

The U.S. Salmon Distribution System

Key Points

- ✓ The U.S. salmon distribution system is complex and varied. Participants include fishermen, fish farmers, processors, importers, secondary processors, broadline distributors, specialty seafood distributors, brokers, traders and many different kinds of retail and food service companies. Salmon flows through this system in many different ways.
- ✓ The salmon distribution system is evolving in several important ways. Salmon distribution channels are changing, with fewer and larger distributors handling an increasing share of total volume, and an increasing share of salmon being sold directly by large fish-farming companies and large wild salmon processors to large retail and food service chains. The retail and food service industries are becoming more concentrated. The farmed salmon industry is becoming increasingly concentrated, with fewer and larger producers accounting for a larger share of total farmed salmon production. Wild salmon primary processors are also becoming increasingly concentrated.
- ✓ The price of salmon increases as it moves through the distribution system from the fisherman or fish farmer to the consumer. Processing margins—the increase from the prices processors pay to fishermen to wholesale prices received by processors—tend to be higher than prices paid to fishermen. Significant costs of salmon processing include tendering, labor, plant overhead and “yield” (lower processed weight resulting in higher fish cost per processed pound). Processors’ profits vary significantly from year to year.

Overview of the U.S. Salmon Distribution System

The U.S. salmon distribution system is complex and varied. There are many ways in which salmon may get from a fisherman or fish farmer to a consumer. They may be as simple as a fisherman selling to a consumer at the dock or they may involve multiple stages of processing, transportation and distribution in which the fish and the products made from it change ownership several times. For every general rule about how things work, there are exceptions (Knapp et al. 2001).

Figure X-1 provides a simplified depiction of the U.S. salmon distribution system. There are many different participants. The most important of these include fishermen, primary processors, importers, secondary processors, broadline distributors, specialty seafood distributors, brokers, traders and many different kinds of retail and food service companies.

Salmon flows through this system in many different ways, as depicted by the arrows in the figure. Many companies may perform multiple functions of the

system, such as: fishing and primary processing; primary processing and secondary processing; importing and manufacturing; or importing and distributing. Some companies handle both wild and farmed salmon; others handle only wild salmon or only farmed salmon. Below, we briefly review the function performed by each major participant.¹

Fishermen and fish farmers catch or grow the fish. As discussed in other chapters of this report, in most North American wild salmon fisheries only holders of limited entry permits can catch fish commercially, and there are numerous restrictions on where, when and how they can fish.

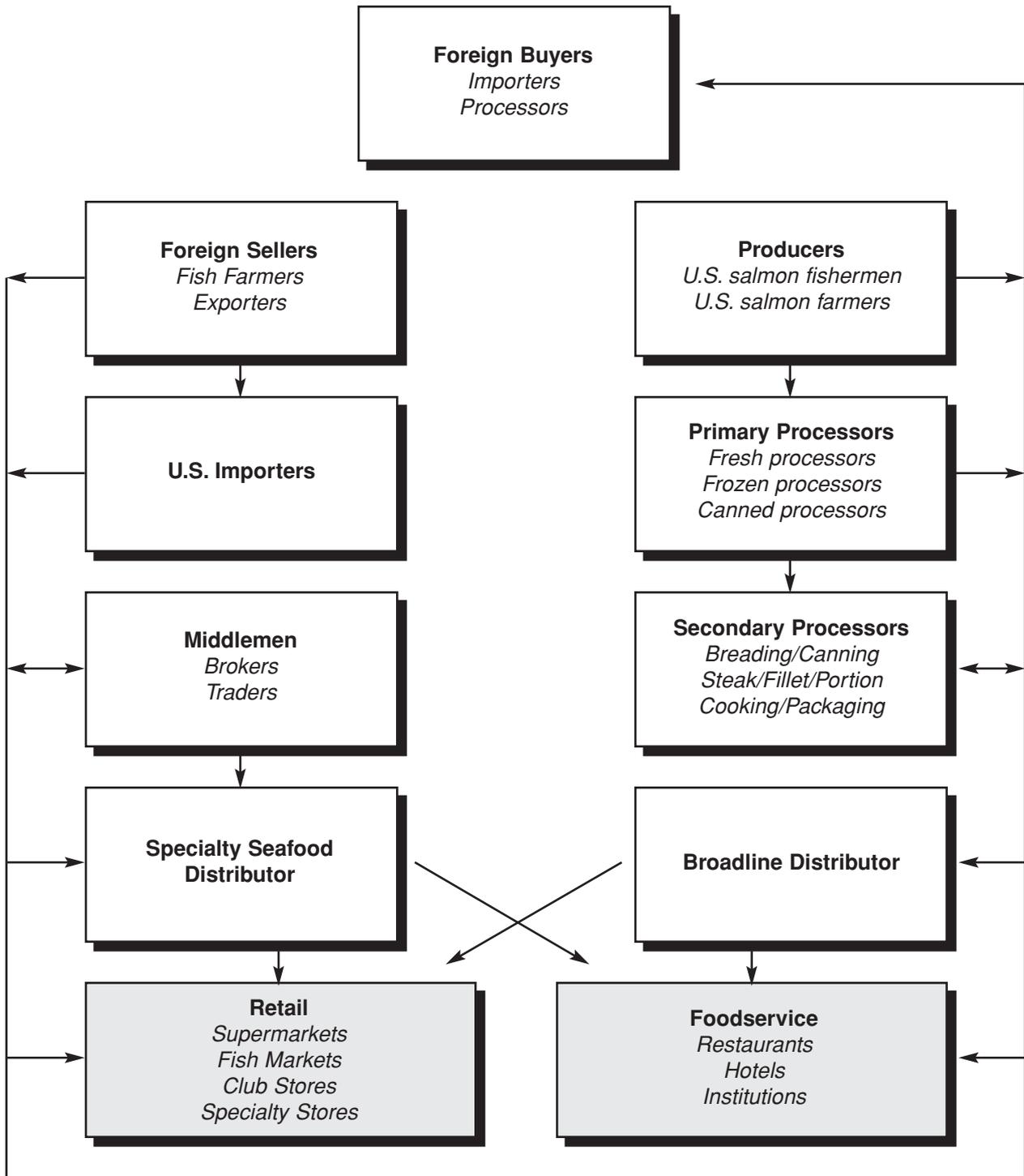
Primary processors head and gut the fish and then usually can it, freeze it, or ship it to fresh markets. The basic function of primary processing is to transform the fish into product forms which can either be shipped directly to fresh markets or stored for later processing and distribution. How much processing a primary processor does can vary greatly, depending on the product and the market.

¹ Much of the remaining text for this section, discussing the functions performed by major participants in the salmon distribution system, was originally written by Peter Redmayne for Knapp et al., *A Village Fish Processing Plant: Yes or No?* (2001).

Secondary processors buy products from primary processors and do additional processing into more convenient product forms. A secondary processor in Seattle, for example, may buy headed and gutted (H&G) salmon from a fish plant in Alaska and have it processed into skinless, boneless salmon portions (e.g.

fillets). Traditionally, secondary processors did their processing in the United States. However more and more secondary processing is being done in developing countries like China and Thailand, due to lower labor costs and a large, skilled work force.

Figure X-1 The U.S. Salmon Distribution System (Simplified)



Many primary Alaska seafood processors also perform secondary processing functions. In this case, primary processors reprocess their own product, as well as raw material they buy from other primary processors. Primary processors will also buy raw material from traders, since processors will not always sell directly to competing processors.

Brokers act as the sales agents for the actual owners of the product (foreign or domestic processors in many cases, or importers) and receive a commission on any sales they transact. Brokers, who do not normally take title to goods, often work a specific region of a country where they have developed relationships with buyers. Brokers normally sell to wholesale distributors or to higher-volume end users such as restaurant chains or supermarket chains.

Traders purchase salmon and sell to other traders, exporters, importers, distributors, foodservice operators or retail supermarket chains. Traders usually specialize in a few specific seafood commodities and minimize market risk by doing “back-to-back” deals where they do not buy products until they have identified a customer. While brokers earn commissions from sales, traders earn a profit on the margin between their purchase price and their sales price. Volume is important for traders because of the small margins realized on each sale.

Distributors purchase products from processors, traders, importers or wholesalers and provide physical delivery of products to foodservice operations (restaurants, hotels, schools, hospitals) or retail markets (supermarkets, fish markets). In general, distributors do not spend a great deal of time “selling” new items and species or developing new markets. Two types of distributors handle seafood: broadline distributors and specialty seafood distributors.

Broadline distributors, who usually specialize in either the foodservice or supermarket markets, sell a very large range of food and non-food items. Foodservice broadliners sell thousands of food, table and kitchen items to restaurants, hotels and food operations at hospitals, schools, cruise lines and other outlets where food is prepared and sold or served. Retail broadliners, on the other hand, will supply supermarkets with a comprehensive, although less extensive variety of items. In a number of cases, retail broadliners are a cooperative owned by a regional group of independent supermarkets.

While seafood is but one of many food items offered by broadline distributors, it is an important commodity. The largest national broadline distributor in the U.S., Sysco Corp., sells approximately \$1 billion worth of seafood annually to its foodservice accounts. Generally, broadline distributors do not purchase seafood directly from foreign suppliers but deal with importers,

processors and brokers. Most of the seafood carried by broadline distributors is frozen. However, a growing number of broadline distributors carry some fresh seafood items that are available on a regular basis.

Specialty seafood distributors, as the name indicates, specialize in seafood or seafood-related products, with an emphasis on fresh products. Specialty seafood distributors sell to both foodservice and retail accounts. Most major U.S. cities have one or two specialty seafood distributors that dominate the market and a number of smaller seafood distributors. Seafood distributors normally make deliveries directly to individual restaurants or retail stores as often as five days a week. In the case of larger supermarket chains, though, a seafood distributor may deliver to a central warehouse and the chain will make deliveries to its individual units. Specialty seafood distributors purchase seafood from importers, processors, brokers, traders and other distributors.

Foodservice buyers include restaurants and institutions (including hospitals, schools, factories and large offices). The restaurant segment of food service includes large seafood chains, such as Red Lobster, Long John Silver’s and Captain-D’s; family restaurants such as Chili’s, Perkins and Denny’s; and casual dining and independent restaurants. While most foodservice operations buy from distributors, the purchase decision is often made after a sales presentation of a new product by an importer, processor or broker. Each foodservice operation has individual requirements as to price, product form, packaging, frequency of delivery and other factors.

Retail buyers consist primarily of large regional supermarket chains. However, in recent years mergers have created some powerful chains with national reach. For example, Kroger Stores, based in Ohio, has purchased major supermarket chains in California, Washington and Oregon, while Safeway and Albertson’s have increased their holdings across much of the U.S. In most cases, seafood purchasing decisions, particularly for fresh products, are made at the national or regional division level. Rarely are purchasing decisions made at the level of the individual supermarket.

Of the 31,000 supermarkets in the U.S. with annual sales in excess of \$2 million, approximately 10,000 have full-service seafood counters. As a rule, a supermarket will not operate a full-service seafood counter unless it can sell at least \$5,000 worth of seafood a week, since the labor costs associated with running a full-service counter are high. A full-service seafood counter in a busy store in an affluent neighborhood can sell \$20,000 to \$40,000 worth of seafood a week.

Large volumes of fresh and frozen seafood are also sold through warehouse/club stores such as Costco and Sam’s Club. Most seafood purchasing decisions for

club stores are also made at the national and regional levels. For some fresh seafood items that are readily available—like farmed salmon—club stores will sign a contract for guaranteed pricing for a three- or six-month period. Depending on the product, club stores will buy direct from processors, importers, or seafood distributors. As a general rule, club stores buy fresh seafood from seafood distributors and frozen seafood directly from processors and importers.

Independent fish markets are still important retail outlets on the East Coast of the U.S., but less so in the West. A retail fish market will generally move considerably more seafood than a seafood counter at an individual supermarket.

Seafood importers purchase products from foreign suppliers that export seafood, including fish farmers. Importers normally purchase products outright and pay for them either on shipment or on receipt of the products in their own countries. In many cases, though, payment will be subject to clearance by local health authorities, such as the FDA in the U.S. In some cases, large seafood distributors, restaurant chains, or supermarkets do their own importing and buy direct from foreign suppliers.

Seafood exporters purchase a product and sell it to a buyer (an importer) in another country. The seafood an exporter buys can be purchased from a seafood processor, or a trading company that has purchased the product from a processor. Many large seafood processors in Alaska do their own exporting and sell their salmon directly to buyers in other countries.

As a rule, exporters will not purchase a product until they know they have a buyer for it. Exporters are usually paid for their products by a Letter of Credit (LC) or by a direct bank wire transfer (TT). Depending on the terms of the sale, an exporter may be paid either when the product is shipped or when it is received by the importer.

Major Salmon Distribution Channels

Figure X-2 shows major distribution channels for wild and farmed salmon within the salmon distribution system. In general, the distribution system for both wild and farmed salmon is evolving in five important ways:

- The retail and food service industries are becoming more concentrated, with large retail and food service chains accounting for a larger share of total sales to consumers. These large buyers are able to reduce costs through economies of scale, including buying in large volumes. They prefer to buy from suppliers who can reliably provide large volumes of consistent quality over long periods of time.
- The salmon distribution system is becoming shorter and more concentrated, with fewer and

larger distributors handling an increasing share of total volume, and an increasing share of salmon being sold directly to large retail and food service chains by large fish-farming companies and large wild salmon processors (Anderson 1997; Naylor et al. 2003).

- The farmed salmon industry is becoming increasingly concentrated, with fewer and larger producers, with facilities in multiple countries, and vertically integrated into feed production and primary and secondary processing, accounting for a larger share of total farmed salmon production (Anon 2002, Anon 2004a, Anon 2004b, Anon 2004c).
- Wild salmon primary processors are becoming increasingly concentrated. Many medium-sized processors and some larger processing plants have been closed or sold to larger processors operating multiple plants in different locations, whose operations are typically diversified to include processing of other wild species.
- New “niche” markets and distribution channels are developing for fresh and value-added products in which higher quality wild salmon products are being sold at higher prices from smaller producers to smaller buyers.

Price Markups in the Salmon Distribution System

As salmon moves through the distribution system from the fisherman or fish farmer to the consumer, its price increases. A consumer may pay \$5.99/lb—or \$15.99/lb—for a salmon product for which the fisherman was paid \$0.59/lb. Many fishermen and many consumers cannot understand why the price should not be higher for the fisherman, or lower for the consumer—or both. They question what accounts for the markups and whether they can be justified by costs. In the remainder of this chapter we examine how and why salmon prices increase as salmon moves through the distribution system.

Throughout this discussion it is important to understand that salmon pricing and price markups are complex topics. As discussed repeatedly throughout this report, there are numerous different salmon species, products and end-markets, which reach consumers in numerous different ways. For all of these species, products, end-markets and distribution channels, prices at different levels can and do change from year to year, from season to season and even from day to day. The factors affecting prices are very complex. Prices at every level are affected by prices at every other level, as well as costs, the structure of the industry, the relative supply of different products to different markets and the myriad factors affecting consumer demand.

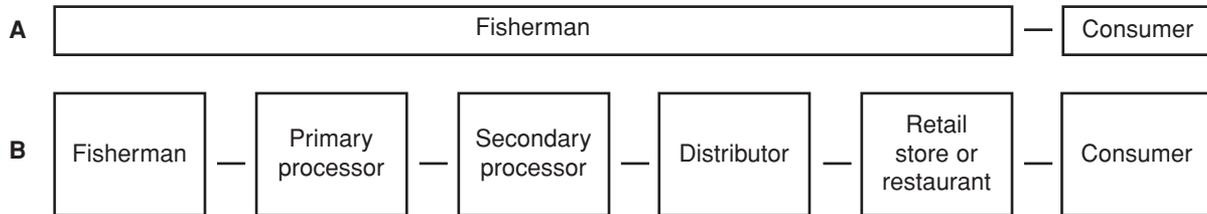
Figure X-2

**Major United States Salmon Distribution Channels
(Each box represents a transfer of ownership of the fish)**

1. Traditional wild salmon distribution channels:

(A) Some fishermen near population centers sell fish directly to consumers.

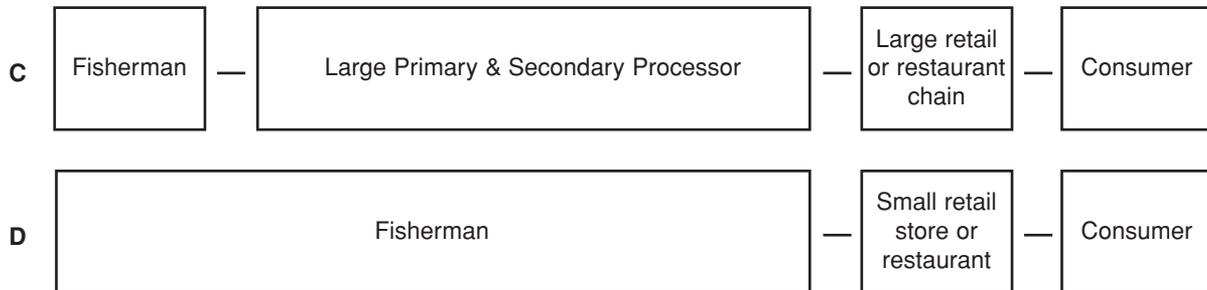
(B) Most fish are sold to primary processors who then sell to secondary processors who sell to distributors who sell to retailers or restaurants.



2. Evolving wild salmon distribution channels:

(C) Large primary processors are producing value-added products (secondary processing) and selling directly to large retail and restaurant chains.

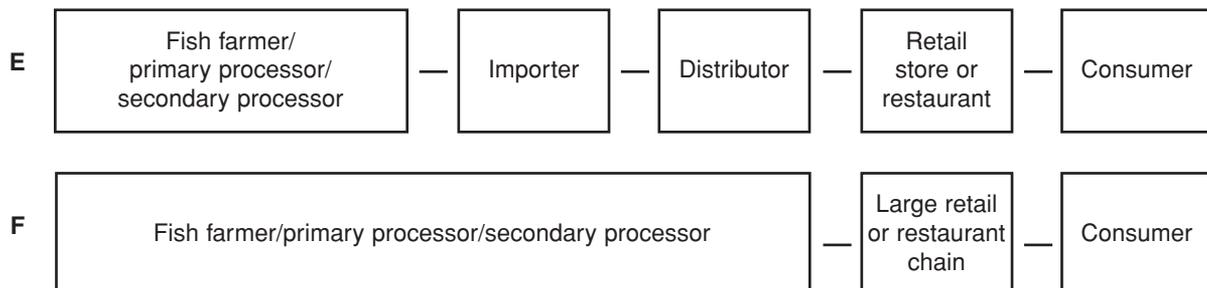
(D) Some fishermen are "self-marketing"—doing their own primary processing and value-adding (or having their fish custom-processed) and selling directly to small retail stores or restaurants.



3. Distribution channels for imported farmed fish:

(E) Foreign fish farmers pay for their own custom processing and sell directly to U.S. based importers (or sometimes distributors), which sell to retail stores and restaurants.

(F) Larger multinational fish farming corporations deal directly with large retail and restaurant chains.



Confusing this issue are differences between popular perceptions that prices should be “fair” and the reality of how markets work. One popular perception is that fishermen should be paid a “fair” price that allows them to earn a decent living for their hard (and often dangerous) work, and that allows them to maintain the standard of living they have attained in the past and compensates them for their investments in boats and permits. Another popular perception is that consumers should be charged a “fair” price for the fish they buy, which reflects actual costs of catching, processing and distributing the fish—rather than excessive profits for middlemen or large and/or foreign-owned corporations.

The reality is that competition drives salmon markets and prices. Put simply, most participants in the salmon distribution system, from fishermen to consumers, try to sell for the highest price they can get and to buy for the lowest price they can get. Not many consumers, retailers, distributors or processors will choose the higher of two price offers for fish of equal quality from sellers who are the same in other respects. Not many fishermen, processors, distributors or retailers will choose the lower of two price offers from buyers who are the same in other respects.²

Salmon markets are complicated by the fact that not all buyers and sellers are “the same in other respects.” Competition occurs not only with respect to price, but also with respect to other factors. Some buyers and sellers are more reliable, or more convenient to deal with, or offer more favorable opportunities to do other kinds of business. At some stages of the distribution system this may allow sellers to mark prices up more than they would be able to if buyers were making decisions based solely on the price of salmon. For example, consumers do not necessarily buy salmon where the price is lowest. They may be willing to pay higher prices at stores in more convenient locations, or which have other products on sale.

Risk is another important and complicating factor in salmon pricing. A profit on one transaction may offset a loss on another transaction. The fact that a seller appears to have earned a substantial profit on a particular fish sale does not necessarily mean that the seller is earning high profits on average.

Effects of Changes in Fish Weight on Prices

An important—and often overlooked—factor in how prices increase through the distribution system is that for any given weight of fish caught by a fisherman or produced by a fish farmer, a smaller weight of fish

products is actually purchased by consumers. For example, 100 pounds of salmon caught by a fisherman may only result in 33 pounds of salmon fillets purchased by a consumer.

The most important reason for this decline in weight is that not all of the weight of the live or “round” salmon is edible product. Typically, 25-28 percent of the weight of wild salmon is lost in heading and gutting during processing, resulting in a 72-75 percent “yield” of dressed/head-off weight from “round weight.” As headed and gutted salmon are further processed into fillets or steaks during secondary processing, more weight is lost. The weight of skinless/boneless fillets is only about 33-38 percent of the round weight of the fish.

The top half of Table X-1 shows typical processing yields for selected wild salmon products from round weight and from dressed/head-off weight. The bottom half of the table shows the implications of the change in weight for the price of the fish.

To understand how changes in weight affect price, consider the example in Table X-2, based on average yields for wild chinook salmon. Suppose a fisherman sells 1000 pounds of chinook salmon to a primary processor who processes them into dressed/head-off fish weighing 720 pounds. Suppose next that the primary processor sells the fish to a secondary processor who processes them further into skinless/boneless fillets weighing 360 pounds.

Suppose further that the fisherman, the primary processor and the secondary processor all sell the fish for a total of \$1000—in other words, without any increase in the total value to pay for costs of processing. After each stage of processing, the fish will have to be sold for a higher price per pound to make up for the lower weight. The price will have to increase from \$1.00/lb to \$2.78/lb—or by 278 percent—just to make up for the lower weight.

In addition to weight losses in processing, other factors also contribute to the difference between the weight of fish caught by fishermen and that purchased by consumers. Some fish may spoil or be damaged in other ways during transportation and storage. In addition, not all products offered for sale are bought. Especially for fresh salmon, fish not sold after one or two days may go unsold, or may have to be sold at a deep discount—meaning that other fish must be sold for a higher price to get the same average price per pound for sales from any given shipment.

² In the salmon industry, as in any industry, there is always a possibility that some participants may engage in illegal price-fixing activity. There is no evidence that illegal activities are a significant factor in overall pricing at any level in the U.S. market for wild or farmed salmon. This does not mean, of course, that no one ever tries to fix prices, or that no one ever succeeds. But given the huge number of participants in the industry, and the ease of entry and exit into every level of the distribution system, in most markets and in most parts of the distribution system it would be difficult to successfully fix prices for any sustained period of time. In 2003, after a widely publicized four-month trial of Bristol Bay salmon processors and importers for alleged price-fixing, an Alaska jury found no evidence of a conspiracy to fix prices after just five hours of deliberation (Loy 2003).

Table X-1 **Estimated Wild Salmon Average Processing Yields and Implied Price Increases due to Changes in Weight**

	From	To	Average Yields and Price Increases (percent)					
			Chinook	Sockeye	Coho	Pink	Chum	
Yield	Round	Dressed/Head-On	88%	92%	92%	91%	89%	
		Dressed/Head-Off	72%	74%	75%	73%	74%	
		Canned		67%	67%	65%	67%	
		Skin-On Fillet	55%	53%	57%	52%	60%	
		Skinless Fillet	46%	46%	51%	42%	50%	
		Skinless/Boneless Fillet	36%	35%	38%	33%	38%	
		Steaks	58%	57%	62%	58%	58%	
	Dressed/Head-Off	Skin-On Fillet	76%	72%	76%	72%	81%	
		Skinless Fillet	64%	62%	68%	58%	67%	
		Skinless/Boneless Fillet	50%	47%	51%	45%	51%	
		Steaks	81%	77%	81%	80%	78%	
	Price increase due to yield (= 1/Yield)	Round	Dressed/Head-On	114%	109%	109%	110%	112%
			Dressed/Head-Off	139%	135%	133%	137%	135%
			Canned		149%	149%	154%	149%
Skin-On Fillet			182%	189%	175%	192%	167%	
Skinless Fillet			217%	217%	196%	238%	200%	
Skinless/Boneless Fillet			278%	286%	263%	303%	263%	
Steaks			172%	175%	161%	172%	172%	
Dressed/Head-Off		Skin-On Fillet	132%	139%	132%	139%	123%	
		Skinless Fillet	156%	161%	147%	172%	149%	
		Skinless/Boneless Fillet	200%	213%	196%	222%	196%	
		Steaks	123%	130%	123%	125%	128%	

Source: Crapo et al 1988.

Table X-2 **An Example of How Changes in Weight Affect Price**

Product	Round fish	Dressed head-off fish	Skinless-boneless fillets
Total price (assumed to be constant)	\$1000	\$1000	\$1000
Yield from round fish	100%	72%	36%
Weight	1000	720	360
Price per pound	\$1.00	\$1.39	\$2.78

Multiple Prices for Products from the Same Fish

A different important—and also often overlooked—factor in how prices increase through the distribution system is that not all of the fish purchased by a buyer are sold for the same price. A processor may process fish purchased from a given fisherman into different products and sell them for different prices. A distributor may sell fish purchased from a given

processor into different markets for different prices. A retailer may sell some fish at a “regular” price and other fish for a “sale” price. In all of these cases, if we look only at the fish sold for the highest price, we will get an unrealistic picture of profits made by the seller as well as what the seller might be able to afford to pay a supplier.

Table X-3 provides an illustration of this point. Suppose a processor buys 1000 pounds of fish from a

fisherman, and finds (as is often the case) that the quality of the fish varies. Suppose he is able to sell one-third of the fish for \$5.00/lb, one-third for \$3.00/lb and one-third for only \$1.00/lb, for a total sales value of \$3000. If his processing cost is \$1.00/lb for all the fish, so that his total costs are \$1000, he can afford to pay a maximum of \$2000 to the fisherman—or \$2.00/lb. If he does this, he will just break even (make zero profit).

If we look only at the third of the fish that the processor sells for the highest price of \$5.00, it will appear that the processor is getting a markup of \$3.00/lb and earning a profit of \$2.00/lb. This is in fact the case—for those fish. However, he is also losing \$2.00/lb for the fish that he is forced to sell for just \$1.00/lb. It would be impossible for the processor to pay the fisherman more for the fish that he sold for \$5.00/lb unless he paid him less for the rest of his fish.

The same point applies more generally to markups at any level in the distribution system. Focusing on the markups and apparent prices for the highest-priced fish may give a misleading picture of average markups for all fish.

Markups Between Ex-Vessel and Wholesale Prices for Wild Salmon

The first markup in the price of wild salmon occurs between the price paid to fishermen and the wholesale price received by processors. Figure X-3 shows average prices paid to Alaska chum salmon fishermen and average wholesale prices received by Alaska chum salmon processors for fresh and frozen chum salmon.³

For example, in 2002 fishermen were paid an average of \$0.16/lb for chum salmon. Processors sold fresh salmon for an average of \$0.45/lb and frozen salmon for an average of \$0.41/lb. Thus the average “processor margin” (defined here simply as the difference between the wholesale price and the ex-vessel price, without any adjustment for yield) was \$0.29/lb for fresh salmon and \$0.25/lb for frozen salmon. The wholesale price was more than double the ex-vessel price.

“Processor margin” defined in this way can be misleading for two reasons. The first reason is that the fisherman’s price is expressed in dollars per round pound, while the wholesale price is in dollars per processed pound. To compare the two prices and see how much the processor is really “marking up” the price, we would need to compare the prices on the same weight basis. Adjusting for an assumed processing yield of 74 percent, the processor paid fishermen \$0.21/lb when expressed in terms of the pounds of fresh or frozen salmon produced from the fish. Thus the processor’s markup over the cost of the fish was lower: \$0.24/lb for fresh salmon and \$0.20/lb for frozen salmon.

Another reason for which this comparison can be misleading—particularly for chum salmon—is that the price comparison does not include the value of the roe produced from the salmon. The value derived by the processor from the fish is substantially higher because salmon roe was also produced from the fish.

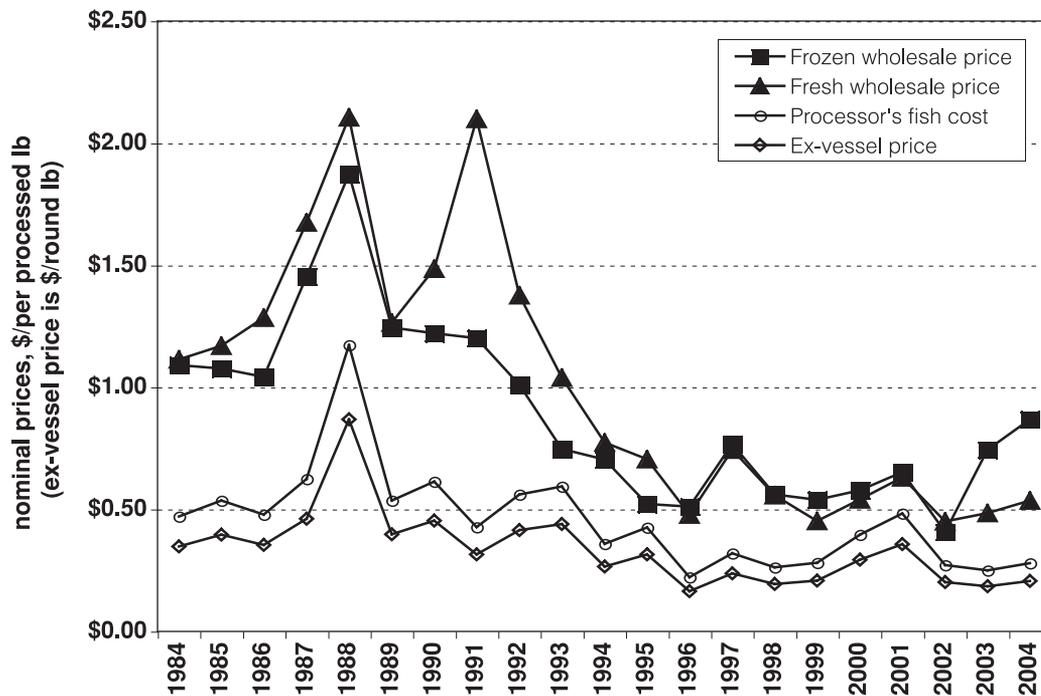
As may be seen from Figure X-3, the processor margins for frozen and fresh chum salmon (the markups between the ex-vessel price and wholesale prices) declined substantially during the 1990s. As salmon

Table X-3		An Example of How Multiple Products or Multiple Prices affect Markups		
Product	Total	#1 fish (highest quality)	#2 fish (lower quality)	#3 fish (lowest quality)
Pounds delivered by fisherman	1000			
Quality distribution of production (%)		33%	33%	33%
Production (pounds)	1000	333	333	333
Processor's selling price (\$/lb)		\$5.00	\$3.00	\$1.00
Processing cost (\$/lb)		\$1.00	\$1.00	\$1.00
Total value of sales (\$)	\$3000	\$1667	\$1000	\$333
Total processing cost (\$)	\$1000	\$333	\$333	\$333
Total payment to fisherman (\$)	\$2000			
Processor profit (\$)	\$0			
Price per pound paid to fisherman (\$/lb)	\$2.00			
Apparent markup by processor (\$/lb)		\$3.00	\$1.00	-\$1.00
Apparent processor “profit” (\$/lb)		\$2.00	\$0.00	-\$2.00

³ This figure was also included in Chapter VII as Figure VII-11. Figures VII-9 and VII-10 are similar graphs of ex-vessel and wholesale prices for sockeye salmon and pink salmon.

Figure X-3

Average Annual Wholesale and Ex-Vessel Prices for Alaska Chum Salmon



During the years 1984-2002, the frozen share of chum production ranged between 64% and 88%. The fresh share ranged between 4% and 21%.

Source: Ex-vessel prices are from CFEC Alaska Salmon Summary Data 1980-2005; Wholesale prices are from ADFG COAR data. Processor's fish cost based on assumed yield of 74%.

prices declined, fishermen and processors earned less money. This was generally the case for other wild salmon species as well.⁴ The processor margin for frozen chum salmon increased in 2003 and 2004.

Table X-4 shows average “processing margins,” calculated in the same way, for all five Alaska wild salmon species for the years 2000-2004. Margins differ from year to year and from species to species. In recent years processing margins have generally been higher than ex-vessel prices. Put differently, the markup between the fisherman’s price and the wholesale price is higher than the price paid to fishermen (which also implies that the wholesale price is more than double the ex-vessel price).

Processors’ costs and profits are the subject of considerable speculation and debate among fishermen. Processors are reluctant to share information about their costs and are often suspicious of efforts to examine whether their profits are “justified”—pointing

out that fishermen tend to focus their interest on years, species and products for which processors make money, rather than those for which they lose money. They also point out the difficulty of calculating per-pound costs when a large share of costs are fixed costs of capital used to process not only salmon but also other species.

However, various studies have attempted to examine costs and profitability of processing salmon. A typical example is the University of Alaska analysis of Bristol Bay salmon processing costs shown in Table X-5 (refer also to the discussion of the analysis on the following page).

In general, these studies have suggested that the most significant costs of salmon processing include tendering, labor, plant overhead and “yield” (lower processed weight resulting in higher fish cost per processed pound). These studies also suggest that processors’ profits vary significantly from year to year.

⁴ The relative decline in processor margins was greater for chum salmon than for other species because of the higher relative price of chum salmon roe and the higher roe yield of chum salmon. Processors could continue to process and sell fresh and frozen chum salmon even with low margins because of the value of the roe.

Table X-4

Average Alaska Salmon Processing Margins, 2000-2004

		Year	Species						
			Chinook	Sockeye	Coho	Pink	Chum		
Ex-vessel price		2000	\$1.92	\$0.78	\$0.57	\$0.15	\$0.29		
		2001	\$1.68	\$0.58	\$0.48	\$0.13	\$0.36		
		2002	\$1.38	\$0.60	\$0.36	\$0.10	\$0.20		
		2003	\$1.41	\$0.62	\$0.49	\$0.11	\$0.19		
		2004	\$1.88	\$0.62	\$0.69	\$0.11	\$0.21		
Wholesale price		Canned		2000	\$2.50	\$2.70	\$1.85	\$1.10	\$0.60
				2001	\$2.36	\$2.27	\$1.68	\$0.96	\$0.79
				2002	\$1.53	\$2.60	\$1.53	\$0.89	\$0.76
				2003	\$1.41	\$2.39	\$1.48	\$0.82	\$0.66
				2004	\$3.06	\$2.24	\$1.44	\$0.87	\$0.66
		Fresh		2000	\$3.96	\$2.39	\$1.38	\$0.46	\$0.54
				2001	\$3.99	\$2.24	\$1.09	\$0.24	\$0.63
				2002	\$3.57	\$1.98	\$1.22	\$0.29	\$0.45
				2003	\$3.31	\$1.97	\$1.23	\$0.76	\$0.48
				2004	\$4.37	\$1.94	\$1.73	\$0.36	\$0.54
		Frozen		2000	\$2.94	\$1.77	\$1.61	\$0.63	\$0.58
				2001	\$2.45	\$1.60	\$1.20	\$0.50	\$0.65
				2002	\$2.15	\$1.78	\$1.04	\$0.54	\$0.41
				2003	\$1.67	\$1.74	\$1.57	\$0.75	\$0.74
				2004	\$3.02	\$1.87	\$2.05	\$0.74	\$0.87
Processing Margin (not adjusted for yield) = Wholesale Price - Ex-Vessel Price		Canned		2000	\$0.58	\$1.92	\$1.28	\$0.95	\$0.31
				2001	\$0.68	\$1.69	\$1.20	\$0.82	\$0.43
				2002	\$0.15	\$2.00	\$1.16	\$0.79	\$0.56
				2003	\$0.00	\$1.76	\$0.99	\$0.71	\$0.48
				2004	\$1.19	\$1.62	\$0.74	\$0.76	\$0.45
				Average	\$0.52	\$1.80	\$1.08	\$0.81	\$0.45
		Fresh		2000	\$2.03	\$1.61	\$0.81	\$0.30	\$0.25
				2001	\$2.32	\$1.67	\$0.60	\$0.11	\$0.27
				2002	\$2.20	\$1.38	\$0.86	\$0.20	\$0.25
				2003	\$1.90	\$1.35	\$0.74	\$0.65	\$0.30
				2004	\$2.49	\$1.32	\$1.04	\$0.26	\$0.33
				Average	\$2.19	\$1.47	\$0.81	\$0.30	\$0.28
		Frozen		2000	\$1.02	\$0.99	\$1.04	\$0.47	\$0.28
				2001	\$0.78	\$1.02	\$0.72	\$0.37	\$0.30
				2002	\$0.77	\$1.18	\$0.68	\$0.44	\$0.21
2003	\$0.26			\$1.12	\$1.08	\$0.64	\$0.56		
2004	\$1.14			\$1.25	\$1.35	\$0.64	\$0.66		
		Average	\$0.79	\$1.11	\$0.97	\$0.51	\$0.40		

Note: Based on Alaska Department of Fish and Game ex-vessel price estimates and wholesale value and volumes from Commercial Operator Annual Reports. Data are statewide annual averages. Differences in processing margin from year to year are partly due to differences in the geographic distribution of catch between different regions with different costs.

A Guide to Typical Bristol Bay Processing Costs

While they vary considerably from processor to processor, it's still useful to begin to understand the typical costs a processor incurs processing your fish. Keep in mind that processing costs can vary widely from year to year. One factor is the run size—the more fish a processor processes, the cheaper the per pound charges for overhead. But if the run size is too big, the cost of long-hauls and flying fish to other plants can add up in a hurry. Another factor that varies from year to year is what's happening in other fisheries. If crab or herring catches are down, a processor has to charge more of his plant and overhead costs to salmon.

TAXES & ASSESSMENTS. Shore based processors pay a 3 percent Alaska business tax on the ex-vessel value of the fish they freeze. Cannery pay a 4.5 percent tax and floating processors pay 5 percent. Processors also pay an assessment of 0.3 percent of ex-vessel value to the Alaska Seafood Marketing Institute (ASMI).

TENDER COSTS. Tender costs in Bristol Bay can range from nothing (in the case of smaller cash buyers) to between \$.15 and \$.20/lb for traditional processors. Tender costs for long hauls to Kodiak or other areas can be as much as \$.25/lb. Tender costs depend on contracts that processors negotiate before the season. Often they can be tied to a herring contract, which can reduce costs. Costs also reflect market conditions: when prices are down, tenders—like fishermen—usually get paid less. In recent years, tender costs have gone up in Bristol Bay as processors have increased tender capacity to improve quality by cutting down on delivery times.

SERVICES TO FISHERMEN. Some processors—especially cash buyers—don't provide any services and, hence, don't have any costs. But most large, established processors provide services to foster loyalty among their fishermen. Providing services such as boat storage, net lockers, delivery of emergency spare parts and other miscellaneous services can end up costing processors as much as \$.05/lb. or more.

ROE VALUE. Roe value per round pound is revenue that offsets a processor's costs. The roe value is the roe yield times the price of roe. Typically, Bristol Bay processors sell their roe "green" (or unprocessed) to Japanese companies, whose technicians grade and process the roe at the plant. Depending on where the fish are harvested and their quality, the roe yield may be between 2 percent and 3 percent of the round weight of the fish. Processors usually receive between \$3 and \$5/lb. for roe. The price is a function of quality (which deteriorates the longer the time between harvest and processing) and market conditions. For fish that get long-hauled to plants in Kodiak or elsewhere, roe yield drops to zero. Usually the roe ends up adding between \$.06 and \$.15 per round pound to the value that your processor gets from your salmon—in effect reducing the cost of the fish to the processor by that amount. Because of long-hauls, average roe value per round pound is somewhat lower for canned salmon. For fish frozen in the round, processors don't get paid

separately for the roe, which gets extracted and processed in Japan.

PROCESSING YIELD: When you remove the head, guts and roe, the weight of your salmon goes down, which increases the cost of fish per processed pound. To calculate the fish cost per processed pound, divide the cost per round pound by the processing yield. Processing yields for H&G sockeye are typically between 74 percent and 76 percent, though yields may be as low as 72 percent for small fish. Processing yields for canned sockeye are about 59 percent, which is equivalent to 75 round pounds for a case of 48 14.75 oz. cans. Even for frozen round sockeye, the final weight ends up 2-3 percent less than the weight purchased from fishermen, for a yield of about 97-98 percent.

PROCESSING COSTS. Processing costs include all the direct costs that a processor incurs from the time fish are delivered to the plant until the fish are shipped from the plant—including labor, packaging, utilities and plant overhead. Processing costs for frozen H&G salmon in Bristol Bay usually range between \$.55-\$.65/lb. on an H&G finished weight basis. Processing costs for frozen round sockeye usually range between \$.40-\$.45/lb. Processors use \$30-\$35/case (for 14.75 oz. talls) as a rule of thumb for the cost of canning sockeye salmon, which works out to \$.68-\$.79/lb. Custom processing rates are a good indicator of processing costs—although sometimes processors will charge less than their total processing costs for custom processing in order to spread plant overhead out over more volume.

TRANSPORTATION & STORAGE COSTS. Depending on when and where they sell their fish, processors may or may not pay transportation and storage costs. Processors used to sell most of their frozen sockeye production to Japanese importers FOB Bristol Bay, so that they didn't incur any shipping or storage costs. That's changing. This year, most Bristol Bay fish went to Japan unsold, adding transportation, import and storage costs. In our mid-range estimates for this article, we compare FOB Alaska costs with FOB Alaska prices, so we don't include any transportation or storage costs. Fish sold in Japan get a higher price—but costs are higher, too. In contrast, most canned salmon is shipped to Seattle, stored in warehouses and sold over the course of the year—at a cost of about \$.08-\$.12 per canned pound.

OTHER COSTS. "Other costs" include all the costs that we haven't listed yet that would normally be subtracted from the selling price in order to calculate profit. They include the cost of a processor's general overhead—office rental and salaries of management and sales personnel. They also include insurance, interest expense on pack loans and debt service for loans on plant and equipment. These costs can vary widely between different processors depending on their debt load and the volume of other species that they process. A very rough estimate is between \$.05 and \$.15/lb.

Source: *Currents: A Journal of Salmon Market Trends*, University of Alaska Anchorage, Salmon Market Information Service, December 1995.

Table X-5

Bristol Bay Processor Costs, Prices, and Profits: Mid-Range Estimates for 1994 and 1995

	Frozen Dressed		Frozen Round		Canned	
	1994	1995	1994	1995	1994	1995
Price paid to fishermen	\$0.97	\$0.75	\$0.97	\$0.75	\$0.97	\$0.75
+ Taxes and assessments	\$0.03	\$0.02	\$0.03	\$0.02	\$0.03	\$0.02
+ Tender cost	\$0.17	\$0.17	\$0.17	\$0.17	\$0.17	\$0.17
+ Costs of services to fishermen	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03
= Fish cost per round lb.	\$1.20	\$0.97	\$1.20	\$0.97	\$1.20	\$0.97
- Roe value per round lb. (= roe yield x roe price)	\$0.09	\$0.09	\$0.00	\$0.00	\$0.07	\$0.07
= Fish cost per round lb., net of roe value	\$1.11	\$0.88	\$1.20	\$0.97	\$1.13	\$0.90
÷ Processing yield	74%	74%	97%	97%	59%	59%
= Fish cost per processed lb., net of roe value	\$1.51	\$1.20	\$1.24	\$1.00	\$1.92	\$1.53
+ Processing costs per processed lb.	\$0.60	\$0.60	\$0.40	\$0.40	\$0.73	\$0.73
+ Transportation and storage costs before sale	\$0.00	\$0.00	\$0.00	\$0.00	\$0.10	\$0.10
+ Other costs	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10
= Processor's total cost	\$2.21	\$1.90	\$1.74	\$1.50	\$2.85	\$2.46
Average price received by processor	\$2.45	\$1.80	\$2.20	\$1.00	\$2.71	\$2.80
Profit or loss (= average price - total cost)						
per processed lb.	\$0.24	-\$0.10	\$0.46	-\$0.50	-\$0.14	\$0.34
per round lb.	\$0.18	-\$0.07	\$0.45	-\$0.49	-\$0.08	\$0.20

Note: Costs and prices can vary widely between processors. Any given processor's profits or losses could be higher or lower than shown in this table.
Source: UAA 1995.

Markups between Wholesale and Retail Prices

It is much more difficult to describe and explain how salmon prices increase between the wholesale and retail level than between the fisherman and the wholesale level. There are two fundamental reasons for this. First, there are far more retail salmon products than there are wholesale salmon products. The same headed and gutted fresh or frozen salmon purchased at wholesale may be made into numerous different retail products of different sizes, different yields, different additives and different packaging.

Secondly, unlike wholesale prices—which tend to be similar at any given time for similar salmon products—retail prices for the same products vary significantly between different stores, even in the same geographic area. What stores charge and what consumers are willing to pay depends not only on the product they are selling but also convenience (store location, parking, availability of other products, etc.), information (knowledge of the consumer and the store staff about the product), reliability (consistency of availability of the product, assurance of product quality) and many other factors. Different stores have different pricing strategies for

salmon. At some stores, salmon is frequently “on sale”—discounted by widely varying amounts.

For these reasons, it is meaningless to talk about “the retail price of wild salmon” or the “retail price of farmed salmon.” It is difficult even to describe the retail price of a particular kind of salmon product in a particular location. This can be seen in the newspaper advertisements for salmon on the following two pages, for salmon sold by stores in the Maryland suburbs of Washington, DC.⁵

In April 2001 stores were selling fresh boneless Atlantic salmon fillets for prices ranging between \$3.99/lb and \$6.99/lb. The same store (Giant) advertised prices of \$5.99/lb, \$6.99/lb and \$3.99/lb on three separate weeks. Clearly, there was no single “retail price of fresh boneless Atlantic salmon fillets” in the Washington, D.C. area in April 2001, nor any standard markup for this product. Rather, there were widely varying prices and widely varying markets.

Similarly, during the summer of 2003 stores were selling fresh chum salmon for prices from as low as \$.99/lb (for whole salmon) to \$2.99/lb (for steaks)—making it difficult to describe the retail price or markups for fresh chum salmon.

⁵ We are grateful for the assistance of Barbara Knapp of Germantown, Maryland, who has collected retail salmon advertisements in local newspapers for more than ten years.

We are unaware of any reliable source of data on “average” U.S. retail prices for fresh and frozen salmon. Although it is easy to go into a store and see what a particular salmon product is selling for in that particular store in that particular week, it is very difficult to determine “average” or even “typical” prices of salmon

sold in a particular area—much less the entire country. This is especially the case because quantities sold vary dramatically between different stores and at different times. A store with a high price may be selling far less salmon than a store with a low price.

Newspaper Advertisements of Selected Maryland Stores for Fresh Boneless Atlantic Salmon Fillets, April 2001

Giant, April 8, 2001



Safeway, April 25, 2001



Giant, April 15, 2001



Giant, April 25, 2001



Magruder's, April 25, 2001



In April, 2001 stores in the Maryland suburbs of Washington, DC were selling fresh boneless Atlantic salmon fillets for prices ranging between \$3.99 lb and \$6.99/lb. The same store (Giant) advertised prices of \$5.99/lb, \$6.99/lb and \$3.99/lb in three succeeding weeks. Photos: Gunnar Knapp

**Newspaper Advertisements of Selected Maryland Stores
for Fresh and Frozen Wild Chum Salmon, Summer 2003**

Magruder's, July 14, 2003



Giant, August 10, 2003



Shoppers Food Warehouse
August 24, 2004



Giant, July 27, 2003



Shoppers Food Warehouse
September 7, 2003



During the summer of 2003 stores in the Maryland suburbs of Washington, DC were selling fresh chum salmon (referred to variously as "Pacific salmon," "west coast silverbrite" and "fresh Pacific silverbrite" for prices from as low as \$.99/lb (for whole salmon) to \$2.99/lb (for steaks). Photos: Gunnar Knapp

Figures X-4 and X-5 compare wholesale prices with advertised retail prices in Maryland stores for fresh farmed Atlantic salmon fillets and various fresh wild chum salmon products. Advertised retail prices vary widely at any given time. Nevertheless, it is clear that for both farmed and wild salmon, prices are higher at the retail level than the wholesale level—typically at least twice as high.

In considering the reasons for this price increase, keep in mind that the product weight sold at retail may be considerably lower than the product weight purchased at wholesale, as discussed earlier. This is one important factor in price markups between wholesale and retail.

Below we briefly discuss other components of salmon price markups above the wholesale level. Keep in mind that these should be considered only general rules of thumb: actual markups vary widely in different markets and at different times (Knapp et al. 2001).⁶

Traders will make whatever margin they can on any given transaction. Because most traders have very little overhead and often work independently in small offices, they can work on a very small margin if the volume of the transaction is large enough. On smaller volume transactions, though, a margin of 5 cents a pound is

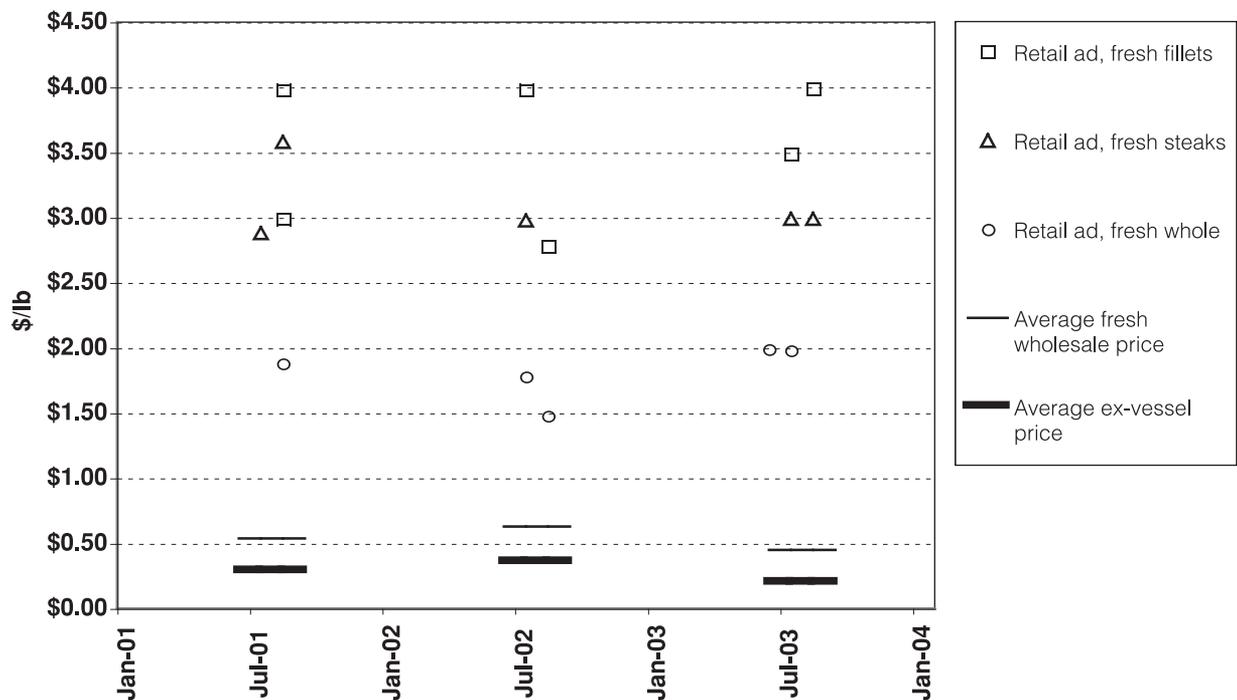
typical. For example, a trader selling a truckload of fresh Alaska chum salmon to a supermarket buyer in Boston will make \$2,000 on a 40,000-pound truckload if he marks it up 5 cents a pound.

Traders can also make a higher margin, if they see a special opportunity that can arise when either the companies they are buying from, or those they are selling to, are not fully aware of the market conditions. In cases like this, it is possible for a trader to make 10 cents or more a pound.

If a trader has to invest a lot of time and effort into a sale, or find a market for a new product, he will normally require a higher margin. A trader trying to develop a new market for, say, a skinless, boneless chum salmon fillet, may not be interested in committing the necessary time and effort unless he thinks he can make a margin of at least 25 or 50 cents a pound on the initial orders. As the business is developed and the volume increases, however, a trader is normally willing to work on a lower margin.

Brokers may earn a commission of between two and seven percent of the sales price, depending on the product and the volume.

Figure X-4 Prices for Imported Chilean Fresh Atlantic Salmon Fillets



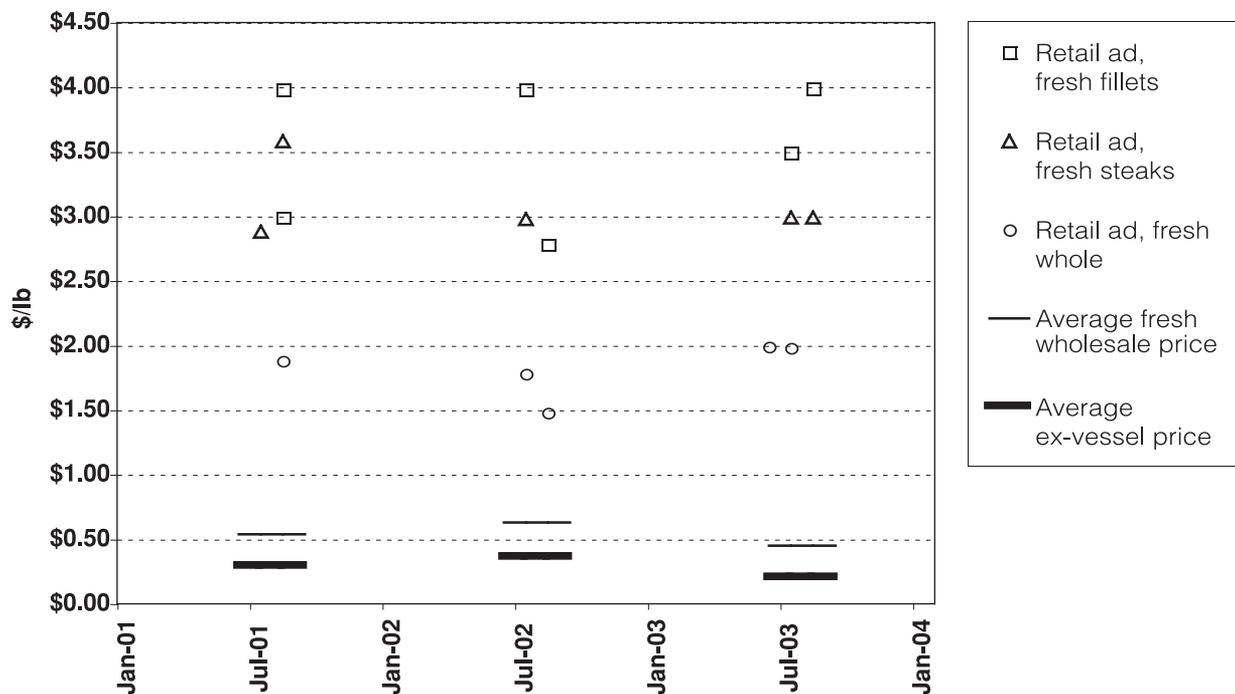
Note: Monthly import price calculated by dividing value by volume for fresh Atlantic salmon fillet imports from Chile. Miami wholesale price is from Urner Barry, Inc., Seafood Price Current.

Source: Wholesale price is from Urner Barry Wholesale Price Data. Average import price is from NMFS Fisheries Trade data.

⁶ Much of the remaining text for this section, discussing other components of price markups, was originally written by Peter Redmayne for Knapp et al., *A Village Processing Plant: Yes or No?* (2001).

Figure X-5

Prices for Imported Chilean Fresh Atlantic Salmon Fillets



Note: Ex-vessel price and wholesale price are statewide averages as reported by the Alaska Department of Fish and Game. Retail ad prices are for selected Maryland stores.

Source: Wholesale price is from ADFG COAR data. Ex-Vessel Price is from CFEC Alaska Salmon Summary Data 1980-2005.

Broadline distributors' markups vary considerably. A broadline distributor like Associated Grocers that delivers to supermarkets will typically mark up frozen seafood items 5 to 10 percent. Fresh seafood items, on the other hand, may be marked up 15 to 20 percent, since they require more handling. In addition, the "shrink"—seafood that must be thrown away because it has gone bad—is much higher with fresh seafood. Broadline distributors that sell to supermarkets can mark product up less, because they deliver a very large volume of orders per stop.

Broadline distributors with foodservice accounts have an average mark up between 10 and 20 percent. If they have to compete with seafood distributors on a certain product, broadline distributors may take a very small mark up to get the business on that item. After broadline distributors have the business, though, they will normally try to increase the mark up. How high the distributor can mark the product up is largely a function of the knowledge of the buyer. Since sales people for most broadline distributors are paid largely on a commission basis, they will charge their customers as much as they can.

Specialty seafood distributors have a higher delivery cost than broadline distributors, because the total dollar value of their order is usually lower because their

deliveries are limited to seafood. However, the higher delivery cost is offset by the fact that seafood distributors have lower overall operating costs. As a result, specialty seafood distributors will normally mark up seafood products about the same amount as broadline distributors, usually in a range between 10 to 15 percent, depending on the value of the product.

There is a growing trend for seafood distributors to supply large customers such as supermarket chains on a cost plus basis. Under this arrangement, a distributor will mark product up a negotiated amount above the distributor's actual cost. Typically, this markup can be anywhere from six to 10 percent above cost, depending on the sales volume of the customer and the level of merchandising support the distributor has to supply.

Supermarkets with full-service seafood departments typically mark up the price of seafood between 10 and 25 percent, although supermarkets may sell the salmon at a low price as a 'loss-leader.' A loss-leader is a product put on sale in an effort to get the customer into the store. As such, some products are sold slightly above, at or below cost as an enticement to draw traffic into stores.

A supermarket's mark up is necessary to cover its high overhead costs, including the labor required to staff a full-service seafood counter. In addition, supermarkets,

like other buyers, have to account for the “shrink” associated with seafood. When a supermarket does a product demonstration and hands out cooked samples, for example, this product is considered shrink. Product that cannot be sold and has to be discarded is also considered shrink. Furthermore, seafood—which is over 70 percent water—will dehydrate over time and lose moisture, which is, of course, weight. In a refrigerated case, this dehydration can be as much as one percent a day.

Because of their higher sales volume and lower overhead, club stores will take a much smaller mark up on items. This markup is typically 10 to 15 percent.

Restaurants generally try to operate with a food cost that runs between 30 and 35 percent. That means for a \$12 entree, the cost of the food will typically be around \$4. A restaurant that pays \$8 for a pound of a chinook salmon fillet, will typically price that salmon portion of

that entree (seafood portions are typically six to eight ounces) at about \$12. By the time the vegetables and starch are added, a chinook salmon entree may run \$16 to \$20, depending on the restaurant. Restaurants need a high mark up on their food to cover their high operating costs, which include labor and real estate.

Examples of Markups from Fisherman to Consumer

Various studies have attempted to describe how and why salmon prices increase from the fisherman to the consumer. Tables X-6 and X-7 are two examples from University of Alaska Anchorage studies from the mid-1990s. Neither should necessarily be considered typical or representative. However, they help to illustrate the numerous ways in which costs and profits are added at different levels, resulting in a much higher final price to the consumer than that paid to the fisherman.

Table X-6 Example of Markups for Fresh Wild Salmon Sold at Retail on the East Coast	
Grounds price paid to fishermen	\$0.80/lb.
Add taxes and assessments	\$0.03/lb.
Add tendering costs	\$0.15/lb.
Subtract roe value	-\$0.12/lb.
Cost of fish to processor (per round pound)	\$0.86/lb.
Cost of fish to processor, after adjusting for 74 percent H&G yield	\$1.16/lb.
Add processing and packaging costs (includes plant overhead costs)	\$0.46/lb.
Add processor’s general overhead and profit	\$0.20/lb.
Add air freight to Seattle and trucking to East Coast	\$0.40/lb.
Cost of fish to distributor	\$2.22/lb.
Add distributor’s mark up (to cover reboxing, reicing, trucking and profit)	\$0.25/lb.
Cost to supermarket	\$2.47/lb.
Add supermarket markup	\$0.52/lb.
Price to consumer for H&G salmon	\$2.99/lb.

Source: UAA 1996.

Table X-7

Estimate of Markups for Wild Salmon Sold at a Seattle Restaurant

The \$17 Copper River King Dinner: Where the Money Goes		<i>Notes</i>
Grounds Price for Copper River King	\$1.55/lb.	
Fishermen's Taxes and Assessments	\$.05/lb.	
Processor's Taxes and Assessments	\$.05/lb.	
Tendering Costs	\$.20/lb.	
Subtract Roe Value	-\$.12/lb.	<i>Assumes 3% yield @ \$4.00/lb.</i>
Cost of Round Fish Delivered to Processor	\$1.68/lb.	
Adjust for H&G Yield (74%)	\$2.27/lb.	
Add Processing, Packaging & Overhead Costs	\$0.46/lb.	<i>Estimate from Craig Wiese, Alaska Sea Grant Marine Advisory Program</i>
Add Air Freight to Seattle	\$0.30/lb.	
Adjustment for Loss on #2's	\$0.13/lb.	<i>Assumes 20% of fish are #2's which sell for 20% less.</i>
Add Processor's Average Profit Margin	\$0.20/lb.	
Cost of Copper River King to Distributor	\$3.36/lb	
Adjust for Skinless Boneless Portions (58%)	\$5.79/lb	
Add Distributor's Labor Cost of Producing Portions	\$0.75/lb	
Add Packaging Costs	\$.10/lb.	
Add Delivery Costs	\$.20/lb.	
Add Distributor's Profit Margin	\$.20/lb.	
Cost of H&G Copper River King Portion to Restaurant	\$7.04/lb.	
Add Restaurant Costs		
<i>Combined Product & Labor Costs</i>		<i>65% of sales price is industry standard</i>
Cost of 8-oz. Dinner Portion	\$3.52	
Other Food Costs	\$0.86	
Labor Costs	\$6.67	
General and Administrative Expenses (Rent, equipment, depreciation, utilities, etc.)	\$5.10	<i>30% of sales price is industry standard</i>
Gross Profit Margin	\$0.85	
Price of Copper River King Dinner	\$17.00	

Note: Prices and costs are typical. Actual costs and prices for specific processors, restaurants and distributors may differ.

Source: UAA 1994.

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