2.2.2.2 Shrimp Aquaculture Production

Figure 4 shows the total world aquaculture production of Penaeid and Metapenaeid species between 1986 and 1991. The data presented indicate a rise in total production from 298,600 metric tonnes in 1986 to 690,100 metric tonnes in 1991, an increase of around 130 percent. With respect to total production of tropical species, the proportion from aquaculture increased from 38 percent in 1986 to an estimated 53 percent by 1991. (see Table 5.) This trend is supported in both the Japanese and US markets where cultured shrimp often accounts for over 50 percent of the total imports[6] (Rosenberry 91).

As illustrated in Figure 5, the Eastern hemisphere has dominated shrimp production in terms of total quantity produced, accounting for 81 percent of total aquaculture production in 1991. The three main producing countries, China, Indonesia and Thailand, account for 57 percent of the total production of cultured shrimp. The main producer in the Western hemisphere is Ecuador, which accounted for 19 percent of total production in 1991.

Figure 5 Total Aquaculture Production

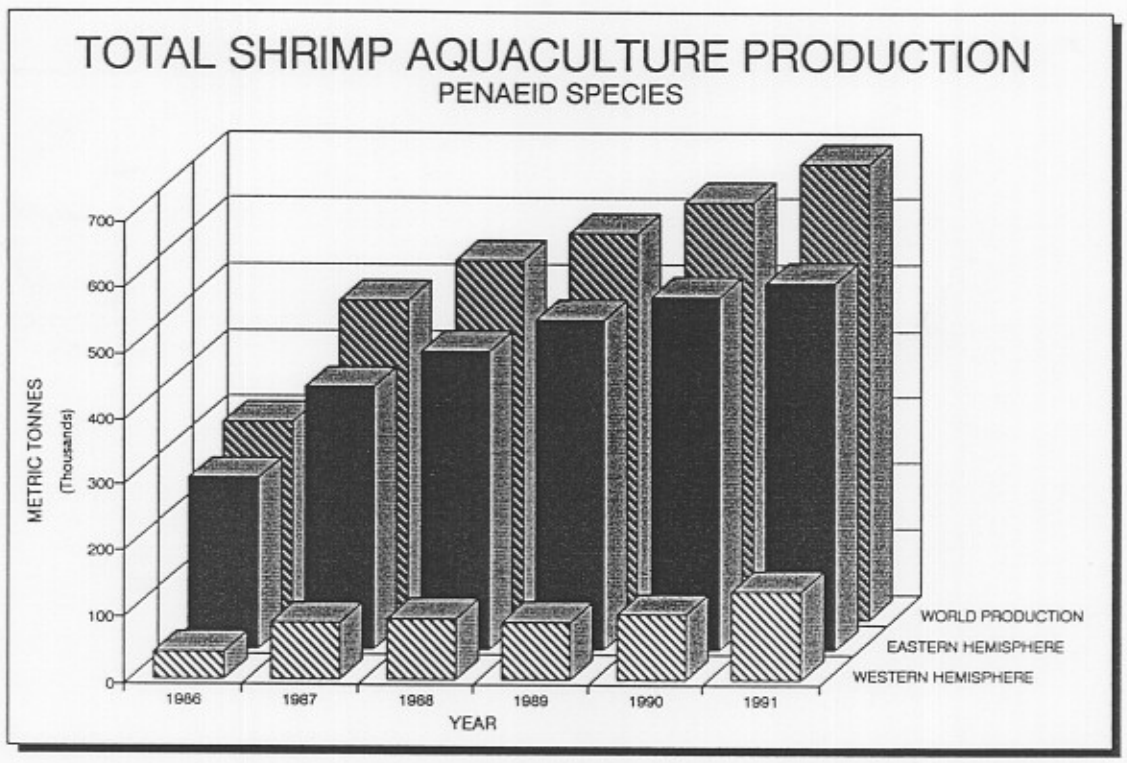


Figure 6 and Table 6 show the trend in production for the four major shrimp producing countries between 1986 and 1991. In the Eastern hemisphere China remains the dominant producer, having increased production from 82,800 metric tonnes in 1986 to nearly 200,000 metric tonnes in 1988 before experiencing a steady decrease in production to a level of 145,000 metric tonnes by 1991.

Indonesian production rose steadily from around 41,000 metric tonnes in 1986 to 140,000 metric tonnes in 1991, an increase of approximately 242 percent.

[6] This compares with the U.K. market in which cultured shrimp only account for 5 percent of the total imports.

Thailand's shrimp production increased from below 18,000 metric tonnes to 140,000 metric tonnes, an increase of 515 percent over the same period. Ecuador, although ranked fourth on a global scale, is the top producer in the Western hemisphere. Ecuador's shrimp production increased from 30,683 metric tonnes in 1986 to approximately 100,000 metric tonnes in 1991.

Apart from the market dynamics and production costs which are considered in section 5, there are other factors pertinent in explaining different countries records in aquaculture production and predicting which ones will come to dominate in the shrimp market.

These factors include disease, hatcheries, feed costs, water quality and the environment. These issues are returned to in more detail in section 5.1, but a brief discussion is presented below.

A review of the status of shrimp culture organised by the FAO during 1988, indicated the then unresolved problem of seed supply as being the major limiting factor in the expansion of the industry (Hjul 1988). The persistence of this factor is emphasised by Rosenberry (1990, 1991) referring to shrimp hatcheries[7] as the weak link in the production of farmed shrimp, with suggestions that large increases in production will only occur once hatchery production becomes more reliable.

Disease is another obstacle for shrimp production, where farms and hatcheries have little defense against the increasing prevalence of viruses. Rosenberry (1991) suggests that it is the more intensive farms which are at greater risk from disease due to the higher stocking densities. Aquaculture production in Taiwan dropped from 81,300 metric tonnes in 1987 to 39,800 metric tonnes in 1988 due to disease which was compounded by environmental deterioration and weak seedstock (Infofish 1991).

The impact of most of these factors is greatest upon intensive farms, but due to increasing land costs and the greater product control offered by intensive production, it is expected that the shift towards large intensive farms will continue. In many producing regions, the land shortage has been caused by the realisation that the value of mangrove swamps, which in the past were dismissed as largely unproductive financially and replaced with shrimp farms, includes externalities such as erosion control, spawning grounds and ocean organic food source. Many of the producing countries have now declared mangrove swamps as conservation areas or have special procedures for conversion permission to be granted (Csavas 1988). A proposal to ban shrimp farming in Thailand's mangrove forests after 1997 for environmental reasons has been approved by the Thai Cabinet. This is likely to severely damage the shrimp industry in Thailand, with neighbouring Indonesia and Malaysia now presenting a better investment opportunity.

[7] Hatcheries are involved with the spawning of egg-laden female shrimp. The juveniles are then supported through several larval and postlarval stages before they are stocked in the grow out ponds.

Figure 6 Aquaculture Production by Country

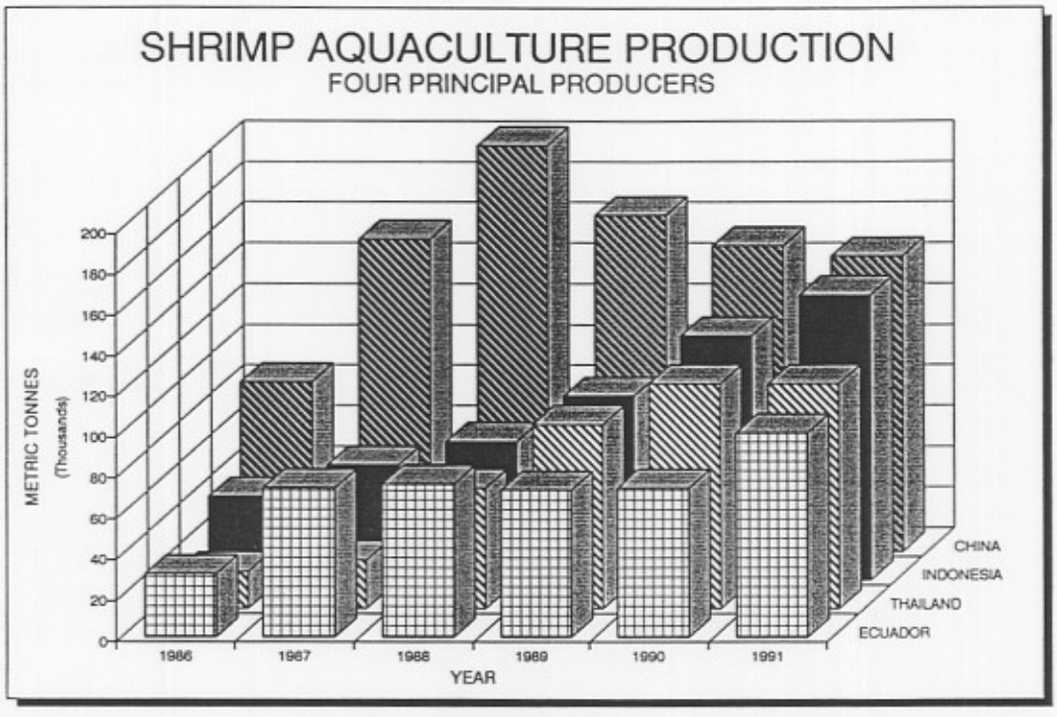


Table 6 Principal Countries of Origin for Shrimp Produced by Aquaculture

COUNTRY	1986 MT	1967 MT	1988 MT	1989 MT	1990 MT	1991 MT
EASTERN HEMISPHERE						
CHINA	82800	153200	199400	165000	150000	145000
INDONESIA	40888	55967	67470	90000	120000	140000
THAILAND	17686	23566	58936	90000	110000	110000
OTHER	116757	165576	126880	155100	155500	161500
TOTAL	258331	398309	452686	500100	535500	556500
WESTERN HEMISPHERE						
ECUADOR	30683	72953	74480	72000	73000	100000
OTHER	9589	11467	16447	13409	24410	33610
TOTAL	40272	84420	90927	85409	97410	133610
TOTAL	298603	482729	543613	585509	632910	690110

SOURCE : FAO Aquaculture Production (1986-1988); World Shrimp Farming (1988-1991).

2.2.3 Principal Product Forms

With the prospect of an increasing quantity of shrimp being placed on the world market, producers are beginning to look towards the diversification of their product (Scura 1992). Product differentiation can be effected by altering the size or species of the shrimp caught, or cultured. Alternatively shrimp products can be differentiated by the additional processing applied to them. This export of more sophisticated, value-added shrimp products is a growing trend amongst developing country producers. Josupeit (1992) suggests that value added shrimp products may have the best potential amongst seafood exports from developing countries to the European Community. This trend is corroborated by the fact that during 1991 the volume of imports into the USA increased by 8% from the previous year, whilst the value of these imports rose by 12% over the same period. A report by Globefish (1992) suggests that a major contributory factor was a 33 percent increase in imports of peeled shrimp, a value added product, between 1990 and 1991.

Shrimp markets are segmented by the products entering them and products can vary according to species, colour, origin, size as well as type and level of processing and packaging. This section briefly reviews the different shrimp products. The following section (section 2.3) identifies the related market segments in each of the major markets. Various shrimp product forms are regularly offered to the markets:

i Live shrimp. This product has a limited market and commands very high prices.

ii Fresh shrimp. This is usually a product which is restricted to domestic markets within easy reach of the landing sites. There is a limited amount of international trade in this product.

iii Frozen shrimp. This is the most commonly internationally traded product form. This is usually reprocessed into a variety of other forms.

iv Canned shrimp.

v Dried shrimp.

Further differentiation in these five major product forms exists in order that the specific segments within the market can be targeted effectively. Headless shell-on shrimp are the most commonly traded product in the frozen form. Other forms include whole head-on, peeled and deveined (P&D), peeled and undeveined (PUD), breaded P&D, battered P&D, cooked and other regional speciality product forms. The import of cooked shrimp is currently low volume because of strict quality controls due to concerns over illness caused by *Listeria monocytogenes*. The 1990's are likely to see shifts in the markets for product types, particularily if the mobilisation of women within the work force increases as predicted for lesser developed countries.

On the international market shrimp is sold by size, expressed as count (or number of individual units) per lb or count per kg. The size of shrimp generally determines its end use and thus the market segment which it will enter. The product form, however, will depend very much on the characteristics of the market in question.

Some experimentation has been done with packaging technology in producer countries in an effort to increase the export of value added products, but there has been limited success due to vested interests in processing facilities in consumer countries, concerns over quality and the need for high responsiveness to market fluctuations which is more easily met by processors in the consuming country.

New market segments will appear as suppliers become capable of programming their production to meet buyers' requirements in terms of a timed supply of specific volumes of certain sizes, species and product forms.

Traders in the various markets usually identify shrimp by their colour and country of origin. Table 7, below, lists some of the more prevalent species traded on the international markets, giving latin names, common names, characteristic colour and country of origin.

The most important producer characteristic is a reputation for consistent good quality of supply such that the product is fresh, and uncontaminated, the counts per pound are accurate and the size and colour are uniform. Once a producer has this reputation, it is reinforced through brand name promotion. Virtually all shrimp on the world market is sold under a brand name with some exporters marketing different species and size of shrimp under different brand names.

Table 7 : Commonly Traded Penaeid Species.

SPECIES	COMMON NAME	COLOUR	ORIGIN
P. aztecus	Northern brown	Brown	Western Atlantic; Gulf of Mexico
P. brasiliensis	Redspotted	Pink	Western Atlantic (N. Carolina to Brazil)
P. indicus	Indian white	White	S.E. Asia; India; E. Africa; Madagascar
P. japonicus	Kuruma	White	S.E. Asia; India; China
P. merguiensis	Banana	White	S.E. Asia; India; Australia; Persian Gulf
P. monodon	Black tiger	Pink (cooked)	S.E. Asia; India; N. Australia; E. Africa
P. notialis	Southern pink	Pink	Eastern Atlantic (Mauritania to Angola); Western Atlantic (Mexico to Brazil)
P. occidentalis	Western white	White	Eastern Pacific (Mexico to Peru)
P. orientalis	Taisho	White	China; Korea
P. semisulcatus	Green tiger	White	India; S.E. Asia; E. Africa; Persian Gulf; Australia; Japan
P. vannamei	Whiteleg	White	Eastern Pacific (Mexico to Peru)

Source: Holthuis (1980); Rackowe (1984); Infofish Reports (1991/92).

2.3 Main Markets: Characteristics

For each of the main markets, preferences for colour and size are described, any import restraints noted and price and apparent consumption trends shown. The inclusion of price trends illustrates the various levels of uncertainty associated with the different categories of shrimp traded on the international markets. Since the Japanese market sets the global trend, some time is spent describing Japanese price movements.

Due to the fact that the only publicly available disaggregated data for shrimp imports is that published by the National Marine Fisheries Service of the US Department of Commerce (see section 4.2), and that thus the only market for which a disaggregated demand analysis is feasible is the US market, the US market characteristics are described in greater detail. US market structure and the implications for demand analysis model specification are returned to in section 4.3 following a description of available data in section 4.2.

How much shrimp has actually been traded over a given time at a certain price is measured using apparent consumption. Apparent consumption is taken as the amount of a product utilised by a population within a given period and is based on a simple input/output model. Where all the data are available for a given market, the apparent consumption may be estimated as follows:

$$AC = (((QTI + QTDP) - QTX) +/- QCSH)$$

where; AC = Apparent consumption; QTI = Quantity total of imports; QTDP = Quantity of total domestic landings; QCSH = Change in cold storage holdings and QTX = Quantity of Exports.

It should be noted that due to the general difficulty in obtaining the required data, as indicated above, a 'best estimate' was calculated for each market as follows:

U.S.A.:

All the data were available and the estimate was obtained using the above formula.

Japan:

The data for exports were unavailable for the therefore a proxy for apparent consumption was derived from total imports and domestic landings.

Europe:

Only total import data[8] were available for European market and therefore total imports were used as a proxy for apparent consumption in this market.

2.3.1 U.S. Markets

Colour and species

Regional preferences for shrimp are associated with the colour of the headless shell-on raw product. In a description of the US regional preferences, Rackowe (1983) indicates that the northwest market prefers white shrimp; the northeast brown shrimp and the Pacific coast pink shrimp. Filose (1988) suggests a different preference pattern, with white shrimp being most prized

[8] The import data available did not distinguish between cold water and tropical species. Yang (1992) indicates that approximately 50 percent of the shrimp consumed in Western Europe are cold water species. Given this estimate, the proxy for apparent consumption of tropical shrimp species in Western Europe is taken at one-half of the total shrimp imports entering the region.

on the west coast from Los Angeles to Vancouver, and in the north-east from New York to Montreal, brown shrimp in the middle states and middle eastern coast and pink shrimp in the south east.

Black tiger has not had as big an impact as predicted on the US market due to 3 factors: lack of continuous supply to the US market due to Japanese demand, uncertainty on behalf of US buyers regarding country of origin and related quality and therefore prices, and increased uncertainty over pricing following the bypassing of traditional importers by suppliers of black tigers.

Size

Large shrimp are usually sold to the more expensive restaurants where the unit cost of a meal is relatively high. The favoured countries of origin are the US domestic production itself, and Mexico and Panama. Filose (1988) describes how the low Panamanian harvest of 1987 led to domestic produced large shrimp moving through the distribution network more quickly. Mexican supplies started well at the beginning of the season (October 1987) but slowed markedly during February of 1988 which led to an increase in the price for large shrimp.

Medium sized shrimp are supplied mainly to the ubiquitous family style restaurant in the US where the unit price of a meal is within reach of the blue collar worker. Medium sized shrimp also enter the institutional markets (hospitals, prisons, schools, work lunch rooms etc), where the consumer choice is not directly observed.

The medium sized market experienced a large increase in supply, largely from China and Ecuador, but also due to returns to average catches by domestic and Mexican shrimp boats. A number of Ecuadorian and Asian producers attempted by-passing traditional US distributional channels in 1987, leading to confusion over pricing at different levels of the market which lead to instability in price (Filose, 1988). The price declined by 30% but then improved as the quantity demanded increased due to the improved price relative to substitutes. Filose (1988) suggests that the medium size category should perhaps be further divided, as the 26/30 and 31/35 size classes are increasingly being used by restaurants, and the 36/40 group is being sold through supermarkets as medium-large. Only size 41/50 was considered to be in oversupply in early 1988 (Filose, 1988).

Small sized shrimp enter the supermarkets as canned, breaded or frozen blocks. These sizes are also supplied to both the restaurant markets mentioned above. Filose states that the small size category also comprises two distinct compartments, one including the 51/60's, 61/70's and the 71/80's and the other the 81UP's. Ecuador's aquaculture production shifted into the 51/60 category during 1987, and further increases in imports of this size were made from China and Asia. This increased supply depressed the price of 51/60's but also imposed a ceiling on the price of 61/70's and 71/80's. The size category 81UP is used primarily by further processors as peeled meat and is in a more normal supply pattern.

Import constraints

Although U.S. domestic shrimp fishermen have asked for government assistance in protecting their profits there are currently no import duties.

Price trends

Filose (1988) suggested several factors that were likely to determine short term prices in 1988. These included: the level of stocks in Japan and whether the relative strength of the dollar against the yen would lead to Japan exporting surplus to the US; the general state of the US economy, given that shrimp are considered a luxury good; and the level of aquaculture production, primarily for medium and small sized shrimp.

Regarding the long term outlook, Filose (1988) suggested that Mexico will continue to set the price

for large shrimp. Filose (1988) further predicted that increased production from aquaculture would only translate into increased demand in the US if products were actively and accurately marketed to increase sales. Filose (1988), analysing the US market from the point of view of a large import and distribution company, claimed that any deviation from traditional distribution patterns to achieve short term sales would lead to instability and adversely effect prices in the long term.

A seasonal pattern can be observed in US shrimp prices. As the season in the Gulf of Mexico advances, shrimp sizes in the US market increase. The price of each size tends to drop as domestic production of that size increases. Import prices tend to follow US fishery ex-vessel prices, with the highest prices usually being paid in the first half of the calendar year.

Consumption trends

Imported shrimp account for approximately 70% of supply to the US market. Apparent consumption generally peaks in December after climbing from lower levels in April. Demand for shrimp also increases over holiday weekends and seasons. During the 1970's, a significant portion of the US shrimp market was concentrated in a few large companies who would build up inventories during the second half of the year when domestic catch Mexican imports were at high levels in order to supply customers in the first half of the following year when both imports and domestic landings were light. This procedure became less profitable during the 1980's, due to the year round availability of cultured shrimp and the greater number of companies buying directly from exporters in Asia and Latin America. Inventory fluctuations have been smoothed out and the size of the cold storage holdings has decreased relative to the total market.

Cold storage holdings may still play an important role in the market dynamics of large shrimp given that little of the cultured shrimp are in the large size category.

It is estimated that approximately 70% of shrimp consumed in the US is consumed out of the home.

Further discussion of both price and apparent consumption trends in the US market will be presented in section 4.3 following the description of disaggregated data availability in section 4.2.

2.3.2 Japanese Markets

Colour

Regional preferences have been documented (Rackowe 1983) but seem to be less distinct than the US market. White shrimp are used in most markets and are the most popular. In the west of Japan preferences are for the 'king' and 'flower' shrimp.

Size

Large shrimp are used mainly in the high priced restaurant trade, sushi shops; medium sized shrimp are used in sushi shops, retail shops and supermarkets, and small shrimp are used in Chinese restaurants and are processed into other food products.

Import Constraints

Japan has no quantitative limit on shrimp imports and duties vary according to international agreements, the development level of the exporting country and the extent of value adding processing.

Price Trends

Figure 7a illustrates the trend in nominal prices for different size categories of white shrimp on the Japanese wholesale market. Figure 7b indicates the trend in real prices for the same species in the same market between January 1987 and August 1989. Using definitions outlined in Chapter 2.3, the 13/15 and 16/20 size categories, represented in Figures 7a and 7b, are defined as large shrimp while the 31/35 and 41/50 sizes fall into the medium category.

Figure 7a Nominal Japanese Shrimp Market Prices

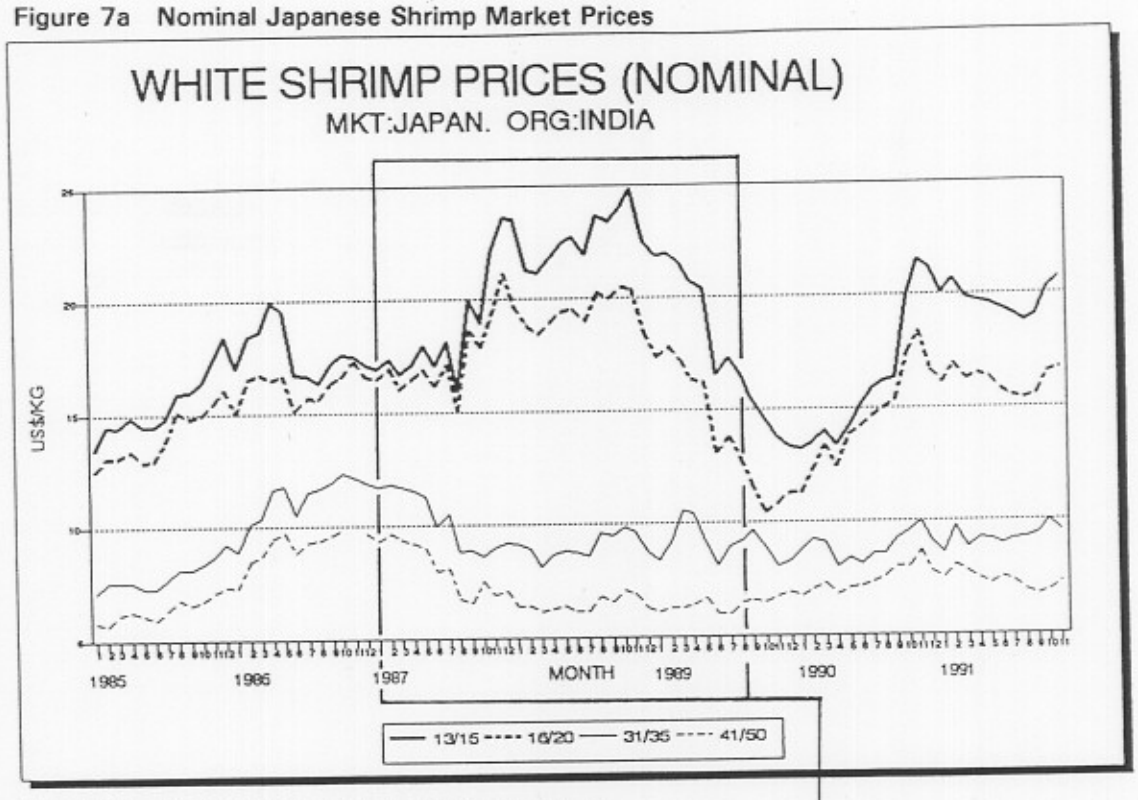
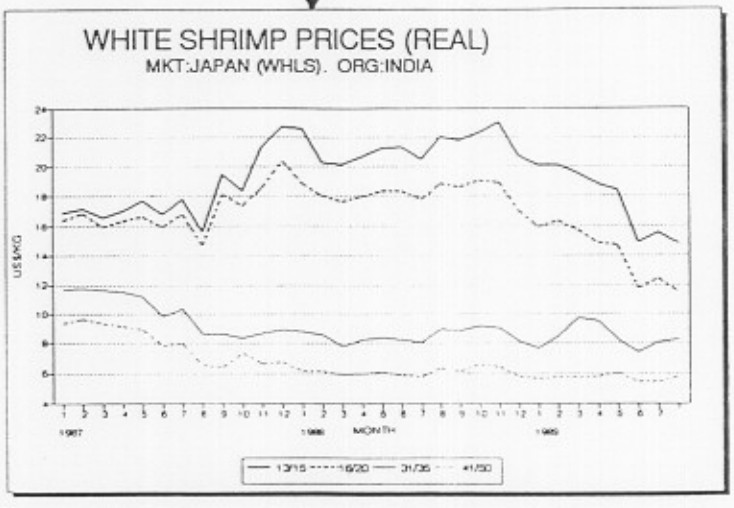


Figure 7b Real Japanese Shrimp Market Prices



Generally speaking, the nominal price of large shrimp increased steadily between 1985 and 1987, peaking by the end of 1988 before plummeting to 1985 levels by the end of 1989. During 1990 the price of the large sizes recovered sharply, peaking at a level on par with the 1987 nominal

prices before falling slightly during 1991. Towards the end of 1991 the price recovered sharply to the same levels as observed at the end of 1990 before levelling off at a slightly lower level for the first half of 1992. After an initial modest rise by the end of 1986, nominal prices of medium sized shrimp decreased to their 1985 levels and remained constant during the whole period up to 1991.

The prices of both large and medium shrimp climbed sharply in the second half of 1992 to the previous highs observed in 1988, before dropping slightly in December 1992.

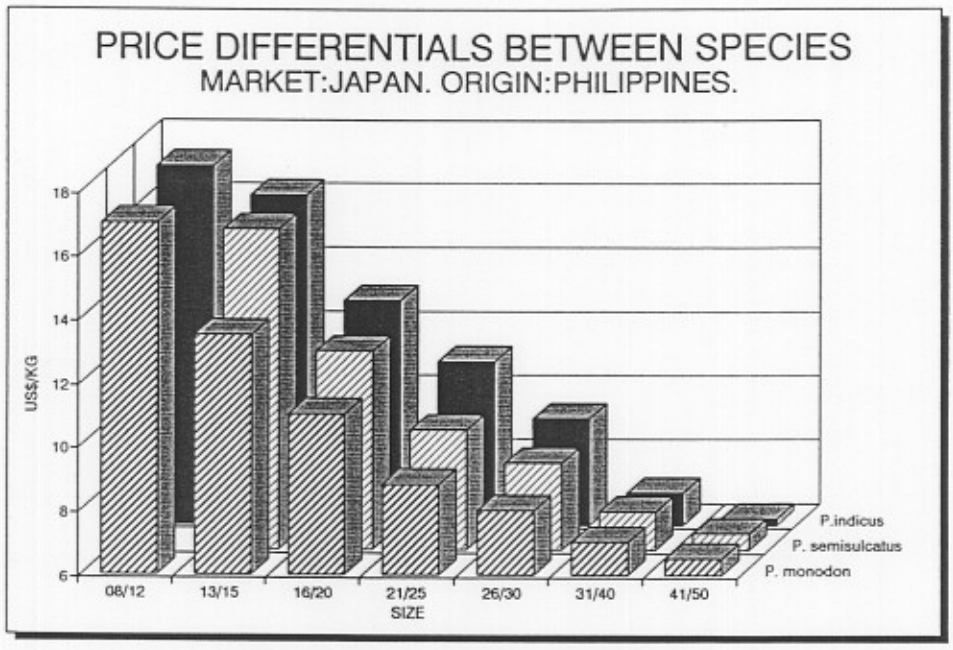
In Figure 7b the trend for both the large and small size categories shows a similar pattern as was represented by the nominal prices, although the overall fluctuations were dampened owing to the use of real prices. The medium size categories show a gradual fall in real prices between January 1987 and August 1989.

It has been suggested that the slump in prices for the larger size categories during 1989 was due to a combination of Chinese shrimp exports flooding the world market (Chong 1990) and the influence of events in the Japanese market (Infofish 1990). The late Emperor Hirohito's illness during 1989 stemmed consumer expenditure on all activities and products perceived as being associated with festivities. As a result there was a fall in demand for large size categories of shrimp sold through restaurants and sushi bars at the upper end of the market. This initially lead to surplus supply and a further slide in price as the excess shrimp were sold. The rapid increase in prices towards the end of 1990 was due to a shortage of large shrimp as demand increased. The slow down in the Japanese market in 1991 was partly due to lower meat prices following the liberalisation policy on meat imports in April 1991 and the sale of high inventories of stock piled cold-water shrimp which were bought at cheap prices in mid-1990. Meat is a recognised substitute for shrimp and other shellfish (Bell 1976, Yang 1992).

There are two features which are apparent from the price trends in Figures 7a and 7b. Firstly, prices of the medium size categories in the Japanese market are relatively stable compared with the price fluctuations experienced by the larger sizes. Two possible factors may cause this feature, one being that the increased stable production of medium sized shrimp by aquaculture methods has a stabilising affect on prices for those sized shrimp. If this part of the explanation is correct, as the market share of aquaculture production increases, price fluctuations should dampen down further. The other possibility is that since price fluctuations in size categories are a response to quantity supplied or to changes in consumer income levels, the trend implies that medium sized shrimp are relatively inelastic compared with the elastic nature exhibited by the larger size categories. Changes in quantity supplied or income levels will prompt larger variations in the price of elastic goods than with inelastic ones. Secondly, there is a substantial price differential between the medium and large size categories. This price differential supports the hypothesis that the two size categories occupy different market segments, as described earlier in this section.

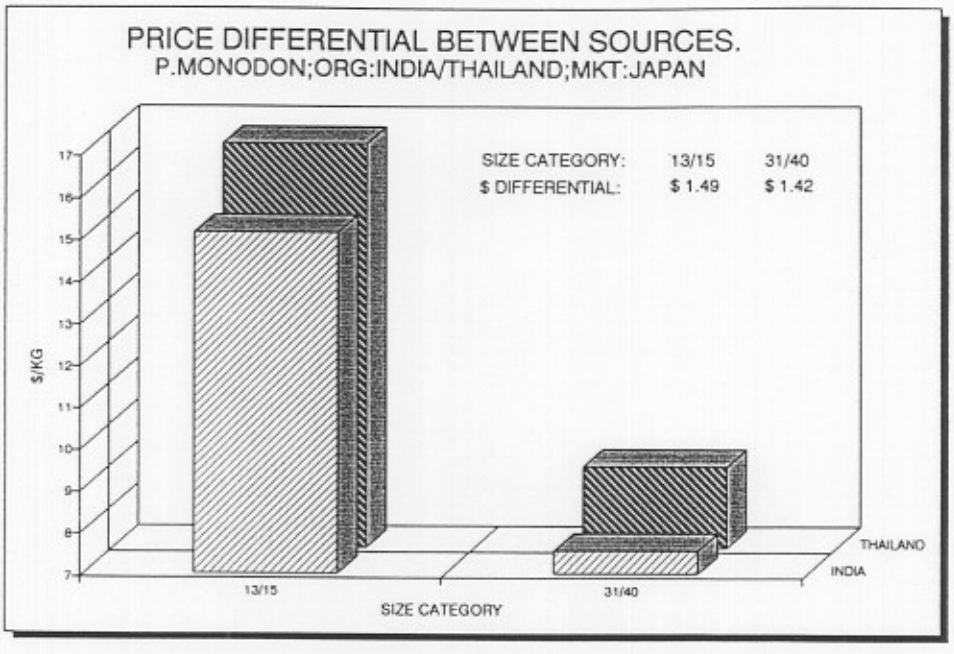
Figure 8 is indicative of the price differentials received by the different species in different markets. White shrimp such as *Penaeus indicus* command higher prices than do the *Penaeus monodon* and *Penaeus semisulcatus*. Not represented are *Metapenaeus rosenbergii* which have the lowest prices for all sizes.

Figure 8 Price Differentials Between Species in the Japanese Market



The origin or source of shrimp is also an important factor in determining price on any one market, as illustrated in Figure 9, below. The figure indicates Japanese market prices for 13/15 (large) and 31/40 (medium) size categories of Penaeus monodon exported from Thailand and India.

Figure 9 Price Differentials For Shrimp Imported From Different Sources



The data show that, on average, the large and medium size categories of Thai shrimp command a 9.9 percent and 18.7 percent premium over the respective Indian size categories on the Japanese market. The price differential in this case may be a result of historical quality related problems associated with the Indian product which are not present with the Thai product. Alternatively, Indian exports may be dominated by wild caught shrimp which, as Chong (Infofish Int. 5/90) suggests, are sold at lower prices than cultured shrimp. Chong (1990) indicates a definite price differential between captured and cultured products based partially on differing production costs of the two systems, where lower costs are associated with the capture fishery (except trawlers).

2.3.3 European Markets

Colour

Each European country has its own characteristic demand for shrimp (Jouspeit 1992) but generally speaking it can be divided into two parts: Mediterranean countries and Northern European countries. The Northern European countries prefer the coldwater species of shrimp as opposed to a greater preference for tropical species in Mediterranean countries. Pink or red shrimp monopolise the Italian market and other colours have little chance of entering this market.

Size

Large shrimp enter the higher end of the market where they are used in restaurants, department stores and specialist seafood outlets;

Medium sizes shrimp are used in the cheaper restaurants, institutional establishments and reprocessed to be used in supermarkets as frozen consumer packs.

Small shrimp are canned or used in the cheaper end of the catering trade.

Import Constraints

Trade between members of the EEC is free, but access and import duties for trade with states outside the EEC depends on trading agreements, the development level of the exporter, colonial affiliations, the shrimp species and product form.

Price

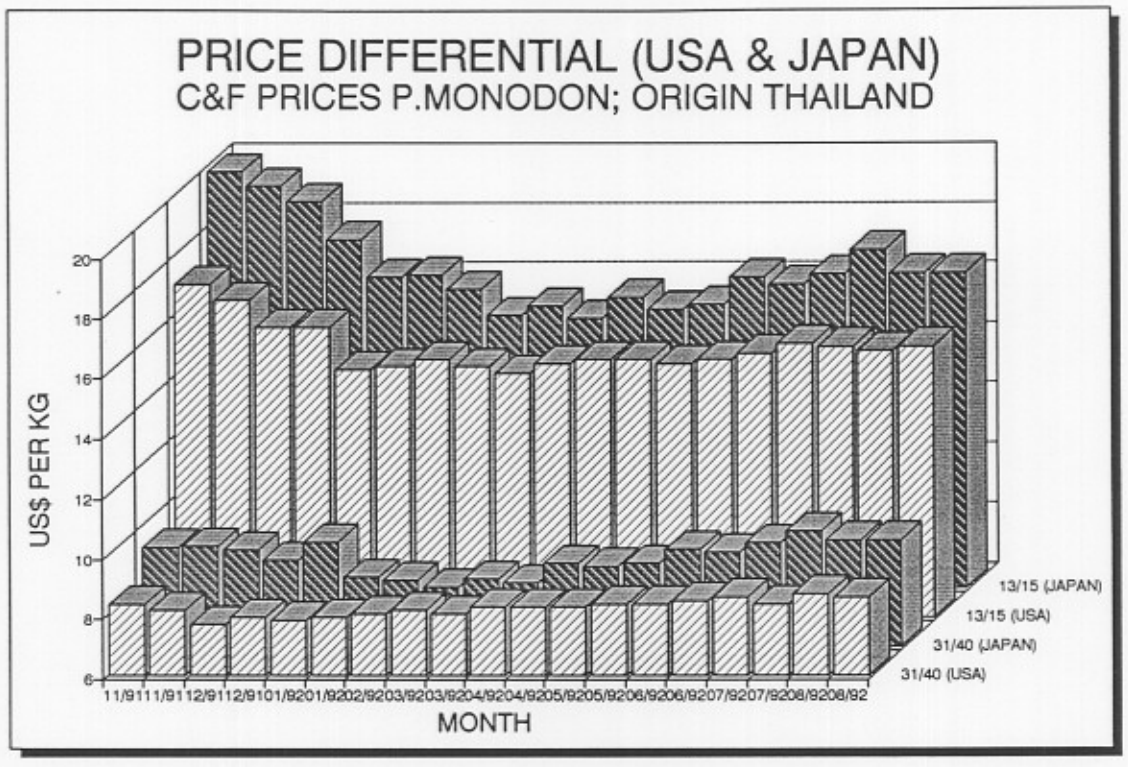
Chong (1990) indicates that in the European market wild caught shrimp maintain a price premium over cultured shrimp on the basis of taste.

2.3.4 Prices: Main Markets Comparison

The market in which the product is sold has also been found to be important in that there is often a difference in prices paid for the same species in different markets. Figure 10 indicates nominal prices paid for Thai *Penaeus monodon* on the Japanese and US markets. The dominance of the Japanese market is clear with a substantial price premium paid for both large and medium size categories of shrimp.

Infofish (1991) claim that the Japanese market is relatively price elastic whereas U.S. market expansion is more strongly related to personal disposable income. This could perhaps reflect the different behaviour of consumers in each of the countries, with per capita consumption of shrimp in Japan approximately double that of the U.S. Europe is also relatively price elastic due to the greater influence of variable quantities of cold water shrimp being placed on the market.

Figure 10 Price Differential Between U.S. and Japanese Markets



2.3.5 Consumption: Main Markets Comparison

Figure 11 illustrates the trend in the apparent consumption of all sizes of shrimp in the different markets. The European market shows the greatest change, with an increase in apparent consumption from 107,000 metric tonnes in 1882 to 292,000 metric tonnes in 1989. The percentage increase in consumption between 1988 and 1989 was highest for Europe (7.8 %) followed by USA (1.7%) and Japan (0.3%), respectively. In order to compare the rate of change in consumption in the different markets, a consumption index is used, taking 1984 as the base year.

The trend in Figure 11 indicates a levelling off in consumption after 1987 in both the US and Japanese markets. The European market has continued to expand in terms of total volume of imports. Although observations are made over a relatively short time period (1982 to 1989) the trend in the volume of tropical shrimp imports seems to have stabilised at around 280,000 metric tonnes in both the US and Japanese markets. With European imports estimated at 146,000 metric tonnes in 1989, the total quantity demanded by the three major markets may now be close to 710,000 metric tonnes.

Factors such as population growth, employment, income levels and greater product awareness may influence the eventual size of the markets and it is likely that there will be some maximum limit to their expansion, as implied in the trends in Figure 11.

Market analysis reveals that an increasingly greater proportion of shrimp is being sold for home consumption due to reduced prices and improved freezing and transport capabilities. Infofish (1991) conclude that the only way to substantially increase the quantities of shrimp consumed is via the promotion of home consumption. Such promotion would include new packaging, promotions and a widening of the retailer base.

Although unfortunately no data are available, it must be noted that different trends may be apparent if individual curves were drawn for the consumption of the different size categories in the different market segments. This is an important factor given the potential future increases in output from aquaculture shrimp production (see Chapter 3.1.3). Falling market prices as a consequence of oversupply is the unavoidable result in a situation where production is increasing at a greater rate than can be absorbed by the market.

Figure 11 Apparent Consumption Trends

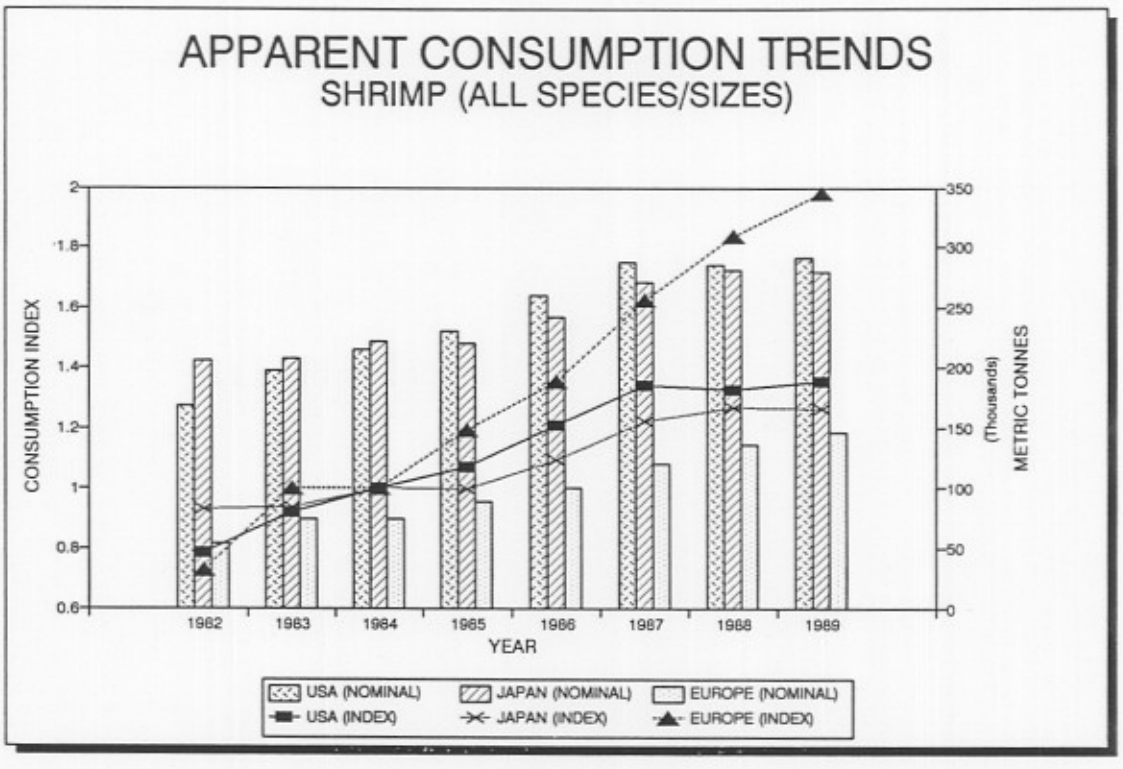


Table 8 Apparent Consumption in Industrial Markets (Metric Tonnes)

	1982	1983	1984	1985	1986	1987	1988	1989
USA: Source LMR Shrimp Market Report; Globefish.								
Domestic Landings	67700	64900	78900	85275	94000	81150	71900	74480
Imports	111300	146800	144450	152000	175700	213350	227268	226659
Exports	-7100	-8400	-6100	-6800	-9100	-10000	-10000	-8800
Cold Storage Adjustments	-3300	-5942	-2200	-450	-726	3500	-3992	-1089
Total	168600	197358	215050	230025	259874	288000	285176	291251
INDEX (1984)	0.78	0.92	1.00	1.07	1.21	1.34	1.33	1.35
JAPAN: Source LMR Shrimp Market Report; Fishdab; Globefish.								
Total Imports	145900	143100	158700	165500	194200	223300	231600	234600
Domestic Landings	59900	64400	62900	55000	48000	47800	49300	45000
Total	205800	207500	221600	220500	242200	271100	280900	279600
INDEX (1984)	0.93	0.94	1.00	1.00	1.09	1.22	1.27	1.26
EEC: Source Globefish; LMR Shrimp Market Report.								
Total Imports	53700	73700	73700	87850	99650	119650	135500	146000
Total								
INDEX (1984)	0.73	1.00	1.00	1.19	1.35	1.62	1.84	1.98

Source : Globefish; Fishdab; LMR Shrimp Market Report (1992); Yang (1992).