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*A*tlantic Canada's Position in the International Fish and Seafood Trade

Seafood products in general and shellfish in particular have become increasingly popular with a growing number of consumers. These products now account for 16 percent of the animal protein consumed worldwide, and demand per person is growing, a trend that recent studies say should continue. According to the National Marine Fisheries Service, world demand for seafood products will increase by 50 percent in the next fifteen years and reach 120 million tonnes.³⁷ Globally, three-quarters of fisheries production is destined for human consumption, one-third of which is sold as frozen products, while the rest is canned, salted, dried, or smoked. Given the characteristics of fish and especially the problems preparing it, demand for it is higher in its processed forms and as items on restaurant menus. It should be noted that the real price of fish is rising more quickly than the price of other foodstuffs, particularly meat and grains.³⁸ In the short term, this is the result of limited supply — supply being the determinant of market prices. In the long term, however, the price of fish is influenced mainly by demand and generally fluctuates more than the price of other food products.

Of all the major food categories, fish, crustaceans, and molluscs (both fresh and processed) are the most marketed worldwide. No fewer than 195 countries export a percentage of their production, and 180 countries import fisheries and aquaculture products in varying volumes. Exports reached 23 million tonnes in 1997, close to three times the volume sold in 1976, while in the same year the percentage of world production destined for import-export rose to 38 percent.³⁹ Since 1995, exports have brought in over US\$50 billion per year, which is approximately 10 percent of the value of agricultural

37. National Marine Fisheries Service, *News Release* (Washington, DC, June 2000).

38. In real terms, the price of beef in the United States has decreased by 11 percent since 1982; pork, 23 percent; and chicken, 7 percent, while the price of fish, all categories combined, has increased by 52 percent: according to "Fish Price Index Prices," *Fulton Fish Market News* (March 2000).

39. FAO, *World Review of Fisheries and Aquaculture* (August 1999), 16–18

exports. In terms of value, almost all fish exports (95 percent) are in the form of edible products, although in volume, fishmeal and fish oil account for a substantial percentage (28 percent in 1997) of world fisheries production. Over 90 percent of traded products have undergone fairly substantial processing.

Growth in the seafood products trade has kept pace with growth in production, a trend that has accelerated in recent years. The upsurge in imports and exports is linked to worldwide economic growth and is supported by the expanding supply of a variety of seafood products from around the world. The increase in supply can also be attributed to aquaculture, particularly the farming of popular species such as shrimp, whitefish, salmon, and shellfish. However, a percentage of the increase in world seafood trade is only nominal, the result of trade among countries that belong to a single political entity.

What are the factors behind the demand for seafood? There are several, including a higher standard of living, urbanization, demographic and social changes, the health benefits of eating fish, the growth in tourism, and so on. All these factors affect not only the level of demand but the nature and type of products consumed. Consumers are increasingly turning to fresh and ready-to-serve processed products, take-out and delivery, and restaurants.⁴⁰

As we have seen, the world supply of seafood products is not only demand-driven; it is also stimulated by innovation and mass-marketing strategies. In fact, the distribution and marketing sectors are undergoing strategic restructuring, forcing suppliers and buyers-distributors of fish products to cooperate with each other more effectively. The entry of major agri-food producers into the fisheries is also resulting in a more consistent supply as well as in quality standardization. Wide-scale distribution, both of fresh and prepackaged, preserved products, means that large volumes of extremely fresh basic products have to be supplied upstream. At the same time, there is a push to develop aquaculture products so as to exercise greater control over both the supply and the quality of fish and seafood, especially since local supply is still too often vulnerable to the vagaries of the fishery and to price wars that push up the price of basic products.

40. We might mention in this regard the proliferation in the United States of the all-you-can-eat seafood buffet restaurants. See Seafood.com "Buffet Restaurants Increasing Factor in Seafood Sales" (July 1999).

Industrializing countries are increasingly active in the international trade in food products, both as buyers and suppliers, thereby contributing to the steady and increasing globalization of production and trade. More directly, however, it is the growing array of new products available on the markets, quality standardization, and more effective international networking by suppliers of raw materials, processors, and intermediaries that are increasingly stimulating the world market.

That said, Western countries dominate seafood product importing/exporting, accounting for half of all exports and 90 percent of imports. Nevertheless, developing countries, Asian countries in particular, are also making an important contribution to the seafood trade, given that close to half the supply finding its way onto world markets (46 percent of the volume and 49 percent of the value of world exports) is shipped by Asian countries. Half the world's seafood exports come from developing countries and are imported mainly by developed countries.

The geographical flow of the seafood trade has changed markedly since the early 1990s, particularly with respect to imports (see table 12). For example, the European Union's share of world imports fell from 38 percent in 1990 to 32 percent in 1997, although the total value of its imports increased from US\$15 billion to US\$18 billion. The same is true for Africa, which saw its share of fish and seafood imports fall from 2.2 to 1.7 percent. Imports rose in Asia (Japan excluded) from US\$3.9 billion in 1990 to US\$7.7 billion in 1997, increasing Asia's percentage of total imports from 9.8 to 13.6 percent. Japan, the world's third-largest trading bloc and top importer of seafood products, has also been importing more to meet its huge demand: the value of Japanese fish and seafood imports went from US\$10.7 billion in 1990 to US\$17.1 billion in 1996, but fell again to US\$15.6 billion in 1997 because of the country's financial crisis. Japan has also maintained its share of the import market, i.e., approximately 27 percent, as has the United States, whose market share is still hovering around 14 percent.

There have also been major changes in exports, although less than in imports. Asia (excluding Japan) has increased its percentage of world seafood exports from 25.7 to 26.6 percent. Although this may seem minor at first glance, the result is an increase of approximately US\$5 billion, *twice* the value of Canadian exports. Exports from the

Table 12
Imports-Exports of Seafood Products,
by Trading Bloc, 1990–97

Trading Bloc	1990	1992	1994	1996	1997
Imports (in millions of US\$)					
European Union	14,975	16,500	16,211	18,471	18,056
Japan	10,668	12,832	16,202	17,098	15,588
United States	5,568	6,024	7,043	7,080	8,150
Rest of Asia	3,867	5,394	6,465	7,752	7,647
Rest of Europe	1,714	1,928	2,305	3,141	3,167
Canada	620	687	922	1,168	1,137
Africa	883	845	877	903	934
South America	269	280	504	782	791
Common. Ind. States	–	70	287	500	513
Central America and the Caribbean	283	277	396	351	346
Exports (in millions of US\$)					
Rest of Asia	10,166	12,245	15,925	16,596	15,016
European Union	7,795	8,390	8,970	10,680	10,574
Rest of Europe	4,135	5,635	6,848	8,102	7,521
South America	2,550	3,493	4,397	5,168	5,974
United States	3,020	3,251	3,007	3,148	2,875
Africa	1,504	1,623	2,078	2,542	2,528
Canada	2,271	2,087	2,189	2,300	2,278
Central America and the Caribbean	750	780	1,105	1,531	1,655
Common. Ind. States	–	976	1,847	1,877	1,432
Japan	808	792	758	725	902

Source: FAO, annual statistics on world trade in seafood products; compiled by the author.

European Union, the second-largest exporter, are down from 19.7 to 18.7 percent, while the United States dropped from 7.6 to 5.1 percent, Canada from 5.8 to 4.0 percent, and Japan from 2.0 to 1.6 percent. Exports are up in the rest of Europe (10.5 to 13.3 percent), South America (6.5 to 10.6 percent), and Central America (1.9 to 2.9 percent).

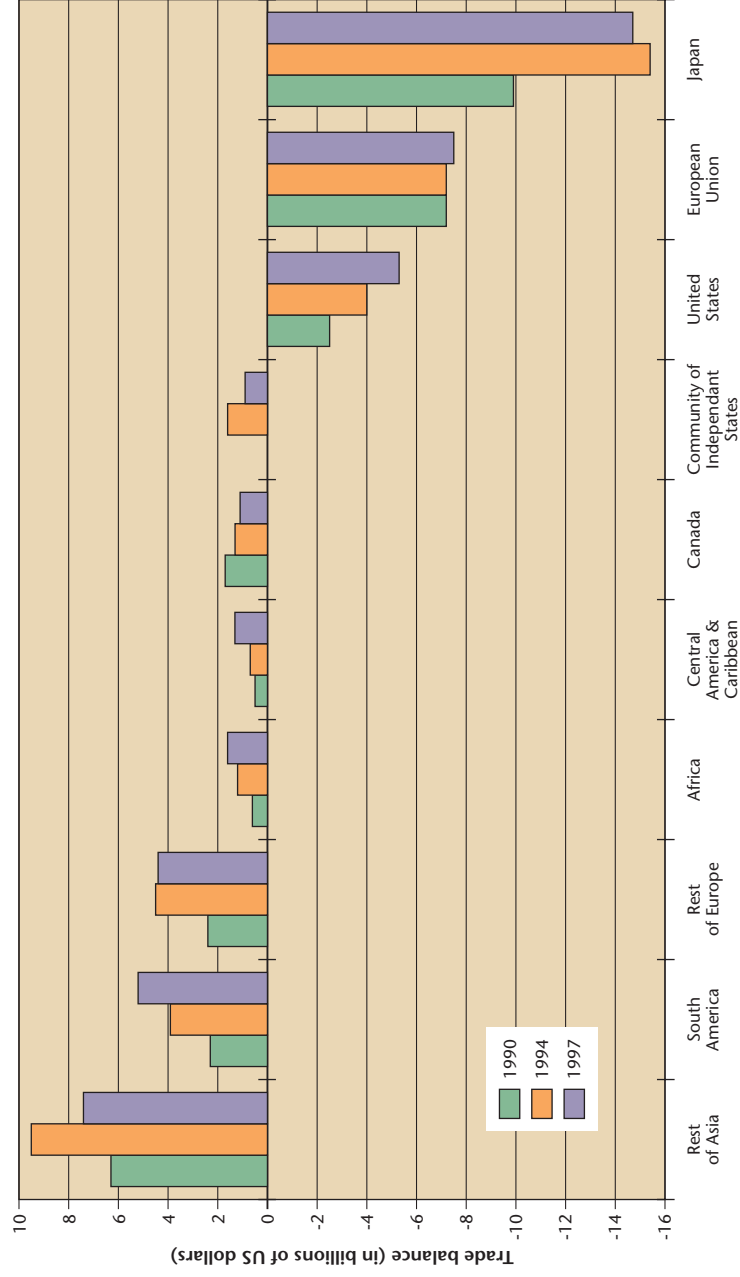
The trade balance in the seafood sector is increasingly in the Third World's favour, as shown in figure 6. From US\$6.3 billion in 1990, the fish trade surplus in Asia (excluding Japan) rose to US\$9.5 billion in 1994 and fell to US\$7.4 billion in 1997. These data show a clear trend toward the globalization of trade in fish and seafood products.

China (including Taiwan), Norway, Thailand, and the United States are the world's top four exporters of seafood products. Thailand's exports doubled between 1985 and 1990 and again between 1990 and 1995 (see figure 7), mainly the result of its phenomenal aquaculture development, especially its shrimp farming. However, major problems (uncontrolled disease and pollution) have hit the aquaculture industry in recent years, relegating Thailand to fifth place in 1997. Exports from Norway have soared since 1994, largely because of salmon farming, so that it now ranks second overall behind China. It should be noted that Taiwanese (US\$1.78 billion in 1997) and Hong Kong exports are included with those from mainland China. The United States exports a wider variety of products in various forms. We should also point out that the United States, itself a major importer, is a leader in the marketing of seafood products. Many of the primary products it imports are processed further and then exported internationally. In Europe, Denmark is also a hub for the marketing of seafood products. The majority of its imports are re-exported to EU countries, particularly Germany. Denmark's processing firms are highly capitalized, and their clients include the major food distribution chains that resell products under their own brand names.⁴¹

The list of main seafood exporters includes some producers farther down the list who, in recent years, have demonstrated remarkable staying power (see table 13). They include, for example, Canada, whose exports seem to have been only partially weakened by ground-fish moratoriums; Chile, a growing force in aquaculture, particularly in salmon farming; Indonesia, which has modernized its fisheries and expanded its aquaculture industry to include shrimp farming, thus gradually strengthening its position on international markets; Spain, a major fisheries power that is currently restructuring its supply but still has major production capacity, particularly in canned products; and the Commonwealth of Independent States (CIS), which is slowly recovering from the dismantling of the Soviet empire and is adapting

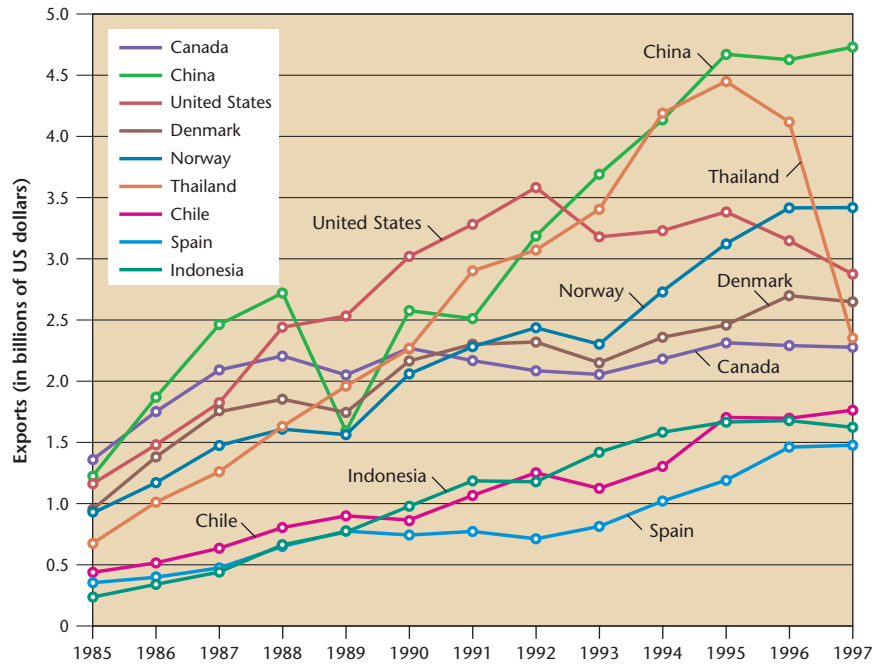
41. Information obtained from the FAO, FISHERY COUNTRY PROFILE/PROFIL DES PECHES PAR PAYS.

Figure 6
Trade Balance in Seafood Products, by Trading Bloc, 1990, 1994, and 1997



Source: FAO, annual statistics on world trade in seafood products; compiled by the author.

Figure 7
Main Exporters of Seafood Products, 1985–97



Source: FAO, annual statistics on world trade in seafood products; compiled by the author.

fairly well to the new rules of international trade. Although mostly obsolete, the production capacity of the CIS is still impressive, and large segments of the industry are positioning themselves to take advantage of growing international trade.

That list is far from complete, however, given that in 1997 those nine countries accounted for a total of US\$24.6 billion in exports, just under 48 percent of the total value of exports worldwide. At least eight other countries recorded exports of at least \$1 billion: in order of importance they are the Netherlands, South Korea, Iceland, Peru, the United Kingdom, India, France, and Argentina. Other countries with significant potential, both in resource supply and in production expertise and capacity, are also a presence on international markets: Germany, Australia, Mexico, New Zealand, and Viet Nam.

Japan tops the list for imports, although financial difficulties in recent years have somewhat reduced its consumer spending. Japanese consumers buy between 12 million and 13 million tonnes of seafood

Table 13
Main Countries Importing and Exporting Seafood Products, 1990–97

Country	1990	1991	1992	1993	1994	1995	1996	1997
Imports (in millions of US\$)								
Japan	10,668	12,085	12,832	14,187	16,202	17,940	17,098	15,588
United States	5,568	6,000	6,024	6,290	7,043	7,141	7,080	8,150
Spain	2,361	2,748	2,898	2,630	2,643	3,111	3,140	3,089
France	2,809	2,926	2,935	2,556	2,797	3,221	3,194	3,077
Italy	2,458	2,690	2,643	2,138	2,275	2,301	2,612	2,590
Germany	1,900	2,115	2,191	1,866	2,324	2,486	2,549	2,374
United Kingdom	1,911	1,912	1,907	1,629	1,889	1,920	2,068	2,153
China (Hong Kong)	1,112	1,232	1,398	1,379	1,649	1,832	1,928	2,104
Mainland China	633	897	1,172	1,120	1,434	1,553	1,821	1,863
Denmark	1,116	1,148	1,197	1,094	1,415	1,574	1,619	1,521
Canada	620	675	687	821	922	1,044	1,168	1,137
Netherlands	770	868	889	792	1,019	1,196	1,145	1,111
South Korea	365	568	498	537	731	839	1,068	1,029
World	39,482	43,483	45,294	44,585	51,516	56,446	57,392	56,422

Exports (in millions of US\$)										
Norway	2,060	2,282	2,437	2,302	2,727	3,137	3,431	3,419		
Mainland China	1,182	1,560	1,592	2,320	2,835	2,857	2,937			
United States	3,020	3,282	3,251	3,008	3,007	3,384	3,148	2,875		
Denmark	2,088	2,175	2,320	2,151	2,359	2,460	2,699	2,649		
Thailand	2,265	2,901	3,072	3,404	4,192	4,452	4,119	2,351		
Canada	2,271	2,168	2,087	2,055	2,189	2,322	2,300	2,278		
Taiwan	1,525	1,802	2,369	1,804	1,809	1,762	1,782			
Chile	866	1,067	1,252	1,125	1,302	1,698	1,686	1,763		
Indonesia	979	1,186	1,179	1,419	1,579	1,673	1,682	1,624		
Spain	744	773	713	814	1,023	1,190	1,467	1,477		
Netherlands	1,306	1,352	1,396	1,283	1,434	1,455	1,481	1,425		
South Korea	1,363	1,491	1,359	1,333	1,416	1,571	1,515	1,382		
Iceland	1,240	1,280	1,253	1,138	1,265	1,342	1,426	1,360		
Russian Federation	-	-	826	1,471	1,720	1,635	1,686	1,356		
Peru	400	499	517	685	980	870	1,120	1,342		
United Kingdom	962	1,122	1,147	1,037	1,190	1,207	1,315	1,278		
India	421	648	673	836	1,125	1,041	1,116	1,236		
France	931	926	955	858	910	993	1,003	1,101		
World	35,366	38,560	40,018	41,118	47,060	51,734	52,813	51,437		

Source: FAO, annual statistics on world trade in seafood products; compiled by the author.

Note: The value of imports is always higher than product value, because certain shipping-related expenses are included in imports, such as insurance, transportation, and other similar expenditures.

products each year, approximately 3.5 million tonnes of which are imported (US\$15.6 billion in 1997). Japan imports mainly high-value products, such as shrimp, salmon, tuna, snow crab, and lobster, which make a major contribution to the country's high trade deficit. The European Union, the second-largest trading bloc in terms of imports, consumes 13 million tonnes of seafood products each year, 7 million tonnes of which are imported (US\$18.1 billion in 1997). We should point out that a large percentage of the European Union's trade is among member countries. Denmark and the Netherlands are European hubs for the marketing of seafood products.

In Europe as a whole, France and Spain dominate in imports of seafood products, each valued at US\$3 billion in imports in recent years. Their markets are fairly different: Spain is also a major exporter of seafood products (ninth worldwide in 1997), and Spanish consumers prefer traditional, medium-value products, such as salted, smoked, and canned fish, while French consumers enjoy fresh and chilled seafood and precooked foods. Italian consumers are increasingly buying prepared and ready-to-serve products, and German consumers, although they have strong purchasing power, traditionally have little interest in high-end seafood products, preferring less-processed primary products for the time being, i.e., pelagic fish to supply Germany's large canning industry. Imports to the United Kingdom have remained steady at approximately 900,000 tonnes (US\$2 billion). The Netherlands, on the other hand, has a fairly modest domestic market but is a European trading hub for seafood products.

■ **Leading Products on International Markets**

In international trade, the level and nature of imports and exports depend in large part on the characteristics of the exporting and importing countries. For example, China has by far the highest level of aquaculture production in the world, but almost all of its production is consumed domestically. Iceland, on the other hand, exports almost all of its fisheries production, as does Canada, which benefits from its proximity to the United States, the world's largest market for fish. Products such as tilapia are traditionally consumed locally, but markets for imitation products are emerging, particularly in the United States, in response to the relative scarcity of groundfish such as cod. Furthermore, some countries with traditionally high food production have, with the help of foreign capital, turned to the intensive farming of species that only countries with strong economies and a high standard of living can generally afford. This is the case

with Thailand, Indonesia, Viet Nam, and Ecuador, countries that are putting all their efforts into large-scale shrimp farming. Others have adapted their management style and developed their technological expertise to produce a consistent, quality, affordable product for international markets, as Norway, Chile, and Canada have done with farmed salmon.

Because of all these factors, the structure of the world seafood industry has changed dramatically in the last ten years. Canned, salted, and other traditional products that once reigned supreme have been replaced on certain key markets by fish and fish products, molluscs, and crustaceans. It is no exaggeration to say that when we talk about a world market, we are basically talking about the market for shrimp, groundfish, tuna, salmon, small pelagic fish (sardines), and industrial products (fishmeal and fish oil). In terms of volume, the main product groups traded (with world-trade percentages in parentheses) are groundfish, particularly fillets (18 percent), shrimp (17 percent), tuna (9 percent), salmon (6.7 percent), cephalopods, mostly squid (4 percent), and small pelagic fish in-brine, smoked, or canned (4 percent). In 1997 nonfood products (fishmeal and fish oil mainly) represented 4.6 percent of the volume of seafood products traded internationally (see table 14).

The world trade structure takes on a different look when we examine product value instead of volume. For example, frozen crustacean products and by-products account for 38 percent of international trade. The expansion of markets for seafood such as lobster, crab, shrimp, and bivalves is particularly significant for eastern Canada, which has large and varied stocks of marine invertebrates and a recognized expertise in processing those species. Let us look then at which seafood product groups are the most heavily traded internationally and Canada's, more specifically eastern Canada's, position in that market.

Groundfish: More Substitutes for Traditional Products

Until recently, groundfish had long dominated international trade in seafood products. The reason for the change is in part the depletion of groundfish stocks but also the growing trade in molluscs and crustaceans as well as the increase in aquaculture, which produces mainly carp and other cichlids, shrimp, salmon, trout, and shellfish (mussels and oysters). Also important in this regard is the high unit value of processed fish products, which in the minds of consumers are still mass-produced. Markets are nervous about any increase in

Table 14
International Trade, Main Seafood Product Groups, 1999

Species and Products	Estimated Share of World Trade (%)
Groundfish	18.2
Fresh and frozen fillets	10.1
Fresh and frozen blocks	3.2
Flatfish, fresh and frozen	2.4
Other fresh fish	2.5
Shrimp (all types)	17.0
Tuna (all types)	9.2
Fresh and frozen tuna (including loin)	6.3
Canned tuna	2.9
Salmon	6.7
Fresh and frozen salmon	5.8
Canned salmon	0.9
Industrial marine products	4.6
Fishmeal	4.0
Fish oil	0.6
Cephalopods	4.0
Pelagic fish	4.0
Herring, anchovy, sardine, mackerel	2.8
Canned	1.5
Fresh and frozen	1.3
Fresh and frozen mackerel	1.2
Canned mackerel	0.4

Source: FAO, GLOBEFISH, "World Exports Fishery Product," 1999 (industrial estimates).

the price of groundfish fillets, for example, although an increase in the retail price of some seafood is not necessarily seen as negative. Today, groundfish account for 12 percent of seafood products traded internationally.⁴²

42. According to a presentation by Trond Sjøholt (GLOBEFISH) at the fisheries conference held in Copenhagen, 25 November 1998.

World groundfish catches fell from 11.5 million to 8.0 million tonnes between 1990 and 1996, with the sharpest drops being recorded for Pacific cod and Alaskan pollock. The trends are similar for flatfish (1.0 million tonnes landed in 1996 compared to 1.2 million tonnes in 1990). Despite moratoriums on Canada's East Coast, Atlantic cod catches have remained steady because of greater stock productivity in the Barents Sea. Exports of fresh and frozen cod fillets fell from 307,600 tonnes in 1990 to 231,600 tonnes in 1996, and groundfish exports from Iceland dropped from 121,000 tonnes in 1990 to 66,000 tonnes in 1997, the result of a decline in that country's landings. During that time, exports of salted and pickled groundfish increased, and in Norway alone, exports rose from 45,000 to 70,500 tonnes between 1990 and 1997.⁴³

Naturally, Canadian exports of fresh and frozen fish fillets decreased as a result of the moratoriums, from 91,500 tonnes in 1990 to 40,400 tonnes in 1995. And shipments of fish blocks plummeted even further, from 56,000 tonnes to 4,200 tonnes.⁴⁴ Exports did begin to recover in the mid-1990s, but it was due to imports of primary products. During that time, a large part of the world cod trade consisted of Russian exports of dressed and trimmed fish to Canada, Iceland, and Norway for further processing.⁴⁵

High-priced whitefish fillets are beginning to be replaced by less costly hoki fillets from New Zealand, which are gradually winning acceptance in Europe and the United States. Since 1995, hoki exports from New Zealand have benefited from the European Union's reduction in customs duties for a growing number of products exported to Europe. In the US market, farmed whitefish, mainly catfish but also tilapia, is increasingly replacing capture groundfish.

Shrimp

Of the many fish species sold internationally, shrimp has the highest value. World shrimp production has continued to grow, from 2.7 million tonnes in 1990 to 3.5 million tonnes in 1997. At 829,000 tonnes, China alone accounts for one-quarter (24 percent) of global

43. According to FAO, GLOBEFISH, *The World Market for Groundfish* 57 (November 1998).

44. Fisheries and Oceans Canada, international trade database: <http://www.ncr.dfo.ca/communic/statistics/trade/trade.htm>

45. We note the increased use of basic groundfish products by processors, which has resulted in a rise in imports of fully dressed fish (fresh and frozen) from 45,000 tonnes in 1990 to 127,000 tonnes in 1996 (from \$128 million to \$381 million): according to Department of Fisheries and Oceans statistics.

production, while Indonesia, Thailand, and India each report production varying from 300,000 to 350,000 tonnes. Intensive aquaculture is the main reason behind this expansion: today, 25 to 30 percent of world shrimp production comes from aquaculture. In 1997 production of tiger prawns, mainly from aquaculture farms, reached 608,000 tonnes, i.e., 17 percent of total shrimp production (both fisheries and aquaculture). Small Japanese shrimp (akiamei) ranks second at 500,000 tonnes. Shrimp exports are relatively stable at approximately 1.2 million tonnes. Exports of prepared shrimp rose steadily from 1990 (115,300 tonnes with a value of US\$901 million) to 1996 (189,000 tonnes, with a value of US\$1.7 billion), and then fell sharply in 1997 (171,000 tonnes, with a value of US\$1.4 billion). The drop was caused by production declines in Thailand, where infections ravaged aquaculture farms. The recent rise of Ecuador — to third place in the world in 1997 — is worthy of mention: 56 percent of Ecuador's production, estimated at 110,000 tonnes in 1997, is sold to the United States. India also increased its production substantially, with exports climbing from 62,000 tonnes in 1990 to 105,500 tonnes in 1997.⁴⁶

Some northern countries, including Canada, are making an impact on international markets with exports of coldwater shrimp, mostly in the form of prepared products. Other such countries are Iceland (26,650 tonnes, with a value of US\$172 million), Denmark (19,300 tonnes, with a value of US\$170 million), and Norway (15,500 tonnes, with a value of US\$96 million). Canada exported just over 32,000 tonnes of shrimp in 1997, valued at US\$120 million. Shrimp exports passed the 40,000-tonne mark in 1990.

Herring Products

Herring belongs to the family of small pelagic fish, which also includes mackerel, pilchard, and anchovy — the top three species. Hovering around 20 million tonnes, world captures of small pelagic fish are relatively stable. Herring catches tend to fluctuate, increasing from 2.0 million to 3.3 million tonnes between 1990 and 1997. Norway is the top producer of herring, followed by the former USSR, Iceland, and Canada. Sardine catches, however, are falling off, particularly in Peru and Japan, where ocean warming caused by El Niño has had a disastrous impact on the sardine and anchovy fisheries. As a result, world production of canned sardines and pilchards fell

46. Information from FAO, GLOBEFISH, "Production and Trade, Shrimp Analysis — 1999" among other sources.

from 560,000 to 340,000 tonnes between 1990 and 1997. Morocco is the top sardine producer (56,000 tonnes), followed by Peru (55,000 tonnes). The main markets for canned sardines and herring are the European Union (42,000 tonnes were imported in 1997) and the United States (20,000 tonnes).⁴⁷

There is what amounts to a tradition in New Brunswick of processing herring and sardines. The industry focuses mainly on three types of products: dried and smoked herring in the southeastern part of the province, canned herring and sardines in the Bay of Fundy area, and herring roe, produced mainly in the northeast from fall herring. These three segments are export-oriented. The canned sardine and small herring industry has steadily increased its sales to the United States, rising from \$15 million in 1990 to nearly \$30 million in 1999. The same is true for exports of small herring to the US market, which have jumped from \$9 million to \$17 million over the last ten years.⁴⁸

The main target of the herring roe industry is Japan, the only major buyer. Volumes vary according to the quality of the herring and the roe, and the price Japanese consumers are willing to pay. Exports rose from \$30 million to \$37.6 million between 1995 and 1996, fell back to approximately \$15 million in 1998, and rose again to \$17 million in 1999. Over 90 percent of Canadian exports of herring roe go to Japan.

Exports of smoked herring, a speciality of producers in southeastern New Brunswick, were valued at \$33 million in 1999, an 18 percent increase over 1995. The main markets are the Dominican Republic and Haiti, as well as the United States, where there are large Latin American communities.

Salmon

Salmon, particularly farmed salmon, is a popular commodity in international trade. World salmon production (both the fisheries and aquaculture) reached 1.1 million tonnes in 1990 and rose to 1.6 million tonnes in 1997 — a result of aquacultural production, particularly that of Atlantic salmon, which accounted for 561,000 tonnes or 38 percent of world salmon production. Although third in 1990, Atlantic salmon subsequently rose to first place among salmon species, ahead of chum salmon (348,000 tonnes), pink salmon (319,000 tonnes), and sockeye salmon (132,000 tonnes).

47. See FAO, GLOBEFISH, *The World Market for Herring* 63 (March 2000).

48. Based on data from STRATEGIS, Industry Canada.

The farming of Atlantic salmon has continued to grow in recent years, with world production reaching 865,000 tonnes in 2000. A list of the main producing countries is provided in table 15.

With over seven hundred aquaculture sites, Norway is by far the world's top salmon producer: 330,000 tonnes in 1997, a 78 percent increase over 1990. That growth has continued, with an estimated production for 2000 of 445,000 tonnes.⁴⁹ After Norway, where almost all (96 percent) of the salmon comes from aquaculture, Japan ranks second with 312,000 tonnes, mainly from fishing. Fishing also accounts for most of the salmon produced in the former USSR — 220,000 tonnes. The United States is also a major producer of salmon, mainly from the Pacific coast fisheries, although its production fell 22 percent between 1990 and 1997 to 220,000 tonnes. Other major producers include Chile (175,000 tonnes, mostly from salmon farms) and Great Britain (120,000 tonnes). Chilean producers who have the lowest production costs, have increased their exports to Japan. Canada is a major supplier of both wild (capture) and farmed salmon (68,000 tonnes). In British Columbia, however, there has been a marked decline in the landings of capture salmon, from 96,000 tonnes in 1990 to 30,000 tonnes in 1998.

Salmon is marketed in four forms: fresh and chilled, frozen, canned, and smoked. As well, of course, there are various products that consist partially or entirely of salmon. Fresh salmon shipments are made up mainly of Atlantic salmon, world exports of which rose from 172,000 tonnes (US\$988 million) in 1990 to 463,000 tonnes (US\$1.8 billion) in 1997. At 205,000 tonnes (US\$764 million) or 44 percent of world exports of fresh salmon, Norway is becoming a leading supplier of the product. In fact, Norway's potential for salmon production is enormous. Generally speaking, the only real constraint on the expansion of salmon production is market price. In 1992 Canada climbed to second place among world salmon producers, and in 1997 Canadian exports of fresh salmon approached 46,000 tonnes (US\$248 million) or 10 percent of world exports, most of it going to the United States. Denmark exports more fresh salmon than Canada, over 68,000 tonnes in 1997, but mostly to other European Union countries. Fresh salmon exports from two other suppliers, Chile and the United Kingdom, have risen dramatically, from 8,000 to 25,000 tonnes each between 1990 and 1997.⁵⁰

49. FIS—Market Reports, *Farmed Atlantic Salmon Production and Market Report* (June 2000).

50. FAO, GLOBEFISH, "Production and Trade, Salmon Analysis — 1999" and Commodity Update, Salmon, September 2000.

Table 15
Estimated Production of Farmed Atlantic Salmon,
by Country, 1998–2000

Country	Production (in thousands of tonnes)			Change, 1998–2000	
	1998	1999	2000	(in thousands of tonnes)	Percentage Change
Norway	343	410	445	102	29.7
United Kingdom	112	120	120	8	7.0
Chile	102	104	130	28	27.5
Canada	58	62	68	10	17.2
Faroe Islands	19	36	40	21	110.5
United States	21	23	24	3	14.3
Ireland	17	19	20	3	17.6
Other	19	18	18	-1	-5.3
Total world	691	792	865	174	25.2

Source: FIS-Market Reports, Farmed Atlantic Salmon Production and Market Report (June 2000).

Exports of frozen salmon have declined by 10 percent since 1990, falling to 211,000 tonnes (US\$690 million) as a result of the overharvesting of capture stocks. The United States is still the main supplier of frozen salmon, accounting for one-third of world exports down from 59 percent in 1990. Chile, on the other hand, exports just over 50,000 tonnes (US\$176 million) of frozen salmon, although we should point out that it exported only 11,000 tonnes of the product in 1990. Chilean producers are increasingly targeting the US market, where they have built a solid reputation. The third-largest supplier of frozen salmon is Norway; however, that country's exports have fallen by 36 percent since 1990. Most of its 28,000 tonnes is exported to the European market, mainly to Denmark and France.

International trade in canned salmon fluctuated significantly during the 1990s, a reflection of the ups and downs in the harvesting of wild salmon, which is the product of choice for canning. World production is approximately 100,000 tonnes, 70,000 tonnes of which is produced in the United States. The former USSR is still the second-largest supplier, although its production fell from 34,000 to 13,600 tonnes between 1990 and 1997. The situation is similar in Canada, which produced 30,000 tonnes in 1998 compared to 97,000 tonnes in 1990.

World exports of smoked salmon have shot up in recent years, more than doubling since 1990, from 13,000 tonnes to almost 29,000 tonnes, and with a commercial value of US\$324 million in 1997. Denmark is by far the leading supplier, producing approximately 17,000 tonnes or 58 percent of world smoked salmon exports. The United Kingdom, Norway, Chile, and France are also major exporters.

Lobster

World landings of all species of lobster experienced strong growth during the 1980s and remained fairly stable in the 1990s, totalling 162,000 tonnes in 1997. *Homarus americanus* is the most abundant lobster species, with world catches totalling 77,600 tonnes, a drop of 3 percent since 1990, while spiny or rock lobster ranks second with 70,000 tonnes. European lobster is also harvested.⁵¹

Canada has long been the top producer-supplier of lobster, exclusively of the *americanus* species. Landings increased markedly in all areas of the Maritimes until the early 1990s, when supply began gradually falling off (from 48,500 tonnes in 1991 to 39,300 tonnes in 1997). Nevertheless, Canada is still the world's top lobster supplier, followed by the United States, where Maine and Massachusetts account for most of the catch. Lobster catches in the United States have increased substantially in recent years, and in 1997 the US surpassed Canada in the volume of lobster landings.

Australia and New Zealand are also major lobster producers, serving mainly the Japanese market. The species they harvest are all similar to the spiny or rock lobster family. Australian producers were the first to crack the US market with frozen lobster tails.

On world markets, Canadian producers compete mainly with producers of spiny or rock lobster in the Caribbean, the Baja-California coast, and South America's Atlantic coast; the principal countries concerned are Cuba, Brazil, the Bahamas, and some Central American countries. US landings are steady at approximately 3,000 tonnes annually. The value of catches of the European lobster, *Homarus gammarus*, has been relatively low in recent years. France, England (Scottish lobster is particularly popular in England), Ireland, and Denmark are the main producers. However, because the supplies of this species fall far short of the demand, its price is high. Consumers

51. FAO, GLOBEFISH, *The World Market for Lobster* 36 (June 1995).

in the European Union prefer the taste and quality of its meat, although *americanus* lobster is gaining acceptance.

Many people may be surprised to learn that eastern Canada does not have a monopoly on international lobster markets. In fact, numerous other suppliers also ship to the most lucrative markets, offering various kinds of lobster, as well as processed, chilled, and frozen products aimed at a variety of market niches (from midrange to high-end). Despite the increasing competition with Canadian lobster, however, most European imports of live and chilled lobster (including whole frozen lobster) come first from Canada and then from the United States. US producers are beginning to increase their shipments to the European market.

World lobster exports consist of two product families: lobster shipped fresh (live or cooked and chilled whole) and various frozen products, such as lobster cold pack, lobster pieces (tails and claws), and frozen lobster meat. Exports of live and chilled lobster have soared in recent years, increasing from 37,500 tonnes (US\$380 million) in 1990 to 72,300 tonnes (US\$900 million) in 1997. Canada is the top exporter of fresh/live lobster with shipments of 20,600 tonnes (US\$215 million), followed by the United States, which exported 19,700 tonnes in 1997, valued at US\$182 million.⁵² American dealers are increasingly shipping lobster abroad, particularly to Europe.

In the other category, processed lobster products, international exports remained stable during the 1990s at approximately 52,000 tonnes. The total value of exports was US\$707 million in 1997. Again, Canada was the main exporter with 9,800 tonnes (US\$140 million) and even succeeded in increasing its market share. Producers in New Brunswick and more recently Prince Edward Island are mainly responsible for Canada's performance, although they have had to rely on substantial imports of lobster from the US to supply the main plants, which were suffering from a shortage of supply. Because of the high price of spiny or rock lobster, however, Australia recorded the highest value of exports for processed lobster products, i.e., US\$145 million.

The fact remains that international trade in lobster and lobster products is largely dominated by the United States. The second-largest consumer market for Canadian producers is the European Union, led by France (which imported two-thirds of Canadian live/chilled lobster shipments in 1998) and followed by Germany, Belgium, the

52. FAO, GLOBEFISH, "Production and Trade, Lobster Analysis — 1999" and Commodity Update, Lobster, November 1999.

United Kingdom, and the Netherlands. At present, Japan is not a major market for Canadian producers, who ship equal volumes to the Japanese and Belgian markets, i.e., approximately \$25 million. Japan is a major market for spiny or rock lobster and buys between 70 and 75 percent of Australian and New Zealand production (22,000 tonnes in 1997).

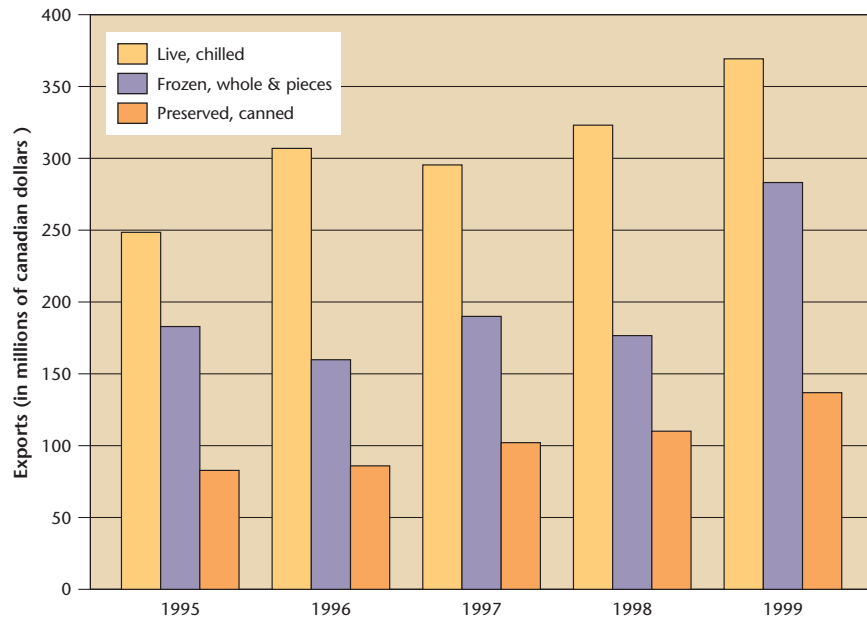
Some Asian countries, such as Hong Kong and Singapore, import varying quantities of lobster. In 1997 the value of Hong Kong's imports of live and chilled lobster (US\$158 million) ranked it second overall behind the United States. Nova Scotia's lobster producers recently entered this market, and in 1995 and 1996 their sales amounted to Can.\$15 million. Attempts have also been made to diversify products sold on the US market, specifically targeting the southern states. As a result, live lobster exports from Nova Scotia to Florida and California climbed from \$5.5 million in 1990 to \$12.6 million in 1998. A new market has also opened up in Nevada, which bought \$4 million worth of products from the area in 1999.⁵³

Another interesting aspect of the lobster market is consumer interest in prepared and canned lobster products. Internationally, the supply of these products has grown steadily for several years, from only 700 tonnes in 1988 to 8,800 tonnes in 1997. Since the mid-1990s demand has been particularly high in the United States. Canadian exports of prepared lobster rose from \$83 million in 1995 to \$137 million in 1999, an increase of 65 percent. This product category has outstripped other lobster products in sales growth: for fresh and live lobster, sales increased by 48 percent, for frozen lobster by 55 percent. Figure 8 illustrates these trends.

Although Canada appears to be mainly a major producer-exporter, it is also a major importer. Canadian imports of lobster reached \$190 million in 1998, \$180 million of which was for live lobster. Almost all those imports, which were from New England, went to New Brunswick to supply the lobster-processing industry. The Canadian consumer market for seafood products is fairly disorganized, and wholesale buyers in central Canada often buy from US brokers, who sometimes resell products from Atlantic Canada. We will look at this feature of the Canadian market later.

53. Figures from STRATEGIS, Industry Canada.

Figure 8
Changes in Lobster Exports from Eastern Canada,
by Product Type, 1995-99



Source: STRATEGIS, Industry Canada; compiled by the author.

Crab

Another lucrative species that undoubtedly helps maintain the vitality of Canada's fisheries is crab. There are several types of crab, the most important in terms of production being swimming crab, rock crab, blue crab, king crab, and snow crab. Canada produces king crab and snow crab, the production cycles of which tend to alternate: declines in catches on the Pacific coast, where king crab is fished, often correspond to an increase in catches in Atlantic Canada, where snow crab is the dominant species, and vice versa. This phenomenon is important and has a direct impact on markets, particularly in Japan, where all types of crab are popular.

World crab production, all types combined, grew considerably in the last decade, from 850,000 tonnes in the early 1990s to 1,200,000 tonnes in 1997. With 86,800 tonnes harvested in 1998, Canada is only a modest supplier, although landings have more than doubled since 1992. China alone produces 340,000 tonnes of crab (160,000 from aquaculture), four times Canada's production. The United States

produces 195,000 tonnes and Viet Nam 187,000 tonnes. The top crab importer is Japan, with 124,000 tonnes (US\$901 million) in 1997. The US market also imports increasing volumes (32,000 tonnes in 1997, with an estimated commercial value of US\$246 million).⁵⁴

Nonetheless, Canada is the top supplier of crab to world markets, with shipments of almost 36,000 tonnes in 1997 (US\$224 million). Canadian production has increased with the expansion of the snow crab fishery in Newfoundland, where landings rose from 11,000 tonnes in 1990 to close to 70,000 tonnes in 1999.⁵⁵ The United States exports just over 20,000 tonnes of crab (US\$114 million). World exports of processed and canned crab fell from 30,000 to 23,000 tonnes between 1993 and 1997, mainly because of a drop in production in Thailand, which was replaced by Canada as the top exporter of canned crab. However, Canada's exports of canned crab are only modest (4,400 tonnes in 1997, with a value of US\$47 million). The former USSR is also a major supplier, especially to the European market, where the Chatka brand is popular with consumers.

Bivalves

Bivalves, or shellfish, include various species of invertebrates, the best known of which are sea scallops, oysters, mussels, and clams. These products are generally consumed fresh and near the producing areas. However, a number of other products such as mussels are becoming increasingly popular internationally. Fifteen percent of world mussel production is traded on international seafood markets, i.e., 200,000 tonnes or twenty-five times Canada's production, which was 8,200 tonnes in 1998. Over three-quarters or 1.3 million tonnes of world mussel production is farmed. China produces 400,000 tonnes of farmed bivalves, Spain 190,000 tonnes, and Italy 124,000 tonnes. The European Union is still the largest mussel market, with imports of 161,000 tonnes in 1997 (the main buyers are France, Italy, and Belgium) supplied by the Netherlands (53,000 tonnes), New Zealand (25,000 tonnes), and Spain (23,000 tonnes). Canada's exports have held steady at between 5,000 and 6,000 tonnes, for a value of \$13 million to \$15 million. The main source of Canadian production is Prince Edward Island and a large share of its production is sold in the Maritimes and central Canada.

54. FAO, GLOBEFISH, "Production and Trade, Crab Analysis — 1999" and Commodity Update, Crab, November 2000.

55. Government of Newfoundland and Labrador, *The 1999 Newfoundland and Labrador Seafood Industry — Year in Review*, 2000.

Clams have only recently been marketed internationally, with just 140,000 tonnes (5 percent) of the 2.8 million tonnes produced finding their way onto world markets. China dominates this sector with over 60 percent of world production, followed by the United States (13 percent), Japan, Thailand, and Malaysia. Malaysia's clam production increased from 40,000 tonnes in 1990 to 84,000 tonnes in 1997. Of Canada's production of 32,000 tonnes, which is harvested mainly in Newfoundland and Nova Scotia, producers have been exporting approximately 7,500 tonnes annually in recent years, for a value of \$60 million or more. China, South Korea, and North Korea are the main suppliers of international markets, which accounted for 140,000 tonnes in 1997.⁵⁶

Another seafood product that is in high demand on international markets is oysters. From 1991 to 1997, world oyster production rose from 1.4 million to 3.3 million tonnes. China is mainly responsible for this increase and alone accounts for 71 percent of world production. South Korea and Japan are also major suppliers, each producing approximately 220,000 tonnes. Officially, Canada produces only about 7,000 tonnes of oysters and sells 1,200 to 1,500 tonnes abroad, which generates revenues of approximately \$6 million. World exports are approximately 24,000 tonnes, with South Korea exporting 6,800 tonnes (US\$45 million) and France 4,800 tonnes (\$14 million). The Netherlands and New Zealand are becoming more active in international trade, while Canada is fairly static. Japan is the largest market for oysters, followed by Italy, Korea, and the United States.

Although scallops top the list of shellfish exports in eastern Canada, Canada as a whole accounts for only 3 percent of world scallop production, which was estimated at 1.7 million tonnes in 1997. While Canada produced only 147,000 tonnes of scallops in 1990, China increased its production to 1 million tonnes in 1997; in so doing it moved ahead of Japan (500,000 tonnes), the United States (65,000 tonnes), and Canada (51,000 tonnes). World demand for scallops continues to grow: exports have risen from 40,000 tonnes in 1991 to 75,000 tonnes in 1997, with a commercial value of US\$558 million. The main market for scallops is the United States, where demand was particularly strong during the 1990s. The United States imports over 27,000 tonnes (US\$243 million) of scallops, followed by France, which imports close to 14,000 tonnes (\$121 million). Canada

56. FAO, GLOBEFISH, "Production and Trade, Bivalves Analysis — 1999" and Commodity Update, Bivalves, July 1999.

exports a steady 6,000 to 7,000 tonnes of scallops per year, with a commercial value of approximately Can.\$130 million. Those exports could easily rise, were it not for the higher demand in Canada together with a drop in stock productivity in Nova Scotia's Bay of Fundy.

This brief overview of global imports and exports of seafood products shows that Canada is both a major producer and a secondary supplier in this sector and is proof of the increasing globalization of the seafood products trade. The data also show the growing market for seafood products, two of which, tiger prawns and Atlantic salmon, had a major impact on the direction of the international trade in seafood products during the 1990s.

■ **Changes in Import-Export Flow in Canada and Eastern Canada**

Canadian fisheries production in recent years is estimated at between \$3.5 billion and \$4.0 billion, and some 88 to 90 percent of that is exported to approximately one hundred countries. In 1998 Canada exported 497,500 tonnes of fish products, valued at \$3.2 billion, and \$3.8 billion worth of products in 1999, a 22 percent increase over 1995. On the other hand, the Canadian market (including processing plants) imported nearly 450,000 tonnes of fish and other seafood products in 1998, valued at approximately \$1.8 billion. Imports of seafood products for domestic consumption and industrial purposes also rose sharply, and their value increased by almost 40 percent between 1995 and 1999.

The three main markets for exports of Canadian seafood products are the United States (68.6 percent), Japan (12.8 percent), and the European Union (9.4 percent). Canada also shipped seafood products to newly industrialized countries in Southeast Asia (Taiwan, South Korea, Hong Kong, and Singapore) (2.7 percent in 1999) and to the Caribbean (1.7 percent).

Eastern Canada has the largest commercial fishery in the country and accounted for 78 percent of Canadian landings in 1998. That percentage fluctuated wildly throughout the 1990s, mainly as a result of the groundfish moratorium. As well, the value of production is highest in eastern Canada, a lead that is strengthening. The region accounted for two-thirds (66.7 percent) of the value of commercial fisheries production in Canada in 1990, 77 percent in 1995 (despite the groundfish crisis), and 82 percent in 1998. Following the major

decline in groundfish stocks, the region's main processing plants restructured and diversified their supply, relying more extensively on imports of basic products. They also sought to diversify their production (focusing on a wider product range and using underutilized species) while targeting further value-added processing.

Canada's industrial sector as a whole has taken a number of innovative approaches to competing on world markets. On the East Coast in particular, the fisheries were fairly successful in adapting to the new realities of the 1990s by, for example, forming joint ventures, developing technology exchanges, and signing marketing agreements with companies in Japan, the United States, and Europe. Those agreements are proof of the sector's efforts to adjust to the rules of the new economy. In the area of product technology, processing, and postprocessing, cooperative initiatives were implemented to enhance the competitiveness of businesses and to ensure resource conservation. For example, Newfoundland and Nova Scotia obtained 100,000 tonnes of raw materials from foreign suppliers and then successfully marketed them. Indeed, the use of new, selective import strategies to make regional production facilities more cost-effective is enhancing the image of the Canadian industry and resulting in the development of new expertise.

■ **Processing: Diversification on Canada's East Coast**

The seafood industry, like the agri-food industry, is noted for having a particularly wide range of products available on the market. That diversity is in part a result of changing demand and in part due to the large number of aquatic species, several of which are suitable for processing into various products and by-products. We should also point out that suppliers of basic products (e.g., fresh and frozen fish, whole or slightly processed products, and crustacean meat) deal with secondary and tertiary processors. Consequently, a product on a supermarket shelf may have begun life by being sold by a fisher to a dealer, who may then have sold it to a processing plant for basic trimming or meat extraction, after which it may have been bought by a wholesaler or processing plant for use in a product that was further processed.

Regionally, the industry's sources of supply fall into three categories: local supply (landings) provided by fishers and chartered vessels, regional and interprovincial supply, and foreign imports. Given the scarcity of resources, a growing number of processors are increasingly

buying from foreign supplies, a trend that is confirmed by import data. Processors are also turning more to the aquaculture industry, which is growing by leaps and bounds in many maritime areas. In a number of instances, processors have taken over certain segments of the aquaculture industry (e.g., Connors Brothers in the case of farmed salmon) or formed partnerships with growers to ensure a supply of raw materials (crustaceans and shellfish).

In eastern Canada, DFO lists eight hundred operations that produce over three hundred different products and by-products, and at least half of them export their products (see the list in Appendix C).⁵⁷ Most companies specialize in the industrial processing of seafood products, mainly trimming and freezing/deep-freezing. Secondary processing operations are less common, to say nothing of tertiary processing and beyond, i.e., value-added processing in nonfood sectors.

Determining the structural profile of Atlantic Canada's processing sector as a whole is a difficult proposition. Even DFO has trouble producing a comprehensive list of products the plants are producing. At best, such a list can often be provided only every few years.⁵⁸ Why? No doubt because the industry is fragmented and geographically scattered, and even more because it covers an incredible variety of activities. It is also a seasonal sector, where the accuracy of some information (number of workers, resource purchase price, product selling price, investment, etc.) is often doubtful. Apart from a private survey,⁵⁹ there are only two official sources of plant-production information: Statistics Canada's *Annual Survey of Manufactures* and annual plant production reports prepared by Fisheries and Oceans Canada. And they each present the data on this industry differently: Statistics Canada looks at financial data on production (number of employees, hours worked, wages, costs of raw materials, value of shipments, value

57. The Department of Foreign Affairs reports 402 businesses in western Canada that export fish and seafood products: 216 of them are in Nova Scotia, 56 in New Brunswick, 53 in Newfoundland, 46 in Quebec, and 30 in Prince Edward Island. See the Directory of Canadian Fish and Shellfish Exporters, Market Intelligence Division, InfoCentre Data Base, Ottawa, 1997.

58. The most recent production reports available from DFO, dated the summer of 2000, were for the Gulf region (1998) and Scotia-Fundy (1996), which are part of the Maritimes administrative region. Reports for Quebec are available for 1998. It was impossible, however, to obtain a similar profile for Newfoundland from either the Department of Fisheries and Aquaculture or the Department of Fisheries and Oceans.

59. Such as the study conducted in 1992-93 by the firm Coopers and Lybrand for the Cashin Commission. See Supply and Services Canada, *The Fish Processing Sector in Atlantic Canada: Industry Trends and Dynamics* (Ottawa, June 1993).

added, etc.), while DFO provides detailed data on production volumes and value by species and by product category. Using both sources, together with Industry Canada import-export data, we can establish a relatively complete overall provincial profile, which is what we present in the following pages.

Statistics Canada defines the seafood products industry (SIC 1020) as establishments primarily engaged in eviscerating, skinning, filleting, breading, precooking, blanching, or otherwise processing fish, including molluscs, crustaceans, fish roe, or other marine animals and plants, as well as establishments primarily engaged in producing fish oil and fishmeal.⁶⁰ That definition is inadequate, however, as it fails to take into account the extremely diverse nature of the processing sector on Canada's East Coast. As we pointed out, there are at least eight hundred businesses involved in buying/selling, preparing, packaging, processing, and canning fish and seafood, half of which are exporters. And not all of them necessarily process fish (see Appendix C).

Although in some areas the industry is dominated by large vertically integrated producers — as is the case in Newfoundland, Nova Scotia, and southwestern New Brunswick — there are many medium-sized and small producers of various types. From ordinary buyer-wholesalers, cottage-industry producers of dried and smoked fish, and producers of prepared foods to processors-retailers, what is referred to as the industry's secondary segment covers a full range of operations. These processors use approximately forty commercial species to make several hundred products and by-products, a number that will inevitably grow not only because previously ignored species are being harvested but mainly because the aquaculture industry is growing.

With that in mind, we can prepare a production profile by examining the numerous products from two perspectives: first, major product categories (fresh and chilled, frozen, salted, in-brine, and canned products) and, second, main species groups (groundfish, pelagic fish, molluscs, and crustaceans) and dominant groups by species. We allow for a more detailed description of the status of regional production. Table 16 provides an overall profile based on product category and arranged by DFO administrative region. The data we use are detailed and relatively current — except for Newfoundland, which provides data by major species group only. We also examine the production

60. Statistics Canada and Industry Canada, *Industry Overview, Fish Products Industry (SIC 1021)*; strategis.ic.gc.ca/.

Table 16
Industry Profile of Fish and Seafood Production in Eastern Canada,
by Product Category and by Administrative Region

Type of Products	Scotia-Fundy ^a	Gulf ^b	Quebec ^c
Fresh and chilled	\$282,000,000	\$138,000,000	\$80,000,000
Number of species listed (number of products)	47 species (128 prod.)	36 species (60 prod.)	16 species (28 prod.)
Frozen	\$216,000,000	\$332,000,000	\$122,000,000
Number of species listed (number of products)	35 species (144 prod.)	34 species (118 prod.)	15 species (24 prod.)
Salted, dried, and in-brine	\$41,000,000	\$24,000,000	\$10,000,000
Number of species listed (number of products)	10 species (26 prod.)	8 species (32 prod.)	1 species (3 prod.)
Canned	\$62,000,000	\$1,000,000	–
Number of species listed (number of products)	1 species (10 prod.)	4 species (5 prod.)	–
Other	\$10,000,000	\$2,000,000	\$49,000,000
Number of species listed (number of products)	–	6 species (3 prod.)	12 species (>12 prod.)
Total production	\$611,000,000	\$497,000,000	\$261,000,000
Number of species listed (number of products)	Approx. 50 species (> 300 prod.)	Approx. 40 species (>200 prod.)	Approx. 20 species (< 100 prod.)

Sources: Compiled by the author from the following sources: plant production reports, Department of Fisheries and Oceans (Moncton, Halifax); *Annual Statistical Review: Marine Fisheries in Québec*, various years; Government of Newfoundland and Labrador, *The 1998 Newfoundland & Labrador Seafood Industry — Year in Review*, 1999.

Note: We were unable to obtain a similar product list for Newfoundland. We know, however, that in 1998 production in that province was as follows: groundfish (\$296 million), pelagic fish (\$42 million), molluscs and crustaceans (\$392 million), and seals (estimated at \$25 million), for a total production of \$755 million.

^a Scotia-Fundy, 1996 (southern and southwestern Nova Scotia and southern New Brunswick).

^b Gulf Region, 1998 (the east coast of New Brunswick, Prince Edward Island, and northern Nova Scotia).

^c Laurentian Region, 1998 (Quebec).

in those regions, taking into account the types of products and the species group to which they belong.

In addition to shedding light on specific regional characteristics, these data indicate a particularly wide range of products in each region, with half or more of the production value being made up of frozen products that in most cases have undergone some degree of processing. However, Nova Scotia, specifically the Scotia-Fundy sector, departs somewhat from the general model: fresh and chilled products predominate there and represent nearly half the value of plant production. Except for some occasional minor preparation (evisceration, washing, and cooking) these products are unprocessed; they include live lobster, whole fish, farmed salmon, mussels, and oysters, among others. Approximately 30 percent of production is sold fresh in the Gulf and Quebec regions. We have no Newfoundland data for this category, but there is every reason to believe that fresh products account for a much smaller percentage of production in Newfoundland because of the province's remote geographic location and the limited size of its domestic market, a hypothesis that is confirmed by an examination of export data.

In Scotia-Fundy, although frozen products rank second, there is substantial production of canned and other types of products, particularly salted and in-brine products. Production is less diversified in the other regions, although the number of species harvested and the number of products and by-products made from those species are particularly high. Scotia-Fundy places first in product diversification, followed by the Gulf region, Newfoundland (based on the number of species harvested and the list of import-export products), and finally Quebec, which has a less-diversified profile.

Overall, half of plant production, both volume and value, is made up of frozen products that are astonishingly diverse for most of the species. Frozen products include products in their original state (whole, not shelled), packaged and slightly processed products, and higher value-added products. The category comprising salted, smoked, and in-brine products represents a modest percentage of production (5 to 7 percent), but it is still fairly high in the Scotia-Fundy, Quebec, and Gulf regions. These are traditional regional products, found mainly in Nova Scotia (groundfish), the east coast of New Brunswick (pelagic fish, including herring and some groundfish production), and Quebec (salted and dried groundfish). A large number of small dealers/producers in several other regions used to produce traditional dried fish, but it is now left to established producers in the

sectors mentioned. Production of canned goods is even more concentrated, mostly in southwestern New Brunswick. A single company, Connors Brothers, produces canned sardines and is a world leader in that sector. Processing plants prepare other kinds of products such as fish oil, fishmeal, and some nonfood products. We will look at those products in more detail in our analysis of import-export flows using complementary and more recent data.

According to DFO, regional production in Scotia-Fundy consists of over 300 products: 128 fresh, 144 frozen, 26 salted and in-brine, and approximately 10 canned. The wide variety of products can be explained by the unusually large number of producers in the region and by the availability of so many species (approximately fifty). In the Gulf region, DFO lists over 200 products made from approximately 40 species: approximately 60 fresh, 118 frozen, 32 salted and in-brine, and 5 canned, as well as fish oil and fishmeal.⁶¹ Production is just as diversified in Newfoundland, but in Quebec there are fewer products because raw materials are limited.

Each of the five categories uses different species from three main groups: groundfish, pelagic fish, and crustaceans and shellfish (molluscs). In Scotia-Fundy, for example, those three groups generate 155, 94, and 49 products and by-products respectively. Gulf region producers generate approximately 50 products from groundfish and 80 products from each of the other two species groups.

As we might guess, most production, regardless of the province, is from a small number of key species; the same is true for products and by-products. In the Gulf region, those key species are lobster (\$310 million in products in 1998, including \$90 million in fresh products), snow crab (\$60 million, mostly in frozen products), herring (\$31 million, two-thirds of which are pickled products, as well as \$9 million in herring roe and \$2 million in fishmeal), mussels (\$20 million in fresh products), rock crab (\$16 million), peeled shrimp (\$11 million), groundfish products (\$9 million), clams and quahogs (\$8 million), mackerel (\$6 million), smelt (\$5 million), and scallop meat (\$4 million).⁶² There is greater diversity in the Scotia-Fundy region, where the main production for 1996 was as follows: groundfish (\$204 million, half of that in frozen products, mainly filets, \$73 million in fresh

61. According to DFO annual reports on plant production.

62. We note that the value of export products exceeds the production value as reported by processing companies to Fisheries and Oceans (annual DFO plant production reports). Since it appears that data reported by processors are underestimated overall, it is more appropriate to use the export figures.

and chilled products, and \$24 million in salted and pickled products), lobster (\$140 million, mainly fresh), herring (\$95 million, two-thirds of it canned), scallop meat (\$80 million, half fresh and half frozen), shrimp (\$37 million), and so on. It should be noted that salmon production amounted to only \$5 million in 1996 because of contamination problems, but it exceeded \$100 million in subsequent years.

In Quebec, the industry profile is a bit different because of the proximity of large urban markets and access to the southern Ontario market. Some companies with good market connections have tried to create a niche market for seafood products, and as a result there are a number of processing plants in urban areas, several of which have turned to value-added production. Those plants do not necessarily buy from regional suppliers (fishers or suppliers in the area) but import from abroad through trade channels they have established.

In terms of leading products, Quebec processors have the highest snow crab production (\$61 million in 1998), mainly frozen sections (claws and legs, not shelled) and fresh and chilled products. Shrimp products rank second with \$48 million in production, followed by lobster products (\$35 million, shipped mainly fresh or live) and groundfish products (\$22 million), half of which is traditional Gaspé-cured salt cod. As well, some additional products are made from pelagic fish (\$9 million), scallops (\$6 million), and various shellfish (\$11 million).

■ Trade Flow in Eastern Canada

Eastern Canada's fish industry is mostly an export industry. In the four Atlantic provinces, fisheries exports are second only to exports of refined petroleum products. The percentage of production (from the fisheries, aquaculture, and the processing plants) that is exported varies from province to province and from year to year, based on the type of product. We do know, however, that between 90 and 95 percent of the value of production is shipped to international markets. The percentage of production exported is highest in Newfoundland and the Maritimes as a result of their limited provincial markets and their fairly restricted access to the central Canadian market. In Quebec, the fishing and seafood-processing industry successfully exports a substantial percentage (between 20 and 30 percent) of their production.

An interesting aspect of the trade flow in Atlantic Canada is without a doubt the sharp increase in imports in recent years. As we

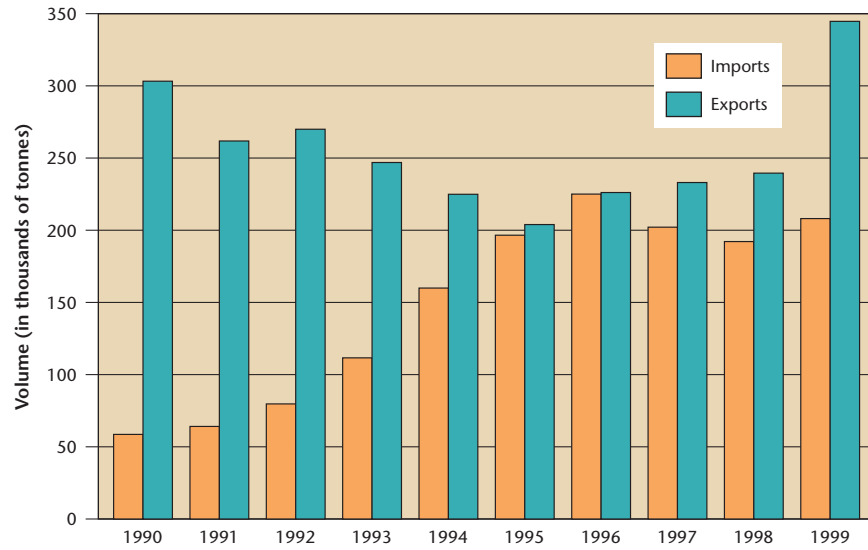
pointed out earlier, because of the impact of the groundfish moratorium, processors have had to turn to other species or obtain their supply from abroad. Imports of groundfish, particularly cod and pollock, rose from approximately 25,000 tonnes before the moratorium to over 82,000 tonnes in 1998. Import and export trends for all species and products are clearly illustrated in figures 9 and 10.

Although the volumes imported in 1990 represented only one-fifth of exported volumes, imports and exports were almost identical in 1996. Imports have fallen slightly since then but have remained very high. In 1990 the value of imports was only 10 percent of the total value of exports, compared to 36 percent in 1996 and 31 percent in 1999. The main products imported are, of course, groundfish (Atlantic cod from the Barents Sea as well as Pacific cod and Alaskan pollock), followed by shrimp (Thailand), mollusc meat (Asia), meal and other feed for farmed fish (South America), and lobster (Maine and Massachusetts).

The main supplier to processors in the region is the United States, which in recent years has accounted for between 35 and 38 percent of the value of imports. The largest volume of imports from the US goes to lobster producers in New Brunswick, who spend over \$100 million each year on lobster from Maine and the neighbouring states. Shipments of groundfish from Alaska also contribute to the high level of US imports to eastern Canadian provinces. After the US, the maritime countries of Eastern Europe (the former USSR and Baltic countries) are the main sources of imports for processors in Atlantic Canada and Quebec and are the top suppliers of groundfish products imported for further processing and resale on the US market.

In terms of value, approximately 20 percent of seafood products imported to eastern Canada are from Eastern Europe, 14 percent from Western European countries that are not members of the European Union (Iceland, Norway and Denmark), and 8 percent are from the European Union. Eastern Canada also imports from South America, particularly fishmeal from Peru, and from Asian countries (Thailand and China). Table 17 shows the top eight blocs that traded with eastern Canada in 1995 and 1999 (imports and exports of seafood products). Apart from the United States, four countries supply \$50 million or more in seafood products to the regional market: Russia (\$85 million), Iceland (\$69 million), Denmark (\$62 million), and Norway (\$49 million), with Thailand, Estonia, and China not far behind.

Figure 9
Volume of Seafood Product Imports and Exports,
Eastern Canada, 1990–99



Source: Department of Fisheries and Oceans Canada, annual statistics on commercial fisheries and aquaculture; compiled by the author.

Figure 10
Value of Seafood Product Imports and Exports,
Eastern Canada, 1990–99



Source: Department of Fisheries and Oceans Canada, annual statistics on commercial fisheries and aquaculture; compiled by the author.

Table 17
Sources of Supply for Eastern Canada, the Fisheries (SIC 0310)
and the Fish Products Industry (SIC 1020), 1995 and 1999

Trading Bloc	Import Value (in thousands of Can.\$)		(%)	
	1995	1999	1995	1999
United States	203,565	324,332	36.7	38.4
Eastern Europe	113,832	162,946	20.5	19.3
Western Europe, except European Union	72,803	118,342	13.1	14.0
European Union	37,853	73,846	6.8	8.7
South America	18,794	27,654	3.4	3.3
Southeast Asia, NIC (total)	3,572	8,491	0.6	1.0
Japan	2,495	6,705	0.5	0.8
Central America, except Mexico	13,608	5,714	2.5	0.7
Subtotal	466,522	728,030	84.2	86.2
Others	87,672	116,656	15.8	13.8
Total (all countries)	554,194	844,686	100.0	100.0

Source: STRATEGIS, Industry Canada; compiled by the author.

An interesting characteristic of Canada's East Coast fishery is its great diversity, a strength that enables it to weather the hard times: a decline in one species is offset by price increases for, or expanded production of, another species; a new market replaces a failing market; or an active segment of the industry compensates for problems in another segment. The groundfish crisis is a good example of the industry's ability to adjust. Once the moratorium was imposed, it completely paralyzed the groundfish industry not only in Newfoundland but also in several other maritime areas (Cape Breton, northeastern New Brunswick, and the Gaspé Peninsula). However, each of these regions and even Newfoundland, which depended heavily on groundfish, recovered within a few years and are now among the most active export areas. Credit for a recovery of that kind must go to local businesses; the expansion of some lucrative fisheries, particularly snow crab and shrimp, have been of great assistance. That is why, all things considered, the industry as a whole has continued to post positive results — results that have concealed the magnitude of the groundfish crisis, if only from a statistical standpoint. It should also

be noted that in terms of trade, the vitality of the US market has compensated for the relative weakness of the Japanese market.

Based on plant production reports compiled by DFO, the foregoing analysis of the structural profile of the fish and seafood-processing industry in eastern Canada reveals an astonishing variety of products in each region. Table 18 reflects the overall profile by providing a list of exports of leading products and product groups.

The table shows that in 1999 and 1995, lobster products represented the largest category of fisheries industry exports from eastern Canada, with a value of \$789 million. Snow crab products ranked second, with total exports of \$604 million. Together, lobster and snow crab products account for approximately half of regional fish and seafood exports. We should point out that over thirty products are derived from these two species. The firm price for lobster, not larger catches, helped push up its export value. Processors in New Brunswick recently began importing lobster from Maine and the neighbouring states to supply their raw material and thus extend their period of activity. We should also point out that Nova Scotia producers and traders have developed particularly lucrative niches in the United States (Florida) and Asia (Hong Kong).

The snow crab sector is vulnerable because of its heavy dependence on the Japanese market for frozen crab sections and on the US market for crabmeat. Moreover, there are wild fluctuations in production caused by resource cycles: landings can drop or rise rapidly within a few years, as was the case in the Gulf of St. Lawrence and, more recently, on the east coast of Newfoundland. In the past few years, this sector has been affected by the weak Japanese market pushing down prices. However, with the expansion of the crab fishery in Newfoundland and the popularity of crabmeat on the US market, this industry has been able to weather the vagaries of supply and demand.

Another important category is groundfish products — exports rose from \$368 million to \$508 million between 1995 and 1999. Given the current crisis in the availability of this resource, such an increase is surprising, especially because it is not attributable to a single leading product, but rather to an upturn in various segments of the industry. By importing basic products, the groundfish industry not only has been able to maintain its vitality but has probably been able to strengthen it (see table 18).

Table 18
Exports of Principal Seafood Products and Product Groups, Eastern Canada, 1995 and 1999

Product	Exports (in millions of dollars)		Change, 1995-99 (in millions of dollars)	(%)	Total Fish Exports (%)	
	1995	1999			1995	1999
Lobster products						
• live, fresh	549.9	789.3	239.4	43.5	26.5	28.8
• frozen, not shelled	284.5	369.0	84.5	29.7	13.7	13.5
• prepared, canned	182.8	283.3	100.5	55.0	8.8	10.3
Crab products						
• frozen, sections	82.6	137.0	54.4	65.9	4.0	5.0
• prepared, canned	506.9	603.9	97.0	19.1	24.4	22.0
• frozen, sections	446.2	515.0	68.8	15.4	21.5	18.8
• prepared, canned	52.5	86.2	33.7	64.2	2.5	3.1
• not frozen	8.2	2.7	-5.5	-67.1	0.4	0.1
Groundfish products						
• frozen fillets and blocks	368.4	507.8	139.4	37.8	17.7	18.5
• salted, dried, and pickled	122.2	199.8	77.6	63.5	5.9	7.3
• fresh and chilled fillets	126.8	144.3	17.5	13.8	6.1	5.3
• Flatfish (fresh, chilled, and frozen)	97.2	135.6	38.4	39.5	4.7	5.0
	22.3	28.1	5.8	26.0	1.1	1.0
Shrimp						
• frozen	138.3	244.1	105.8	76.5	6.7	8.9
• prepared and canned	121.4	145.6	24.2	19.9	5.8	5.3
	16.9	98.5	81.6	482.8	0.8	3.6

Scallops	134.8	124.1	-10.7	-7.9	6.5	4.5
• fresh and chilled	88.3	66.5	-21.8	-24.7	4.3	2.4
• other	46.5	57.6	11.1	23.9	2.2	2.1
Salmon (fresh and chilled)	76.1	123.4	47.3	62.2	3.7	4.5
Herring products	95.5	108.6	13.1	13.7	4.6	4.0
• Sardine and herring (canned)	24.3	46.6	22.3	91.8	1.2	1.7
• Liver, eggs, milt (frozen and in-brine)	43.3	28.2	-15.1	-34.9	2.1	1.0
• Herring and fish (salted, smoked, and pickled)	22.1	28.1	6.0	27.1	1.1	1.0
• Herring and mackerel (frozen)	5.8	5.7	-0.1	-1.7	0.3	0.2
Molluscs and shellfish	90.6	102.9	12.3	13.6	4.4	3.8
• Molluscs (fresh and chilled)	78.2	71.7	-6.5	-8.3	3.8	2.6
• Mussels and oysters (fresh)	9.0	21.4	12.4	137.8	0.4	0.8
• Shellfish (prepared and canned)	3.4	9.8	6.4	188.2	0.2	0.4
Other products	115.3	134.8	19.5	16.9	5.6	4.9
Total (seafood product exports)	2,075.8	2,738.9	663.1	31.9	100.0	100.0

Source: STRATEGIS, Industry Canada; compiled by the author.

Shrimp is another example that clearly illustrates the characteristics of the fishing industry on Canada's East Coast. When cod stocks were relatively stable, the Northern shrimp catch was at its lowest. With the collapse of groundfish stocks, however, the shrimp grounds were able to recover — according to scientists because cod is a predator of shrimp. Expansion of the shrimp fishery off Newfoundland and Labrador, in the northern part of the Gulf of St. Lawrence, and on the edge of the Scotian Shelf has once again revived an industry in need of raw material. Exports of shrimp from eastern Canada climbed from \$138 million to \$244 million from 1995 to 1999. The growth in prepared shrimp exports is noteworthy and effectively illustrates the effort made by the industry to produce higher value-added products, even when it means importing supplies from other countries.

Scallops have long provided relative stability for the Nova Scotia fisheries in particular. The province benefits from its proximity to several major beds in the Bay of Fundy and on the continental shelf further south. However, most of these beds are being fished to capacity, and fishing fleets have been forced to redouble their efforts to maintain catch levels. In 1999 the value of scallop exports was \$124 million, an 8 percent drop from 1995.

Salmon shipped fresh is another major species exported from Atlantic Canada. The value of those exports reached \$123 million in 1999, an increase of 62 percent from 1995. To deal with increasing competition, especially from Norway and Chile, producers in New Brunswick's Bay of Fundy, where the salmon are farmed, must innovate both technically (controlling disease and accelerating salmon growth) and in order to limit costs. One of the principal advantages of the fishery is its proximity to its main market, the United States. Another is its solid reputation for quality among US consumers and traders.