole. As a result, the labor training cost of food manufacturers increased.

3 Tighter supply and escalating cost of domestic produce for food processing

Taiwanese food industry depends much on domestic agricultural produce for processing purposes. However the increase in supply of produce is very slow and an increasing amount of this produce has to meet the demand of the fresh market, thereby leaving only a very limited amount for food processing purposes.

Besides, the price of domestic agricultural produce has been escalating continuously, and trebled in the past three decades, resulting in a large difference between domestic prices and international prices for many agricultural products. For instance, the domestic sugar price is about NT$22 (about US$ 0.76) per kg while the international sugar price is only about NT$14 (about US$ 0.48) per kg. However because of the government's perseverance in safeguarding agriculture, many agricultural products can not be imported freely. Therefore, food manufacturers have to bear the high raw material cost of their food products.

4 Surge in prices of imported grains

Taiwan imports a large amount of grains, notably corn, soybean and wheat, for its food processing purposes. In the last quarter of 1997, New Taiwan dollar depreciated by more than 10%, resulting in an increase in import prices of these grains. The grain milling sector, the feed sector, the noodle sector, the bakery products sector and the edible oil and fat sector have been considerably affected.

5 Insufficiency of research and development efforts

During the period from 1983 to 1995, investment for research and development in manufacturing industries as a whole rose by 11% on the average. Conversely, investment in the food industry fell by more than 30% in 1995 which significantly delayed the upgrading of the Taiwanese food industry.

6 WTO membership

Joining WTO will certainly be beneficial for the Taiwanese food industry in some aspects, but it will also adversely affect the industry in other aspects. Therefore, domestic food manufacturers have mixed feelings concerning Taiwan's future membership in WTO. On the one hand, they expect to acquire cheaper raw materials because of the large reduction in import tariffs. On the other hand, they are concerned about increasing competition with imported foods for the same reason. According to a survey conducted by Professor Woo at National Taiwan University, joining WTO will have a positive impact on the foods requiring more sophisticated production processes and higher added value. These foods include mainly canned food, frozen food, monosodium glutamate, other seasonings, non-alcoholic beverages, bakery products, sugar confectionery and pickled food. At present, raw materials required by these foods have high import tariff rates or non-tariff import restrictions. After joining WTO, import tariff rates could be markedly reduced or non-tariff import restrictions lifted. Therefore, production costs for these foods could be lowered. Moreover, import tariff rates for such foods are not high presently. Therefore, joining WTO will not affect significantly the competitiveness of these imported foods.

However, WTO membership is expected to have a negative impact on the foods requiring simpler production processes or with lower added value. These foods include mainly fresh and chilled meat, edible oil and fat, flour, rice, sugar, feed, tobacco, liquor and dairy products. Currently, the degree of import protection is higher at present for these foods than for their raw materials. After joining WTO, the threat from imported foods will be very great.

7 Increasing competition of imported food products

Taiwan adopted a general policy of trade liberalization about ten years ago. Therefore, even before joining WTO, the Taiwanese food industry has been challenged by strong competition of imported food products for the past decade. The imported value of food products was US$ 2,906 million in 1994. It rose rapidly to US$ 3,574 million in 1997.

8 Increase in raw material costs

In the near future, global raw materials supply and demand will be more or less in equilibrium, and thus international raw materials prices should remain stable. However, because of the depreciation of the New Taiwan dollar in the last quarter of 1997, imported raw materials prices in terms of NT dollars have been higher than before. Production costs for many food sectors, including grain milling, feed, noodles, bakery products, edible oil and fat, fresh and chilled meat, and frozen food, increased as a result.

Conclusion

In spite of the many constraints listed above, food manufacturers in Taiwan are used to struggle for survival. Many of them have implemented the following strategies which have helped them to stand firm and compete.

1 Strategic alliance

It includes within-industry alliances, such as cooperation between a domestic food manufacturer and a foreign food manufacturer, and between-industry alliances, such as cooperation between a food manufacturer and a logistics company. This system brings many advantages, notably market development, cost reduction and increasing profit.

2 Diversification

Besides diversifying within the food industry, large food enterprises are also diversifying into other non-food industries in order to reduce risk.

3 Channel integration

Realizing the importance of channel control for a company, food manufacturers promote integration by developing channel business of their own.

4 International cooperation

A domestic food manufacturer cooperates with a foreign food manufacturer and they jointly establish a new company which aims at overseas investment, or becomes an agent for an established foreign brand which pursues international expansion. In addition, the domestic food manufacturer can introduce foreign raw materials, technologies, management practices, and brands into Taiwan.

Looking into the future possible trends of the industry, in the case of production, novel miscellaneous foods, such as those which imitate foreign foods and use novel imported raw materials or semi-processed materials, will be developed. Production and processing of foods by Taiwanese manufacturers in overseas countries will be more common than before, and more of these foods will be sold back to Taiwan. As consumers' demand for food sanitation, safety and quality increases, food manufacturers will be much more eager to acquire quality marks, such as GMP, CAS, HACCP and ISO 9000. Use of food ingredients in food factories will increase in order to satisfy consumers' diversified needs. Food manufacturers will pay greater attention to the development of labor-saving technology and facilities, as they hope to reap the benefits from automation and economies of scale. They will also have to pay greater attention to environmental protection, and take into account the effect of waste materials and product packaging on the environment. Collaboration, such as in the form of strategic alliance, among food manufacturers will be more common. Food manufacturers will have greater demand for technological and market information.

In the case of selling, food manufacturers will depend more on modern retail outlets, such as the supermarket, the convenience store, and the general merchandise store, for distribution purposes. Non-store selling, including direct selling and multi-level marketing will account for a greater proportion of total food sales. The growth rate of food import will exceed that of food export. Food wholesalers and retailers will have greater bargaining power at the expense of food manufacturers. This will compel food manufacturers to invest in food distribution for greater channel power. Besides, they will invest more in advertising and promotion activities for greater competitiveness in the market.

In the case of consumption, after acquiring higher income and having more leisure time, consumers will ask for higher-priced processed food, novel imported food, health food, beverage and snack food. The increase in the number of working wives will result in higher demand for prepared food, semi-prepared food, frozen food and chilled food. More than 70% of the total population eat lunch outside of their home. This lunch eating out market will even expand in the future. Therefore, demand for ready-to-eat lunch boxes and their related raw materials will grow. Besides the lunch eating out market, the food service market as a whole will expand. The government will pay greater attention to educate consumers on food hygiene, safety and quality, and more regulations will be enforced to ascertain that the contents of food advertisements do not misguide consumers.

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