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Analysis of Seasonal Variation of Indian Frozen Shrimp in the European Union Market

**V. GEETHALAKSHMI*, NIKITA GOPAL, G.R. UNNITHAN
and P. JEYANTHI**

Central Institute of Fisheries Technology,
Matsyapuri P.O., Cochin - 682 029
Kerala

Abstract

Fish, particularly shrimp, is becoming a staple food in the diet of the Europeans. The boost in aquaculture production has led to enhanced frozen shrimp exports from India during the past decade. After Japan and US, European Union (EU) has been found to be an emerging market for Indian frozen shrimp products. During 2006, the value of frozen shrimp exports to EU was 337.93 million US dollars amounting to 57,554 tonnes in terms of volume.

Analyzing the seasonal pattern in the prices realized by the commodity in an international market will enable strategic planning for maximum gains. This article presents the analysis of seasonal variation in prices according to various size grades of Headless (HL) Black Tiger in the EU shrimp market. The prices realized for HL Black Tiger shrimp exports to the EU during 2006 was in the range of 6.30 to 11.30 \$ per kg for the grade 16/20, 5.10 to 10.00 \$ per kg for the grade 21/25, and 2.95 to 9.80 \$ per kg for the grade 26/30. A sharp decline in the prices was realized in the export of HL Black Tiger to EU over the past few years. The reasons for the price fluctuations have been identified. The seasonal variation in the prices during 2006 was studied, and it was found that for the popular grades like Black Tiger shrimp, the seasonal indices were high during the third quarter of the year. Lowest prices were realized during the first quarter of 2006. Our export strategy should be based on the seasonal demand for the products with more stress on value addition with an Eco label.

Introduction

India is one of the major shrimp producing countries in the world. The boost in aquaculture production in India during the early 90's has led to enhanced production of shrimp, and Andhra Pradesh is a leading producer of shrimp in India with a production of more than 70,000 metric tonnes during 2005–2006 out of total production of 1.4 lakh metric tonnes during the same year. After Japan and US, European Union (EU) has been found as an emerging market for Indian frozen shrimp products. During 2006, India exported 53,216 tonnes of frozen shrimp to the EU valued at 332.5 million US

*Corresponding Author: Tel: 91-484-2395973
Email : geethasankar@gmail.com

dollars. Belgium is the largest market for Indian frozen shrimp among the EU countries, and during 2006, India had a market share of 18.1% ([Anon 2006](#)) at this market. Imports of shrimp by Italy from India have increased to 43% in the current year thereby making India as the leading Asian supplier to Belgium.

More than 90 countries export frozen shrimp to the EU countries. India exports frozen shrimp to 13 countries in the EU. It exports shrimp products in Peeled Deveined (PD), Headless (HL), Cooked, Blanched, and Individually Quick Frozen (IQF) forms. Black Tiger is one of the major varieties of frozen shrimp exported to the EU from various ports of India. Recently, the EU had to reject products of Pakistani origin re-exported by Indian companies. This happened after the EU imposed a ban, for quality reasons, on Pakistani shrimp in March 2007.

The price of a commodity depends on the demand and supply for it in a particular market. Generally, it is observed that over the past few years, there is a sharp decline in prices of frozen shrimp products in all the major markets. The prices of HL Black Tiger of popular grades were analyzed with the aim to understand how the seasonal variation is reflected in the prices of Indian frozen shrimp in the EU market. This article presents analysis of the prices of Indian frozen shrimp exports to the EU market and suggests effective strategic measures that will ensure a steady market for Indian products in EU.

Material and methods

Weekly price data of prices of shrimp traded at the EU shrimp market for different varieties and grades were collected for the period 2001 to 2006 from published data of MPEDA and pooled to get monthly data. Analysis was carried out for the product forms and grades of shrimp where continuous data was available for these years. In addition, data was collected from UN Commodity trade statistics database on quantity and value of frozen shrimp exports. The seasonal variation in prices was studied by calculating the monthly indices for selected grades-16/20, 21/25, 26/30 and 31/40. Seasonal indices were calculated using standard procedure ([Krishna Rao 1972](#); [Waugh et al. 1969](#)). In addition, analysis of the prices of HL Black Tiger originating from different ports in various markets was compared using Analysis of Variance technique.

Results and Discussion

There were 95 types of products exported to EU market as frozen shrimp. It was observed that these products were in the forms of HL shrimp, PD shrimp, Peeled Undeveloped shrimp (PUD), and IQF shrimp. The major importing countries in the EU

are UK, Belgium, Germany, France, Netherlands, Italy, and Spain. The main ports from which frozen shrimp were exported are Visakhapatnam, Tuticorin, Chennai, Kochi, Mumbai, and Veraval. To the EU market, Brown, Pink, White, and Black Tiger varieties are exported.

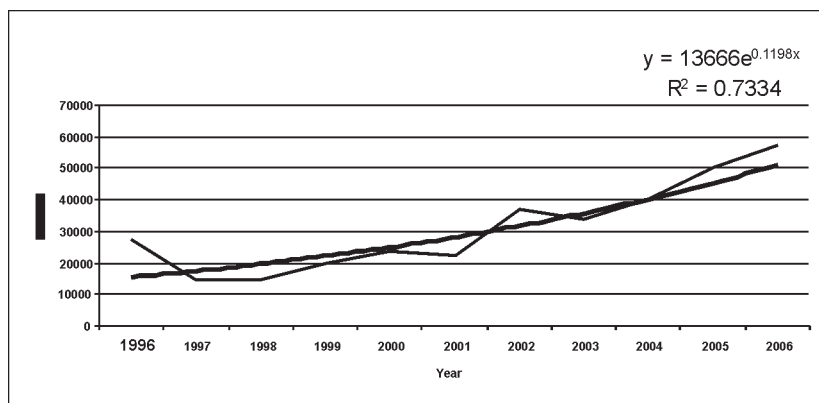


Figure 1. Shrimp exports to European Union.

Fig.1 shows that the volume of shrimp exports to the EU has increased exponentially ($R^2 = 0.73$) during the past decade. As mentioned earlier, among the EU countries, Belgium is the largest market for Indian frozen shrimp and 32.08% of value realized from out of the total shrimp exports to EU was from this country. The next largest market for Indian frozen shrimp among the EU countries is UK (25.82%) followed by France (10.8%).

The data pertaining to weekly prices of HL Black Tiger shrimp in popular grades realized in the EU market during 2001 to 2006 were compiled. Table 1 gives the monthly average prices in dollar per kg realized by HL frozen shrimp from India in the grade 21/25 exported to EU during 2001 to 2006. It was found that there was a sharp decline in the prices until 2004 and there appears slight stability in 2005. The trend was similar in the case of other popular grades of HL shrimp viz., 16/20, 25/30, and 31/40.

It was observed that the price fall was drastic from 2002 onwards. The percentage variation in prices in comparison with previous year was ranging from 23 to 30%.

Similarly, analysis of the prices of frozen shrimp exports in the form of PD in the popular grades viz., 26/30, 31/40, and 41/50 was carried out, and in general, decrease in prices was realized over the years. Table 2 gives the average prices of PD frozen shrimp exported to EU for the popular grade 26/30.

Table 1. Average prices of Headless frozen shrimp (Grade 21/25) exported to EU countries

Month	Average price (\$ per kg)					
	2001	2002	2003	2004	2005	2006
January	12.60	8.65	8.97	8.35	7.79	5.60
February	13.04	9.54	9.35	6.93	8.03	-
March	13.56	9.64	8.09	8.00	8.45	-
April	11.92	9.09	8.00	7.11	8.59	9.50
May	12.05	9.25	8.62	7.88	7.82	8.80
June	-	-	8.55	7.25	7.53	7.10
July	7.00	8.77	8.73	8.63	8.48	7.88
August	-	7.50	9.01	7.74	7.69	8.03
September	8.10	8.33	9.26	7.55	8.27	9.60
October	7.47	8.85	8.23	7.88	8.33	-
November	-	9.38	7.66	7.97	7.60	8.69
December	8.13	8.90	5.46	7.96	7.80	9.50

Table 2. Average prices of Peeled Deveined frozen shrimp (Grade 26/30) exported to EU countries.

Month	Average price (\$ per kg)					
	2001	2002	2003	2004	2005	2006
January	14.60	10.33	10.05	8.53	8.80	7.1
February	13.90	-	9.30	8.44	9.02	7.32
March	-	-	9.63	8.64	8.98	8.04
April	-	9.02	9.74	8.54	9.26	7.8
May	11.65	9.63	9.14	9.19	9.19	8.92
June	-	10.25	9.18	8.70	8.72	8.9
July	-	9.63	8.78	7.92	7.73	9.5
August	12.30	8.35	9.52	8.76	7.68	8.62
September	-	-	8.98	8.95	7.96	8.93
October	9.40	11.70	7.67	8.70	7.79	9.1
November	8.70	11.37	8.55	8.90	7.81	9.33
December	8.90	11.45	-	9.01	7.68	9.73

The analysis of prices of IQF shrimp in the popular grades 100/200 and 200/500 did not reveal any decrease in prices over the years (Table 3).

Table 3. Average prices of IQF shrimp (Grade 100/200) exported to EU countries.

Month	Average price (\$ per kg)				
	2001	2002	2003	2004	2005
January	-	2.10	2.73	4.30	3.50
February	-	-	3.72	-	2.80
March	-	2.10	3.60	3.80	3.72
April	-	2.90	3.68	3.20	4.10
May	3.90	2.35	4.09	2.90	3.47
June	3.74	2.90	3.64	-	3.65
July	3.50	-	3.82	3.31	3.63
August	-	2.82	3.87	3.25	3.99
September	3.45	3.43	3.90	3.47	3.85
October	3.80	3.53	3.10	3.54	3.73
November	-	3.64	4.01	2.96	4.00
December	3.15	-	-	3.10	3.88

A cursory look at the prices of frozen shrimp, in general, in the major forms like HL and PD reveals that a sharp decline in prices is realized over the years. In the case of IQF shrimp, no appreciable change is observed during the past years. The supply of shrimp from developing countries has increased over the years and is exceeding the actual demand leading to fall in prices.

When the antidumping investigations were initiated against the warm water frozen shrimp of Indian origin and five other countries, there was an apprehension that shrimp trade will be affected and there will be an impact on the prices. To explore whether the antidumping investigations and subsequent slapping of duties on Indian shrimp exports to US had any effect on the prices of shrimp realized in the EU market, the average monthly prices of popular varieties of frozen shrimp during 2006 was analyzed. Black Tiger is a popular variety of shrimp exported in large volumes to all the major markets especially in EU and USA. It is exported to EU in HL, PD, PUD and Cooked forms. The monthly prices of HL Black Tiger realized in the EU market during 2006 were computed by pooling the weekly prices for the popular grades. Fig. 2 depicts the pattern of average monthly prices of HL Black Tiger shrimp realized during 2006 in the popular grades 16/20, 21/25, 26/30, and 31/40.

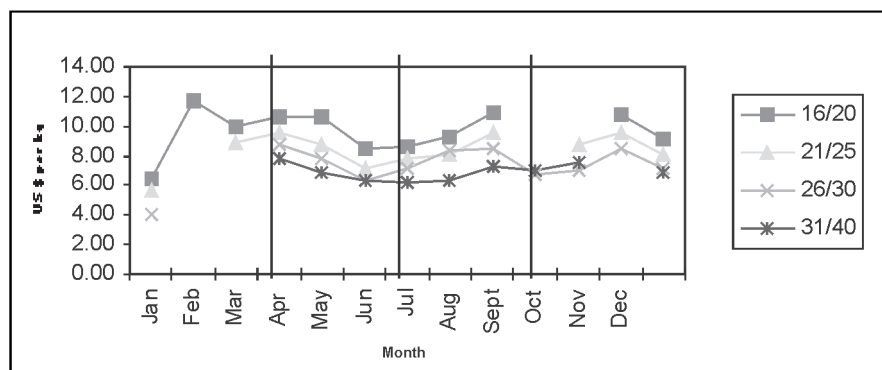


Figure 2. Monthly average prices of HL BT shrimp exports in EU market during 2006

The seasonal indices were calculated for grades 16/20, 21/25, 26/30, and 31/40 of HL Black Tiger shrimp exports to EU. Table 4 gives the gradewise average monthly prices of the Indian frozen shrimp to EU pertaining to the variety Black Tiger exported in the HL form. Table 5 gives the monthly seasonal indices of prices of HL Black Tiger shrimp for the grades 16/20, 21/25, 26/30, and 31/40 pooled over the past five years.

The percentage variation between the maximum and minimum indices ranged from 26 to 38%. The indices were high from February to October for all the grades. Comparatively lower indices were reported during November to January. Fish consumption tends to drop during summer and increase toward the end of the year—possibly because of the tradition of eating fish in the Christmas holidays. However, contrary to what one might expect, the prices fell during this period.

For the grade 16/20, the seasonal indices varied from 0.87 to 1.12, the maximum being during the month of April. For the grade 21/25, the maximum index was computed during April, and it varied from 0.8 to 1.12. In addition, in the case of grade 26/30, the maximum index was computed during the month of April and the range of the seasonal index was from 0.84 to 1.21. Seasonal index varied from 0.90 to 1.27 in the case of grade 31/40 with maximum computed during October.

It was observed that during 2006, average prices of frozen shrimp exported from Chennai and Tuticorin was \$4.53 per kg and \$4.3 per kg, which was more than the prices realized from Kochi, Kollam and Mangalore ports (\$3.59, \$3.25 and \$3.9 per kg, respectively). The fact that products from these ports are able to bargain better prices has to be further explored.

From the data, it was observed that in the popular grades 16/20, 21/25, 26/30 and 31/40, the prices of HL Black Tiger shrimp exports to various countries varied significantly ($p < 0.05$). In addition, the port of origin of the export had also significant impact on the prices ($p < 0.01$) with $R^2 = 0.93$. Particularly, higher prices were realized from UK compared to Belgium during the same period.

Table 4. Average monthly prices of Indian frozen shrimp (Black Tiger) in EU (US \$ per kg)

	January	February	March	April	May	June	July	August	September	October	November	December	Overall
	8.84	10.11	10.61	10.60	9.51	9.13	9.64	9.44	9.30	8.93	9.40	8.20	9.45
16/20	(±3.19)	(±2.98)	(±0.90)	(±0.28)	(±1.78)	(±1.72)	(±1.83)	(±1.85)	(±1.23)	(±2.30)	(±0.00)	(±2.77)	(±2.23)
	8.03	8.80	9.32	9.50	8.43	7.86	8.88	8.28	9.00	9.47	6.83	7.79	8.5
21/25	(±2.46)	(±2.79)	(±1.15)	(±0.62)	(±1.08)	(±1.45)	(±1.36)	(±1.76)	(±1.02)	(±2.13)	(±2.63)	(±2.23)	(±1.86)
	6.74	8.73	8.33	9.38	7.80	6.52	7.77	8.04	7.39	8.15	7.44	6.93	7.73
26/30	(±2.50)	(±1.39)	(±1.03)	(±3.00)	(±1.00)	(±1.22)	(±1.03)	(±0.93)	(±2.14)	(±1.83)	(±1.68)	(±2.00)	(±1.80)
	6.06	6.96	7.26	6.71	7.30	6.39	6.88	6.66	6.79	8.60	6.73	6.09	6.76
31/40	(±2.46)	(±2.50)	(±0.84)	(±2.16)	(±0.70)	(±1.00)	(±0.85)	(±0.98)	(±0.72)	(±2.83)	(±1.09)	(±1.95)	(±1.52)

• Figures in parentheses indicate standard deviation

Table 5. Seasonal indices of prices of Indian frozen shrimp (Headless Black Tiger)

	January	February	March	April	May	June	July	August	September	October	November	December
16/20	0.94	1.07	1.12	1.12	1.01	0.97	1.02	1.00	0.98	0.95	0.99	0.87
21/25	0.94	1.04	1.10	1.12	0.99	0.92	1.04	0.97	1.06	1.11	0.80	0.92
26/30	0.87	1.13	1.08	1.21	1.01	0.84	1.01	1.04	0.96	1.05	0.96	0.90
31/40	0.90	1.03	1.07	0.99	1.08	0.94	1.02	0.99	1.00	1.27	0.99	0.90

Moreover, for HL Black Tiger exports, a comparison of prices realized from USA, Japan, and EU revealed that Japan has always offered competitive prices. EU imports shrimp of a much lower price in comparison with the other markets ($p < 0.05$). This can be explained by the fact that EU imports more of coldwater shrimp, which is generally smaller and lower in price than the tropical shrimp. Fig. 3 gives the monthly average prices of HL Black Tiger shrimp exports to the major markets during 2006 for the grade 16/20.

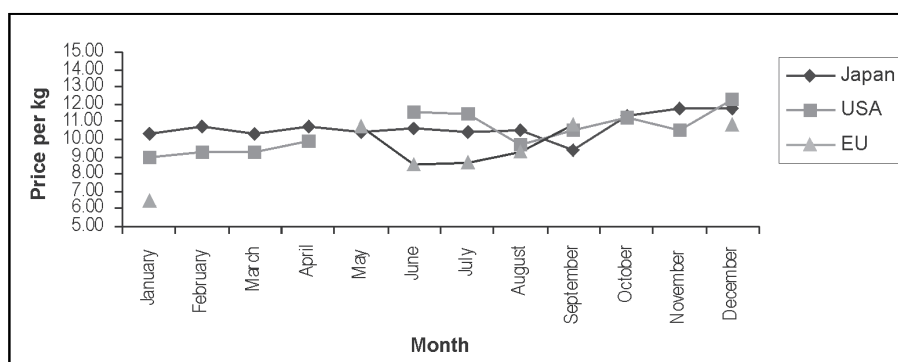


Figure 3. Monthly average prices of HLBT shrimp exports at major markets Grade 16/20 during 2006.

Conclusion

The EU is India's largest trading partner in seafood exports. The EU process regulations are very stringent and the exporters incur additional costs to abide by these regulations. In spite of this, India is able to export large quantities of seafood to the EU during the last few years. However, it is seen that shrimp trade has not grown in value terms in the last years. This is because the supply exceeds demand. There are some opportunities to improve the prices realized such as diversification of markets and more exports of value-added shrimp like butterfly cut, ring presentation, and coated products. Moreover, highlighting the quality of the product through a geographical denomination of origin or ecolabeling will certainly boost up prices. EU market depends on the value of Euro and future economic growth. At present, Euro is strong on US dollar making the EU market attractive for trade. Newer markets like Southeast Asia, Latin America, and China have to be explored. For example, China is the seventh largest shrimp importer and some of these shrimp goes for reprocessing but an increasing share stays in the country.

The prices of Indian frozen shrimp to EU exhibit a seasonal pattern. The seasonal demand for the product must be taken into account while developing marketing strategies so as to realize better prices. Increased domestic demand should be kept in mind while

sending various products into a market. It is also necessary to maintain stringent quality standards to compete with other supplying countries and for being able to sell our product at a premium. India does not have a single seafood ecolabel. Measures should be taken to ensure that Indian products go with a single ecolabel to obtain a sustainable price premium. Market research on consumer's tastes and preferences could further improve India's recent export performance.

Finally, the phenomenon of brand names in the retail trade in frozen fish products should be kept in mind. There is a dual tendency: on one hand, there is one brand name that captures almost half the sales; on other hand, distributor's brands (or no-name products) also account for a very high percentage.

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