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Agricultural Policy Implementation Project

General Directorate for Development Planning and Agricultural Investments (DGPDIA)
Ministry of Agriculture, Republic of Tunisia

AN EXPORT DEVELOPMENT STRATEGY FOR TUNISIAN SEAFOOD PRODUCTS

Final Report 91-7

July 1991

by

Martha Blaxall
Richard Pace
Peter Gati
Nicola Katz

Prime Contractor
Abt Associates Inc.

Subcontractor
Hill & Knowlton

In collaboration with

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EXECUTIVE SUMMARY

Tunisia's exports of fishery products increased steadily throughout the 1980s, reaching a total of 23,594 tons in 1990 with a value of more than 90 million dinars. These increases reflect recent policies instituted by the Government of Tunisia to promote and expand exports of seafood products. In support of this effort, the Ministry of Agriculture, in cooperation with the Agency for International Development (AID), sponsored an analysis of export promotion strategy directed towards identifying and assessing new and expanded markets for Tunisian fishery products, with particular emphasis on the United States, the European Community and Japan. The project was also asked to evaluate impediments to market expansion and to indicate how existing barriers to successful penetration of these markets could be overcome.

This Report addresses the following topics: The Tunisian Fisheries Sector, Current and Potential Markets, Major Impediments to Expanded Seafood Exports, and an Action Plan for Export Expansion. This last section includes a set of conclusions and recommendations for Tunisian fisheries exporters and government officials.

THE TUNISIAN FISHERIES SECTOR

The fisheries sector occupies an important role in the Tunisian economy, representing about 9% of the value of agricultural production and about 10% of GDP. Fifty-five thousand people were employed in the fishery sector in 1990, and an additional 9,000 were employed in various types of processing and support services.

Fishery exports represent an important source of foreign currency for Tunisia and a profitable business activity for seafood exporters. In recent years, exports have increased significantly, rising from 11 million DT (6,700 tons) in 1980 to 94 million DT (24 thousand tons) in 1990. In value terms, fishery exports represent 5% of national exports and between 30% and 35% of all foodstuff exports.

Fishery Resources and Production

Production of fishery products in Tunisia has declined since 1988, when 102,000 tons were harvested. This decline is attributed to a significant increase in fishing effort since the early 1980s due to a doubling of the coastal fleet, overfishing of shrimp and white fish stocks, illegal fishing in the Tunisian zone by Italian trawlers, and habitat degradation from increased industrial pollution in the Gulf of Gabes. Recognizing these problems, the Commissariat Général de la Pêche (CGP), the principal fisheries agency, is leading a government-wide effort to improve fisheries

management, reduce pollution, and target fishing effort on those stocks in the North which are currently underfished.

Processing Sector

Approximately 15% of the fish produced in Tunisia is further processed by about 20 canneries and 36 facilities which pack fresh and frozen seafood items. These plants are divided into two types: those that pack for export and those that serve the domestic market exclusively. The export sector is characterized by relatively new, well-equipped, and high quality processing methods, and is generally in conformance with the sanitary standards and technical requirements demanded by importers in Europe and Japan. Eighty percent of the product processed in export plants is sold abroad.

Inadequate cold storage facilities, seasonal catch fluctuations and a lack of raw material force the processing sector to operate well below full utilization. Thus, even though labor costs are relatively low (approximately $1 US per hour), shortages of fish and the resulting high fixed costs in processing plants, prevent Tunisia from achieving a competitive cost advantage in most of its high value seafood products.

Aquaculture Sector

Three major aquaculture facilities are currently operating in Tunisia, producing loup and daurade for export markets in Italy, France and Spain. A total of about 300 tons was exported in 1990, though projections of 3,000 tons by 1996 are included in the VIIIième Five Year Plan. The principal impediment to rapid expansion has been a lack of technical expertise due to the inexperience of the Tunisian managers. Rapid growth of the aquaculture sector -- an essential part of Tunisia's strategy to expand exports -- will depend largely on overcoming this impediment -- both in terms of trained managers and workers, as well as in access to a network for obtaining equipment, feed, other supplies, and specialized technical assistance.

Government Policies and Programs in Support of the Fisheries Sector

The fisheries sector has been targeted for special incentives and programmatic support beginning with the VIième Five Year Plan initiated in 1982. Government subsidies are provided for fuel, direct investments, production expansion and improvements geared towards increased exports, and for transportation costs of exports to non-traditional markets. Special additional subsidies are available to encourage the exportation of canned sardines. Loans and grants available for boat construction have played a major role in increasing the size of the fleet. Exporters generally agreed that these subsidies have been instrumental in developing new export markets, but now argue that additional assistance is needed to provide access to reasonably priced short and medium term loans to finance working capital and inventory build-up, and to remove

or lessen trade barriers in the EC.

CURRENT AND POTENTIAL EXPORT MARKETS

Tunisia's seafood exports are concentrated in a small number of product groups. Crustaceans, principally frozen shrimp, constitute about one-third of the value of all seafood exports, followed by cephalopods, principally frozen octopus and cuttlefish, and fresh white fish. Canned sardines, other mollusks, coral and sponges, are relatively minor in current export statistics.

Italy is the largest market for Tunisian seafood exports, importing the majority of Tunisian fresh fish, crustaceans and cephalopods. France and Spain are second in volume and value, respectively. Japan has developed as a market for fresh blue fin tuna in the last several years. A very small quantity of seafood products, principally cephalopods and fresh and frozen tuna, is exported from Tunisia to the United States.

Tunisian exporters are sophisticated about their traditional markets, which depend heavily on Tunisia as a source of raw material for retail and institutional markets; even Japan has developed its reliance on bluefin tuna. Shortages in supply, rather than inadequate demand, are the major impediment to further export growth.

Export Markets for Shrimp

Shrimp exports have declined as stocks have decreased since the late 1980s. The major export product is head on, frozen, fingerlayered shrimp in a 1 kilogram pack. Principal markets are Italy, Spain and France. With additional product available, either from investments in aquaculture, or from a revitalization of the wild stocks, markets in Belgium, Holland, England and Germany offer promising opportunities. The U.S. and Japan, while large markets for shrimp, prefer head off product or species not available in Tunisia, arguing against trying to develop these markets with the limited supplies of shrimp likely to be available.

Export Markets for Cephalopods

Tunisia now exports nearly 10,000 tons of cephalopods annually to its three traditional markets and to Greece. The principal product is a cleaned, frozen block, size graded in accordance with Spanish or Japanese grading systems. Prices are strong, and lack of supply, rather than demand, is the primary barrier to selling more product in foreign markets. Possible market opportunities also exist for frozen octopus and cuttlefish in the U.S. and Japan.

Export Markets for White Fish

Tunisian exports of fresh and frozen white fish have increased steadily since the early 1980s, reaching a peak of 2,255 tons in 1990 with a value of 26.6 million dinars. The major species exported--loup, daurade, eels, grouper, rouget -- are of great interest in Tunisia's Mediterranean markets. However, if Tunisia is successful in expanding aquaculture production to 3000 tons plus per year, new markets will need to be developed to maintain prices at or near their current high levels, particularly since competition for breams and bass will come principally from farms in their current markets of Italy and France. Both the U.S. and Japan represent large potential markets for these products.

Export Markets for Tuna

Tunisian exports of bluefin tuna reached about 460 tons in 1990, most of which was exported fresh to Japan. Greater amounts could be exported to this market if Tunisian processors and boat owners are able to improve their handling, including using more ice and building more onboard refrigeration units. The U.S. also represents a potential market in smaller quantities, and it may be possible to sell a frozen steak to the U.S. for the retail market. Market opportunities in Europe are extremely limited.

Export Markets for Canned Sardines and other Canned Products

Tunisia exported 237 tons of canned and semi-canned products in 1990, most of that being canned sardines and prepared product for canned sardines, tuna and anchovies. The major markets are Middle Eastern countries, other African countries such as Libya, and Eastern European markets, particularly Czechoslovakia. European sales have been small for several reasons: the Tunisians have not adopted the preferred pull top, aluminum can; the Europeans prefer the larger fish available from Morocco and Portugal; import quotas limit Tunisian exports to the EC; and Tunisian exporters have traditionally dealt with only a handful of importers. Also, the lack of raw material in Tunisia has limited the availability of product for export.

Sardine markets can be expanded with appropriate market knowledge and a transfer of processing and packaging technologies. Improved fishing techniques and cold storage facilities are needed to maintain product quality and availability on a year round basis. If this can be done, markets in the U.S., in the U.K., and in other EC countries can be successfully penetrated by Tunisian canners packing for export markets.

Other canned products such as anchovies prepared from imported raw materials, octopus from Tunisian product and canned mackerel, also have potential markets in these countries should Tunisian exporters seek to exploit them.

MAJOR IMPEDIMENTS TO EXPANDED SEAFOOD EXPORTS

If Tunisia is to attain its goal of significant, sustained growth in fishery exports, it must overcome several critical impediments. The lack of raw materials is the most critical constraint. If that can be resolved, there still remains a lack of knowledge about market requirements and buyer preferences in non-traditional markets, and a distinct lack of awareness among potential new buyers regarding the availability of species and products from Tunisia. These are compounded by inadequate shipping routes to new markets in the U.S. and Asia, which contribute to non-competitive prices in some markets, and by trade barriers, particularly those found in the European Community which discriminate against Tunisian products. Each of these impediments must be addressed through a carefully orchestrated effort undertaken jointly by the industry and the Government.

AN ACTION PLAN FOR EXPORT EXPANSION

Tunisia is ideally situated to become a much larger source of seafood products for Europe, Japan and the United States due to its relatively low labor costs, its production of high quality seafood products demanded by these countries, its close proximity to its major markets in the EC, a favorable environment for aquaculture, and an entrepreneurial export sector willing to experiment with new markets and products.

Short-term Actions

To realize expanded exports in the short term, Tunisia must continue to develop its "niche marketing strategy," that is, providing small quantities of high value, first quality products rather than large quantities of lower priced, commodity type products. Implementation of this strategy would be assisted by the following:

- Establishment of a private, seafood exporters federation to promote and expand Tunisian seafood exports by providing a single, unified and well-financed industry entity for this purpose;

- Development of new products/markets which require little or no new technical capability. Examples include canned sardines in oil for the U.S. and U.K. markets, fresh grouper for the U.S. and Japan, retail packs of cut up cuttlefish and octopus in the U.S. and EC, retail markets for tuna steaks in the U.S., expanded octopus markets in the U.S. and Japan;

- Improving quality control standards onboard and in processing facilities; and

- Encouraging competition in the sardine can market, including permitting easy importation of aluminum cans for export and domestic use.

Medium Term Actions

Over a period of 12-24 months, training and technical assistance for new fishing and processing methods, and developing the fisheries management and infrastructure needed to maximize the utilization of Tunisia's fisheries resources are recommended. This includes:

- Establishment of a well-funded government institute for technical assistance to ensure that the latest technologies, the most knowledgeable consultants and the most up-to-date market information are made available to the various segments of the fisheries sector devoted to export trade;

- Creation of an effective fisheries management regime with participation of industry as well as scientific and governmental representatives;

- Developing a program to maximize the freezing of sardines for subsequent, year round processing; and

- Development of new products/markets with various types of value-added cephalopod, shrimp and tuna products, including those processed from imported raw materials.

Longer Term Actions

In the long term, several new products and markets must be developed if Tunisia is to escape saturation of its traditional markets for farm-raised breams and sea bass. The feasibility of value added products should be examined as well. Other products that make sense to explore in a two year plus time frame include:

- Skinless, boneless sardines for the U.S. market, perhaps on a private label basis; and

- Production of farmed shrimp, such as the Penaeus orientalis variety found in China, which is heartier than the tropical shrimp farmed in South America.

1.0 INTRODUCTION

1.1 Study Objectives

As part of the Agricultural Policy Implementation Project (APIP), the Ministry of Agriculture of the Government of Tunisia requested an analysis of export competitiveness and promotion strategy directed towards identifying and expanding markets for Tunisian fishery products. This assignment included two components:

- to evaluate Tunisia's fishing industry, in light of its current and projected production levels, with respect to the following characteristics -
  - quality
  - handling methods
  - processing methods and technologies
  - product diversity
  - markets and marketing expertise
  - cost competitiveness, and
  - export potential;
- to identify and assess new and expanded markets for Tunisian fishery products, with particular emphasis on the United States, as well as Europe and Japan, and to indicate how existing barriers to successful penetration of those markets could be overcome.

The scope of the project was to examine not only the fishery products obtained from exploitation of wild stocks in Tunisia's fishing grounds, but also the current and potential production from the aquaculture sector. Since wild stocks are fully exploited in most of the higher value species, development of an aquaculture sector is critical for obtaining the raw material needed in an expanded and export-oriented fishery products sector. Thus, the project also incorporated a brief assessment of the opportunities available in Tunisia for the development of aquaculture.

1.2 Methodology and Study Limitations

To carry out the project, the following tasks were undertaken:

- Market research, in the United States, on the U.S., European and Japanese markets related to products available in Tunisia which are or could be exported to these countries;
- An analysis of recent trade statistics to identify how and where Tunisian exports of seafood products have penetrated markets in the U.S., France and Japan;

- Organization of a project team comprised of a fisheries development specialist, a seafood marketing expert, and a specialist in canned seafood products of Mediterranean origin;

- A site visit to Tunisia by the project team to meet with Tunisian officials, industry representatives and others knowledgeable about the Tunisian fishing and seafood processing/marketing sectors.

In addition, the Project Team was able to incorporate information from two recent theses written by Tunisian students at the Universities of Tunis and Sfax, dealing with factors affecting the exportation of seafood products from Tunisia. The author of one of these studies, Ms. Salima Meddeb, currently a employee at CEPEX, the Centre de Promotion Des Exportations, accompanied the project team on its site visit throughout the coastal areas. The team was also assisted in arranging plant visits by the Chamber of Commerce of the South at Sfax, Gabès, and Medenine, and by the Commissariat General de la Pêche (CGP), the principal government organization concerned with fisheries issues.

The Project Team visited all the major fishing ports on Tunisia's East Coast, and talked with principals of seafood processing facilities in Tunis, Sousse, Chebba, Sfax, Gabès, Zarat, Zarzis, and Jerba. The group also visited aquaculture farms near Hergla, Sfax, and Jerba, observing three different aquaculture technologies: intensive, pond-based farming; extensive farming; and semi-extensive, using floating cages. In total, the Team visited the following facilities:

- 3 Aquaculture operations

- 7 Freezing/fresh fish plants

- 5 canneries

- 2 research institutes

- 7 ports.

Although at least half of the plants which process fresh, frozen and canned product for exportation could not be visited within the time frame available, it is the project team's opinion that those plants which were visited are representative of the entire export sector in Tunisie. The appendix lists the names and locations of those facilities which were included in the site visit.

In addition to its edible seafood industry, Tunisia also has a small, but important export industry in coral products and sponges. These products were not included in the purview of the purview of this study.

1.3 Organization of the Report

Using the information obtained in the literature, and through personal interviews and site visits, the team carried out an assessment of Tunisia's seafood export sector and prepared this report. The report is organized into five chapters.

Chapter 2 describes the Tunisian fishery sector, including the size of the resources available for commercial exploitation, the degree of modernization found in the processing and marketing sectors, the importance of international trade and investment, recent aquaculture developments, and the major government policies and programs supporting the fisheries sector. This includes a brief summary of the Five-Year Plans instituted by the Government of Tunisie. Chapter 3 addresses current export activities in the three major markets covered in this study -- the U.S., the EC, and Japan. Potential markets for existing or new products are also identified, along with recommended product modifications needed to enhance Tunisia's ability to penetrate non-traditional markets. Chapter 4 analyzes the major impediments to expanding Tunisian seafood exports and proposes various approaches for overcoming those impediments. Finally, Chapter 5 concludes with an action plan for export expansion. This plan includes short, medium and long term actions to be undertaken by both the government and the industry.

2.0 A GENERAL DESCRIPTION OF THE FISHERIES SECTOR IN TUNISIA

The fisheries sector occupies an important role in the Tunisian economy, representing, in recent years, about 9% of the value of agricultural production and 10% of GDP.[1] Fishing is the third largest component of the agricultural sector after arboriculture and livestock breeding. Fifty-five thousand people were employed in the fishery sector in 1990, and an additional 9.000 were employed in various types of processing and support services.

Fishing is a traditional Tunisian industry. Tunisia is now the 4th largest fishing nation in the Mediterranean, (after Italy, Spain, and Greece), with recent annual production ranging between 85.000 and 100.500 tons.[2] It is estimated that the total annual catch by all 18 Mediterranean countries is 1.500.000 tons.[3]

Fishery exports represent an important source of foreign currency for Tunisia and a profitable business activity for seafood exporters. This creates a strong incentive for these producers to upgrade their plants and processing methods to meet international quality standards. In recent years, exports have increased significantly, rising from 11.000.000 DT (6.700 T) in 1980 to 94.000.000 DT (24.000 T) in 1990. In value terms, fishery exports represent 5% of national exports and between 30% and 35% of all foodstuff exports.[4]

The VIIème Five-Year Plan (1987-1991) projected an annual growth rate of 7% for the fisheries sector and allocated considerable resources to achieve this goal. This included modernizing the fleet, expanding and improving port facilities, and improving processing capability. Investments in aquaculture projects were also part of the Plan. The VIIIème Plan continues these goals, but with a greater reliance on the private sector to realize them. The Plan also embraces a stronger commitment towards achieving effective fisheries management and an optimal

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[1] DGPDIA, and U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, "Tunisian Fisheries, 1978-1988," July, 1989.

[2] Olfa Belhassine, "Une richesse à proteger et à promouvoir," La Presse, May 20, 1989.

[3] Samir Ben Romdhane, "Pour une meilleur exploitation des ressources marines:, Les Cahiers de la Presse, September 1988, p. 11.

[4] DGPDIA.

distribution of the fishing effort among all of the stocks; the highest valued stocks are now fully exploited or overfished, and even the inshore pelagic species are heavily exploited.[5]

Section 2.1 Fishery Resources and Production

Tunisia has a coastline of approximately 1.300 km on the Mediterranean Sea. The adjacent continental shelf comprises about 77.000 square km. Most of the resources are marine although there are several coastal lagoon and brackish-water lake fisheries located near Tunis, Bizerte, and Bibau. Of the 30 fishing ports in the country, half are in the southeastern provinces of Sfax, Monastir and Mahdia. One-third were built in the last 20-30 years and are relatively modern and well-equipped. Sfax is the largest port with more than 3.200 vessels.

2.1.1 Recent Production Trends

The volume of coastal fishing has fallen in recent years, after reaching a peak of almost 103.000 tons in 1988. As seen in Table 1, 1990 production reached only 88.600 tons, a decline of nearly 7% from 1989, and a reduction of 13.8% from 1988's record catch.

TABLE 1

TUNISIAN FISHERY PRODUCTION, 1982-1990
(thousands of tons)

YEAR	PRODUCTION	YEAR	PRODUCTION
1982	62,8	1987	99,2
1983	67,2	1988	102,8
1984	74,9	1989	95,1
1985	88,9	1990	88,6
1986	93,0		

Sources: Budget Economique 1991, Ministère de l'Agriculture, Gouvernement de Tunisie, and Salima Meddeb, Les Exportations Tunisiennes des Produits de la Mer: Realités et Perspectives, (Université de Tunis III, Institut Superieur de Gestion de Tunis, 1990), p. 7.

[5]"Tunisian Fisheries, 1978-1988", p. 1.

Tunisian fishery experts attribute the recent decline in total production to a significant increase in fishing effort since the early 1980s. Table 2 illustrates the near doubling of the fleet since 1981, to a total of 12.355 vessels. Most of the increase occurred in the small, relatively inexpensive coastal vessels. Many of these vessels are dilapidated, with outdated technology and very little flexibility in what and how they can fish. Although the number of other types of vessels has also increased, these still represent only a relatively small proportion of the total fleet.

TABLE 2

INCREASE IN THE SIZE OF THE TUNISIAN FISHING Fleet
BY TYPE OF VESSEL, 1981 - 1990

Type of Vessel	Number of Vessels		Percentage Increase
	1981	1990	
Chalutiers	202	396	96,0%
Thoniers	22	45	104,5%
Sardiniers	192	308	60,0%
Barques côtières	6.200	11.606	87,0%
TOTAL	6.616	12.355	87,0%

Source: Budget Economique 1991, Ministère de l'Agriculture, Gouvernement de Tunisie.

Production Variability. Fishery catches vary considerably from year-to-year, depending on the species. For example, tuna production fell in the summer of 1990 due to the migratory nature of the species and climactic conditions which affected the water's translucency. Total tuna production was only 3.500 tons, compared with 1989's total production of 3.800 tons.[6] Small pelagics (poisson blue), on the other hand, were abundant. In 1990 Tunisia produced 30,000 tons of these fish -- tonnage unmatched in seven years,[7] and the second largest amount after the record catch in 1988.

Shrimp fishing has been severely affected by the decline in fishery resources, particularly in the coastal fishery. In 1983, shrimp production in the Golfe de Gabes attained 1.200 tonnes; by 1988, this figure had fallen to 216 tonnes; and in 1989, shrimp production was only 143 tonnes. In Sfax, for example, 1990 shrimp production dropped almost 300 tons to 1.817 tons.

[6] Mohammed Ayed, "Le thon revêche", La Presse, June 23, 1990.

[7] Ibid.

According to many coastal fishermen, the fall in productivity can be attributed to a handful of "pirate-like" trawler fishermen who have entered the area from elsewhere and fished with little respect for the environment or small boat fishermen. These trawlers ("chalutiers") destroy large amounts of algae, phytoplankton, small fish, and other resources fished by small boat fishermen. More than 80% of this type of trawler fishing occurs in the Golfe de Gabes. In 1989 alone, trawlers reputedly destroyed 33.500 octopus pots and 10.000 fishing lines belonging to 103 coastal fishermen in the area, representing a loss of about 73.400 Dinars (approximately $61.200).[8]

However, the reason for the shift from coastal to deeper water fishing trawlers may also reflect a depletion of inshore resources due to overfishing. Another factor may be the illegal fishing by Italian trawlers which are reputed to harvest approximately 20.000 tons per year within the Tunisian zone.[9]

Regional Distribution of Fishery Resources. As traditional fishing areas, the harvests in Gabes and Medenine represent more than 70% of the entire Tunisian catch; 80 percent of all trawling allegedly takes place in the Golfe de Gabes. The Southern regions have the most extensive port infrastructure, with at least seven full-size ports in the two governorates of Gabes and Medenine. Combined landings in these two areas reached more than 27.000 tons in 1990, with Gabes providing just over 50% of that amount. Sfax, with the highest reported production, landed almost as much as Gabes and Medenine in 1990. Exports from all of these regions have also increased significantly over the last few years, particularly in value terms, due to higher fish prices.[10]

Landings in the northern governorates of Jendouba and Bizerte have declined in recent years despite government efforts to encourage the fleet to move into these areas where stocks are reputedly underutilized. The northern provinces are targeted for significant infrastructure in the next several years.

[8] Soufiane Ben Farhat, "Le calvaire des pêcheurs cotiers", La Presse, April 19, 1990.

[9] This estimate of the size of illegal Italian fishing was provided by the Director of INSTOP, Mr. Salem Bel Haj, in a meeting on May 17, 1991.

[10] "De nombreux atouts", Les Cahiers de la Presse, September 1988, p. 10 (Original source: "Redynamisation de la pêche maritime dans le Sud", November 1987).

2.1.2 Fishing Methods.

Four fishing techniques are used in Tunisia. These are: coastal fishing (la pêche côtière), night fishing (la pêche au feu), trawler fishing (la pêche au chalut), and tuna fishing (la pêche au thon).[11]

Coastal Fishing. Although the coastal fleet is spread out along Tunisia's coastline, 80% of the boats reportedly fish off the south and eastern parts of the country. It is estimated that about one third of the fleet is motorized and the remainder is comprised of sail or row boats. In 1990, the coastal fleet produced about 40.534 MT of fish, about 45% of total national production.

The motor boats are between 8 and 14 meters long, are constructed of wood, and carry motors ranging between 15 CV and 110 CV. Most are equipped with depth sounders (appareil de relevage) and various types of gear, depending upon the species being sought. The coastal vessels use purse seine nets for the majority of their catch, which includes shrimp, tuna, white fish, etc. The system of using potted clay pots for octopus is dated but effective. These coastal vessels do not have fish finders and will fish only as far as 70 kilometers from the shore. They usually leave port late in the afternoon and return the next morning.

The quality of the fish observed was excellent in spite of the fact that ice is used sparingly, if at all. The high quality of the fish is a function of the rapid turnaround of the catch (12 Hours) and the fact that fishing is done at night, thereby avoiding the sun and the heat of the day.

Night Fishing. This type of fishing uses lights to attract fish to the surface, where they can be caught by a filet tournant or seine. It is restricted to sardines, sardinelles, anchovies, mackerel, saurels, and bogues. Night fishing is done by several hundred "units," principally off the Northern and Eastern coasts near Kelibra and Sousse. In 1988, night fishing yielded 32.000 tons, or 31% of total national production. By 1990, this amount had declined to less than 30.000 tons. Most of the catch is seasonal, during the six to eight months of calm seas.

A "unit" is comprised of three or four vessels: a 12-18 meter boat to carry the catch [remorqueur vessel], powered by a 90 to 250 CV motor; a 5 to 12 meter seiner, and two 4-5 meter boats equipped with the lamps needed to attract the fish. In the Bizerte region, only three vessels are used: a remorqueur/porte-filet and two porte-groupes.

[11] "De nombreux atouts," p. 13.

Trawler Fishing. In 1990, there were more than 350 trawlers, most of which were located in the Southeastern part of Tunisia. More than half of their landings are made at Sfax. These boats, which are 16 to 30 meters long and equipped with 250 to 800 CV motors, produced 17.000 tons, representing nearly 20% of national production.

Three principal types of trawlers are used in Tunisia. The Mediterranean bottom trawler is used for benthic species (shrimp, rouget, pageot, etc.); the large, vertically opening trawlers are used to catch benthic and densely schooled pelagics; and the pelagic trawler is used for small benthics and pelagics (saurels, sardines, belt fish, etc.) This latter type was introduced in 1977 by the Office national de pêche (ONP), and served as a model for the subsequent conversion of a number of trawlers in 1982. In general, this fleet is aging and deteriorating.

Tuna Fishing. Tuna fishing is conducted principally by seine fishing (la senne). About twenty boats use a system called pêche a la palangre flottante, which was originally introduced in Tunisia in 1982. Seining is used by about forty vessels, 16 to 22 meters long, equipped with motors of 250 to 600 CV. In 1987, seiners landed 1,500 tons, or about 85% of total tuna production.

The fleets of larger boats generally use a purse seine net method for fishing sardines, tuna, shrimp, etc. The average size of the boats(15 - 25 meters) is not large by European, Japanese and U.S. standards, but they generally have modern electronics to assist them in locating the schools of fish. The larger boats will take six to ten day trips while the smaller boats will fish from four to six days. We were advised that all of the offshore boats carried a sufficient supply of ice but this could not be confirmed and the team believes that more can be done to improve the methods of handling on the boats.

More efficient boats and catching methods are available to the Tunisians (eg. Gulf of Mexico trawlers, Clipper ships with freezing capacity, etc.), but these boats are expensive to operate and difficult to maintain and in the opinion of the team will act to accelerate the depletion of the stock.

Handling Methods. The handling methods on the fishing vessels can be improved, although they seem adequate for the Tunisian seafood industry and the international buyers of Tunisian exports. The raw materials that we examined were good to excellent, suggesting adequate onboard handling methods.

The major practical improvement that needs to be made is greater utilization of ice throughout the catching and processing system. For example, we were advised by a major Japanese buyer located in Sfax, that not enough ice is used in the overall handling of tuna and that better handling methods would result in

larger purchases of fresh tuna by the Japanese. Other improvements in handling which are likely to be more difficult to implement include the utilization of plastic tubs to carry the product, on board coolers or other types of refrigeration on the larger vessels, and on-board heading and gutting of products such as blue fin tuna, where applicable.

2.1.3 Exploitation Rates.

High value, benthic species are overexploited in Tunisia, while lower value species, such as small pelagics, tend to be underexploited. Thus, for white fish, cephalopods, and shrimp, the average rate of exploitation has been in the order of 105% in recent years; exploitation levels are as high as 128% in areas in the East and South. This overexploitation is held responsible for the decline in total production since 1988. Maximum sustainable yield (MSY) for the benthics is estimated at 65.000 metric tons.[12]

The average rate of exploitation for pelagics is estimated at approximately 25% for a stock with an estimated MSY of 140,000 - 160,000 tons. The regional exploitation levels also vary; they are estimated to be at 10% in the North, 30% in the East, and 60% in the South.[13] The coastal stocks are known to be heavily exploited, and the beach seine fishery in the Gulf of Gabes is allegedly overexploited.

The tuna fishery is also heavily fished. The productivity of tuna vessels has been decreasing since 1984. This has been attributed to fewer fishing days, a limited effective depth of the purse seines used in the fishery, and overexploitation of the resource.[14] Similar reports have been made for the shrimp fishery and mollusks. The present status of cephalopod stocks is unknown, although catches have increased in recent years.

The CGP seeks to manage Tunisia's marine resources and control overexploitation through the use of fishing seasons, closed areas, mesh size on nets, and exhortation. These restrictions are often unheeded, forcing the CGP to turn to the Marine nationale to enforce the law.[15] None of these efforts has been effective in curbing overexploitation.

[12] Interview with Mr. Salem Bel Haj of INSTOP, as a meeting held on May 17, 1991.

[13] DGPDIA.)

[14] "Tunisian Fisheries, 1978-1988," p. 2.

[15] "De nombreux atouts", p. 8.

2.1.4 Resource Assessment Activities.

The principal Tunisian organization involved in oceanographic research and resource assessment is the Institut national scientifique et technique d'oceanographie et de pêche (INSTOP), which has been in existence since 1924. In 1973, INSTOP expanded its activities to include aquaculture and established the Centre national d'aquaculture de Monastir. INSTOP currently has four separate departments: commercial fisheries; technical advancements and the application of new fishing technologies; oceanography and marine pollution; and aquaculture and artificial breeding.

INSTOP's work has led to the publication of several documents about the Tunisian fish and aquaculture industries. Among these are the "carte de pêche globale", "carte de pêche par region", and "carte de chalutage". INSTOP has evaluated Tunisia's small pelagic resources such as sardines, sardinelles, anchovies, mackerel, saurels, etc., and its bottomfish resources such as merlu, rouget, daurade, marbre, pageot, cephalopods, crustaceans, etc. However, most of these evaluations were originally conducted in the mid-1970s with few updates. Thus, they may or may not accurately reflect the current size of the stocks. This impedes the development of accurate MSYs and optimal yields. Catch and effort data are also limited.

2.1.5 Environmental Monitoring and Control.

The CGP, the Direction general de la production animale (DGPA), and the Direction de l'hygiene du milieu et de la protection de l'environnement (DHMPE) are all charged with the maintenance of a healthy fishing environment. All three agencies periodically examine water samples from various fishing areas and analyze bacteria levels. Samples are taken every three months, and more frequently if shellfish contamination is reported. These samples are used in the annual chemical analyses conducted by the INSTOP. INSTOP examines fishing zones more frequently to assess the extent of biological and chemical contamination.

Other responsibilities of the CGP include various monitoring and enforcement activities related to environmental quality, control of the fuel discharge [maillage?] from motors, restriction of fishing during certain periods, on-board handling procedures and hygienic conditions. It therefore prohibits fishermen and processors from washing freshly-caught fish with water from the port area and requires fishing boats and processing plants to refrigerate fresh product.

In response to the increasingly serious industrial pollution levels in the Golfe de Gabès, and their implications for the commercial fishing industry, the Sfax-based L'Association de la

protection de la nature et de l'environnement (Sfax APNES) recently organized a seminar on "La Protection de la richesse marine dans le golfe de Gabès." At that seminar the Minister of Agriculture, Mr. Mouldi Zouaoui called for measures "qui s'imposent pour protéger cet important réservoir de richesse nationale." Also noted was the fact that the Government has finally established a commision de la protection de la nature et de l'environnement as part of the VIIIème Five Year Plan. The seminar called for strict enforcement of both fisheries management and environmental quality regulations, the establishment of a continuous dialogue between fishermen and scientists, and more scientific research in the subject area.[16]

2.2 Processing Sector

Approximately 15% of the fish produced in Tunisia is further processed by about 20 canneries and 36 facilities which pack fresh and frozen seafood items. About half of the packing plants are located in or around Sfax, although all of the major ports have some type of facility. Most of the canneries are located in the Governorate of Mahdia, where small pelagics are landed in large quantities during the summer months.[17]

The processing sector is divided into two types of plants: those that pack for export and those that serve the domestic market exclusively. That part of the processing sector which produces only for domestic consumption is characterized by a lack of adequate equipment and procedures that are needed to meet international quality standards. Those that pack for export, on the other hand, are relatively new, well equipped, and generally in conformance with the sanitary standards demanded by importers in Europe and Japan. Several plants pack virtually 100% of their production for export markets, although most of the exporters visited also sell on the domestic market. Overall, 80% of the product processed in the export plants is sold abroad.[18]

The entire processing sector operates well below full utilization due to high production costs, seasonal catch fluctuations and inadequate cold storage facilities. Processing plants visited by the project team handled volumes ranging from

[16] Rafik Benzina, "La Crise du golfe de... Gabès," La Presse, 15 mai, 1991.

[17] "Tunisian Fisheries, 1978-1988", p. 4.

[18] Salima Meddeb, Les Exportations Tunisiennes des Produits de la Mer: Realités et Perspectives, (Université de Tunis III, Institut Superieur de Gestion de Tunis, 1990), p. 80.

two-three hundred tons per year to more than a thousand tons. Volume in any given year was frequently dependant upon the size of the catch in that year. Given the typical undercapacity, most plants have the room and the labor force to expand into value-added products.

Because of inadequate cold storage facilities in all ports and plants, during the high season some of the pelagic catch cannot be immediately canned after harvesting or frozen for canning later in the year. It is, therefore, deemed unfit for human consumption and must be discarded or turned into fishmeal. If freezing and cold storage facilities could be distributed throughout the major ports, more of the product could be frozen at the time of harvesting and made available for canning throughout the year. This would create more effective utilization of the cannery facilities and lower production costs. Improvements in processing and packaging are also required if Tunisia is to realize its export potential.[19]

Most Tunisian processing plants own their own fishing boats, and supplement these vessels' catch with purchases from other vessels throughout the country. Purchases from outside their immediate area are generally trucked to the plant in the plant's refrigerated trucks.

Production Costs. Factor costs in Tunisia are relatively competitive world wide. The average labor cost is about US $1.00, including wages and a social cost equal to about 20% of the hourly wage rate. The relatively low labor cost appears to encourage processing companies to overuse labor in the production process, resulting in relatively low labor productivity. Other operating costs such as electricity, packaging, supplies, etc. appear to be similar to those experienced by plants in other developing countries. The following table illustrates the percentage distribution of the major cost elements comprising export prices for fresh, frozen and canned product.[20]

Cost Element	Fresh fish	Frozen fish	Conserves
Fish costs	75%	79,0%	75%
Labor costs	3	6,0	5
Fixed costs	10	9,5	10
Packaging	5	3,5	5
Freight	5	2,0	5
TOTAL	100%	100%	100%

[19] DGPDIA.

[20] Meddeb, pp. 83-84.

Fish costs comprise the largest segment of costs, followed by fixed costs. Labor costs are relatively minor. If total production could be expanded, fixed costs per unit would fall, reducing average total unit costs, and enhancing competitiveness. The Tunisian firms also appear to have very low marketing and administrative costs, reflecting their limited marketing activities.

2.2.1 Fresh and Frozen Products

The project team visited seven facilities which process seafood products for export markets. The major products are fresh and frozen shrimp, octopus, cuttlefish, tuna, loup, daurade, grouper, and several other species of white fish. When compared with other developing countries that export large quantities of seafood, i.e. Ecuador, Mexico, Indonesia, and Morocco, Tunisia's processing sector operates at a generally high standard of quality in all aspects of processing, handling and packing seafood. There are some areas where improvements can be made to raise the quality of the final product, but these improvements are needed to meet commercial standards and ensure receipt of the highest possible prices in the market rather than to comply with FDA and EEC sanitary conditions; existing practices are, by and large in compliance with the governmental normes. These improvements include:

- Covering all fresh seafood with ice at all stages from arrival in the plant to the final stages of processing, or in the case of fresh fish, until placement in the refrigerated truck;

- Requiring all workers to wear gloves when handling product prior to and during the processing and packing process;

- Installing washing facilities where workers should be required to wash their hands in a sanitary solution after a visit to the toilet or after a break;

- Covering all lights in the processing plant to protect against broken glass falling into the food;

- Incorporating a more complete set of tests to detect major deficiencies such as high bacteria counts, E-coli, staph, etc., so as to meet quality standards and assure product safety.

Processing Methods and Packaging. Although the processing techniques utilized by the Tunisian frozen and fresh processors are simple and labor intensive, they produce a relatively high quality product that is greatly appreciated in their traditional markets in Spain, Italy and France. Modern processing equipment is not generally used due to high capital costs and the complementary requirement for a continuous preventive maintenance system. In addition, most plants simply do not have the volume in any particular specie to justify the expense and production capacity of new labor saving machinery. On the other hand, all of the freezing plants had modern, highly sophisticated cold storage facilities and freezing tunnels capable of quick freezing at 20 and 40 degrees below zero (Centigrade).

The packaging used for all forms of fresh and frozen seafood by the Tunisian processing sector is excellent. Product is well packed and maintained at a constant temperature with plenty of shaved ice. Ice is not placed directly on the product but around the polyliner that protects the fish.

Shrimp. More than 90% of the shrimp are sold head-on. We did not see any automatic grading machines but it appeared that the sight grading system produces a grading consistency that is accepted by international buyers. One firm indicated its intention to purchase a mechanical grader if the test of that equipment in Spain proves positive.

Several packers sell a whole, head on, shell on, cooked shrimp. The cooked shrimp systems consist of large boilers in which the shrimp are placed. Although more efficient machinery could produce better and more accurate yields at a higher production rate, (by minimizing weight loss), the Tunisian industry does not yet produce enough cooked product to justify an investment in this machinery. As the industry moves towards more value-added products, more efficient machinery and the capital costs associated with the acquisition of this machinery will be justified.

The shrimp is packed in a finger layered approach which requires an enormous amount of time and labor but results in a beautiful product. We were advised that the European buyers demanded this form of pack and would not accept the traditional random pack found in the United States. A random pack requires substantially less time and labor.

Frozen shrimp is packed in a 1 or 2 kilo waxed, printed, high quality carton. A 1 kilo pack is odd by international standards but we were informed that this is the only way that the customers will accept the shrimp. The majority of shrimp packs processed in the major processing countries (Ecuador, China, Thailand, U.S.A., India, Brazil, Mexico) are 5 pounds or 2 kilos for the foodservice

segment of the market, and 250-500 grams for the retail trade. The Spanish, French, and Italian markets regularly import large volumes of shrimp packed in 2 kilo packs. The larger 2 kilo pack is more convenient for the foodservice trade and creates more efficiencies at the plant level.

Tuna. Considerable quantities of bluefin tuna are harvested in Tunisia for fresh and frozen export markets in Italy, Japan, Spain and France. Fresh, sashimi quality tuna is exported in wooden crates with a poly-lined styrofoam inner liner. The fish are shipped headless and packed with ice. Due to the strict quality requirements of the Japanese, all of the factories processing fresh tuna store the fish in ice at all times prior to shipment.

Octopus, Squid and Cuttlefish. Large quantities of octopus and squid are found in Tunisian waters, as well as small quantities of squid (*Loligo vulgaris*). The processing methods for the cephalopods were consistent with those seen in other countries such as Thailand and Mexico. The fish are stored on ice, cleaned by hand and neatly packed for freezing in either IQF or block form. Machinery is available to automate the cleaning process but the volume produced by the individual factories is insufficient to support large production capacity of the newer and more expensive machines. The team was impressed with the consistency of the packs with regard to appearance and lack of excessive glaze.

The IQF and block packs prepared by the Tunisians are of high quality and readily accepted in all international markets. The 10 kilo pack is a preferred size and the polybag wrap and master carton quality are acceptable. The 5 kg cuttlefish pack in a styrofoam boat pack is used for the retail trade in Italy.

White fish. Most of the white fish produced in the plants that the team visited were destined for the fresh markets in Italy, France, and Spain, and were shipped in the whole form [entier]. There is no tradition of filleting the fish as is done in the United States. The whole fish were processed in an acceptable fashion with solid packaging, polyliner protection and plenty of ice.

The styrofoam, polylined cartons used by the Tunisians to export fresh fish appear to work very well to protect the fish and keep them cold. As Tunisian exports of fresh product expand to include new markets, such as the U.S., it will be necessary to also use an outer carton to further protect the styrofoam pack.

Value Added Products. In response to international market changes, Tunisian processors have begun to experiment with value added products, and have developed limited markets for these products in Italy, Spain and France. As mentioned above,

cuttlefish is sold in a 5 kg. styrofoam pack for the retail market in Italy, and is also sliced and frozen in a polybag for this and other markets. Squid is also being prepared in this fashion. Several plants have produced a "seafood kabob" consisting of pieces of octopus, squid, onions and shrimp on a skewer. They are individually frozen and packed in a master carton for retail markets in France. Several processors, in addition to the two already cooking shrimp, indicated interest in developing this product in the near future.

Overall State-of-the-Art Assessment. The Tunisian fishing industry produces a limited amount (89,000 tons in 1990) of good quality fresh and frozen seafood products that are processed in simple, relatively clean factories. The fleet is not modern and its handling methods can be improved, particularly with regard to the use of sufficient ice. Nevertheless, the quality of the fish delivered to the factories is generally good, although several Japanese buyers suggested that improvements could be made at the boat level.

As a result of historical trends and traditions almost all of the products are packed exclusively for the Italian, Spanish and French markets (with the notable exception of fresh tuna shipments to Japan). Thus, the Tunisians have conformed to the market requirements in these countries in terms of products, packaging and prices.

2.2.1 Canned Products

The project team visited five processing plants which produce, in whole or in part, canned seafood products, generally sardines and tuna. This sample ranged from the most primitive to the relatively modern and sophisticated. The most primitive are enormously deficient in sanitation and hygiene, with 30-60 year old equipment, some of which is home made. On the other hand, the most modern plants would probably pass an FDA inspection with very minor adjustments.

The more sophisticated plants all produce for export; the canneries producing for the domestic market are the least sophisticated sanitary plants we saw. There is little hope of upgrading the less sophisticated facilities without major investments in plant and equipment, worker training, and management education. Thus, export producing capacity is limited to those plants which have been constructed in recent years principally for the export markets.

Raw material is obtained mostly from small, coastal vessels using purse seine nets on over night fishing trips. No ice is used while the fish is on the boat.

The fish is usually delivered to a local buyer from whom the local processor(s) will purchase their daily need for raw material. In some cases boats work on a contract basis with a particular cannery. Also, several firms, like SECAL in Chebba, own some of their own boats which directly service the canning needs.

In the whole period from catch to processing, no ice is used, which leads to serious product deterioration during the hot summer months when the availability of sardines exceeds the plants' ability to can them fast enough. Some plants, like SECAL, have the capability to freeze excess raw material for processing in the off season, but this is not typical in the majority of facilities.

Canning is traditionally a highly labor intensive industry. Sardines are still hand packed even in countries like Norway where automated packing machinery exist. Machine packing is frequently done in Canada and the U.S. All Tunisian canneries use hand packing methods, since labor is relatively inexpensive (about 614 millimes/hour).

Processing Methods. The processing methods used in Tunisia are the standard methods used by the industry worldwide. Raw material is put into a can (sometimes precooked or smoked) and pre-cooked in the tin without a lid, after which oil or sauce is added. The lid is sealed onto the can mechanically and the closed can is passed through a bath for washing off excess oil/waste. The clean cans are then lowered into an autoclave for sterilization, labeled, and/or boxed. Although this is basically a manual system, in most plants efficiencies are realized through the use of conveyor belts and cranes to lift the trays of sealed cans into the autoclave, etc.

Product forms. Nearly all tunisian sardines are produced as "plain sardines," i.e. skin on, bone in, 6 sardines to a club can. The packing media are either olive oil, soya oil/vegetable oil, and tomato sauce. For special export orders spanish pepper can be used to produce spiced sardines or a lemon or tomato can be used to create different tastes.

Vegetable oil is by far the most frequently used packing medium and considerably cheaper than olive oil, which costs 662 millimes/kilo compared to 1.875 DT per kilo for olive oil). Canners with freezing capacity pack tomato sardines in the winter to hide visual blemishes to the raw material, a common practice in the industry.

The products made for export markets are of excellent quality, and are well received in their target markets. However, since four, rather than six-count fish is preferred in Tunisia's European markets, Tunisian exporters face stiff competition from Portugal and Morocco. This may influence prices obtained in those markets.

Co-incidentally, the U.S. market strongly prefers the smaller sardines which can be packed six to a can. This could be a positive attribute in terms of exporting canned sardines to the U.S.

Sardines packed for the domestic market have several flaws in the way they are processed, and also in the raw materials used in order to keep costs at a minimum. In some of the product we tasted, extremely old and rancid vegetable oil had been used. In conversation with plant operators it became clear that there was little interest in upgrading their operations to export standards. Thus, we do not expect these firms to become future actors in the export sector.

Packaging Materials. The Tunisian canners have to buy empty cans from a state monopoly called STUMETAL, which is the sole producer of cans for the processing sector in Tunisia. (Exporters can import certain cans for re-exportation after processing). STUMETAL has three can sizes for sardine canning, all of which are made out of steel: the internationally known club can 43/802 (126 grams) and also a 13 ounce and a 28 ounce can, often are referred to as institutional size cans. All production for export is in club cans. The cans are usually lithographed, and all product is sold keyless. One plant which we saw also has equipment for boxing (blank can in a card board box) which is a very accepted and often requested packing for the European market.

Although the Tunisian government intends to terminate the monopoly status of STUMETAL, it continues to operate as a monopolist for the time being, dictating which cans are to be produced and the price at which they are to be sold. The state monopoly on sale of cans will hamper the Tunisian industry's efforts to compete successfully in the U.S., as the US market has come to expect non-corrosive, easy open (pull top) aluminum cans. Although the purpose of the monopoly may be to protect the domestic can manufacturing industry, the net result may be that it saves one part of the industry by handicapping the other.

Cost Structure. Because the sardine industry is labour intensive, Tunisia has a tremendous comparative advantage in its low labour cost. Sardine packers are paid 614 millimes/hour; standard social security expenses and taxes are 26,5%. This comes to a total of 776 millimes/hour or roughly $.85.

We have established that most export-directed canners operate with a profit margin of at least 10-12%. As seen in the following calculations, this is a profitable industry for most investors. No taxes are paid on equipment installed or buildings constructed for the purpose of export production, and equipment can be utilized, with proper maintenance, for many years. This means that depreciation in real terms is minimal. Canning is not very power intensive, and there are no other large fixed costs except interest

payments on debt and administrative expenses. The latter is also minimal, since there is very little marketing expense at the present time. The following is the cost structure for a club can of sardines in olive oil for export :

Raw material (85 g)	0,023 dinars
Labor	0,027
Social cost/tax/benefits 0.007	
Olive	0,075
Cost of can/lid	0,100
Total variable cost	0,232

This can will sell at the wholesale price of 0,341 for export, which leaves a gross operating margin of 47% for coverage of fixed cost and profit. Net profit will obviously depend on production volume for the individual plant, but the exporters seem to be doing large volumes with some packers producing as much as 21 million tins per year. Total export production of canned sardines from Tunisia is approximately 6.000 tons per year or 70 million tins. Wholesale prices are subject to shifts in supply and demand, but it tends to trend upward at approximately 5% per year, which is lower than the current Tunisian inflation rate).

Olive oil is relatively expensive in Tunisia due to a controlled marketplace. It sells for about 1.875 DT/kilo. Soya oil is much cheaper and commands 0.662 dinars per kilogram in the world market. Sardines packed in olive oil command approximately 10% more than those in soya/vegetable oil. This is one of the explanations why the Tunisian firms have chosen soya/vegetable oil as the main packing medium. The price of tomato sauce is approximately the same as for soya/vegetable oil.

The cost of the can counts for 43% of the variable cost and stands out both because it so expensive, and also because "STUMETAL supplies only steel cans while the export markets increasingly ask for aluminum cans, which command approximately the same price.

<u>Overall Assessment</u>. On balance, the Tunisians have a definite cost advantage with their low labour rates. They work on solid profit margins and there is probably room for improved prices in their current export markets. On the other hand, productivity is relatively low, and overall profit margins could be increased in unit production costs could be reduced.

2.3 Aquaculture Sector

Tunisia is a country well suited for aquaculture. Its coastline of 1,300 kilometers has many inlets and lagoons where extensive aquaculture can be carried out protected from the elements. While industrial pollution is becoming a problem in some areas, there are still opportunities to find unpolluted water for aquaculture facilities. The generally fine weather, with predictable temperatures, offers a favorable climate for farming a variety of fish and shellfish species.

The Tunisian Government has supported the development of aquaculture through tax relief for investments geared towards export markets, through the establishment of le Centre National Aquacole de Monastir in the early 1980s, and through efforts to provide training and dissemination of research results. The VIIIème Plan projects further investments in R&D for aquaculture firms, and the creation of a national aquaculture program. Investments will continue to depend upon private monies, both domestic and foreign.

2.3.1 Current Status of Export Sector

There are currently three major aquaculture facilities in Tunisia exporting high value finfish, principally loup and daurade, and to a lesser extent, le mulet. The project team visited two of these facilities, Aquaculture Tunisienne and Aquaculture du Sud Tunisienne (AST), as well as a third facility, Sud Aquaculture, located south of Sfax, which is in the early stages of producing loup on an extensive basis. The third major aquaculture farm in Tunisia is Pecherie de Jerba, located in the Lagune de Bougrara in the Jerba area.

The most advanced aquaculture facility seen by the project team is AST, a joint venture between a Tunisian group and a group of French investors known as SEPIA INTERNATIONAL. Originally started in 1985, AST involved SEPIA in 1986 when technological problems threatened to destroy the initial investment.

The farm has been designed with a hatchery, nursery ponds, early stage grow out ponds, and cages about five km offshore for final grow out. Loup (sea bass) is the principal species reared, although daurade is also grown. Loup are raised to a size of 300-400 grams, at which time they are exported to France and Italy. Production in 1990 reached about 280 tons, and is projected to reach about 350 tons in 1991 and full production of 400 tons in 1992. In addition, post larvae are produced in the hatchery for use at the farm and for sale elsewhere in Tunisia.

The future for AST is promising. The firm expects to become profitable in 1991. Having solved many of the start-up technical problems, it is now concentrating on reducing production costs and maximizing production. Fish feed remains the largest cost item (20-25%), followed by energy (20%), wages (10-15%), and packaging, research, equipment, administrative, etc. Because no acceptable fish feed is produced in Tunisia, it must all be imported, principally from France. With this feed, a conversion ratio of 3:1 can be obtained, but AST is trying to reduce that further. Mortality throughout the entire growth cycle is now 40-50%, but cage mortality has been brought down to 10-15%.

AQUACULTURE TUNISIENNE S.A. is located in Hergla, just north of Sousse. The firm was created in 1988 for the purpose of growing loup and daurade in large, rectangular ponds. Initially a 50-50 joint venture between an Italian group and Mr. M'Hamed Driss of Souss, it is now only minimally owned by Italian investors. Its production facilities comprise nursery ponds, post-larval grow out ponds, and final grow out ponds constructed of concrete. An extensive and highly technical system exists to monitor and manage production. Production capacity is 2 million postlarvae and 250 tons of loup per year.

At the present time, AQUACULTURE TUNISIENNE continues to struggle with certain technical problems even as its production for export to Italy is beginning to be realized. Algal clogging of intake pipes remains a serious problem, as well as other problems associated with water purification. The company is making every effort to deal with these problems and maximize its production of exportable product.

Although the project team did not visit PECHERIE DE JERBA, we were told that operation is geared towards the production of daurade and mulet. Founded in 1986, the firm has initial grow out ponds on land, but uses an extensive system for final grow out. Production capacity is about 100 tons, and initial production has been sold in Italy at relatively high prices.

2.3.2 Problem Areas

The VIIIème Plan suggests that optimal exploitation of aquaculture possibilities in Tunisia could yield 3.000 MT in 1996 and 10.000 tons by 2000, from investments, respectively of 30 MD and 100 MD. While this may be a feasible goal, several problem areas need to be addressed before additional investment funds are likely to be deployed in these quantities.

The problem area most noticeable to the project team dealt with technical impediments. AST was the most advanced of the three farms we visited, and appeared to have solved most of its technical

problems at this point in time, thanks to the experience of the French partner. Temperature fluctuations, inappropriate salinity levels, removal of toxic wastes, availability of pure water, and access to low cost feed and PLs remained problems at several of the farms. Most noticeable was the lack of a readily-available network of technical information and experts. The Centre at Monastir did not seem to be an important resource for any of the firms we visited. Rather, there was more interest in learning about foreign contacts in Europe and the United States which could be tapped to solve their technical problems.

Access to investment capital was not stated as a major problem. But barriers to exportation were cited, particularly by AST. Air freight limitations on fresh fish, customs difficulties, and a variety of technical barriers were all mentioned as impeding the steady flow of product for exportation. These problems, it should be noted, were also mentioned by exporters of wild fish.

It appears that rapid growth in the aquaculture sector will depend heavily on the availability of technical knowhow -- both in terms of trained managers and workers as well as access to a network for obtaining equipment, feed, other supplies, and specialized technical assistance.

2.4 Government Policies and Programs Supporting the Fisheries Sector

2.4.1 Major Government Agencies Involved with the Sector

The principal government agency concerned with the fisheries sector is the Comisariat General de Pêche or CGP, located in the Ministry of Agriculture. The CGP is responsible for monitoring the health and status of the fishery resources, for establishing a management regime for the individual fisheries throughout Tunisia, for dealing with food technology questions related to seafood (for example, participating in international meetings of CODEX for fishery products), and for collecting and publishing statistical data and carrying out research related to these activities. Several laboratories and research institutes located in the CGP, such as INSTOP, are delegated specific responsibilities in this regard. The CGP is assisted by other components of the Ministry of Agriculture with respect to inspection of the wholesomeness of fishery products and their appropriateness for export, and by other agencies throughout the government to promote the growth and development of the fishery sector. These include FOPRODEX, which provide export subsidies, CEPEX, which promotes export development, and the Ministry of the Economy for tax subsidies geared towards

expansion of seafood exports. Some of these export-oriented programs are discussed below.

Veterinarians from the Direction de l'Hygiène du milieu et la Protection de l'Environnement (DHMPE) monitor the freshness of the fish supplied to the marketplace in each municipality and conduct organoleptic (smell) tests on fish and shellfish in the markets. All fish deemed unwholesome, and, therefore, dangerous to the consumer, are immediately removed from display and cannot be sold. The DHMPE also controls fish products destined for export; these products must be considered adequate for human consumption and must not contain any additives or residues illegal in the country of destination.[21]

A commission composed of representatives from various organizations (OCT, UTICA, CGP, GICA, etc.) conduct factory inspections at least once every year. The commission looks at factory conditions, the state of the machinery, personnel hygiene, product hygiene, working conditions, and the salinity of water used on fish products.[22] Firms which are found unacceptable must modify their premises to comply with national standards or be forced to terminate their operations.

2.4.2 Role of the Five Year Plans

The VIème Plan. The Government of Tunisia manages governmental investment, subsidies and other policy actions directed towards economic growth and development through a succession of "Five Year Plans" which set long-term goals for each sector and serve as a benchmark against which its development can be monitored. The VIème Plan (1982-1987) was one of the first to contain a major policy initiative directed towards expanding the fishery sector. It had several objectives: (1) to increase annual production from 77,283 tons to 82,900 tons; (2) to promote exports (the volume of fishery exports is second only to olive oil exports); (3) to increase investment, which was then at 113 MD per year -- 53 MD for production and 60 MD for infrastructure; and (4) to improve processing and the condition of fishing boats.

The VIIème Plan. The VIIème Plan, which began in July 1987, sought to maintain the rate of growth achieved during the VIème Plan. The fishery sector was projected to grow at an average annual rate of 7.5% during the VIIème Plan, with annual production expected to reach 133,000 tons by the end of 1991 compared to

[21] Chokri Gharbi, "Préserver l'image de marque des produits de la mer", Les Cahiers de la Presse, September 1988, p. 25.

[22] Ibid., p. 25.

93,000 tons in 1986. Average annual production was expected to increase to 119,000 tons, an increase of 54% from the VIème Plan level of 77,283 tons.

The VIIème Plan placed little emphasis on benthic species, which were already heavily exploited, and focused, instead, on pelagic resources which were only 23% exploited and could achieve a potential catch of 140.000 tons per year. The VIIème Plan hoped to raise the exploitation rates for pelagics to nearly 40%.

Tuna production was projected to reach 1.700 tons yearly. However, shellfish, crustacean, sponge, and other marine species were expected to achieve annual harvests of only 3.000 tons, reflecting the depleted nature of those stocks. Lagoon fishing was expected to reach an annual harvest level of 1.000 tons.

Special emphasis was placed on improving and expanding coastal fishing, which was suffering from inflated prices, irregular employment, and little investment. The VIIème Plan predicted that coastal fishing production would rise from 43.000 tons in 1986 to 52.000 tons in 1991.

Aquaculture was introduced at the end of the VIème Plan, but became a central issue only under the VIIème Plan. Aquaculture was to concentrate on high quality, high price species for export and to reach a production level of 3.000 tons by 1991. This forecast was based on the assumption that 21 MD would be invested in aquaculture during the course of the VIIème Plan.

The VIIème Plan incorporated high goals for export expansion, projecting an increase from the 28 MD reached during the VIème Plan to 100 MD by 1991. Marine exports were forecasted to reach just over 27% of all Tunisian exports, roughly the same percentage as olive oil, the principal export product category.

New vessels to be purchased under the VIIème Plan included 510 barques, 19 chalutiers, and 25 sardiniers. A total investment of 150 MD was planned for modernization and improvement of fishing equipment during the five year period.

Much as the VIème Plan successfully developed new port infrastructure, the VIIème Plan placed its emphasis on completing the reconstruction of Tabarka, Gabes, and Teboulba, expanding the port in El Attaya, and improving the services available in existing ports. Only two new ports, Monastir and el Ketef, were planned for development.

New cold storage capacity was planned to include: 825 additional tons of storage at 0°; 3.600 additional tons of storage at 25°; and 110 tons of additional blast freezer capacity (tunnels de congelation). Ice production was projected to increase by an additional 220 tons per day.

The VIIème Plan also emphasized employment and training to improve the productivity of existing workers and generate the additional revenue needed to expand employment. More than 8.600 new jobs (and indirectly an additional 1.700 new jobs) were to be created. Particular emphasis was to be placed on coastal fishing since training on modern harvesting and processing methods was most needed in this sector and most likely to have a positive effect on productivity.

Workers and technicians were to be trained in aquaculture methods and provided specialty training in civil and electric engineering, electronics, and refrigeration methods. The need for an additional 6.840 skilled workers was estimated, ranging from marine fishermen to technicians. Three thousand persons were enrolled in intensive training programs directed towards fulfilling these needs.

As was discussed earlier in this Chapter, the goals of the VIIème Plan were not met, due to the downturn in fishery production which began in the late 1980s. Realized annual average production was only 98.500 tons, and annual average rate of growth for the five year period was only 2,9%. Thus, the VIIIième Plan adjusted its targets to reflect more accurately, anticipated development from 1992-1996.

The VIIIème Plan. The VIIIième plan was designed to rectify some of the impediments to growth identified during the course of the VIIème plan, and to emphasize fisheries management, expansion of the aquaculture sector for export, and exploitation of the pelagic resources in the North. Training, and dissemination of modern techniques of fishing, processing and fish farming were also given high priority. As stated above, the goal for aquaculture production was set at 3.000 tons by 1996.

2.4.3. Subsidies and Other Financial Support

The government established a policy to encourage both domestic and foreign investment in fisheries and exports of fish and ocean products with Law No. 88/18 of April 2, 1988, Establishing an Agricultural and Fishing Investment Code. This law incorporates incentives to expand the catch of pelagic species throughout Tunisia, and special additional incentives for fisheries in the North. Government subsidies are provided for fuel, direct investments, and for production expansion and improvements geared towards increased exports of canned sardines.[23]

[23] DGPDIA.

Subsidies available for boat construction were originally included in a 1969 law. Under this authority, loans were made available for boat construction up to 75% of vessel costs. Ten percent of the downpayment could be obtained through a grant, and 15% of the loan amount could be borrowed interest free. In the North, slightly higher subsidies were available: 15% of the downpayment could be obtained through a grant, and 20% of the loan was interest free. The cost of a feasibility study was totally reimbursable from the fund, and equipment loans could be made at a 7.5% interest rate. Loans to upgrade or modernize a boat could be obtained at 7%. These subsidies have played a major role in increasing the size of the fleet.

Subsidies available for export expansion have been instrumental in encouraging investment in processing facilities for export and in stimulating the development of new markets. Tax subsidies are available to firms which undertake investments solely for export expansion of fishery products. All taxes on earnings generated by these investments are forgiven as long as all production is sold in export markets. All of the seafood exporters visited by the project team had availed themselves of this subsidy program.

Market studies and export promotion activities are supported by CEPEX, an independent agency tasked with expanding Tunisian exports of all products. CEPEX represents Tunisian exporters at international trade fairs and subsidizes their participation in these expositions. CEPEX will also undertake market studies to identify new market opportunities for Tunisian exporters, and will provide funding for studies analyzing barriers to export expansion.

Transport and marketing subsidies are also available for seafood exports. There is a special export promotion fund known as FOPRODEX, which provides subsidies to enhance the productivity and competitiveness of Tunisian exports. FOPRODEX will pay 50% of the air freight costs for new export markets (i.e. not France or Italy), and 30% of the maritime freight costs for non-traditional markets. Thus, FOPRODEX paid 50% of the air freight costs when Japan was first developed as a market for fresh tuna, but ceased providing this subsidy after 1989 when that market was deemed an established market.

A special subsidy is given to sardine canners in recognition of the high cost of olive oil in Tunisia. Canners are reimbursed after export sales up to a maximum of 75 millimes per can (up from 65 millimes in 1988/89).

All exporters are eligible for pre-shipment loans to cover the costs associated with inventory buildups intended for export markets. These loans are limited to 30% of the projected export value for the year, or higher if the borrower is a new exporter with sporadic export activity. Proof of export status must be

provided to become eligible for this program. Financing of receivables is also possible. The rates since July 1990 have been around 8.25% for short term loans in the agricultural/fishery sector, 8% for medium term loans, and 9% for financing receivables for more than a one-year period.[24]

2.4.4 Industry Views on Government Involvement

The subsidies available to seafood exporters were universally applauded by representatives of these firms who were visited by the project team. There was a general feeling that all of these subsidies had been instrumental in developing new export markets, but that subsidies, alone, would not suffice to maintain these markets. There was also a recognition that the recent joining of GATT by the Government of Tunisia may necessitate curtailment of certain direct export subsidies that are outside the realm of allowable subsidies under the GATT regime.

The main concerns of the exporters visited fell into the categories of short and medium term financing costs, access to working capital, and barriers in export markets that were policy-based rather than market-based. For example, several firms indicated that they had problems financing their inventories during a period of oversupply. Some referred to the bureaucratic problems associated with obtaining bank financing,[25] non-competitive rates, and the lack of advice provided by commercial banks.

Finally, most exporters expressed concern regarding government involvement in the export process other than as a passive subsidizer of activities initiated by the private sector, and/or as a negotiator with foreign governments to reduce trade barriers. There was little support for a "groupement interprofessionel," a committee of producers, exporters and government representatives established to promote agricultural products, although there was some interest among private sector exporters, themselves, for establishing an export promotion association. The principal sentiment pervading the private sector was that individual firms should conduct business activities geared towards expanding exports, with help from the government limited to subsidies and

[24]Meddeb, pp. 23-26, and personal communication. Information on FOPRODEX was obtained from a U.S. Embassy cable from November, 1989. Additional information was found in Ghodhbane Besma. Application du Marketing Agro-Alimentaire par Les Entreprsies Tunisiennes Exportatrices des Produits de Mer, (Memoire de Fin d'Etudes pour La Maitrise en Sciences de Gestion, Université de Sud, Faculté des Sciences Economiques et de Gestion de Sfax, 1989).

[25] Meddeb, p. 83.

international negotiations at the government-to-government level. Within in this environment, most exporters felt confident that they could compete effectively in new and traditional markets.

3.0 SEAFOOD EXPORTS: CURRENT AND POTENTIAL MARKETS

Tunisia's exports of fishery products have steadily increased since the mid 1980s, as seen in Table 3. This reflects recent policies to promote and expand exports of seafood products, as discussed in Chapter 2. Crustaceans, principally frozen shrimp, constitute about one-third of the export value of all seafood exports, followed by cephalopods (principally frozen octopus and cuttlefish), and fresh white fish. The remaining exports are canned sardines, other molluscs, coral and sponges.[26]

As seen in Table 4, Italy is the largest market for Tunisian seafood exports, importing the majority of Tunisian fresh fish, crustaceans and cephalopods. France is the second largest market in volume, but Spain is the second largest in value, reflecting substantial Spanish imports of shrimp and cephalopodes. Spain has become a larger customer in recent years as her foreign fishing grounds have disappeared. Japan has developed as a market for Tunisia in the last several years, principally for imports of fresh bluefin tuna.

Tunisian fishery exports to the United States have been minimal. Tunisian products have been successfully marketed in the United States since the mid 1980s, reaching 55 tons (edible products) in 1990. This included 34 tons of frozen cephalapods, 15 tons of canned tuna, and 4.6 tons of fresh bluefin tuna. Small quantities of yellowfin tuna were also exported. These figures compare interestingly with the 1985 statistics. In that year, Tunisia exported to the U.S. 44 tons of shell-off shrimp valued at US$168,000 and nine tons of canned shrimp valued at US$40,000. The 1990 exports reflect the rapid decline of the wild shrimp fishery in Tunisia and the fact that better prices for shrimp can be obtained in Europe and Japan.

In attempting to sell to the U.S. market, the team recommends the establishment of a relationship with a reputable importer with a good payment history. The team is prepared to provide exporters with the names of well known U.S. importers and distributors. Currently, the potential volume of all Tunisian exports to the United States is too small to consider any type of joint venture or subsidiary arrangement.

Although they are sophisticated about their traditional markets in Italy, France and Spain, many Tunisian exporters lack concrete knowledge about world market demand as well as an understanding of the competitive standards required when marketing in non-traditional markets. Tunisia has high quality standards in

[26]Ministére de l'Agriculture, Tunisie.

Table 3

Tunisian Seafood Exports by Product Type
1986–1990
(Tons and Thousands of Dinars)

Type of Product	1986		1987		1988		1989		1990	
	TONS	MDT	TONS	MDT	TONS	MDT	TONS	MDT	TONS	MDT
Poisson Frais	401	2,453	646	4,536	1,086	9,006	1,530	16,779	2,255	25,628
Crustacés	3,192	27,393	3,799	38,465	4,135	47,472	2,494	32,840	1,719	33,677
Cephalopodes	6,167	18,819	7,769	16,098	10,514	26,023	9,557	30,243	9,343	30,463
Conserves/ Semi – Conserves	36	98	574	760	399	806	730	1,930	237	614
Divers (coquillages, corail, eponges, etc.)	1,541	7,290	1,546	10,385	1,662	10,116	879	6,448	10,040	3,540
TOTAL	11,337	56,053	14,334	70,244	17,796	93,423	14,990	68,240	23,594	94,022

Source: Ministere de l'Agriculture, Tunisie

Table 4

Exportations tunisiennes des produits de la peche,
par pays de destination, 1990

Type de produit	Italie	France	Espagne	Grece	Japon	Autres Pays
Poisson frais						
Tons	1,212	456	59	44	413	17
Dinars (000s)	13,763	4,981	377	303	5,541	164
Crustaces						
Tons	903	227	538	1	0	50
Dinars (000s)	13,709	2,144	17,633	18	0	166
Cephalopodes						
Tons	6,337	784	771	729	94	378
Dinars (000s)	20,277	2,595	2,262	2,898	243	1,228
Conserves/ Semi-conserves						
Tons	21	27	0	11	0	178
Dinars (000s)	107	104	0	88	0	316
Divers (coquillages, corail, eponges, etc.						
Tons	4,229	3,420	2,377	0	0	318
Dinars (000s)	1,135	1,613	296	0	0	2,062
TOTAUX						
Tons	12,702	4,914	3,745	785	507	941
Dinars (000s)	48,991	11,437	20,568	3,307	5,784	3,936

Source: Ministere de l'Agriculture, Tunisie

firms currently exporting to Europe and Japan, although firms producing for domestic or other African/Middle Eastern markets may not reach these standards. Tunisia's pelagic exports (particularly blue fish), frequently encounter difficulty in competing with more experienced producer countries.[27]

This is particularly the case with respect to canned fish, where there is substantial competition, particularly in the Mediterranean region, and where EC members have a comparative advantage. For example, the EC has implemented import quotas for canned products, allotting a quota of 100 tons for Tunisia. Furthermore, many EC countries have canning industries which have highly mechanized production plants that can produce high quality items -- such as prepared foods, semi-prepared foods, frozen breaded filets, seafood salads, etc. -- at lower cost than the traditional Tunisian plants. Finally, other nations, such as Morocco, have achieved preferential status in the EC, by allowing EC countries to fish in their Exclusive Economic Zones, further eroding Tunisian's competitive position in its key markets.

Although there is some concern regarding the impact of 1992 on EC markets, it does not now appear that 1992 will mean stricter controls than what now exists. Sanitary regulations will be harmonized prior to the end of 1992, but initial indications are that they will not make a significant different for exporters that already operate in modern, sanitary facilities. Minimum standards will be established but they will be such that most EC firms and current exporters will be able to comply with little or no difficulty.

Despite these problems, Tunisian fishery exports have continued to grow for the last decade, with the exception of 1989, when a smaller harvest constrained export growth. Existing markets in Italy, Spain and France depend heavily on Tunisia as a source of raw material for retail and institutional markets, and even Japan has developed its reliance on bluefin tuna. At the present time, shortages in supply, rather than inadequate demand is the major impediment to further export growth. The opportunities in each major product area are discussed below.

3.1. Export Markets for Shrimp

3.1.1 Current Markets

As total shrimp production has declined in the 1980s, exports of crustaceans, principally shrimp, have also declined, reaching a high of 4,135 tons in 1988 and a low of 1,719 tons in 1990. Of

[27] Interviews with European importers.

that amount, 1,556 tons were shrimp. Major markets included Italy, (903 tons) Spain (538 tons) and France (227 tons). Nearly all of the exports of shrimp were in the head-on form packed in a 1 kilo, fingerlayered pack. Several exporters have begun to experiment with whole, cooked shrimp in a polybag.

3.1.2 Potential Markets/Products

If more product were available, there are substantial opportunities to expand exports in both existing and new markets. The EC imports more than $720 million dollars a year (125,000 tons) of shrimp of the type available in Tunisia. Japan imports more than 250,000 tons each year, and the United States imports 227,000 tons, an amount which has increased steadily each year. However, the American market is principally a head off market, a product form which has not been produced in any quantity in Tunisia.

Given the strong demand for Tunisian shrimp in traditional European markets, the best opportunities for Tunisian exporters appear to lie in expanding shrimp exports into those markets, as long as supplies are available. The project team does not recommend an aggressive sales effort to sell Tunisian shrimp in the U.S. or Japanese markets. The reasons for this conclusion are as follows:

- The price of Tunisian shrimp in Europe is higher than market prices of equivalent products imported into the U.S. or Japan. Thus, Tunisians would have to receive lower returns to sell in these markets;

- The U.S. market imports shrimp in every form and from nearly every producing country in the world, but the majority of imports are head-off. Headless, cooked, peeled and deveined, and tail-on cooked, are the major product forms. Head on shrimp is imported in very small quantities for ethnic markets and niche markets for white table cloth and hotel restaurant displays; and

- While the Japanese will buy head-on shrimp, they are supplied predominantly by low cost Asian producers of farm-raised black tiger shrimp. This includes Thailand, the Philippines, Indonesia and Taiwan. Chinese Whites priced at very low levels are also imported in large quantities. Other supplies

of wild shrimp include Vietnam and India. Tunisian exporters cannot compete price-wise or quantity-wise with these suppliers.

Thus, the team recommends that if supplies can be obtained, exporters of shrimp seek new markets in such EC countries as Belgium, Holland, England, and Germany, where the Tunisian specie will be more appreciated and, therefore, receive a better price. In addition, these markets will accept the current product forms produced by the industry (cooked whole, head-on, and headless). However, since Tunisian exporters currently have no problem selling their shrimp at high prices in traditional markets, there is understandably no motivation to expand into new markets or products.

3.2 Export Markets for Cephalopods

3.2.1 Current Markets

Tunisia exported 9,343 tons of cephalopods in 1990, down from the 1989 amount of 9,557. The largest market, by far, was Italy (6,337 tons) followed by France (784 tons), Spain (771 tons), and Greece (729 tons). Only 94 tons were exported to the Japanese, and 18 tons, one short container, were exported to the U.S. The product is generally exported in a cleaned, frozen block, size graded in accordance with spanish or Japanese grading systems. Prices are strong, and lack of supply, rather than demand seems to be the present barrier to selling more product in foreign markets.

3.2.2 Potential Markets/Products

The U.S. Market. The U.S. market is not a large consumer of octopus and cuttlefish. Approximately 7,540 tons of octopus and 2,049 tons of squid and cuttlefish were imported in 1990. Principal customers are the traditional Italians, Koreans, Japanese and other immigrants from the Far East or the Mediterranean area. Calamari, or squid, is consumed in large quantities in the U.S. but is not produced in large volume in Tunisia.

Nevertheless, after several interviews with importers of cephalopods, the team believes that the U.S. could import more cuttlefish and octopus, neither of which are produced locally. Tunisian quality and species are acceptable, the size grading conforms to U.S. standards, the packaging is good and the prices are reasonable. The U.S market currently pays $2.60 for frozen large (4 lbs. and up) octopus produced in Spain and Portugal. This is not inconsistent with the current Tunisian export price for that size octopus, which is approximately 29 French francs per kilogram. U.S. import prices of whole, cleaned cuttlefish range from $1.50

to $1.70 per pound, which may be lower than prices in Europe. Other suppliers of octopus and cuttlefish to the U.S. include Mexico, the Philippines and Thailand. The Philippines is the largest exporter of octopus, and Korea is the most important exporter of squid and cuttlefish.

The Japanese Market. The Japanese are the largest consumers in the world of both octopus and cuttlefish. In 1990, more than 87,000 tons of octopus were imported and more than 50,000 tons of cuttlefish and squid were imported (excluding mongo IKA). Tunisia exported more than 94 tons of octopus to Japan during that year, representing a significant increase from the 62 tons exported in 1988, the first year that Japan imported octopus from Tunisia. Morocco, Mauritania and the Canary Islands are the principal octopus suppliers in Japan.

While Japan represents an expansion market for Tunisia, particularly during periods of excess catch and inventories when prices drop to generate cash flow, there are several significant impediments in selling to the Japanese. These are:

- The Tunisian specie is not the preferred one in the Japanese market. The Japanese prefer smaller octopus with smaller tentacles. Also, the yield of the Tunisian specie is lower than other species. This is particularly important in light of the fact that the Japanese boil most of the product they eat;

- The Japanese prefer a different product form, less intensively washed than is the custom in Tunisia;

- The prices of Tunisian octopus and cuttlefish are higher than those offered by some traditional suppliers to the Japanese market (Thailand, China), but not out of line with Moroccan prices.

In spite of these problems, Japan offers opportunity for Tunisian cephalopod exporters. Their packaging is acceptable, their freshness is good, and the processors are able to make minor adjustments in processing the octopus to meet Japanese standards. The Tunisian exporters should actively solicit business with the larger trading companies, such as Mitsubishi, C. Itoh, Taiyo, Mitsui, Tohomenka, Nippon Suissan, etc. In a recent discussion with Mitsubishi, it was indicated that this firm would like to import more product from Tunisia, but simply does not have the appropriate contacts.

The European Community. The Tunisians have developed a solid sales base in the EC, and efforts to diversify sales among more buyers in different countries such as Belgium, Germany, Holland and England should be fruitful. In 1989, the EC imported 52,000 tons of octopus, with the largest suppliers being Morocco (12,009 tons), Senegal (7,658), Thailand (5625), and Tunisia (5604). Germany bought 188 of its 1,335 imported tons from Tunisia, with its principal supplier being Spain (827 tons). Tunisia was the largest supplier to Holland that year, providing 41 out of a total of 99 tons. Market contacts through trade shows, trade missions and product promotional efforts are needed to develop the personal relationships needed to ensure market penetration in these new EC countries.

3.3 Export Markets for Whitefish

Tunisian exports of fresh fish, principally white fish, have increased steadily since the early 1980s, reaching a peak of 2,255 tons in 1990 and a value of 26.6 million dinars. The major white fish species exported include loup (sea bass - 297 tons, daurade (sea bream - 33 tons), eels (219 tons), merou (grouper - 111 tons), rouget (20 tons) and several other species of interest in Mediterranean countries. Although the statistics are difficult to track, it would appear that bluefin tuna represents about 460 tons of the total fresh fish exports, with the remainder being the different species of white fish.

Europe is the principal market, with Italy taking most of the European imports. France is also an important market. Loup, daurade, merous and other high value, desirable species are shipped round, in special styrofoam cartons where they are carefully laid in inner cartons to ensure freshness and quality upon arrival. Product is either shipped by air or by refrigerated truck. Wet ice is placed in the styrofoam box, outside of the polybag in which the fish are enclosed.

Japan is a small market, importing only a handful of fresh fish, other than blue fin tuna. No imports of fresh white fish from Tunisia have been recorded in the United States. Important markets do exist in the Middle East, however.

3.3.2 Potential markets/products.

As worldwide consumption of fresh fish continues to expand, Tunisian exporters must expand their markets in the EC, the U.S. and Japan. This is particularly important in light of the projected growth in aquaculture production, particularly of loup and daurade. It is likely that Tunisia will produce more than 3000 tons of loup and dorade within the next five years. As production increases, processors should have lower production costs, per kilo, thereby being in a position to reduce their sales price and become

more competitive. The current sales price of loup (110FF/kilo) and dorade (90FF/kilo) are very high and will limit their access to markets other than Italy, Spain, and France, the largest markets for these products.

Competition will come principally from farmed breams and bass being produced in the EC in France and Italy. Demand for high quality fresh fish is continuing to grow, which should absorb most of the increase for the next several years. Continuing high prices attest to strong market demand. However, product will need to be made available year round to avoid seasonal fluctuations that can depress prices in times of glut. Also, market penetration into non-traditional segments must be achieved. This will require generic marketing and quality control schemes to ensure that consumers are satisfied with the product after then have been encouraged to try it. Finally, as salmon prices fall, it will be more difficult for breams and bass to remain as high priced as they have been recently. This may exert price pressures despite a growth in overall demand. Lower prices in the U.K. already reflect this effect, as well as the relatively weak demand for these products in that market, where cod and saithe are preferred.

In France, higher incomes and scarcity of wild stocks will encourage the demand for farmed breams and bass. At the same time, these are relatively unknown species except in the Mediterranean area and in Paris. Therefore, substantial marketing efforts may be needed to expand market size. Similar marketing efforts may be needed in Germany, where these species have been virtually unknown.

Both the U.S. and Japan represent large potential markets for fresh loup and daurade, once prices stabilize at a lower level and adequate transport facilities are available. Seabass is an accepted specie in all parts of the U.S. and sells for $3.00-$3.50 per pound at the wholesale level. This prices is substantially below that currently offered by Tunisian exporters. As prices moderate, an extensive sales effort for loup in the United States should pay off significantly.

3.4 Export Markets for Tuna

3.4.1 Current Markets

Although several different statistical series exist, with contradictory information, it would appear that Tunisian exports of bluefin tuna reached about 460 tons in 1990, an increase of 218 tons over the 242 tons realized in 1989. The majority of these exports were purchased fresh by Japanese buyers sent to Tunisia to examine each fish prior to purchase and air shipment to Japan. According to Japanese trade statistics, more than 354 tons of

fresh blue fin and more than 25 tons of frozen tuna were imported from Tunisia in 1990. The U.S. imported a handful of tons, and smaller quantities were undoubtedly shipped to Europe. Japan, however, comprises the major market for this product.

3.4.2 Potential markets/products

The Japanese will continue to purchase all the Grade 1 fresh tuna that Tunisia can produce. In 1990, the Japanese imported nearly 3,000 tons of fresh and 3,000 tons of frozen bluefin tuna. The Japanese pay the highest prices and are excellent customers in that they pay immediately for fresh fish purchases. The Tunisian processors and boat owners should make every effort to increase the amount of Grade 1 tuna available to the Japanese by improving handling, using more ice, and building more onboard refrigeration facilities.

The U.S. represents a potential market for fresh and frozen bluefin tuna from Tunisia, but in much smaller quantities than in Japan. In 1990, only 158 tons of fresh bluefin and 30 tons of frozen bluefin were imported into the U.S. In general, American prefer yellowfin tuna.

Nevertheless, the team believes that with some effort more fresh tuna (#2 grade) can be sold to the U.S., albeit at a lower price than what the Japanese pay for premium grade tuna. We believe that a market may exist for IQF frozen tuna steaks that can be processed from the tuna rejected by the Japanese. Currently, the rejected tuna is used by the canners and an excess inventory is available.

Prospects for increased sales of tuna to Europe are not strong. Tunisian product does not have a good reputation with major tuna importers in France, who prefer a more regular and larger supply than can be made available from Tunisia. Also, the preferred specie in France is yellowfin. Italian buyers will purchase some bluefin, but only to satisfy market gaps.

3.5 Export Markets for Canned Sardines

3.5.1 Current Markets

Tunisia has increased its exports of canned and semi-canned (pre-canned) products substantially since the mid 1980s. Exports increased from 36 tons in 1986 to 237 tons in 1990. Most of that represents semi-conserves, since the export of final canned product has remained relatively small.

The major markets for these exports have been Middle Eastern countries, particularly Jordan, other African countries such as Libya, and Eastern European markets such as Czechoslovakia. The traditional markets in Europe -- Italy, France, and Spain -- have been insignificant for Tunisian canned products. The price the Tunisians obtain in Europe is low compared to what Moroccans and Portuguese receive. The current wholesale price in Spain for a case of plain sardines in a club can with soy oil (100*43/802 @126g) is $45 for Portuguese sardines, $40 for Moroccan and only $34 for Tunisian products.

Canned sardine imports into the European Community are seen in the following table. Individual country data for Tunisia were not available, but total exports to Western Europe would appear to be fewer than 100 tons per year.

Table 5

EUROPEAN IMPORTS OF CANNED SARDINES
BY COUNTRY OF ORIGIN, 1989,
SELECTED MARKETS
(thousands of club can cases)

Importing Country	Exporting Country					
	Morocco	Portugal	Italy	Yugo-slavia	Bulgaria	Other
Germany	231	190				18
France	626	424	177			2
U.K.	321	447	43	54	33	7
Denmark		18				41
Switzer-land	9	26	6			17
Austria		101		59		52
TOTAL	1187	1206	232	113	33	137

Source: Official Trade Statistics of the European Community

Part of the reason that Tunisia has been unsuccessful in Western Europe is that the presentation of the Moroccan and Portuguese product in pull top, aluminum cans, conforms to market requirements, whereas the Tunisian keyless stainless steel product does not. Secondly, the Europeans prefer the larger fish found in

Morocco and Portugal, which pack four to a can, rather than the smaller variety from Tunisia, which pack six to a can. Finally, the Tunisians may be disadvantaged because they are too reliant on a few long term buyers. Increased marketing activity to expand customers could address this impediment, particularly if accompanied by high quality products packed in the type of can desired in Western European markets. No sardines are exported to the U.S., despite the large market there.

Although the greatest export opportunity in Tunisia lies with the sardine, due to the availability of large quantities of raw material, canners continue to suffer from a lack of raw material in the off season; one export-oriented canner is trying to buy raw material from Morocco to sustain his production year-round.

The canneries with freezing capacity are able to operate at 80 - 85% utilization of capacity per year, while some of the canners for the domestic market are operating at as low a rate as 25% utilization. Thus, there is a great need for upgrading the fishing fleet, not just by increasing the number of boats, but by building them with greater capacity. Also, there seems to be an unequal distribution of raw material. More than 30% of Tunisia's sardine catch is brought into the port of Gabès, even though there are no canneries there, only a market. The fish must then be transported north to the canneries for processing. There is an obvious need for greater freezing capacity for sardines if they are to spread the processing throughout the year. Another part of the problem is the lack of hygiene and sanitation in many of the plants packing for the domestic market, a deficiency which excludes them from exporting, even if they had freezing capacity.

There is no shortage of markets for export-quality canned sardines produced in Tunisia. Processors can sell everything they make at a price that yields a cross operating margin of 42%; the gains to be made by increasing the price or by becoming more vigorous marketers could very well be lost in the cost of the marketing activity. Thus, the project team does not recommend that current exporters change their strategies, as they seem to be doing the right thing.

3.5.2 Potential Markets/Products

To commercialize the large, unused resources of sardines available in the Tunisian zone, a long term strategy for market expansion must be developed. This long term strategy should consist of :

- Increased fishing capacity (discussed above)
- Increased freezing capacity (discussed above)

- Increasing knowledge of market demands in new (and existing) export markets and investing in new technologies and processing methods (including training of workers) able to satisfy these demands.

The Tunisian plain sardine in a club can, packed in vegetable oil, is potentially marketable in a great number of markets, including the U.S, with minor adjustments. However, it needs considerable adaptation to market requirements before it can expect to achieve the high prices obtained by well established, quality products from Portugal, Morocco and Spain.

European Markets. For example, most European countries buy plain sardines just as the Tunisians pack them, in vegetable oil in a keyless stainless steel can; this is the case for Italy, Spain, France and the U.K., a major sardine market. However, the market for this product is strictly in the lower priced end of the product line, which is why it is attractive in Eastern Europe. To add value to their product, the Tunisians need to supply an aluminum can with a pulltop opening, which is rapidly becoming the standard product form in these markets. While the Italians, Spanish and French prefer an oil pack, the British also buy substantial quantities of product in tomato sauce. Switzerland is another large sardine market, but the Swiss prefer their sardines de-boned, a product which they now buy from Spain and Portugal. The Benelux countries buy plain sardines in oil, mustard, and tomato sauce, while the Scandinavians prefer their home made brisling sardines.

In terms of packaging, the Western Europeans prefer their cans in cardboard boxes rather than lithograhed or overwrapped. Tunisian canners appear to have the capability to do boxes and should have no problem making this adaptation.

Another modification that could expand markets is to reduce the case size from 100 tins/case (the typical commodity pack), to 25 cans per pack. This is a more marketable case size for retail, since supermarkets can keep lower inventories than with the 100 case size.

In spite of the fact that aluminum pull top cans are becoming the standard in Europe, there is also a market for steel cans with a key opening. This product could potentially be produced more easily by STUMETAL than the pull top aluminum can, and be a feasible, intermediate change that could expand market size while maintaining STUMETAL as a responsive supplier.

The United States Market. In the U.S. market, the small fish available from Tunisia becomes an advantage, as the U.S. market prefers smaller fish (5-6 fish per can). However, the largest

quantity of sardines sold in the U.S. from Mediterranean countries is the skinless, boneless sardine, canned in oil. The main producers of these are Portugal and Morocco, (as well as Norway), countries that have long traditions in packing this form of value added product. Table 6 indicates the size of the U.S. market for various types of imported sardines.

Table 6

U.S. IMPORTS OF CANNED SARDINES, 1990
BY TYPE OF PRODUCT AND COUNTRY OF ORIGIN
(tons)

	Plain	Skinless/ boneless	Tomato Sauce
Canada	1,752		
Norway	981		
Spain	271	11	
Portugal	914	759	103
Thailand	3,279		1,412
Japan	548		366
Morocco	174	142	
Yugoslavia		29	
Mexico			306
Ecuador			3,252
Peru			1,719
Korea			633
Other	1,115	42	275
Total	9,034	983	8,066

Note: Sardines are in club or Dingell can. Plain and skinless/boneless sardines are packed in oil.

Source: U.S. trade statistics

There is a market in the U.S. for plain sardines such as the Tunisians pack, but an aluminum pull-top can is required. The current market price for such a product, C&F New York, is $42 - 46 per case, compared to an FOB price in Tunisia of $36 per case. Shipping costs were reported to be $17,000 for a container from Tunisia (compared to $5,000 from Morocco), which, even with the Tunisian government subsidy of 30%, is too high to allow Tunisian product to compete in the U.S. market. If shipping costs can be brought to a competitive level, then Tunisian product would stand a good chance of penetrating the U.S. market successfully. We have been told that three shipping lines are considering opening routes between Tunis and North America. If this happens, rates should become more attractive.

The skinless and boneless market, however, may provide enough room between the selling price in the U.S. and the FOB cost in Tunisia to cover the extra shipping costs already. A case of 100 cans in soya oil, FOB Portugal, currently commands $74 - $75, while equivalent Moroccan product commands $ 66-$67 C&F New York. This is more than $ 30 per 100 greater than the Tunisians currently get for their plain sardines, and, with their cheap labor costs, they should definitely be in a position to de-skin and de-bone their raw material, buy aluminum cans, and ship the product and still make a substantially bigger profit than what they currently yield in their traditional markets.

The Tunisian sardine is somewhat smaller than the ones caught by Portugal and Morocco, which makes the raw material harder to work with in terms of skinning and deboning, but it is not impossible. We have seen skinless and boneless sardines served with salads in Tunisian restaurants, and if the chef can do it well, so can workers on a packing line who have received a little training.

Being able to make this product would permit Tunisia to penetrate into the large skinless and boneless market in the U.S. In addition to the 983 tons indicated above, there is an additional market of about 5400, in which the product is exported smoked, in oil. Norway dominates this market, along with Canada and Thailand. In the skinless/boneless market, the club cans usually contain soya oil and the dingley cans usually contain olive oil, which commands the highest price. Case size is generally 25, bundled into a two x two case package.

Other market requirements are:

- A paper overwrap which requires special, but inexpensive machinery;
- Ability to pass FDA inspection (which should not be a problem for current exporters);
- Ability to obtain kosher certification by a Rabbi since the Jewish segment is very important in marketing sardines in the U.S.; a great number of potential importers do private label kosher products.

The production of private label products holds the greatest potential for Tunisian canned sardine exporters. Contact with the U.S market must be established via agents situated in Portugal, who are exporters to buyers in New York. These exporters maintain contact with all of the U.S. importers and function as middle men between the manufacturer and the customer. Once a packer has received an order he will receive the label requirement from the customer. It is then up to the packer to produce the label in

accordance with the specifications given. This is an important factor. Some business is also done directly between packer and importer, but the use of an agent is advisable.

Current prices in the U.S market for skinless and boneless sardines are fueled by supply shortages. From February 1990 to February 1991, prices increased 52%. Because of the recent strengthening of the U.S. dollar, prices have come down suddenly, but they are still high. In such a market an additional source of supply would be very welcome and most operators would be willing to work with the Tunisian exporter during the initial learning stages if the prospects of a continuing supply of product were a real possibility.

On balance, the Tunisians may be able to increase their exports of sardines substantially by making adjustments of their product to accommodate market requirements. They have an untapped potential in Europe which they should attack first, after which they may want to go after the U.S market. Under present cost arrangements, this will require providing skinless and boneless sardines, which while a new product for the Tunisians, represents a very lucrative potential business.

3.6 Markets for Other Products

3.5.1 Canned Tuna

Tunisia has a limited, but domestically important production of canned tuna. Some canned tuna is being exported to Libya, but the overwhelming portion is consumed domestically. The species packed are bluefin and bonito.

The industry consists of nine canneries which utilize raw material that the Japanese buyers reject. From what we have observed, the tuna canneries are kept at relatively low hygienic standards (unacceptable levels of flies, birds, cigarette butts, etc. were found in the cooking areas), and the raw material used for packing appeared to be less than fresh (although not unacceptable for human consumption).

The project team believes that the best opportunities for tuna exports from Tunisia are to improve the quality of fresh/frozen bluefin sales to Japan, and to explore the sale of frozen tuna steaks, vacuum packed, for the U.S. market. Whatever remains should be canned for domestic consumption.

We do not foresee Tunisia becoming a player in the international canned tuna market. It is simply too competitive a market, with exceedingly strict requirements. Tunisian landed quantities are so small that any up grade of the industry to internationally competitive standards may cost too much to be worth the additional profits to be made.

3.6.2 Anchovies

Tunisia does not have its own stocks of anchovies in the ocean, but because of the idle production capacity in the off sardine season, it may be possible to import raw material from Argentina or Chile, (or elsewhere), pack it in Tunisia, and then re-export the finished product to Europe or the USA.

This type of business venture has already been carried out by one Tunisian canner in cooperation with a French partner, and can be copied by others if one has the know how.

There is a definite market for anchovies, both in the 2 oz. retail size can and in the 13 oz or 28 oz institutional sized cans, to combat the shortage which has occurred in recent years. Prices have risen substantially, both in the US and Europe, as stocks in Portuguese, Spanish and Moroccan waters have disappeared. These countries are now importing raw material from Argentina and Chile for canning and re-exportation.

The following table displays Morocco's exports of all types of anchovies in 1990:

Destination	Quantity (in tons)
France	3425
Germany	105
U.K.	96
Belgium	163
Holland	1
Italy	295
Spain	1515
Austria	150
Switzerland	306
USA	841

The size of this market should encourage Tunisian canners, with AID assistance, to contact Portuguese, Spanish or Moroccan canners of anchovies to study their packing methods. Tunisian exporters should also contact Argentinian and Chilean fisheries authorities to identify sources of raw material. If properly organized, this could potentially be a very lucrative business for Tunisian canners.

3.6.3 Canned Octopus

There is a market in Europe for specialty foods geared towards certain ethnic groups. One segment of this is for club cans of

canned octopus in spiced oil or hot tomato sauce. This product is traditionally packed in Spain.

This could be a potentially profitable product for Tunisian exporters, yet is would be relatively simple to prepare. It would require cutting up pieces of second grade octopus and cuttlefish for canning. While the market may not be huge, production could commence almost immediately. A study of the European market potential for this product should be conducted to determine feasibility.

3.6.4 Canned Mackerel

There is a substantial market in Europe and the U.S for white meat fillets of canned mackerel. The product is currently manufactured in Portugal and packed in a club can.

Tunisia has limited stocks of mackerel which are currently sold fresh on the domestic market. A feasibility study should be undertaken on the market potential and production capability of this product in Tunisia.

4.0 MAJOR IMPEDIMENTS TO EXPANDED SEAFOOD EXPORTS

According to a recent survey of Tunisian seafood processors[28], there are several major impediments which must be overcome if Tunisia is to attain its goal of significant, sustained growth in its fishery exports. First and foremost is the problem of availability of raw materials. But even if that can be resolved, there remains a lack of knowledge about market requirements and buyer preferences in non-traditional markets, and a distinct lack of awareness among potential new buyers regarding the availability of species and products from Tunisia. These are compounded by inadequate shipping routes to new markets in the U.S. and Asia, which contribute to non-competitive prices in some markets, and by trade barriers, particularly those found in the European Community, which discriminate against Tunisian products. Each of these problem areas is briefly discussed below.

4.1 Limited Supplies of Raw Materials

In the last three years, total seafood production has decreased from a high of 102,674 tons in 1988, to 89,999 tons in 1990. With the exception of sardines and other "blue fish"," the production of almost all other species has declined, despite more people being employed in the industry, a growing number of new processing and freezing facilities, and continued expansion of the fishing fleet. All of the scientific and industry experts place the blame on the decline principally to overfishing -- too many boats concentrated in the traditional coastal areas on the eastern coast of the country. The general consensus is that greater fishing effort needs to be shifted towards the North, and that new techniques need to be introduced which permit fishing at greater depths for the crustacean and bottomfish resources. There is also support for more effective fishery management techniques and a recognition that without conservation, the catch will continue to decline.

A serious consequence of inadequate and irregular supplies of raw material is a high degree of inefficiency, and therefore, a higher cost processing sector. Also, when fish are scarcer, their ex-vessel price rises, sometimes substantially. When supplies are brought in from great distances, they are frequently of poorer quality than desirable for export sale. Workers must be employed even when there is no raw material for processing. Hourly workers, the women who do much of the actual hands-on processing of the fish, work on sporadic schedules, depending on whether fish have

[28] Meddeb., p. 82.

arrived, thereby losing some of the efficiency that comes from regular work schedules and expectations. Irregular supplies mean that sales, too, can only be irregular, placing the exporter in a difficult position vis-a-vis his own buyers in foreign countries, where continuity of supply is frequently more important than price.

Among possible solutions to lack of resources is an enhanced, comprehensive, fishery management and enforcement program, expanded support for aquaculture efforts, including dealing with the financial and technical constraints, and a coordinated effort by the industry and the government to identify and encourage supplies of primary processed product from other nations (Argentina, Mauritania, Spain, Portugal, and West Africa) to enter Tunisia for further processing before they are shipped to their final destination. Several processors have begun to research this kind of "value added" role for their plants, recognizing that the relatively low labor costs in Tunisia offer them the opportunity to develop an industrial processing role similar to that which Korea and China have played in recent years. A corollary need relates to environmental pollution. The industrial pollution in the Gabes area is at the point where it could begin to harm spawning and breeding areas, and further reduce stock size. Effective regulation of environmental standards is of high importance in taking strong measures to prevent further erosion of wild fishery stocks.

4.2 Shortage of/Inadequate Access to Needed Technical Expertise

In discussing impediments to growth in the aquaculture sector, inadequate access to an international technical network was identified as an important impediment to achieving the rapid growth which had originally been envisioned in the five year plans. A similar isolation was perceived in the harvesting and processing sector for captured fish. Several processors expressed interest in learning more about processing techniques that could be applied to local supplies, such as manufacturing surimi from oily pelagics like sardines, or producing quality, value added products from tuna and shrimp. Fishermen and boat owners inquired about fishing boats, gear and methods for deep water shrimp and for rougher weather conditions than their traditional vessels normally fish.

There was also concern about how best to gain access to information about methods and technologies for maintaining and monitoring quality standards required in new markets such as the United States, Japan, and Northern Europe. Not all facilities have analytical labs or access to other capabilities for measuring quality and safety of their products. Many questions were raised about ongoing research on new and evolving preservation techniques, particularly for shipping fresh fish by truck or plane. Although the packaging standards institute in Tunis knows the packaging and

labeling requirements for all countries, it does not address problems uniquely related to the seafood industry, and no other agency has the expertise to provide this service. This serves as a serious constraint to developing quality, valued added products for export.

Two thirds of the respondents to a recent survey conducted of seafood exporters indicated they were displeased with the quality-- and cost -- of local packaging materials, compared with only 17% being displeased with the cost of imported materials. Fifty percent of the respondents were also displeased with the availability of local materials. Almost all of the respondents purchased most of their packaging materials locally.[29]

Part of the problem described here is a traditional reliance on technologies and technical expertise from France, Italy, and, to a lesser extent, from Spain. Thus, American expertise in deep water shrimp fishing, on production of surimi from pelagic species, and on new packaging methods for both fresh and frozen valued added products, have not been available through existing channels. The market, alone, will not bridge this structural gap; rather, special efforts will need to be made to integrate Tunisian businessmen and women into the technologies and methods of processing, harvesting and aquaculture available in the U.S., Scandinavia and South America.

4.3 Limited Awareness of Tunisian Fishery Products in New Markets

Seafood marketing in today's world is best characterized by the term "global." Competition in the major importing nations -- the United States, Japan, France, the U.K., Italy and Spain, etc.-- comes from products originating in all parts of the world. Tunisian shrimp competes with shrimp from Senegal, Morocco, China, India and Ecuador in the French market. Cephalopods imported into Japan are harvested by Moroccans, Spanish, Argentineans, Poles, Americans, Canadians, and Tunisians, among others. Similar competition exists for all of the products in all of the markets which Tunisian processors and exporters hope to penetrate.

Tunisian products are severely handicapped in many of their non-traditional markets because of buyers' being unaware of their availability and being ignorant about their positive attributes. Unless and until a positive perception about Tunisian seafood products is created, particularly in the U.S., it will continue to be an uphill, frustrating struggle for individual buyers to consummate sales at favorable prices. Creating any image, and particularly a favorable image, will require a coordinated effort between Tunisia's food processors and exporters and export

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[29] Meddeb, p. 87.

promotion agencies such as CEPEX. A Tunisian "mark of excellence" or logo must be created and marketed in new markets. Participation in local trade shows must be initiated, and individual visits to major importers to demonstrate product, build confidence with respect to product quality, availability and continuity of supply, and create a familiarity with Tunisian exporters are all required to overcome the lack of information and corresponding disinterest in Tunisian seafood products.

4.4 Inadequate Information About Potential New Markets and Product Opportunities

Foreign buyers outside of traditional markets know little about the advantages or availability of Tunisian seafood products, largely because Tunisian exporters have made little or no effort to provide that information to them. For most exporters, the European Community, and in particular, Italy, Spain and France, absorb all of their export sales. Of the respondents in Meddeb's survey, 100% of the exporters of frozen and canned products sold to the EC, as did 85% of fresh fish exporters. Only 8,3% of frozen product exporters sold to North American buyers (principally cephalopods to the United States). Twenty-five percent of fresh exporters sold to Japan, principally the blue fin tuna, and 16,6% of frozen exporters sold to the Japanese markets, again, primarily the tuna.[30]

Language barriers, unfamiliarity with anglo-saxon business practices, satisfaction with existing sales levels and profitability, and raw material supply problems are examples of the principal reasons why most Tunisian exporters have not pursued a more aggressive strategy to obtain information about new seafood markets. Even where efforts have been made, as in the case of one English-speaking exporter who visited West Coast American seafood producers, there is not enough market knowledge resident in Tunisia to ensure that the contacts made are those with the highest likelihood of being interested in Tunisian products for importation into the United States. The knowledge gap remains sufficiently wide that a cooperative government-industry effort may be needed to ensure market penetration for more than one or two sellers. Market studies of this type, plus other, more targeted studies focusing in depth on cephalopod markets in the U.S. and Japan, for example, or on canned sardine markets in the U.S. and the U.K., may be an appropriate route for providing enough information to the Tunisian processing sector to truly assist its market expansion efforts.

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[30] Meddeb., p. 80, and official trade statistics of the EC, Japan and the United States.

4.5 Non-Competitive Prices

Although Tunisia's factor costs (with the exception of olive oil and packaging materials, particularly cans) are relatively low, productivity and capacity utilization are also low, resulting in relatively high unit costs for many seafood products. Tunisia has remained competitive, frequently selling items at prices higher than international commodity levels for similar products, due to a combination of good quality, proximity to major markets, having a high value product mix (shrimp, fresh tuna, cephalopods, etc.), and producing in the package size desired by its customers. For example, frozen shrimp (26/30 headless count) sells at a price of approximately $5.80 to $5.90 per pound in the U.S. and Japan as compared to a price up to 10% higher for Tunisian headless shrimp in its traditional markets. Fresh sea bass sells for approximately $3.30 per pound in the U.S. as compared to a Tunisian export price of more than $8.

The Tunisians also get higher prices for their cephalopods than is the international norm. The Meddeb survey, in asking exporters how their prices compared to those of their foreign competitors, reported that 100% of the canned sardine exporters, 83% of the frozen seafood exporters, and 43% of the fresh fish exporters responded that their prices were higher than those of their competitors in international markets.[31]

As long as markets remain strong, Tunisia will have no problem remaining a strong competitor on the international marketplace. But if traditional markets soften, and inventories build up, then Tunisian producers will be forced to lower their prices and compete at a different level. At that point, Tunisia's traditional reliance on relatively small quantities processed at relatively high costs and selling prices may not be able to compete with oriental products bearing lower costs and aquaculture products available year round at a consistent size and price. As it is, Tunisian prices do not reflect enormous profits; one-third of the respondents indicated their profit margins on their exported products were five percent or less and just about 50% netted ten percent or less.[32] This does not leave a large margin for absorbing price declines of more than a few percentage points.

Furthermore, in highly competitive markets like the U.S., where price is frequently more important to a buyer than quality or personal relationship with the supplier, Tunisian prices are currently above market levels on most of the products of potential

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[31] Meddeb, p. 84.

[32] Ibid., p. 84.

interest to U.S. buyers (shrimp, cephalopods, daurade, etc.). Although Tunisian exporters indicated they would be willing to take lower profit margins initially to gain market share in the U.S., a more profitable strategy for them may well be to concentrate on the higher priced markets in Europe.

4.6 Freight and Shipping Constraints

Part of the "chicken and egg" character of the barriers facing Tunisian seafood exporters can be attributed to the lack of shipping capacity and ocean freight routes between Tunisia and some of her potential markets. Although freight rates to new markets are partially subsidized to counteract the high costs of air and sea shipping, the subsidies do not compensate for unavailability of cargo space or reasonably direct shipping routes. Between the U.S. and Tunisia, for example, air shipments must change at least once, either at Rome and Frankfurt, and if the connection is missed, there may be an additional 24 hour delay. This size delay can be fatal for fresh fish. For maritime shipping, product can be containerized in Tunisia, but it must be routed through one of the major European ports, causing additional time and expense.

Tunisia's proximity to her large European markets is an advantage over competitors from South America or Asia. Tunisia is well positioned, geographically, to take advantage of the EC growing demand for fresh fish. However, a growing impediment, even in this near-by market, is the lack of an effective, adequately-sized air cargo system to meet the demands of exporters. As the production of farm-raised fish expands, the demand for cargo space will expand commensurately. Exporters are already feeling the shortage of space and becoming frustrated in their ability to satisfy customers properly. Some exporters have resorted to refrigerated trucks as one way to ensure regularity of supply. Clearly, this set of freight constraints must be addressed if Tunisian seafood exports are to grow.

4.7 Trade Barriers

The European Community and Japan, two of the three areas where Tunisian exporters hope to expand sales, maintain complicated systems of tariffs and quotas on imports of many seafood products, some of which are available for export from Tunisia. Complex technical regulations addressing processing and storage conditions, contaminant thresholds, wholesomeness, packaging, and labeling also exist. Finally, there are commercial requirements, typical ways of doing business in terms of product form, packaging, appearance, etc., that can serve as private sector trade barriers if the seller does not conform to them.

Official trade barriers in the U.S. are low, with the exception of canned tuna in oil and a small tariff on canned sardines (not smoked). In Japan, the only tariffs of concern to Tunisian exporters are the three percent tariff on fresh or frozen shrimp, and the five percent rate for cephalopods.[33]

The European Community, on the other hand, continues to operate with quota systems designed to allow only enough imports of certain items to satisfy the raw material needs of its secondary processors of tuna, bottomfish, herring, and eel, among others. Additional quota restrictions imposed by Spain and Portugal as part of their transition to full EC membership are set to expire at the end of 1992. Notable as a restriction for Tunisia is a quota established by the community on canned sardine imports, under which the initial 14.000 tons can be imported duty free, but the subsequent 6.000 tons faces a 10% tariff.[34] This is a particular concern because of the EC's policy to give larger quota allocations to countries which permit EC vessels to fish in their waters than to other countries, regardless of their ex-colonial status. Thus, Tunisia, with no excess stocks, is disadvantaged compared with Morocco, which receives a mucn larger canned sardine quota. Since Tunisia has never formally granted fishing rights to the Italian boats which fish in its zone, it has never been able to capitalize on the EC's policy which rewards that type of behavior.

Equally important is the range of technical regulations and commercial requirements which can become trade barriers for firms which neither understand nor have the capability to conform to them. Tunisia's inexperience in the U.S. market means that it is relatively unfamiliar with U.S. requirements. Tunisian exporters should be provided with clear, non-bureaucratic descriptions of FDA requirements and U.S. commercial norms to assist their product development efforts. Also, to minimize shipments being held up by FDA at the border or rejected by a buyer, these firms should work closely with their prospective importers, including having a representative from the importing firm present in the packing plant during processing and packaging, to make sure that the product is entirely acceptable and the labeling and packaging conform to U.S. standards.

[33] Committee on Fisheries, Organization for Economic Co-operation and Development, Fisheries Issues: Trade and Access to Resources, (Paris: April 1989), pp. 127-130.

[34] Ibid., p. 124.

5.0 AN ACTION PLAN FOR EXPORT EXPANSION

Tunisia is ideally located to become a much larger source of seafood and other agribusiness products for Europe, Japan and the United States. Specific competitive advantages include:

- Relatively low labor costs (approximately $1/hour)
- Availability of high quality seafood products of the type consumed in most European countries, Japan and the United states (shrimp, octopus, sea bass, tuna, cuttlefish, etc.)
- Close proximity to its major markets in the EC
- Potential aquaculture sites which cannot be duplicated in most European or Mediterranean countries
- Willingness of seafood exporters to experiment with new markets and products, including value added, retail packs.

As the consumption of fresh fish, vegetables, and fruit continues to grow in Western Europe, the U.S., and Japan, the Tunisian seafood sector should be well positioned to take advantage of its strengths to begin supplying products to these countries. In order to capitalize on its strengths rather than its weaknesses (i.e. having relatively high priced products which are noncompetitive with commodity products on both price and quantity terms), Tunisia should undertake a series of short, medium and long term steps to improve and expand its market base in Europe, and create new, value-added products for all three major world markets. These steps must be geared towards qualitative improvements in fresh, frozen and canned products now produced in Tunisia, as well as towards the development of new products designed to satisfy specific market niches for high quality, valued added seafood products.

5.1 Short Term Actions (6-12 Months)

A series of short term actions are recommended to build upon existing capabilities and market opportunities. These actions include policy-oriented, technical, and market expansion type

recommendations. They can all be initiated within the next year, with relatively low cost, and if successfully implemented, could yield handsome returns for Tunisian seafood exporters.

5.1.1 Development of Niche Marketing Strategies

As indicated above, Tunisia's strengths lie not in low-cost, high quantity production of either wild or farmed products, but in providing relatively stable supplies of high value, first quality products with traditional appeal in the Mediterranean. As long as these products remain available from Tunisia, they are likely to command the highest prices existing in their primary markets, Italy, Spain, France, and more recently, Japan.

In developing an export expansion strategy, Tunisian exporters have wisely realized that by capitalizing on their existing markets and continuing to expand their product line with items conducive to today's busy consumer, they have an excellent chance to develop broader markets and new products. Thus, they have elected a "niche" marketing strategy. The most aggressive exporters scrutinize the major markets for specific product opportunities in which they can be a market leader and reap the early profits before the market becomes saturated with commodity-type sellers offering considerably lower prices and quality.

5.1.2 Establishment of a Seafood Exporters Federation

At the present time there is no private sector organization dedicated solely to the expansion of Tunisia's seafood exports, although general government agencies such as CEPEX include seafood as a priority category for promotional efforts, the Ministry of Agriculture is trying to expand a broad base of agri-business exports, including seafood, and a private export-oriented organization headed by the President/Directeur General of FRIMAR/SECAL, Mr. Hedi Ben Hassen, is another useful group encouraging Tunisian seafood exports. None of these entities, however, has procured the commitment of the industry and the financial resources to undertake the dedicated effort necessary to create a positive recognition of Tunisian seafood products in new markets, or to generate the type of information and contacts needed by Tunisian businessmen looking to expand sales in these markets.

Thus, one short term action recommendation directed to the industry is to establish a Seafood Exporters Federation, comprised of seafood exporting companies, shipping companies, and packaging/refrigeration firms, for the sole purpose of promoting and expanding Tunisian seafood exports and providing a single, unified industry voice vis-a-vis the government and other entities

on matters of critical importance to seafood exporters. The Federation would be financed by contributions from members -- with a mandatory minimum contribution and voluntary additional contributions. To be effective it must be staffed by an experienced, aggressive individual with the ability to reconcile differing opinions among members and effectively lobby for the Federation's program at the national and regional government levels.

Issues which the Federation could address in its initial stages might include:

- guaranteed minimum cargo space on each flight to major European or Middle Eastern markets;
- Formation of a small, cargo-only airline equipped to keep seafood products (and possibly other agricultural products on a paying basis) at appropriate temperatures;
- Establishment of coolers and freezers in each major airline terminal from which seafood is exported;
- Initiation of negotiations with the EC regarding Italian fishing vessels harvesting up to 20.000 tons of fish in Tunisian waters each year, with the goal of obtaining preferential trade concessions into key EC markets;
- Establishment of a new, commercially-oriented Tunisian products promotion office in New York or Washington, D.C., for the purpose of educating U.S. and Canadian fish buyers on the advantages of Tunisian products; and
- Development of a logo-based seafood export promotion program for Tunisian products geared towards educating prospective buyers on the unique quality aspects of these products.

The Federation could also work directly with CEPEX to enhance the effectiveness of seafood firms' participation in the international and national food fairs. One such exposition to be explored is the Boston Seafood Show.

The success of other nations' efforts to promote their products with similar type organizations speaks for the importance buyers now attach to this type of promotional effort. Virtually every major exporting group has established promotion agencies,

either autonomously or as part of a national effort. These groups include the Norwegian Salmon Farmers Association, the Scottish Salmon Board, the Alaska Seafood Marketing Institute, FIOM in France, the Indian Marine Products Export Agency, and the Saudi Fisheries Authority.

Finally, the Federation could support targeted market studies of non-traditional markets, such as the U.S., for specific products which Tunisian exporters believe they can export competitively. Also, the Federation could sponsor educational tours in both directions -- Tunisians visiting buyers in potential markets, and buyers being invited to visit Tunisia to meet local exporters.

5.1.3 Development of New Products/Markets

There are several product/market opportunities that are available for exporters willing to conform to market norms in new areas. These include:

- Canned sardines in oil in the club can for the U.S. and U.K. markets. It may be prudent to undertake a market study first to identify product forms, packaging, types of sauces in demand, legitimate importers, pricing structures, etc.;

- Fresh grouper airshipped to markets in the U.S. and Japan;

- Expansion of U.S. market sales for block and IQF frozen octopus;

- Exploration in the U.S. and EC markets for cut up cuttlefish pieces in a food service pack;

- A feasibility study of possible niche markets in the U.S. for the 5-lb./2 kg. pack of frozen and fresh finger laid shrimp;

- Increased sales of fresh and value-added, cooked shrimp in non-traditional EC markets;

4 By improving on-board handling of bluefin tuna, increased export sales to Japanese buyers; and

- Development of markets for #2 tuna in the non-Japanese, U.S. food service (and retail) marketplace.

Although the Japanese prefer to buy only the smaller octopus sold by Tunisia, it is likely to be beneficial for Tunisian processors of octopus to solicit business with the larger trading companies such as Mitsubishi, C. Itoh, Taiyo, Mitsui, Nippon Suisan, etc. In a recent discussion with Mitsubishi, it was made clear that there is interest in importing more product from Tunisia, but that the appropriate commercial contacts had not yet been made. If this be the case, then much has to be done by the Tunisians to solicit more business from the Japanese companies.

5.1.4 Other

There are several additional actions which could be undertaken in the short term that could enhance the quality and marketability of some Tunisian products. These include:

- Establishing national norms for plant safety and hygiene specifically for export-oriented firms, to facilitate access to U.S./EC/ Japanese markets. This would include requiring quality control programs, testing facilities on site or nearby, all lights to be covered to prevent broken glass from falling into the fish, forbidding animals inside or around processing plants, mandating protective coverings at entrance ways to minimize outside dirt and dust from entering the plant; and

- Enhancing competition in the market for sardine cans, by permitting easy importation of aluminum cans for export and domestic use.

5.2 Medium Term Actions (12-24 Months)

5.2.1 Establishment of a Government Institute for Technical Assistance

Another important problem area that needs to be addressed in Tunisia is a series of concrete steps to ensure that both the wild and the farm sectors of the seafood industry have access to information about the latest technologies, worldwide, and can identify consultants or other sources of assistance on an as needed basis. In addition, certain types of assistance could be provided by government extension agents who are well trained in specific kinds of problems facing the Tunisian seafood exporter.

Thus, a specific recommendation for the CGP is to either establish a separate Institute or highlight the existence of one that already exists for the purpose of providing technical assistance on an on-going basis to a wide variety of fishermen, processors, fish farmers, and marketers. This Institute would not duplicate the activities at Monastir in aquaculture, but would take a broader focus in its mandate to help. Several ideas for specific actions to be undertaken include the following:

- Establishment of a toll-free number to be called by exporters needing assistance;
- Attendance at major international food technology, fishing equipment and aquaculture trade shows, with newsletters and other means of disseminating findings to industry members;
- Publication of resource pamphlets with lists of consultants and other firms and individuals who can be contacted to solve specific technical problems; and
- Maintaining a current information file on items of interest to local industry members. This could include keeping information about making surimi from pelagics, how to locate fishermen from Louisiana interested to teach Tunisians how to deep water trawl for shrimp, etc.

5.2.2 Development of New Products/Markets

Squid and Cuttlefish. In the United States, more than 80% of squid and cuttlefish products are sold in a processed form (rings, tentacles, slices, breaded, etc.), depending upon the availability of product. It may be possible, therefore, for Tunisian exporters to develop a market for value-added cuttlefish and squid in the U.S. market. It is also worth exploring the feasibility of importing raw material from countries such as Uruguay and Argentina and utilizing the excess capacity and low labour costs in Tunisian plants to process these products locally. Possible products to be made include:

- boiled, IQF octopus for Italy, Spain and France;
- IQF calamari rings and tentacles (70-30% mix), in the US and EC;
- IQF slices of cuttlefish in a 2-kilo bag for U.S. and the EC; and

- Extruded calamari rings processed from squid and cuttlefish.

Other Products. Within the 12-24 month period designated as the "medium term", there are several value added products which could be experimented with for EC markets. For example:

- An IQF or tray pack of shrimp scampi;
- A Paella Polybag pack on a private label basis;
- A brochette product for retail and food service, featuring shrimp, vegetables and possibly other fish products;
- Frozen, IQF tuna steaks (6 ounce, 7 ounce and 8 ounce sizes) for the U.S. retail marketplace;
- Canned small octopus and cuttlefish pieces in a spicy sauce for the European market and the ethnic U.S. market; and
- Development of an aquaculture feed from processing plants' waste products so as to reduce the production costs of farmed loup and daurade, thereby enhancing their competitive cost position in the marketplace over the longer term.

5.2.3 Creation of an Effective Fisheries Management Regime

The serious concerns with overfishing and the recent decline in total production have been described in detail in Chapter 2. The critical importance of establishing an effective fisheries management regime that not only conducts frequent and timely resource surveys, but also enforces regulations established to conserve fishery resources with credible penalties, cannot be overemphasized. While concern for the resource is growing, adequate resources have not been made available to carry out these roles. The U.S. government (NOAA/NMFS) and other nations with various programs should be solicited to assist the Tunisians develop a comprehensive program.

5.2.4 Development of a Plan for Freezing Sardines for Subsequent Processing

Cold storage facilities are available in some ports, i.e. Gabes, in which sardines can be frozen when harvested if supply is greater than demand. But there is not enough cold storage capacity to handle all of the sardines that are available at certain times of the year, resulting in product deterioration and loss.

If freezing capacity were available throughout the coastal areas, vessel owners could then freeze and hold onto their harvests for sale to processors throughout the year. Processors could then buy in season at low prices, freeze product, and operate more days per year. Thus, cold storage facilities can serve to expand and stabilize the overall market for sardines.

For this reason, one recommendation for the medium term is for a joint government/industry group to undertake a feasibility study of this issue and develop a plan that can maximize the utility of the sardine harvest and the availability of sardines throughout the year.

5.2.5 Other

One other way in which the Tunisian canned sardine industry can become more attractive to U.S. buyers is to obtain two U.S. certifications that are essential for maximizing sales. One, of course, is an FDA certification that will be made at the plant, and the other is a kosher certification by a Rabbi, who will issue an certificate authorizing the approved firm to affix the kosher label to its retail product. High cleanliness and sanitary standards are required to obtain these certifications, which are necessary for importation into the U.S. in the case of FDA, and important for generating sales with the major U.S. importers in the case of Kosher certification.

5.3 Long Term Actions (12-36 Months)

5.3.1 Development of Value Added products From Aquaculture Production

Although only one aquaculture facility is currently producing enough mature product to export on a continuous basis, there is already concern developing regarding a potential sea bass/bream glut over the next five years. The experience of Norwegian salmon eventually being shut out of the U.S. market due to market

preferences and non-competitive prices, has not been lost on the Tunisian fish farming companies.

As a result, it would behoove an industry group to begin market studies to examine the feasibility of value added products from daurade and loup in advance of any market saturation that might occur from a rapid rise in the volume of farmed product. If these studies were favorable, experimentation in fillets and other product forms could commence.

5.3.2 Other Actions

New products that make sense to explore in the longer term include:

- Skinless boneless sardines for the U.S. market, perhaps on a private label basis;
- Production of farmed shrimp, perhaps the Penaeus orientalis (or chinensis);
- Vacuum packed tuna steaks for direct sale in the U.S. retail marketplace; and
- Importation of anchovies from Argentina and Chile to expand the total supply of anchovies available for creating a canned anchovy market in Europe and the U.S.

While a great many ideas and recommendations have been described, there are several actions which warrant the highest priority. These include addressing the lack of knowledge about foreign markets among Tunisian businessmen, and the corresponding ignorance about Tunisia in non-traditional markets. The specific actions supporting this goal, including the development of the Exporters' Federation also become high priority.

A second area of priority refers to the transportation constraints due to inadequate air freight capacity. This has already become a disruptive element for fresh fish exporters and proves to be worse in the future. It must be resolved, either with an airline or trucking solution. Perhaps use of a modified atmosphere, refrigerated truck could handle the bottleneck caused by the airlines.

APPENDIX A

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APPENDIX B

THE AMERICAN MARKET FOR SEAFOOD PRODUCTS

SECTION 1.0 OVERVIEW

The American market for seafood products is one of the largest in the world. U.S. demand for fishery products (including both edible and industrial products such as fishmeal and oils), exceeded more than seven million tons and $8.8 billion dollars in 1989, an increase of 37% in volume and 85% in value over 1980 levels (see Table B-1 and Diagrams B-1 and B-2). Shellfish, and particularly shrimp, represented 17% of the total volume and 47% of the value of all seafood products. Other important product groups include fillets and steaks (19% of demand) and canned products, particularly canned tuna (see Table B-2 and Diagrams B-3 and B-4).

On a per capita basis, Americans consumed slightly more than 2.3 Kgs of canned fish in 1989, a little more than one Kg of shrimp and shrimp-based products, and 1.4 Kg of fillets and steaks, particularly cod, sole, hake, haddock, flounder and pollock. Total consumption of seafood products reached 7.09 Kgs per person, of which fresh and frozen products comprised two-thirds and canned products one-third.

Compared with other industrialized countries, U.S. per capita consumption of seafood products is relatively low. According to FAO statistics for the period 1984-1986, consumption of seafood products on a live-weight basis, was 18.5 Kgs in the U.S., 69.3 Kgs in Japan, 25.8 Kgs in France, 18.8 Kgs in England, 17.9 Kgs in Italy, 33.6 Kgs in Spain, and 22.4 Kgs in Canada.

U.S. consumption of seafood products remains much higher on the East and West coasts than in other parts of the U.S., reflecting the greater availability of seafood products along the seacoasts. As the distribution of fresh and other high quality seafood products into non-coastal areas has improved, fish consumption has increased throughout the United States.

Approximately 63% of the seafood products consumed in the U.S. are imported, as seen in Table B-4. Table B-5 and Diagrams B-5 and B-6 indicate the principal categories of seafood products which were imported in 1989: whole tuna ($402 million); canned tuna ($375 million); shrimp ($1.7 billion); white fish fillets ($562.7 million) and fillet blocs for secondary processing ($325 million).

TABLEAU B-1

TAILLE DU MARCHE AMERICAIN

MILLIONS DE TONNES ET MILLIONS DE DOLLARS

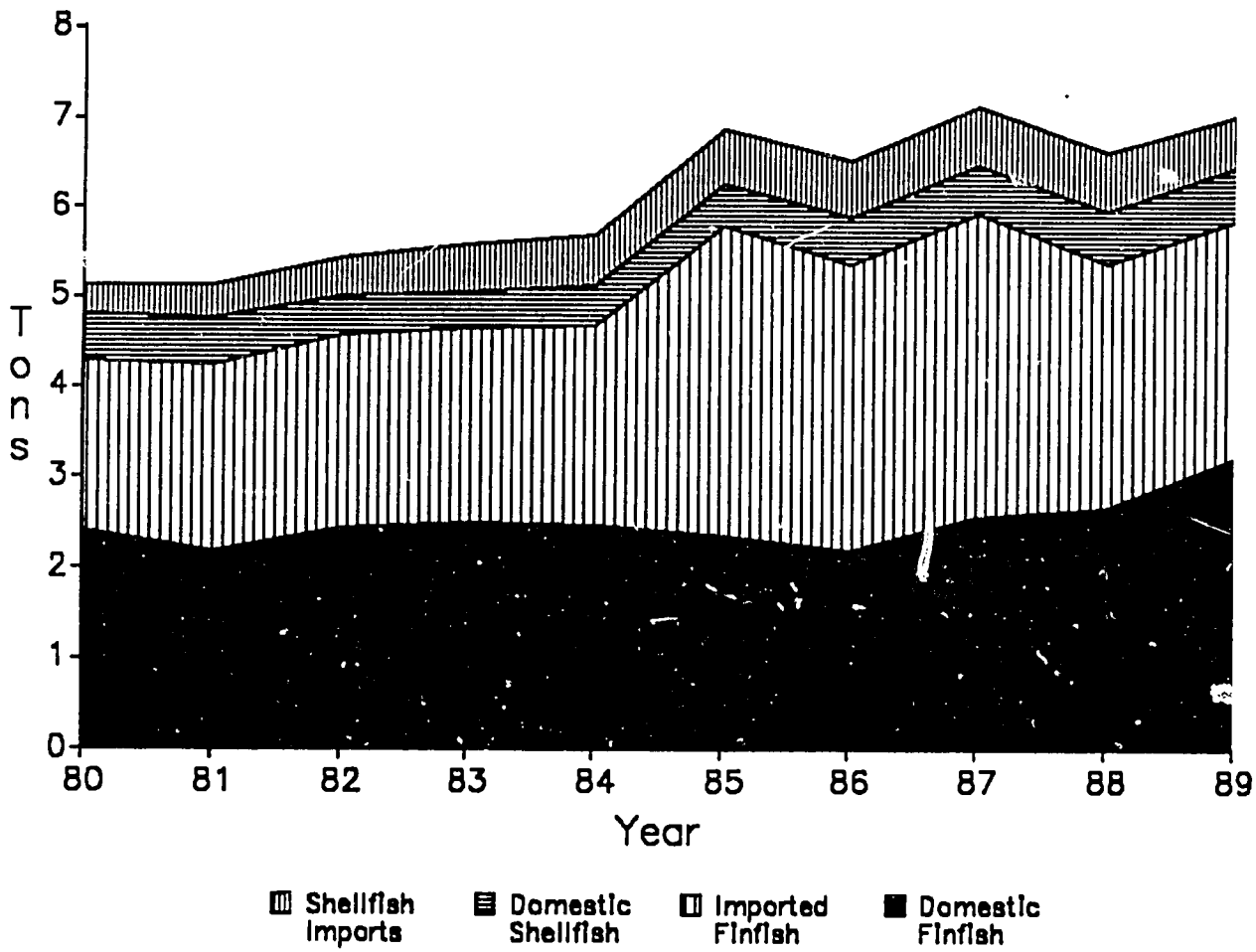
1980 A 1989

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Poisson										
National	2.42	2.19	2.45	2.51	2.48	2.37	2.21	2.59	2.68	3.24
	$1,155	$1,196	$1,190	$1,171	$1,188	$1,193	$1,319	$1,629	$2,023	$1,726
Importations	1.88	2.07	2.14	2.15	2.22	3.43	3.16	3.35	2.72	2.63
	$1,268	$1,446	$1,385	$1,606	$1,520	$2,008	$2,404	$2,939	$2,729	$2,891
Total poisson	4.30	4.26	4.59	4.67	4.69	5.80	5.37	5.94	5.40	5.87
	$2,423	$2,642	$2,575	$2,777	$2,708	$3,201	$3,723	$4,568	$4,752	$4,617
Crustaces										
Nationaux	0.52	0.52	0.44	0.41	0.45	0.47	0.53	0.54	0.58	0.60
	$1,082	$1,192	$1,200	$1,184	$1,162	$1,133	$1,444	$1,486	$1,497	$1,512
Importations	0.33	0.37	0.42	0.53	0.55	0.60	0.63	0.66	0.65	0.56
	$1,203	$1,340	$1,599	$2,021	$2,023	$2,056	$2,409	$2,772	$2,730	$2,598
Total Crustaces	0.85	0.89	0.86	0.94	1.00	1.07	1.15	1.20	1.23	1.16
	$2,285	$2,532	$2,799	$3,205	$3,185	$3,189	$3,853	$4,258	$4,227	$4,110
Total	5.15	5.15	5.45	5.60	5.70	6.87	6.52	7.14	6.63	7.03
	$4,708	$5,174	$5,374	$5,982	$5,893	$6,390	$7,576	$8,826	$8,979	$8,727

Source: National Marine Fisheries Service

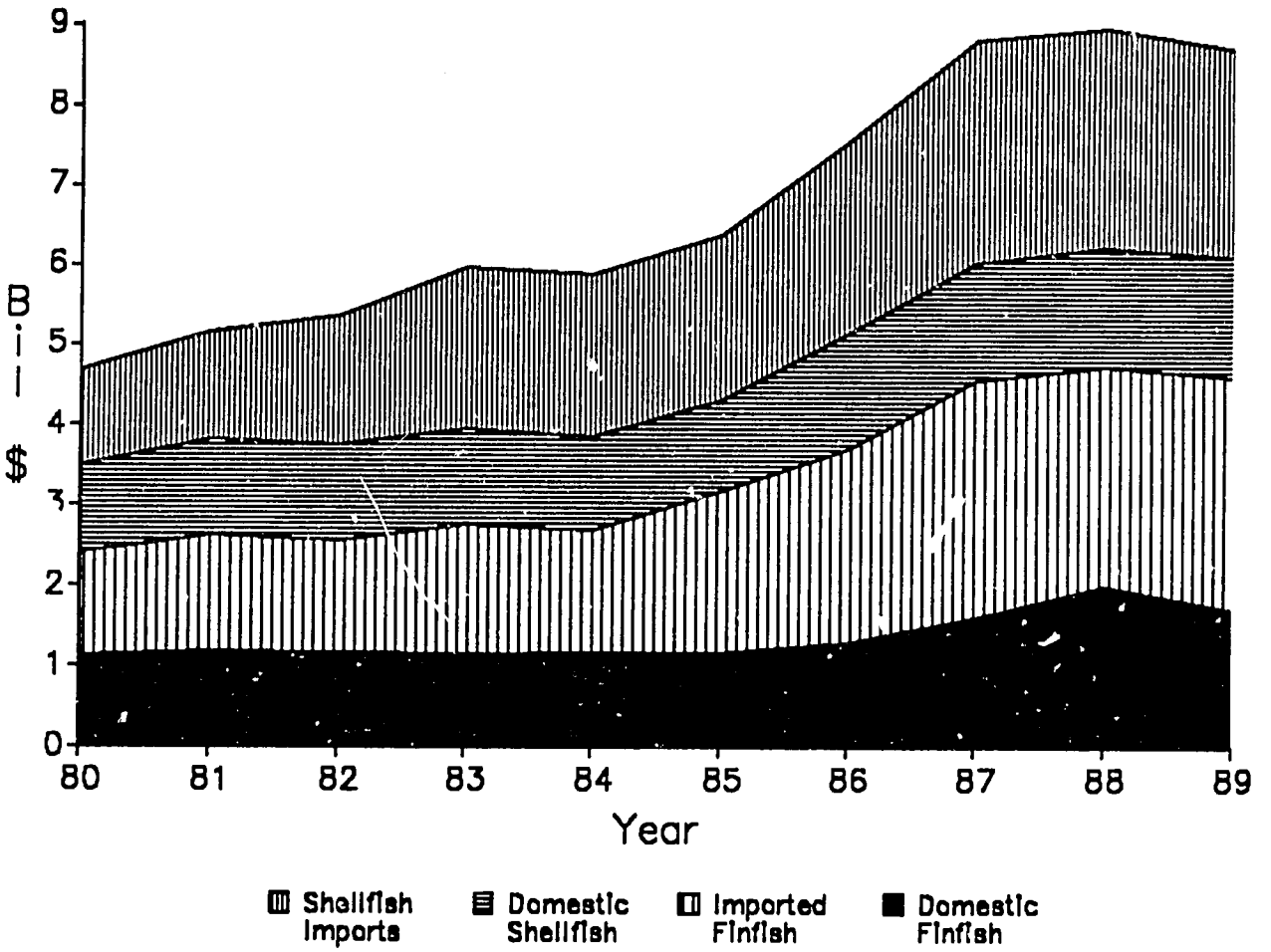
Diagram B–1

U.S. Consumption of Seafood Products
In Tons
1980 – 1989



Source: National Marine Fisheries Service

Diagram B-2
U.S. Consumption of Seafood Products
In Billions of Dollars
1980 - 1989



Source: National Marine Fisheries Service

TABLEAU B-2

PRODUITS DE LA MER LES PLUS CONSOMMES AUX U.S.A.

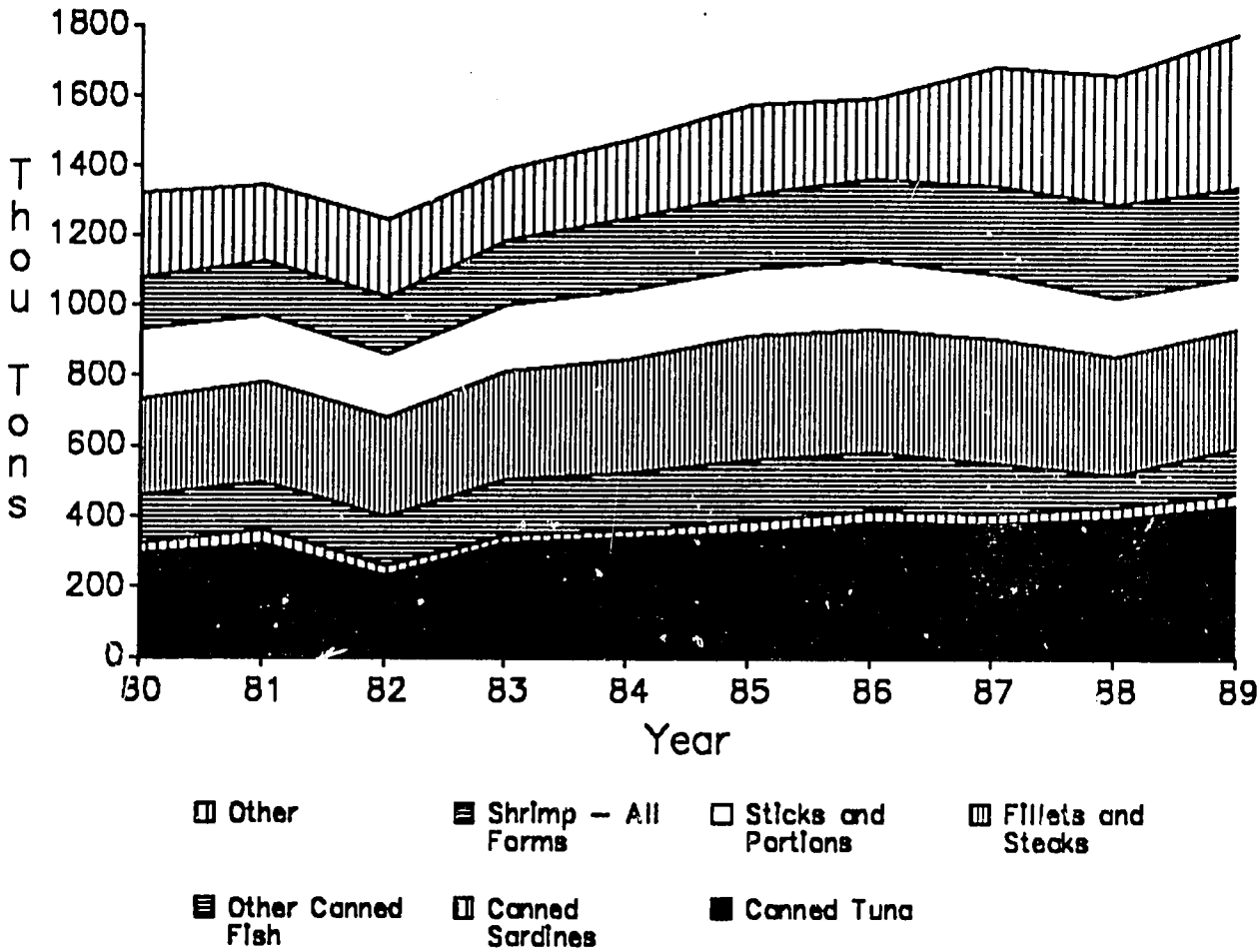
(MILLIERS DE TONNES)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CONSERVES										
Conserve de Thon	300	324	285	330	345	359	391	384	402	439
Conserve de Sardines	31	42	31	21	21	33	33	33	34	34
Autres Conserves de Poisson	135	136	138	160	162	174	163	142	89	101
Total Conserves	465	501	454	511	528	565	587	559	525	574
PRODUITS FRAIS ET CONGELES										
Filets et Tranches	272	286	283	304	322	352	343	351	335	338
Batonnets et Portions	199	186	178	189	197	191	196	186	168	146
Crevettes-Portions Preparations	147	153	160	182	205	215	239	252	268	259
Autres	242	221	223	209	225	253	228	340	368	440
Total Frais et Congeles	860	846	844	884	949	1,011	1,010	1,129	1,139	1,183
TOTAL	1,325	1,347	1,298	1,395	1,476	1,577	1,597	1,687	1,664	1,757

Source: National Marine Fisheries Service

Diagram B–3

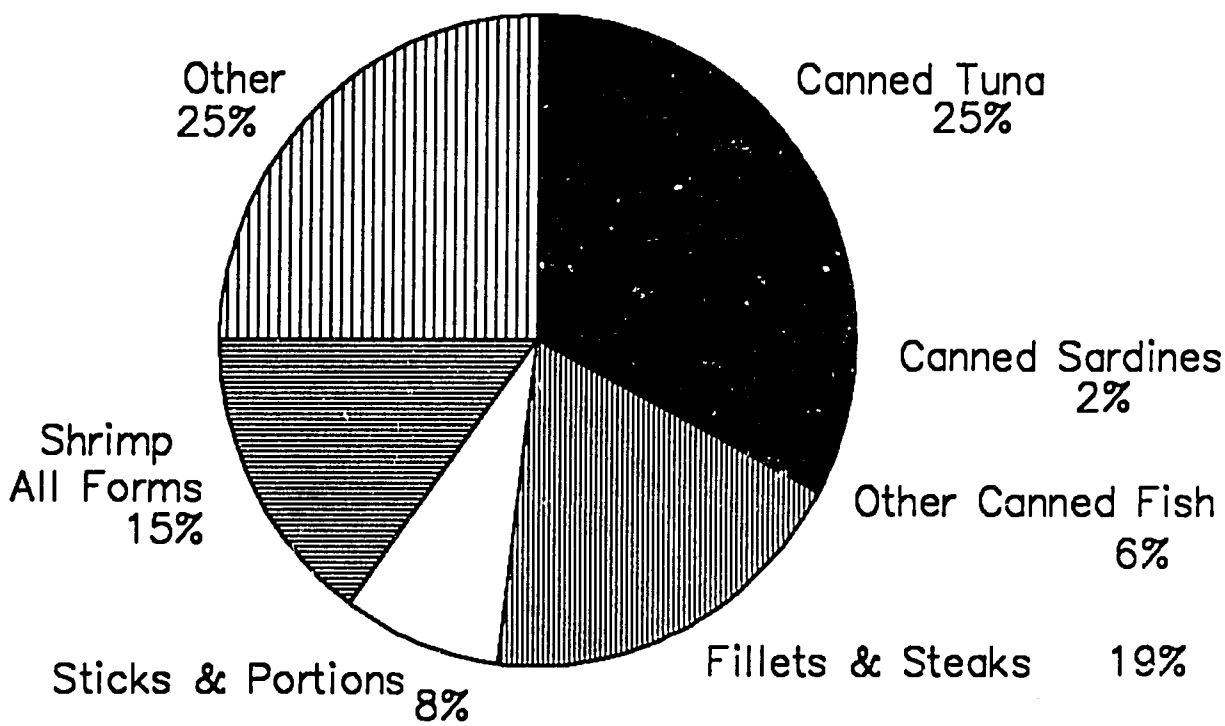
Major Species Consumed in the U.S.
(000 Tons)
1980 – 1989



Source: National Marine Fisheries Service

Diagram B ·4

Percentage Distribution of the
U.S. Seafood Market by Type of Product
1989



Source: National Marine Fisheries Service

TABLEAU B-3

PRINCIPALES CATEGORIES DE PRODUITS DE LA MER
CONSOMMES AUX U.S.A. 1988-1989

	1988			1989		
	Milliers de tonnes	KG/ Habitant	%	Mille Tonnes	KG/ Habitant	%
CONSERVES						
CONSERVE DE THON	402	1.64	24%	439	1.77	25%
CONSERVE DE SARDINES	34	0.14	2%	34	0.14	2%
AUTRES CONSERVES DE POISSON	89	0.36	6%	101	0.41	6%
TOTAL CONSERVES	525	2.14	32%	574	2.32	33%
PRODUITS FRAIS ET CONGELES						
FILETS ET TRANCHES	335	1.36	20%	338	1.36	19%
BATONNETS ET PORTIONS	168	0.68	10%	146	0.59	8%
CREVETTES-PORTIONS PREPARATIONS	268	1.09	16%	259	1.05	15%
AUTRES	368	1.51	22%	440	1.77	25%
TOTAL FRAIS ET CONGELES	1139	4.64	68%	1183	4.77	67%
TOTAL	1664	6.78	200%	1757	7.09	200%

Source: National Marine Fisheries Service

TABLEAU 8-4

ORIGINE DE L'OFFRE AMERICAINE DES PRODUITS DE LA MER

(MILLIARDS DE DOLLARS)

1989

Origine	Poisson		Crustaces		Total	
Production Nationale	$1,726	37%	$1,512	37%	$3,238	37%
Importations	$2,891	63%	$2,598	63%	$5,489	63%
Total	$4,617	100%	$4,110	100%	$8,727	100%

Source: National Marine Fisheries Service

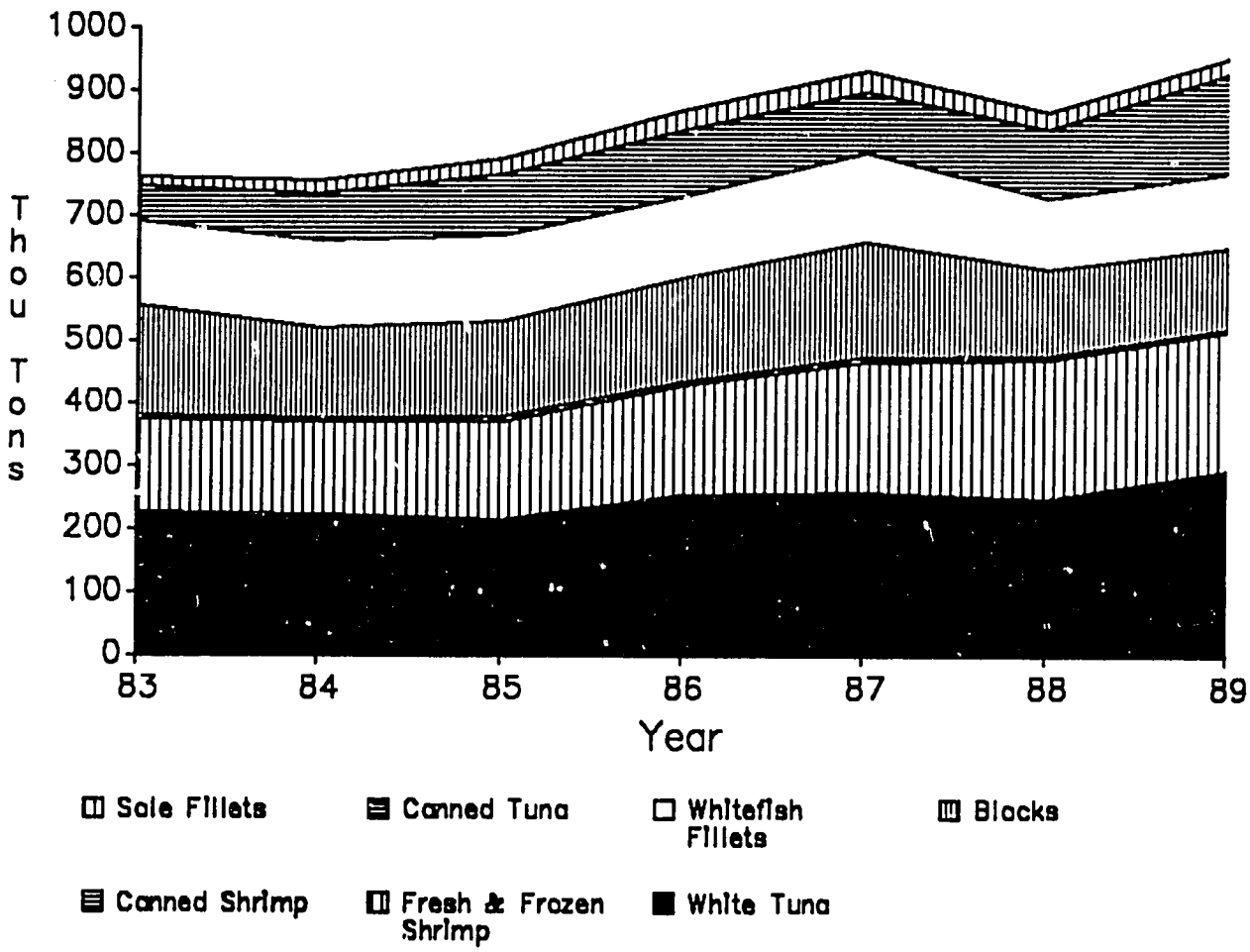
Nearly all categories of imported product have increased steadily since 1983, reflecting continuing growth in demand for these products. Imports have increased by 52% during this seven year period, particularly imports of frozen, headless, shell-on shrimp, whole tuna, and canned tuna.

It is likely that Americans will continue to increase their consumption of seafood products for the foreseeable future. Concern about a healthy lifestyle, which has turned many Americans away from red meat to other sources of protein, has been an important factor in the recent growth in seafood consumption. Other reasons include improved processing and marketing methods by seafood producers and retail outlets, and a relatively new concern with maintaining the high level of quality now demanded by consumers. At the same time, the seafood promotion campaigns supported by the Federal government and various states have heightened the awareness of the American consumer to the advantages of eating a wide range of seafood products. This has translated into strong demand for these products at the retail, institutional, and restaurant sectors. U.S. harvested product has been unable to satisfy this demand, leading importers to identify new sources of supply and to increase shipments from existing foreign suppliers. In this context, the opportunities for high quality Tunisian products appear extremely favorable.

The remainder of this Appendix describes the market segments in the U.S. and their distribution channels, as well as the current conditions of supply and demand for white fish fillets and steaks, and shrimp. These are the Tunisian products which appear to have the most promising opportunities to succeed in the U.S. market.

Diagram B–5

U.S. Seafood Imports by Major Categories
1983 – 1989
(000 Tons)



Source: National Marine Fisheries Service

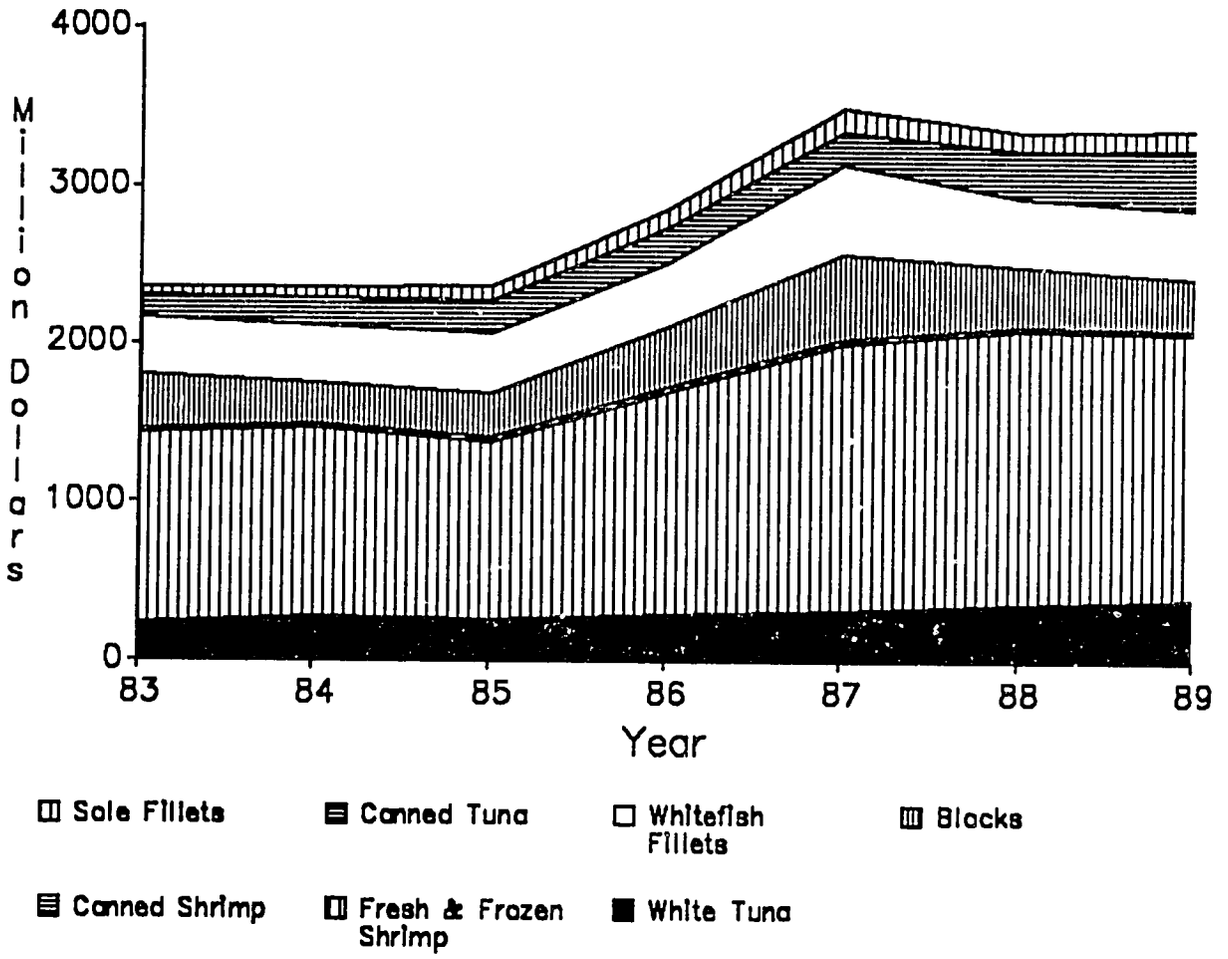
TABLEAU B-5
DES FRUITS DE MER
IMPORTATIONS AMERICAINES PAR CATEGORIES PRINCIPALES
MILLIERS DE TONNES ET MILLIERS DE DOLLARS

	1983	1984	1985	1986	1987	1988	1989
Thon entier	229.21 $245,061	224.04 $281,380	217.23 $266,335	255.67 $298,522	259.76 $330,759	249.61 $372,298	294.80 $401,790
Crevettes fraiches et congelees	148.94 $1,198,023	149.24 $1,189,941	155.54 $1,120,749	174.39 $1,404,931	209.24 $1,676,844	222.21 $1,725,971	223.07 $1,684,788
Conserves de crevettes	5.98 $25,499	6.16 $26,409	7.75 $32,163	7.15 $29,406	7.77 $33,380	6.41 $28,730	5.13 $20,399
Blocs	174.44 $338,554	143.45 $262,901	151.57 $275,064	165.11 $379,887	183.11 $539,358	137.59 $382,482	128.53 $325,689
Filets de poisson de fond	135.29 $369,484	139.68 $368,232	138.70 $380,197	130.26 $410,718	143.11 $570,065	114.88 $431,126	120.24 $437,044
Conserves de thon (non a l'huile)	55.41 $136,906	73.52 $166,774	96.94 $208,578	107.22 $227,919	95.90 $206,051	110.79 $297,922	157.80 $374,987
Filets de sole	16.19 $53,590	20.76 $68,240	26.30 $89,675	29.70 $112,096	33.12 $148,734	26.56 $119,996	26.52 $125,656
Autre	1,923 $1,285,382	2,023 $1,205,532	3,248 $1,723,402	2,920 $1,978,927	3,091 $2,241,856	2,503 $2,111,833	2,234 $2,120,895
Total d'importations	2,682.85 $3,627,000	2,774.05 $3,543,000	4,034.48 $4,064,000	3,782.67 $4,813,000	4,014.52 $5,711,000	3,371.05 $5,441,628	3,190.00 $5,497,849

Source: National Marine Fisheries Service

Diagram B–6

U.S. Seafood Imports by Major Category
(Millions of Dollars)
1983 – 1989



Source: National Marine Fisheries Service

SECTION 2.0 DISTRIBUTION CHANNELS

The American market for seafood products is comprised of three principal segments: retail, institutional, and restaurant. The latter two, generally referred to as the "food service sector," are the most important segments for fishery products, representing approximately 65% of total U.S. consumption of these products.

Within the retail segment there are two types of outlets:

- supermarkets, which belong to large chains or large buying groups; and
- smaller retail stores which are either independent or part of a chain.

As indicated in Diagram B-7, there are two types of buyers in the institutional segment:

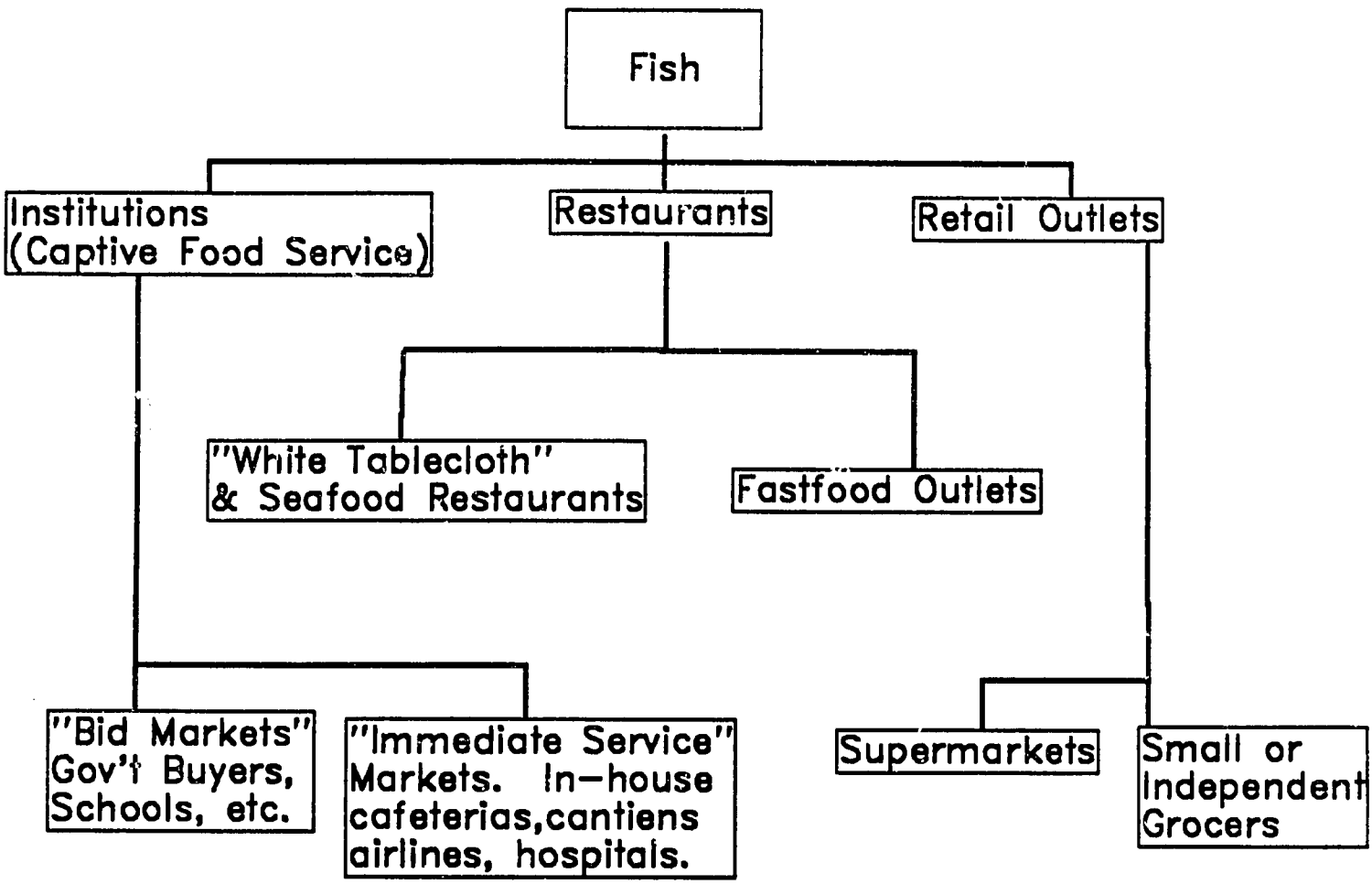
- school systems, Federal feeding programs, prisons and large hospital chains, which issue "bids" or formal procurement requests for large quantities of precisely-specified items; and
- those such as corporate cafeterias, airlines and other institutions not buying on the bid market, which purchase through regular wholesale distribution channels.

In the restaurant segment there are also two types of buyers:

- "white tablecloth" and seafood restaurants whose business depends on providing high quality food on a consistent basis; and
- fast food outlets, such as McDonald's, which sell large quantities of a standardized product.

While the distribution channels for each of these market segments have certain similarities, there are important differences which reflect the market attributes demanded by each type of buyer.

Diagram B-7
Market Segments for Seafood Products
in the United States



The most important segment is the restaurant segment, which accounts for about 46% of total frozen groundfish sales and an even greater portion of shrimp sales (see Diagram B-8). Diagrams B-9 and B-10 illustrate the distribution channels for the institutional and retail segments, respectively. Canned products are sold principally in these two segments.

In all three cases, imports dominate U.S. supplies, and particularly frozen white fish blocks, fillets, frozen shrimp and canned tuna and sardines. Imported products are sold in container loads to large, "master" distributors or importers who arrange for the resale of the container to a wholesale buyer, or who "break bulk" and sell less-than-container-load quantities to a variety of local and national buyers. These buyers then distribute at the local level to individual restaurants, institutions and retail outlets.

U.S. products follow essentially the same channels. In both cases, product is placed in cold storage facilities around the country and released in small quantities to buyers at a price somewhat higher than that of a container load. Several of the major foreign suppliers, in particular the Canadian and Icelandic companies, have established their own sales operations in the U.S. to serve as intermediaries between the exporter and the U.S. buyer. This arrangement allows them to realize the normal markups of between eight and 12% for their own subsidiaries.

In addition to importers and distributors at the national level, each of whom takes ownership of the product and acts as a trader in the marketplace, there are two other types of intermediaries which play an important role in the distribution chain -- the brokers and the secondary processors. Brokers do not take possession of the product, but represent processing firms and distributors in a defined geographic sales region. They have a list of clients with whom they are in regular contact to take orders for the firms which they represent. In a sense, then, they serve as an independent sales operation for the exporter and the importer. For providing this service, brokers generally receive a commission of five percent, depending upon the product and the general level of competition in the marketplace.

Secondary processors, most of which are also importers and nationwide distributors, tend to buy large quantities of raw product -- fillets, fillet blocks, and raw, shell on shrimp -- to process into a variety of value added products such as fillets, steaks, breaded sticks and portions, breaded shrimp, etc.

Diagram B-8

Distribution Channels for Frozen Seafood Products in the Food Service Segment

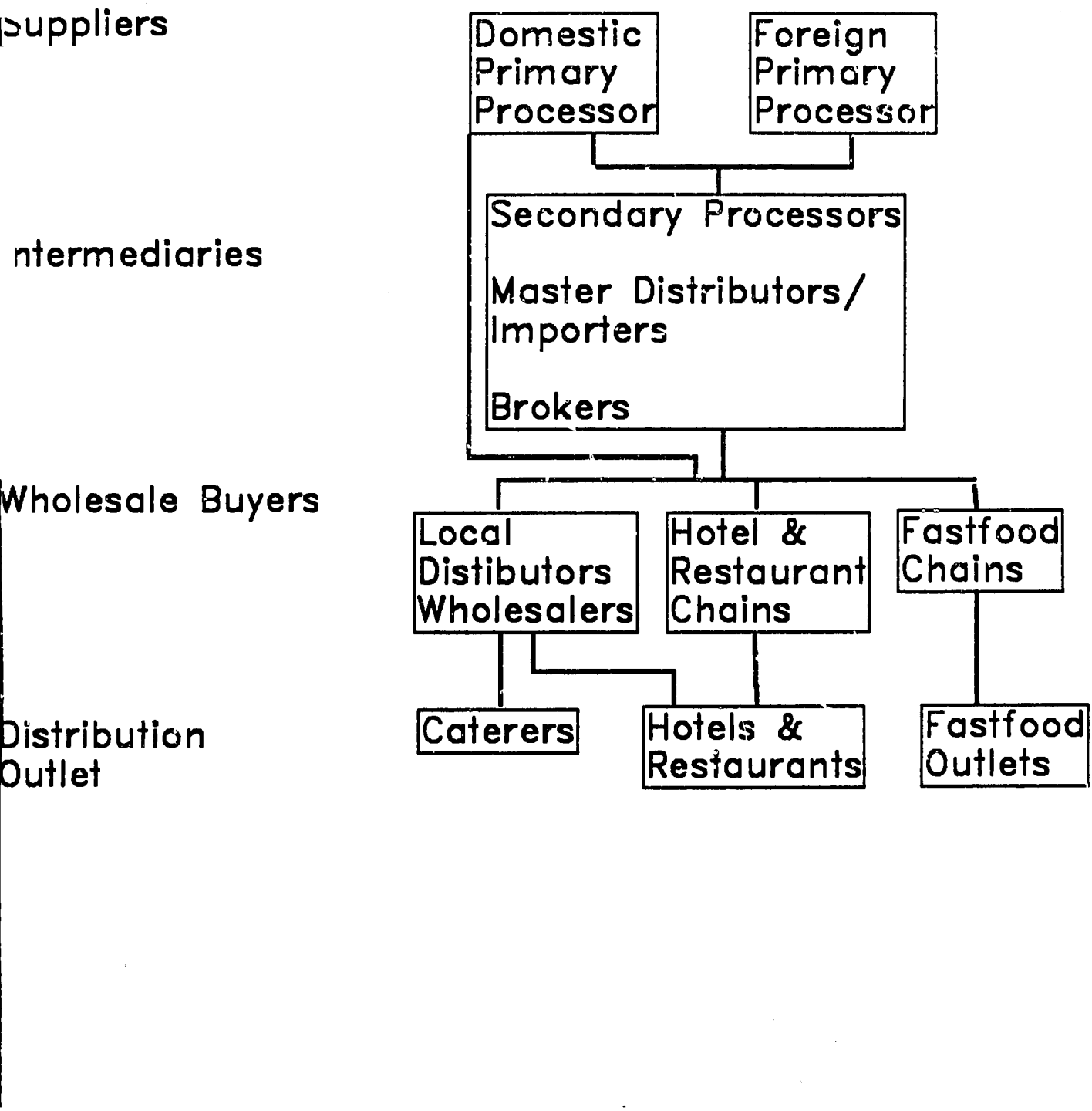


Diagram B-9

Distribution Channels for Frozen Seafood Products in the Food Service Segment

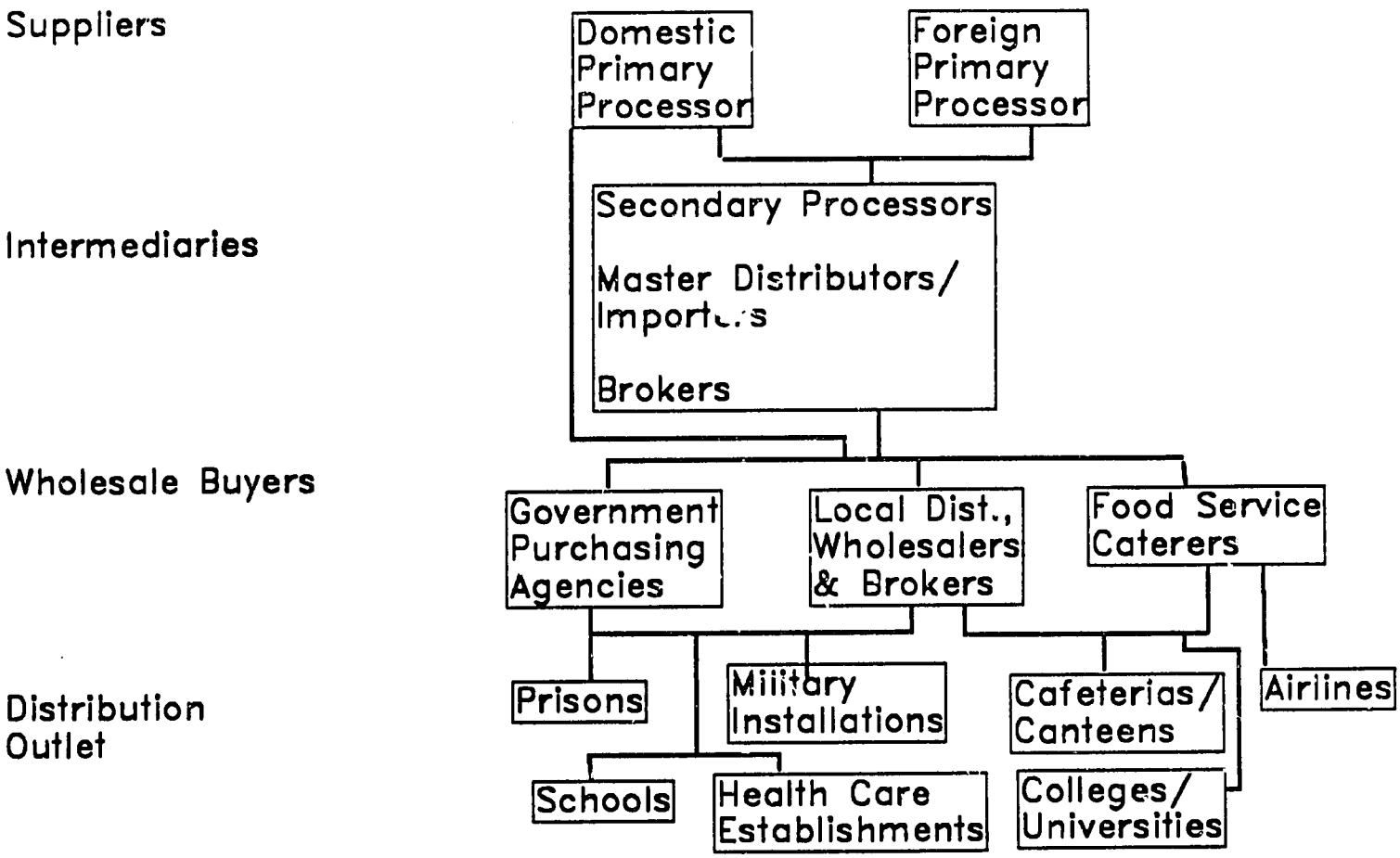
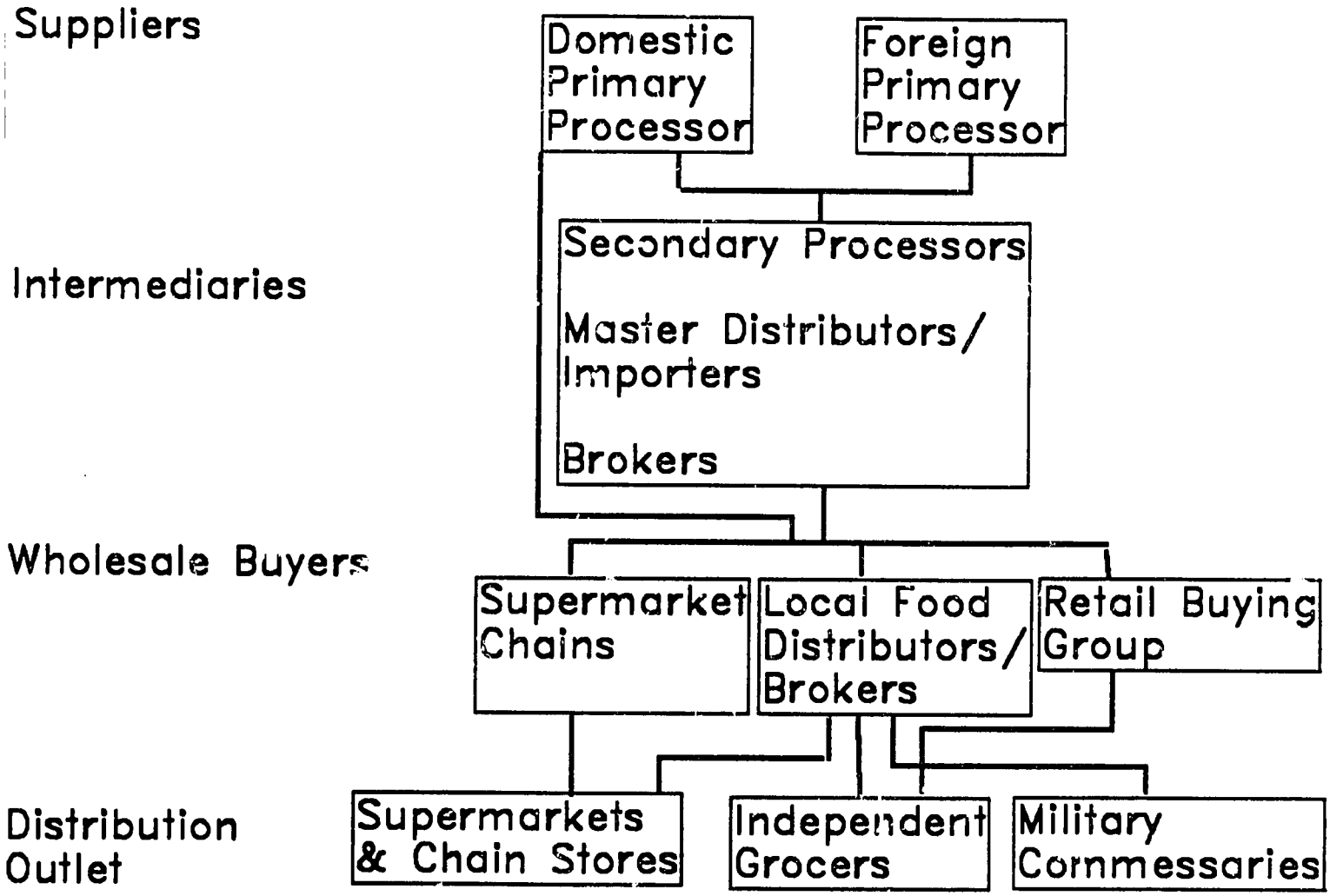


Diagram B-10

Distribution Channels for Frozen Seafood Products in the Food Service Segment



These value added products are then placed in packages for sale at the retail, institutional and restaurant level, and are sold directly to national or regional chains. In certain cases, these products will be stored in public cold storages prior to being sold to the final buyers by brokers or other agents representing the processing firms.

Each of the segments in the U.S. market has a slightly different set of priorities regarding the most important market attributes. Buyers frequently trade off price and quality, and unless their relative importance is understood within a particular market segment, the seller may be frustrated by trying to sell the wrong product at the wrong price.

For example, white tablecloth restaurants can frequently "differentiate their product" in the consumer's mind by creating and maintaining a reputation for serving interesting and high quality food at reasonable prices. They have some flexibility in what they can charge, and they are willing to pay a little more for their fish from a particular supplier if they can be assured that this product consistently meets the quality standards demanded by their customers.

In the institutional bid market, however, price is the critical determinant in the decision to buy. Generally, the bid document provides the precise specifications to which the product must conform, with emphasis on species, product form, packaging and delivery date. The buyer confirms that the seller's bids meet these specifications and then makes his purchase decision based on price. Quality in an esthetic sense is not important beyond certain average standards.

Table B-6 lists those characteristics of the market which must be considered for each of the three principal market segments. For example, as was mentioned above, price competition is very keen in institutional markets, moderately important in the retail and fast food segments, and relatively unimportant in white tablecloth restaurants. Conversely, quality is most important in the white tablecloth restaurants and less important in the institutional segments. Product form, packaging and distribution are also very important in this segment.

TABLE B-6

Key Market Attributes of U.S. Seafood Markets

- Price
- Quality
- Quantity
- Product form
- Packaging
- Species Preferences
- Distribution/Availability
- Promotion and Advertising Support

In the retail sector, however, promotion and advertising support are essential. Product form and packaging are also very important and must conform to industry norms.

The product form, packaging and quality requirements for white fish, and shrimp are described in detail in this chapter. It is, however, important to note that there are certain minimum requirements in the U.S. market with respect to product quality and presentation which apply to all market segments, and which must be satisfied before beginning an export program to the U.S. The differences among sectors tend to be based on objective perceptions held by each buyer with respect to quality, with this perception having been influenced by the promotion and advertising campaign of the supplier, the actual reliability of supply, and the general characteristics of the products provided by a particular firm.

These perceptions affect the price buyers are willing to pay for specific products. For example, cod fillets from Iceland have consistently commanded a price about $.75 per pound higher in the restaurant sector than the exact same product from Canada. The same situation exists with canned sardines; Norwegian product obtains a higher price than either American or Portuguese product.

It sometimes happens that even if a supplier from an exporting country has product of excellent quality, but other companies in the same country have previously exported product of poor quality, then the high quality supplier will be viewed with the same negative perception rightly attributed to the low quality suppliers. To avoid this problem, certain countries, such as New Zealand, have developed stringent quality standards which must be met by all of their exporters, and have refused export permits for all product which does not meet these standards.

Another difference between the restaurant sector and the retail sector concerns the variety of products which can be sold. Restaurants are much more likely to try new species and new ways of presenting seafood products than are retail chains. In Boston, for example, until recently retail chains have not sold many species other than the traditional cod, flounder, haddock and sole. They have only a passing interest in species such as farm-raised catfish, red snapper, grouper, and other species found in Tunisia, even though these species have developed significant followings in the South and the Midwest. This reflects not only regional differences in consumer tastes, but also the conservatism of the retail buyers, since red snapper and grouper are readily offered in Boston seafood restaurants.

The retail sector is practically impossible for a first time exporter to penetrate. The large secondary processors and master distributors dominate the limited market for frozen seafood products. The retail chains do not accept any new brands without their being part of a broader product line and without a massive, multi-million dollar advertising campaign. The packaging and labeling requirements are very difficult to satisfy due to detailed FDA specifications and regulations on these product characteristics. Also, significant amounts of money must be paid in advance to retail chains for the "privilege" of obtaining shelf space in their stores. If the consumer does not respond positively within a short period of time to a promotional campaign, then the product is quickly removed from the shelf, regardless of the amount of money paid by the supplier.

For these reasons, with the exception of canned products, which are sold principally in supermarkets, the best entry points for new products or new suppliers to the U.S. market are through the restaurant and institutional segments. As indicated above, these two segments are not only the largest -- comprising 65-70% of total seafood consumption in the U.S. -- but their requirements, in terms of product form, packaging, labelling and distribution, are much easier to satisfy. High quality products which are packaged according to standard commercial requirements and which are at competitive prices are generally able to be sold relatively quickly to restaurants, wholesalers and distributors at the local level. Moreover, promotional expenses are small, and there are many buyers searching for quality imported product.

These factors should encourage Tunisian seafood processors (with the exception of canners), to explore the restaurant and institutional segments as the markets with the greatest potential in the United States.

SECTION 3.0 THE AMERICAN MARKET FOR WHITE FISH

The United States represents one of the largest markets in the world for white fish. The most important product forms include fresh and frozen fillets and steaks, and frozen fillet blocks for further processing into breaded sticks and fillets. In recent years, the demand for fillets and steaks has been between 150,000 and 200, 000 metric tons per year (see Table B-7). Imports have supplied most of the demand -- 73.4% in 1989.

The most popular species in the U.S. are those with a mild taste, such as cod, haddock, sole, flounder, turbot, hake, whiting and pollock (See Table B-8). There is also considerable demand for red snapper, grouper, bream, and croaker, which are fished in limited quantities in the Gulf of Mexico and along the Southeastern Coast of the United States (See table B-9).

Canada is the principal source of North Atlantic white fish such as cod, haddock, flounder, perch and whiting. Other important suppliers include Iceland, Norway, Denmark, Korea, Poland, Argentina and Japan. The Canadian products are considered of average quality, while the Scandinavian products have the reputation of being of the highest quality. Table B-10 indicates U.S. white fish imports by species and country of origin. Since the import statistics group together under the category "other species, whole" most of the species available in Tunisia, it is impossible to know exactly what quantity of each specie is, in fact, being imported. It is generally known, however, that the majority of croaker, rouget, grouper, red snapper, and whiting consumed in the U.S. is imported.

3.1 Commercial Aspects of the U.S. White Fish Market

Frozen and fresh white fish fillets are the most common white fish product form sold in the United States. Table B-11 summarizes the different packaging requirements for fillets, which are generally sold in one of the following product forms.

- **"IQF"** - individually quick frozen - in which the fillets are individually frozen and carefully packed in a waxed box which is then placed in a master carton. Several fillets are packaged individually in cellophane and placed in a box of five pounds. Ten of these boxes are then placed in a master carton. This

TABLEAU B-7

DEMANDE AMERICAIN DE FILETS ET TRANCHES DE POISSON BLANC

	1984		1985		1986		1987		1988		1989	
	TONNES	%	TONNES	%	TONNES	%	TONNES	%	TONNES	%	TONNES	%
PRODUCTION NATIONALE	43.078	23.6%	38.223	21.6%	48.552	27.2%	50.221	26.0%	39.998	25.8%	43.509	26.6%
IMPORTATIONS	139.697	76.4%	138.698	78.4%	130.263	72.8%	143.112	74.0%	114.876	74.2%	120.235	73.4%
TOTAL	182.775	100%	176.921	100%	178.815	100%	193.333	100%	154.874	100%	163.744	100%

Source: National Marine Fisheries Service

TABLEAU B-8

IMPORTATIONS AMERICAINES DE FILETS ET BLOCS DE POISSON BLANC ESPECES SELECTIONNEES, 1983 A 1990 TONNES ET MILLES DE DOLLARS

BLOCS	1983	1984	1985	1986	1987	1988	1989	1990*
- Cabillaud	89,801.60	75,292.45	74,617.97	78,346.19	73,915.61	68,157.90	61,531.31	1,091.65
	$211,117	$162,742	$162,748	$215,947	$275,031	$237,317	$195,071	$7,997
- Turbot	1,428.59	1,734.21	1,330.31	807.17	987.75	334.85	307.17	96.64
	$2,216	$2,454	$2,089	$1,805	$3,026	$848	$796	$508
- Aiglefin	12,589.70	8,552.89	7,394.28	11,112.07	12,361.62	8,097.10	5,780.85	2,846.64
	$29,653	$20,764	$17,503	$31,353	$43,783	$27,904	$21,603	$31,705
- Colin d'Alaska	36,057.41	31,498.52	36,025.86	31,635.66	40,479.13	27,911.98	20,762.25	9,920.15
	$46,118	$39,562	$43,899	$44,266	$82,165	$47,647	$31,512	$33,313
- Sebaste	2,738.11	1,709.44	638.38	349.36	1,314.88	612.52	455.99	3,503.18
	$4,414	$2,403	$1,155	$1,957	$4,213	$1,518	$1,219	$19,275
- Merlan	11,067.49	5,368.32	8,627.50	7,295.83	14,857.08	7,552.63	11,002.27	5,819.87
	$13,209	$5,897	$9,827	$10,094	$28,289	$13,935	$15,548	$19,648

* Through December 1990

Source: National Marine Fisheries Service

TABLE B-9
WHITE FISH SPECIES FOUND IN BOTH THE UNITED STATES AND THE MEDITERRANEAN SEA

Latin Name	American Name	Tunisien Name
Sparidae[1]	Scup, Porgy	Dorade, Pargo, Sargo
Sciaenidae	Atlantic Croaker Black Drum	Tambour, Maigre Ombrine, Corvina
Mugilidae	Mullets	Muge cabot
Ariidae[2]	Sea catfish	Barbel
Serranidae	Grouper, Jewfish Sea Bass	Bar, Merou, Serrans
Carangidae	Horse mackeral Jack mackeral	Chinchard
Soleidae Soleinae Sole, Solea	Dover sole	Sole
Scorpaenidae	Red snapper[3]	Rascasse
Sebastes	Rockfish, Ocean perch, Redfish, etc.	Rascasse de fond
Mullidae	Goatfish, rouget Striped mullet	Rouget, Rouget barbet Surmullet

Less common species with a commercial potential in the United States are as follows:

Trichiurus	Atlantic cutlassfish	Poisson sabre
Trachinidae	Weever	Vive
Zeus faber	John Dory	St. Pierre

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[1] In Europe, the names are pagre (red porgy), dorade royale (common sea bream), bogue (black sea bream), and pageot (pandora).

[2] This specie is often confused with the Anarhichas family, known under the name of wolfish or loup. This latter specie is commercialized in the U.S. in fresh or frozen fillet form.

[3] In the U.S., the term "red snapper" is often used for a variety of fish, notably the rascasse, but FDA permits the term "red snapper" only for the specie Lutjanus Campechanus.

TABLEAU B-10

IMPORTATIONS AMERICAINES DE POISSON BLANC ESPECES SELECTIONNEES, PAR PAYS D'ORIGINE TONNES ET MILLIERS DE DOLLARS

	Tonnes	Milliers De Dollars
POISSON BLANC ENTIER		
- Cabillaud, frais		
Canada	11.854,73	$16.572
Maroc	2,82	$3
Autres	109,09	$245
Total	11.966,64	$16.820
- Brosme, Aiglefin, Merlu, Colin d'Alaska, frais		
Canada	25.242,45	$24.453
Autres	145,37	$438
Total	25.387,82	$24.891
- Sole et autres poissons plat sauf le fletan, frais		
Canada	8.217,32	$11.505
Maroc	11,33	$16
Senegal	1,52	$9
Autres	463,16	$2.859
Total	8.693,33	$14.389
- Thon (Skipjack), entier, frais et surgele		
France	21.666,99	$15.524
Ghana	15.517,15	$11.118
Espagne	7.154,23	$5.126
Equador	5.941,71	$4.388
Venezuala	4.258,80	$3.716
Republique de Malagasy	2.639,54	$1.891
Cote d'Ivoire	1.414,98	$1.014
Autres	16.754,82	$13.681
Total	75.348,22	$56.458

Source: National Marine Fisheries Service

TABLEAU B-10
IMPORTATIONS AMERICAINES DE POISSON BLANC ESPECES SELECTIONNEES, PAR PAYS D'ORIGINE TONNES ET MILLIERS DE DOLLARS

	Tonnes	Milliers De Dollars
- Autres Especes de Poisson, entier, frais		
Canada	11.067,93	$8.215
Mexique	7.360,06	$14.104
Equador	4.159,08	$10.544
Costa Rica	3.461,87	$12.160
Venezuala	1.868,32	$5.509
Senegal	55,53	$203
Moroc	13,26	$140
Namibia	5,58	$9
Mali	1,07	$15
Niger	0,61	$11
Seychelles	0,68	$2
La Republique d'Afrique du Sud	0,36	$2
La Republique d'Afrique Centrale	0,02	$2
Autres	4.279,96	$16.329
Total	32.274,33	$67.245
FILETS DE POISSON BLANC		
- Cabillaud, Surgeles		
Canada	41.071,49	$176.956
Islande	23.117,93	$98.316
Kenya	18,37	$75
Autres	14.061,26	$60.043
Total	78.269,05	$335.390
- Brosme, Aiglefin Merlu, Colin d'Alaska, surgeles		
Islande	8.369,38	$28.131
Canada	7.856,67	$27.934
Dannemark	5.031,81	$22.650
Autres	7.532,96	$23.898
Total	28.790,82	$102.613

Source: National Marine Fisheries Service

TABLEAU B-10

IMPORTATIONS AMERICAINES DE POISSON BLANC ESPECES SELECTIONNEES, PAR PAYS D'ORIGINE TONNES ET MILLIERS DE DOLLARS

	Tonnes	Milliers De Dollars
- Des Especes Divers, Filets de Poisson, frais et surgeles		
Argentine	14.711,73	$14.707
Nouvelle-Zelande	12.617,05	$74.341
Uruguay	8.420,88	$16.659
Japan	8.104,53	$43.302
Bresil	7.819,53	$23.334
Taiwan	6.672,93	$20.859
Coree du Sud	5.689,94	$19.313
Cote d'Ivoire	20,31	$63
Angola	18,17	$66
Mozambique	16,96	$104
Nambia	16,93	$58
Maroc	2,04	$8
Niger	1,36	$4
Senegal	1,27	$4
Mali	0,38	$3
Ghana	0,24	$3
Autres	22.508,72	$89.708
Total	86.622,97	$302.538

Source: National Marine Fisheries Service

TABLE B-11

PACKAGING NORMS FOR FILLETS IN THE U.S. MARKET

- **Principal size/weight of master carton -**

  4/10 - four boxes of 10 pounds each (retail and food service)
  10/5 - 10 boxes of 5 pounds each (retail or food service)
  12/1 - 12 boxes of 1 pound each (retail)

- **Size consistency of fillets**

  Each fillet must weigh the amount specified on the box (i.e. 4-6 ounces, 6-8 ounces, etc.)

- **Fillet wrap**

  For retail each fillet must be individually wrapped in cellophane or separable from the other fillets in an IQF pack. For a one pound frozen block, the entire block is wrapped in cellophane

  For a larger weight pack the individual fillet layers must be wrapped in cellophane

- **Labelling**

  Each box must be labeled with the term "Product of Tunisia" and indicate the name of the importer

particular packaging is sold to institutional and restaurant buyers. The individually frozen fillets are also placed in 25 pound cartons.

- **"Layer packed"** - in which a layer of fillets is placed in a waxed box with plastic wrap placed between each layer before freezing. Unless this is done with the greatest of care, it is not always possible to separate the individual layers without first thawing out the entire box. A "shatterpack" version of a layer pack does permit separation of each layer.

Most frozen fillets sold to restaurants and institutional buyers are packed in layerpack cartons or individually frozen. Certain restaurants prefer the IQF fillet because its packaging offers greater protection against dehydration. There is a small but growing market for fillets packaged individually in 10 ounce retail boxes. This represented a market of about $30 million in 1987 for species including cod, haddock, perch, sole and founder. At that time the majority of the fillets were imported, but the development of the Alaska factory trawler fleet in the last several years, and its production of Pacific cod and Alaska pollock has led to a significant U.S. supply in the white fish fillet marketplace.

In general, the frozen fillets packed in detachable layers for the food service sector are packed in cartons of 40, 45 or 50 pounds containing four or five boxes of 10 pounds or three boxes of 15 pounds. The IQF fillets are usually packed in cartons of 25 pounds. Other aspects of the products' processing and packaging are as follows:

- **Glazing:** fillets are usually lightly glazed (3%) to protect against dehydration;

- **Size classification:** Although there are variations by species, the following classification system, in ounces, is usually applied for most white fish species found in Tunisia: 2-4 ounces, 6-8 ounces, and 8 ounces or larger;

- **Boneless, with or without skin:** Most species are sold skinless except for the sea bass and sea bream, each of which has an attractive red skin. All skin-on fillets must be descaled before freezing,

and the bones must be removed, including those in the stomach.

- **Other norms:**

  - The fillet should be blood-free

  - Each fillet must be flat, with a regular appearance,

  - Fillets should be shiny and white, without discoloration

  - There should be no odor or evidence of thawing

- **Labeling**

  - Must be in English with or without a French version, and must indicate the following:

  - "Product of Tunisia"

  - What the contents is, i.e. skinless, boneless, grouper fillets

  - Size of the fillets (i.e. 4-6 ounces)

  - The name of the processor

  - The name of the importer or distributor in the United States

  - Net weight of the contents (net of glazing and packaging).

It is very important to use the name commonly applied in the United States for each specie from Tunisia. For example, in the U.S. the term "red snapper" (rascasse) can be used only with the species Lutjanus Campechanus according to FDA regulations, even though many sellers use this term in a broader sense. Another problem can arise with croaker, which, in a skinless and boneless form is frequently sold as grouper or red snapper. To avoid problems with the FDA from incorrect labeling or false claims with the consequent seizure and destruction of the product, the Tunisian exporter must insist that his American importer supply the common American name appropriate for the precise specie which is being imported.

Although the market for Tunisian species in the U.S. is not as great as the market for cod and flounder, it nevertheless does exist, and particular in the restaurant

segment. The major cities in which markets can be found are East coast cities such as New York, Boston, Philadelphia, Baltimore, Pittsburgh, Cleveland, Detroit, Dallas, Kansas City and Washington, D.C. The Fulton Fish Wholesale Market in New York City is an important distribution point for the majority of species available in Tunisia, and most of the large importers and distributors buy and sell products which are similar to the Tunisian species. Importers in Miami are also interested in these species.

An important segment of the white fish market is the market for 16.5 pound frozen skinless, boneless fillet blocks which are produced in plate freezers. These blocks are sold to secondary processors to be transformed into frozen, breaded sticks and portions. Approximately $325 million of frozen white fish blocks were imported in 1989 (129,000 tons) principally from Canada, Korea, Denmark, Iceland and Poland. Cod blocks are in greatest demand followed by Alaska pollock, hake, red snapper, haddock and sole.

Limited quantities of white fish are sold in other forms. Some white fish are sold whole, gutted, without the head, either to high quality restaurants or to ethnic restaurants which prefer to eat whole fish rather than fillets. The retail market for whole fish is for small, pansize fish for frying, such as breams. Such markets tend to be regional in nature, catering to ethnic groups, southern cities, and lower income population groups. The price for these products tends to vary between $1.00 and $3.00 per pound.

Breams are generally sold at the retail level with the head on, scaled, and gutted. Croaker is often sold headed, gutted and scaled and classified as follows: 8-12, 12-16, 16-18 ounces. The rouget is sold gutted, head on, scaled, IQF. at wholesale markets in New York, at Washington, D.C. and in Boston. The sea bass is sold not only in fillets, but also whole, with or without the head, and gutted.

With respect to the other species, the markets for whole fish are generally concentrated along the East Coast and in the Midwest, although lower priced whole fish are found in retail markets in the South. Demand lasts all year long, although it increases during the fresh season. For example, during the summer and fall, when large quantities of croaker come to the Gulf of Mexico, consumption rises.

Whole fish are usually lightly glazed, frozen, and packed individually in a cellophane sleeve to protect the skin. They are then carefully placed in a carton so as to avoid breaking or curling the tail. The eyes on a head-on product must be brilliant, the flesh firm, and the skin scaled and absent of holes or marks. Whole fish are generally packed in 25 pound cartons, four or five inner boxes to a carton.

3.2. Prices

Recent wholesale prices, per pound, for white fish fillets sold in the United States are relatively high. Cod, the most common specie, tends to sell around $2.55 for Canadian-packed fish, and around $.65 to $.75 more for Icelandic product. Sole and flounder are very expensive and sell around $3.50 or more per pound. Frozen fillets of red snapper sell around $2.75 to $3.25, depending upon the size and the country of origin.

3.3 Prospects for Tunisia

The American market for frozen, mild, high quality white fish is strong and will continuing to expand. The American consumer is accustomed to cod, sole and other similar species. However, he or she is willing to try new species, particularly in restaurants, if their appearance and taste resemble those of the common species. The sea bass, and to a lesser extent the rouget and the sea bream, have already established a position in the American market, and their buyers are constantly searching for new sources of supply. Thus, if the Tunisian exporters are prepared to supply quality fillets which can meet the specifications and price requirements of American consumers, they will find immediate opportunities in the U.S. market.

SECTION 4.0 THE U.S. MARKET FOR SHRIMP

The United States is an important export market for shrimp and shrimp related products for many countries. The United States is currently the second largest importer of shrimp in the world, behind Japan. In 1989, the United States imported more than 228,000 metric tons of shrimp worth over $1.7 billion. With U.S. consumption rising and domestic landings stagnant, imports are gaining a larger share of the domestic market.

Tunisia currently produces saltwater white and pink shrimp (Penaeus kerathurus and Parapenaeus longirostris) with both heads and shells on. Although the Spanish and the French prefer whole, shell-on shrimp which the consumer peels while eating it, whole, unpeeled shrimp is rarely served in the United States, except in ethnic communities. Americans prefer head off shrimp, raw, cooked or breaded.

4.1. U.S. Consumption of Shrimp

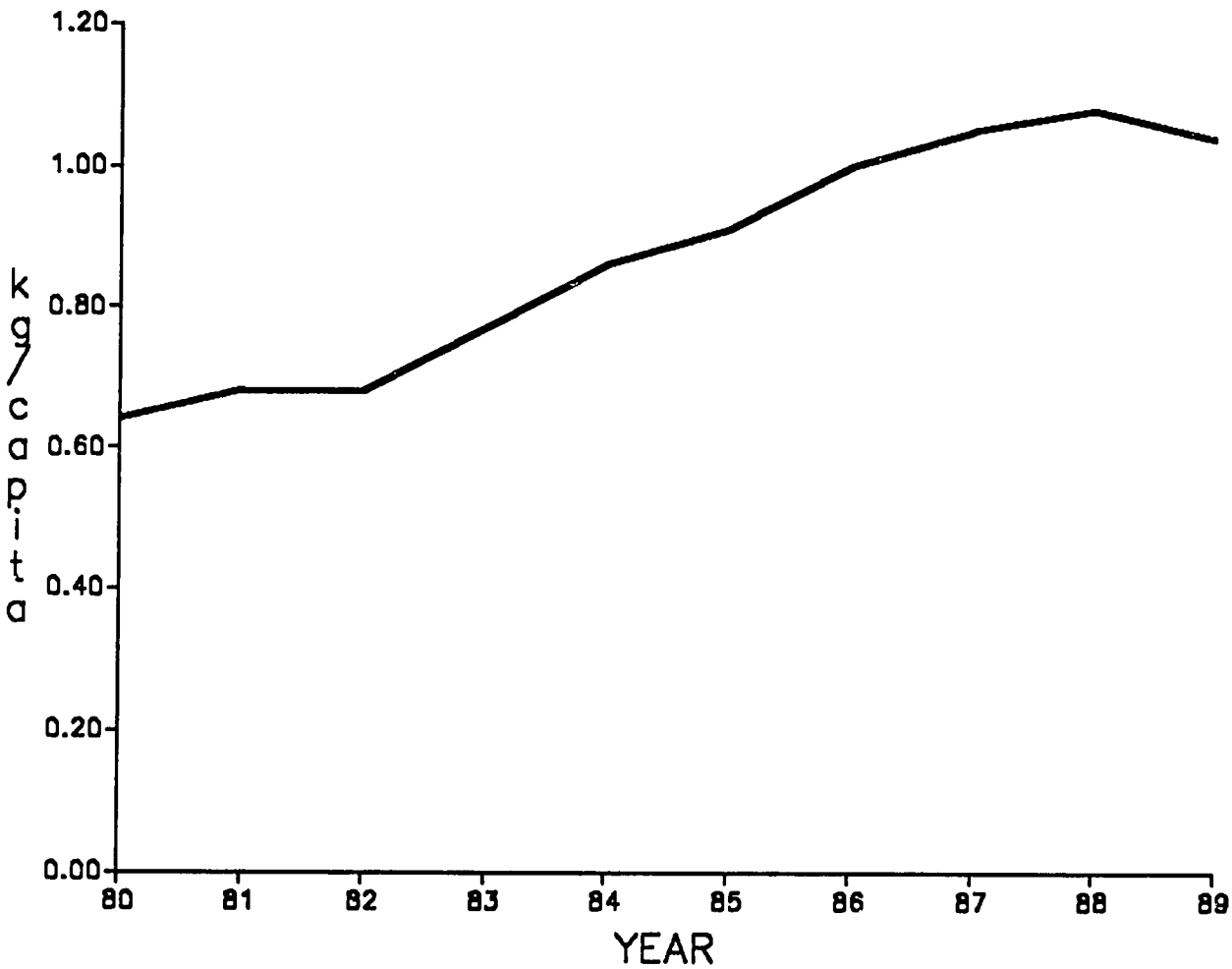
U.S. consumption of shrimp has steadily increased from .64 Kgs per capita in 1980 to 1.05 Kgs per capita in 1989 (See Diagram B-11), and is expected to grow further. This increase can be attributed to some extent to the health orientation which Americans have adopted in the last decade. As seafood has received public acclamation as a "healthful" food, Americans have increased their seafood consumption. Restaurant and fast food franchises have also taken advantage of Americans' changing nutritional patterns by offering seafood products on their menus. As an example, McDonalds recently introduced shrimp salads to their menu. With fast food franchises increasingly offering shrimp dishes on their menus, consumption will certainly increase in the future, particularly if prices continue to decline as worldwide supplies continue to grow.

Demand in the United States exists for every size of shrimp. Large sized shrimp (under 15 count) are served mainly in "white tablecloth" restaurants as main dishes, while slightly smaller shrimp (16-20 count) are used by restaurants in shrimp cocktails. Medium sized shrimp (26-50 count) are used by processors, often in breaded shrimp products. Breaded shrimp are often served in family style restaurants. The small shrimp with higher counts are used by restaurants for salads and by processors for shrimp based products.

The bright picture for the American market contrasts sharply with current forecasts for the world's largest shrimp importer, Japan. Japan's annual per-capita consumption rate

Diagram B-11

American Per Capita Consumption of Shrimp 1980 - 1989



Source: National Marine Fisheries Servicew

is the highest in the world (1.9 Kgs per year), but population growth is stagnant. As the country becomes more affluent, Japanese eating habits, particularly among the younger generation, are changing, with more meat and less fish-related products being consumed. Shrimp might be an exception, as more restaurants in Japan are offering shrimp dishes, but Japan's imports may not grow substantially in the near future. The United States is likely to be the primary growth market for shrimp exporters in the foreseeable future.

4.2. U.S. Supply of Shrimp

As consumption has increased, the U.S. supply of shrimp has grown dramatically, increasing 45% (from 268,000 metric tons to 388,000 metric tons) between 1983 and 1989. A large part of this increase was satisfied by domestic landings, but imports increased 48% from 1983 to 1989 (See Diagram B-12 and Table B-12). During 1989, import growth accelerated while domestic production declined. Future growth will depend upon imports, as North Pacific and North Atlantic stocks have been almost fully exploited. In particular, the United States will depend upon warm water production from Latin America and Asia, including farmed shrimp.

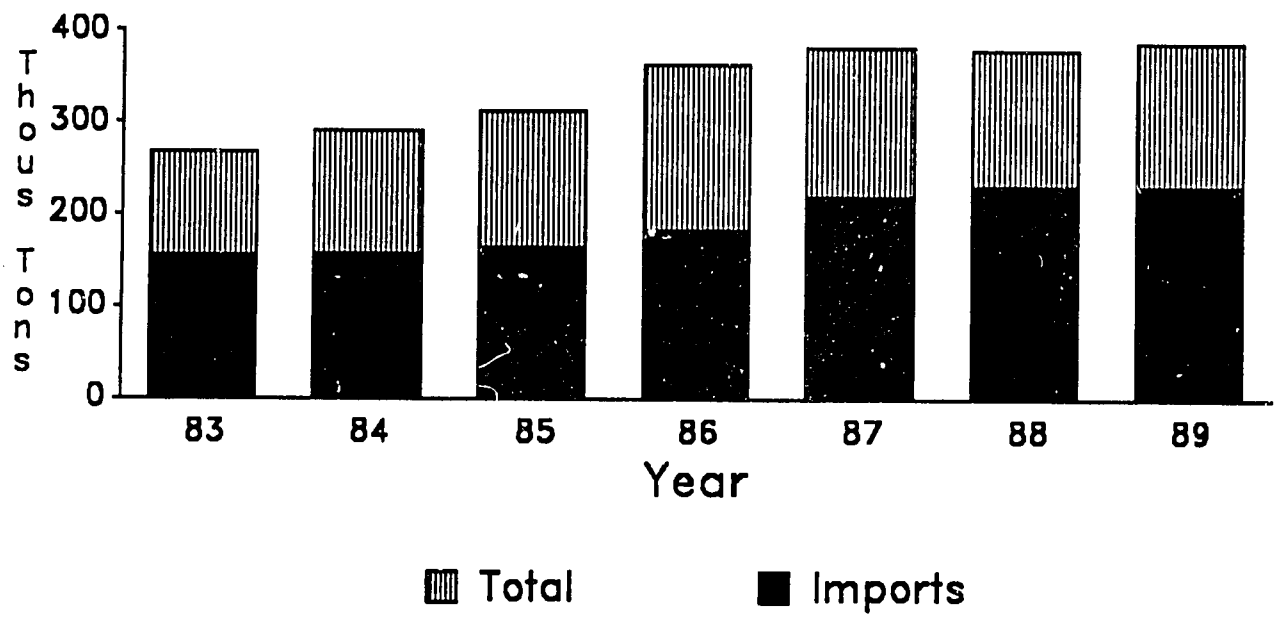
Between 1983 and 1989, U.S. domestic shrimp landings increased 41%, from 113,000 metric tons to 159,000 metric tons. Domestic landings peaked in 1986 at 181,000 metric tons and then declined since 1987, mainly due to reduced landings from the Gulf of Mexico. It is unclear whether landings from the Gulf will improve in future years, but with North Atlantic and North Pacific landings stagnant, domestic landings will probably not increase greatly in the near future.

4.3. Shrimp Imports

Since domestic landings peaked in 1986, imports have grown steadily and are expected to remain at a high level for the foreseeable future. U.S. shrimp imports increased dramatically after 1980, reaching 227,000 metric tons in 1990, more than double the 99 thousand metric tons imported in 1980 and at about the same level as in 1988 and 1989.

The U.S. imports shrimp in one of five different product forms, all of which are headless. The most popular form is fresh or frozen shell-on shrimp, which comprised 62% of shrimp imports in 1990. Peeled, raw, fresh or frozen shrimp is the second most popular variety, comprising 30% of total shrimp imports, followed by other types of shrimp, (3% of imports), canned shrimp (2% of imports) and breaded shrimp (less than 1% of imports). (See Diagram B-13).

Diagram B-12
The U.S. Markets for Shrimp
(Thousands of Tons)
1983 - 1989



Source: National Marine Fisheries Service

TABLEAU B-12

La Demande Americaine De Crevettes
Tonnes Et Milliers De Dollars
1983 A 1989

	1983	1984	1985	1986	1987	1988	1989
Importations	154.913	155.397	163.297	181.536	217.017	228.62	228.205
$	1.223.522	1.215.350	1.152.912	1.434.337	1.710.247	1.754.701	1.703.087
Domestiques	113.281	136.912	150.402	181.572	164.765	150.124	159.489
$	503.395	438.4	472.85	662.744	578.084	506.034	467.571
Total	268.194	292.309	314.699	363.108	381.782	378.744	387.694
$	1.726.917	1.704.750	1.625.762	2.097.081	2.288.308	2.260.735	2.172.758

Source: National Marine Fisheries Service

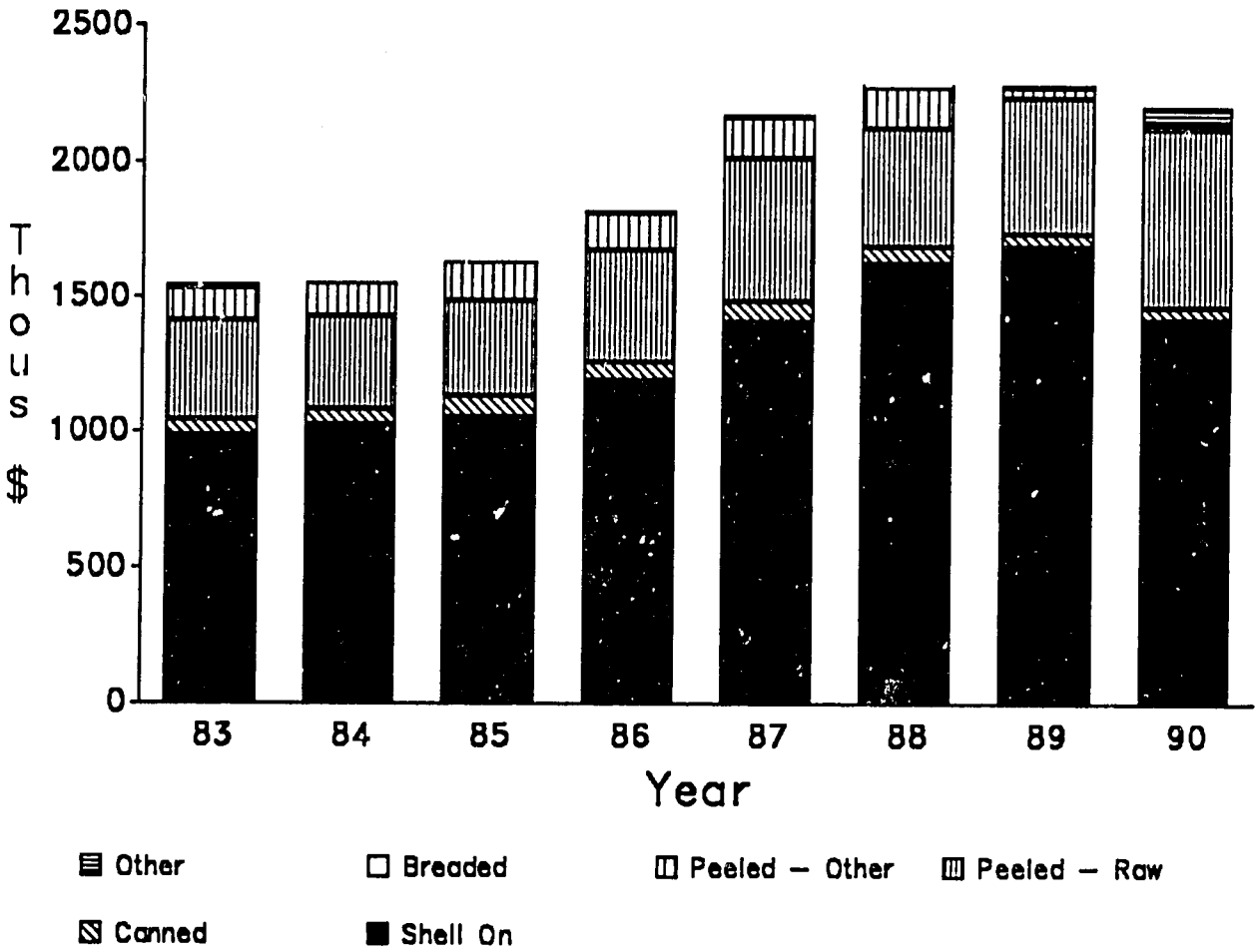
TABLEAU B-13

Importations Americaines De Crevettes
Par Presentation Du Produit Final
Tonnes Et Milliers De Dollars
1983 A 1990

Forme	1983	1984	1985	1986	1987	1988	1989	1990
Avec Peau	98.435	102.403	105.554	118.895	140.686	162.778	168.99	142.089
$	896.306	913.993	866.566	1.080.127	1.224.234	1.337.211	1.363.564	1.154.040
En Conserve	5.978	5.162	7.753	7.149	7.773	6.415	5.134	4.415
$	25.499	26.409	32.163	29.406	133.38	28.73	20.399	19.51
Epulche-Cru	37.006	34.329	35.178	41.671	52.953	43.793	49.645	66.348
$	218.186	205.038	173.298	221.263	313.521	244.016	277.812	394.02
Epulche-Autre	12.276	12.359	14.54	13.716	15.055	15.012	4.189	1.06
$	72.655	70.106	79.348	102.709	136.137	142.256	42.471	6.862
Pane	1.218	145	271	106	549	621	247	146
$	10.876	804	1.537	832	2.952	2.488	941	598
Autre								6.911
$								85.667
Total	154.913	155.397	163.297	181.536	217.017	228.617	228.201	227.992
	1.223.522	1.216.350	1.152.912	1.434.337	1.353.323	1.754.701	1.705.187	1.660.697

Source: National Marine Fisheries Service

Diagram B-13
U.S. Imports of Shrimp by Product Form
(Thousands of Dollars)
1983 - 1990



Source: National Marine Fisheries Service

Mexico has traditionally been the largest supplier of shrimp products to the United States, but the development of shrimp farming (aquaculture) has had a dramatic effect on the origin of U.S. shrimp imports in recent years. As shrimp aquaculture technology has been perfected, farmed shrimp has surpassed wild shrimp as the most important source of imported product. In 1988, due to its successful aquaculture program, China replaced Ecuador as the largest exporter of shrimp to the United States. In 1990, China exported more than 57,000 tons of shrimp to the U.S., an increase of 23% over the amount reported in 1989.

Shrimp supplies will definitely increase in the next several years as more countries develop or expand their aquaculture programs. In Southeast Asia, where Taiwan, China, Japan, Thailand, the Philippines, Indonesia, India, Bangladesh and Burma are all expanding their aquaculture programs, there will be increasing competition to gain market share in the United States.

4.4 Prices

Like most internationally-traded commodity products, shrimp prices vary dramatically, depending upon the supply and demand internationally. Since weather conditions are an important variable for both wild and farm-raised shrimp, supplies can change greatly from year to year. A bad harvest by a major shrimp producing nation can bring notable increases in international prices.

Seasonal patterns are also important in determining U.S. prices. Shrimp prices of a particular size and color rise and fall in tandem with production seasons. In the United States, prices tend to decline in May and June when the Gulf of Mexico season begins. Import prices have traditionally followed domestic ex-vessel prices, although this is changing as imports are increasingly dominating the market.

Import prices are strongly affected by the quality and reliability record of the producing nation and the individual packer. Variations in selling prices of shrimp from different countries reflect the producers' reputation for good quality, accurate weights and counts, and uniformity of size and color.

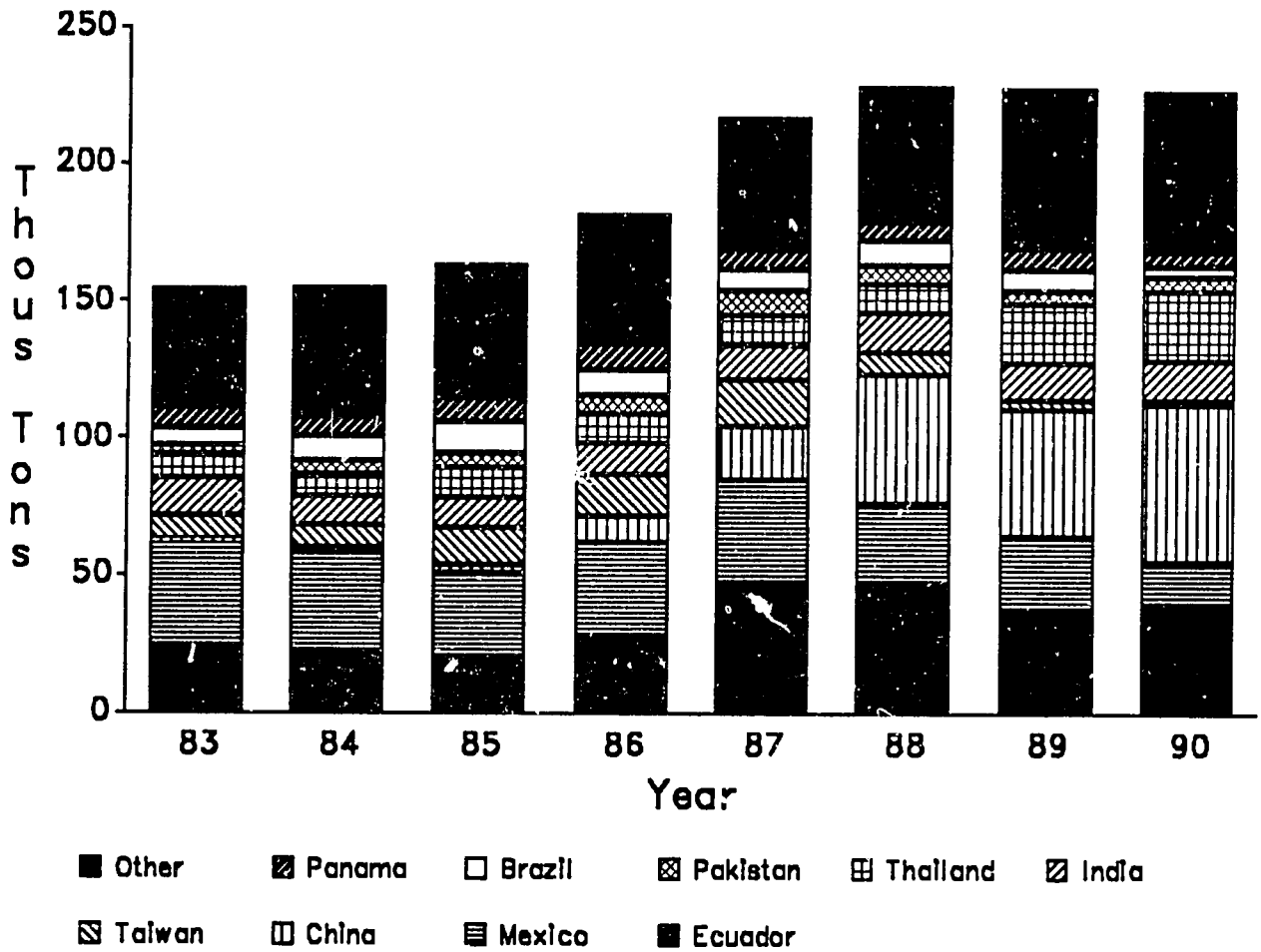
Although the market is highly dependent upon supply and demand, there are some basic trends. Prices differ greatly depending upon specie, size, color, and form. Larger shrimp are generally more expensive than smaller shrimp. Prices of medium and small shrimp peaked in 1986 and have fallen since that time as supplies of imported products, particularly from Ecuador and China, have expanded. Shrimp with count size of 26/30 per pound have fallen from over $14.30 per KG in mid

Diagram B-14

U.S. Imports of Shrimp by Country of Origin

(Thousands of Tons)

1983 - 1990



Source: National Marine Fisheries Service

1986 to approximately $13.00 per KG in March 1991. (New York Wholesale Prices) Since increases in aquaculture production impact the medium and small market the most, (it is costly to farm large shrimp) prices for these sizes could remain soft for the foreseeable future.

While the prices of medium and small size shrimp have been falling, large shrimp (counts of 15 and under per pound) have seen prices rise due to supply problems. With supplies of large shrimp extremely limited, prices should remain high in the near future.

4.5 Product Form, Packaging and Quality Requirements

The standard shrimp product found in the United States is a frozen five pound block of raw (or "green"), headless, skin on shrimp. Except for limited ethnic markets, there is almost no market in the U.S. for head on shrimp. There is, on the contrary, a strong market for shell-off, raw, undeveined or deveined shrimp. Many restaurants prefer the raw, shell on shrimp.

The commercial characteristics of frozen shrimp are as follows:

- **Presentation:** skin on, headless, frozen in a block of 2 to 5 pounds or IQF;

- **Packaging:** the blocks must be packed in a plastic bag and placed in a waxed box inside of a master carton weighing 50 pounds. The IQF shrimp must be put in three pound plastic bags, 10 bags to a master carton. The product must be graded carefully and the number of shrimp per pound in the bag or box must be clearly indicated in the labeling. The American size grading system must be used.

- **American Size Grading System:** In the U.S., shrimp are sold according to a size grading system which is based on the number of shrimp per pound of a given size, measured with the skin on. The number must be consistent, that is, all the shrimp within a particular packaging must have the same size. The classification system is as follows:

  ♦Under 8 shrimps per pound (6-8 per pound)
  ♦Under 10 shrimps per pound (8-10 per pound)
  ♦Under 12 shrimp per pound (8-12 per pound)

♦Under 15 shrimp per pound (11-13 or 13-15)
♦16 to 20
♦21 to 25
♦26 to 30
♦31 to 35 or 31 to 40
♦36 to 40
♦41 to 50
♦51 to 60
♦61 to 70
♦71 to 80 or 71 to 90
♦91 to 100
♦110 to 130 or 100 to 200
♦130 to 200 or 130/150 to 150/200
♦200 to 300 or 300 to 500 and above

Most shrimp with shell on are of the under 15 variety, or "U/15," to 61 - 70. Shell on shrimp smaller than 71-90 are very rare.

- **Quality Standards**

  - Frozen blocks must be packaged in plastic wrapping in cardboard boxes placed in a master container;

  - Glazing must completely cover the entire block;

  - The packages of IQF shrimp must be of strong plastic without any indication of ice crystals in the bags. The shrimp must be individually glazed and entirely separated;

  - The product must have a fresh appearance and odor. There should be no sign of any dehydration or of white spots along the edges, or any soft places;

  - There should not be any black spots on the shrimp, or any indication of sulfites;

  - Unless the labeling indicates that "broken pieces of shrimp" are in the box or sac all shrimp must be whole, with five parts to each tail. There should not be any broken shells;

  - The packaging must not contain any pieces of shell, feet, tentacles, or other foreign material;

- The number of shrimp and their weight must be guaranteed; and

- The shrimp in the middle of the package must conform exactly to the specie and presentation described in the labeling and the invoice.

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