

Overview of U.S. Salmon Consumption

Key Points

- ✓ During the years 2000-2004, Americans consumed an average of about 284,000 metric tons of salmon annually, of which approximately:
 - one-third was Pacific salmon and two-thirds was Atlantic salmon
 - one-third was wild and two-thirds was farmed
 - one-third was domestic production and two-thirds was imported
 - three-fifths was fresh salmon, one-fifth was frozen salmon and one-fifth was canned salmon
- ✓ There were significant differences in U.S. consumption of Pacific salmon (which is mostly wild) and Atlantic salmon (which is mostly farmed):
 - 45 percent of Pacific salmon was canned while almost no Atlantic salmon was canned
 - 34 percent of Pacific salmon was frozen while only 13 percent of Atlantic salmon was frozen
- 21 percent of Pacific salmon was fresh while 87 percent of Atlantic salmon was fresh
- ✓ Total U.S. salmon consumption increased dramatically from about 130,000 metric tons in 1989 to more than 300,000 metric tons in 2004, mostly due to rapid growth in consumption of imported farmed salmon. Between 2000 and 2004, about 78 percent of fresh and frozen salmon consumption in the United States was imported farmed salmon.
- ✓ Between 2000 and 2004, about 16 percent of total salmon consumption in the United States was canned salmon.
- ✓ Since 2001, salmon (including canned salmon) has ranked third among fish species consumed in the United States, after shrimp and canned tuna and accounted for about 14 percent of U.S. fish consumption. Fish represented less than 8 percent of total U.S. consumption of meat, poultry and fish in 2001, while salmon represented just 1 percent.

Introduction

Our goal in this chapter is to provide an overview of U.S. salmon consumption. This overview is needed to understand the salmon trade and marketing issues discussed later in this report.

We begin by describing U.S. salmon consumption: how much salmon Americans consume, what species they consume, what products they consume, where it comes from and how much is wild and farmed. Next we describe recent trends in salmon consumption over time. We then discuss the relative scale of U.S. salmon consumption compared with consumption of other kinds of seafood and compared with meat.

The data presented in this chapter are estimates derived from a number of sources. In general, estimated consumption is equal to U.S. production plus imports minus exports.¹ Appendix C describes how the estimates were derived and the data sources they are based on. In reading the chapter, it is important to keep the following in mind:

- Our estimates of consumption from imports are more reliable than our estimates of consumption from domestic production—because more comprehensive and detailed data are available for imports than for domestic production.
- Our estimates of longer-term trends in consumption

¹ This method of estimating consumption is known as a “disappearance model.” Consumption is assumed to be the total of all potential sources of supply minus the volume that “disappears” from potential supply.

are more reliable than our estimates for any given year, or for year-to-year changes.²

Our estimates should not be considered precise measures of U.S. salmon consumption—but they do provide a useful overview of U.S. salmon consumption and how it has been changing.

Overview of U.S. Salmon Consumption

Not all salmon is the same. Salmon consumed in the United States varies by species, product, origin (domestic and imported) and type (wild and farmed). There are important differences in U.S. consumption and trends over time for different combinations of these characteristics.

Tables VIII-1 and VIII-2 provide an overview of average annual U.S. salmon consumption for the period 2000-2004.⁵ In those years, Americans consumed an average of about 284,000 metric tons of salmon annually. Of this total, 105,000 metric tons (37 percent) was Pacific salmon (chinook, sockeye, coho, pink and chum), while 180,000 metric tons (63 percent) was Atlantic salmon.

Fresh salmon accounted for about three-fifths of total U.S. consumption (63 percent) while canned salmon accounted for about 16 percent and frozen salmon accounted for about 21 percent. About two-thirds (68 percent) of U.S. salmon consumed was imported and about two-thirds (65 percent) of salmon consumed was farmed.

There are significant differences between Pacific and Atlantic salmon consumption in products, origin and

Four Important Characteristics for Describing Salmon Consumption

Species:	Americans consume <u>five species of Pacific salmon</u> (chinook, sockeye, coho, pink and chum) as well as <u>Atlantic salmon</u> . ³ These species vary considerably in size, taste and suitability for different kinds of products.
Product:	Americans consume salmon which is initially processed or imported in three major product forms: <u>canned</u> , <u>frozen</u> and <u>fresh</u> . Increasingly, fresh and frozen salmon are being imported as value-added fillets. ⁴
Origin:	Americans consume both <u>domestic</u> and <u>imported</u> salmon.
Type:	Americans consume both <u>farmed</u> and <u>wild</u> salmon.

Table VIII-1

Estimated Average Annual U.S. Salmon Consumption, 2000-2004
(thousand metric tons, import and primary processing weight basis)

	Pacific	Atlantic	Total
Total	105	180	284
Canned	47	0	47
Frozen	36	24	60
Fresh	22	156	178
Domestic	81	10	91
Imported	24	170	193
Wild	97	2	99
Farmed	7	178	185

Note: Estimates include only canned, frozen and fresh products. Products for which species were “unspecified” are included in “Pacific salmon” category. Estimated using the United States Salmon Market Database described in Appendix C. See Appendix C for detailed discussion of methodology and sources used to develop estimates.

² This is partly because domestic production data are incomplete, particularly for products produced from U.S. Pacific Northwest wild salmon. In addition, the estimates do not account for changes in inventories of frozen and canned salmon from year to year. They may overstate consumption in years when inventories are built up, or understate consumption in years when inventories are drawn down.

³ A related species of growing importance is salmon trout. Our consumption estimates in this chapter do not include salmon trout.

⁴ Smoked salmon is also an important salmon consumer product, but accounts for a relatively small share of imports or primary processing.

⁵ See Appendix C for a detailed discussion of how the estimates for all tables and graphs in this chapter were derived.

Table VIII-2 Shares of Estimated U.S. Salmon Consumption, 2000-2004, by Product, Origin, and Type

	Pacific	Atlantic	Total
Total	100%	100%	100%
Canned	45%	0%	16%
Frozen	34%	13%	21%
Fresh	21%	87%	63%
Domestic	77%	6%	32%
Imported	23%	94%	68%
Wild	93%	1%	35%
Farmed	7%	99%	65%

Source: Based on estimates in Table VIII-1

type. Close to half (45 percent) of the Pacific salmon was canned, 34 percent was frozen and only 21 percent was fresh. In contrast, none of the Atlantic salmon was canned, 13 percent was frozen and 87 percent was fresh. Most (93 percent) of the Pacific salmon was wild, while almost all (99 percent) of the Atlantic salmon was farmed. Most (77 percent) of the Pacific salmon was domestic salmon produced in the United States, while most (94 percent) of the Atlantic salmon was imported. (However, 23 percent of the Pacific salmon was imported and six percent of the Atlantic salmon was domestic.)

Pacific salmon accounted for almost 100 percent of canned consumption, 60 percent of frozen consumption and only 12 percent of fresh consumption.

Table VIII-3 provides more detailed estimates of U.S. salmon consumption for the years 2000-2004 by species and product. There were considerable differences between the five species of Pacific salmon in total volume consumed and the mix of products consumed. Canned salmon accounted for the largest share of consumption for pink salmon (91 percent). Frozen salmon accounted for the largest share of

consumption of sockeye salmon (69 percent), coho salmon (43 percent) and chum salmon (59 percent). Fresh salmon accounted for the largest share of consumption (80 percent).⁶

As shown in Table VIII-4, pink salmon dominated estimated U.S. canned salmon consumption (96 percent) followed by sockeye and chum salmon. Atlantic salmon accounted for the largest share of frozen salmon consumption (40 percent) followed by chum salmon (23 percent), sockeye salmon (12 percent) and pink (9 percent). Atlantic salmon dominated fresh salmon consumption (88 percent) followed by chinook and chum salmon.

These differences between consumption patterns for different species are important. They show that not all wild salmon is the same: different species of wild (mostly Pacific) salmon are sold in different product forms and compete in different ways with farmed (mostly Atlantic) salmon in the U.S. market. Put differently, as we discuss later in this report, different species of wild salmon vary in the ways and the extent to which they have been affected by competition from farmed salmon.

Table VIII-3 Estimated Average Annual U.S. Salmon Consumption, 2000-2004, by Species and Product (thousand metric tons, import and primary processing weight basis)

	Pacific						Subtotal,	Atlantic	Total
	Chinook	Sockeye	Coho	Pink	Chum	Unsp.	Pacific		
Canned	0	2	1	45	2	-4	47	0	47
Frozen	2	7	3	5	14	4	36	24	60
Fresh	9	1	3	-1	7	3	22	156	178
Total	11	10	8	49	23	3	105	180	284

Note: Negative number for fresh pink salmon indicates that reported exports slightly exceeded reported domestic production plus imports. Actual consumption is probably very low. Negative number for "unspecified" results from the fact that species is not reported for some export products. See Appendix C for more detailed discussion.

⁶ Percentage shares for each species were calculated from the data in Table VIII-3.

Table VIII-4

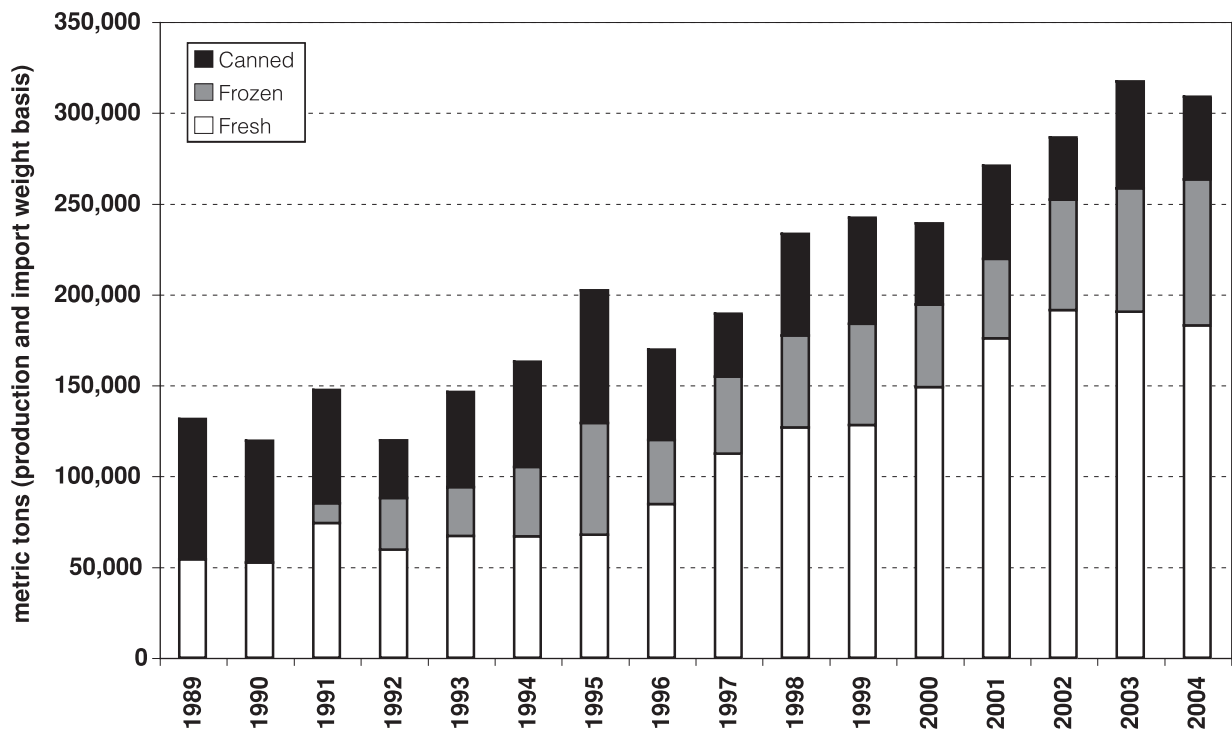
Shares of Estimated U.S. Salmon Consumption, 2000-2004, by Species and Product

	Pacific						Subtotal, Pacific	Atlantic	Total
	Chinook	Sockeye	Coho	Pink	Chum	Unsp.			
Canned	0%	4%	2%	96%	5%	-8%	100%	0%	100%
Frozen	4%	12%	5%	9%	23%	7%	60%	40%	100%
Fresh	5%	1%	2%	-1%	4%	2%	12%	88%	100%
Total	4%	4%	3%	17%	8%	1%	37%	63%	100%

Source: Based on estimates in Table VIII-3.

Figure VIII-1

Estimated United States Salmon Consumption: Canned, Frozen & Fresh



Source: Estimated using the United States Salmon Market Database described in Appendix C.

Trends in U.S. Salmon Consumption

Estimated total U.S. salmon consumption increased dramatically from about 130,000 metric tons in 1989 to more than 300,000 metric tons in 2004, as shown in Figure VIII-1. Most of the growth in total consumption was due to rapid and sustained growth in consumption of fresh salmon, which more than tripled from 54,000 metric tons in 1989 to 183,000 metric tons in 2004.⁷

Note that estimated consumption of canned and frozen salmon fluctuates significantly from year to year. This is because most canned and frozen salmon is wild salmon, for which catches and production—which determine the volumes available for consumption—vary greatly from year to year.

⁷ Our consumption estimates cover the period 1989-2004 because these are, respectively, the first year for which detailed data for U.S. salmon trade are available and the most recent year for which detailed data for Alaska salmon production were available when this report was written. Our estimates show zero consumption of frozen salmon for 1989 and 1990 because exports exceeded reported imports plus estimated domestic consumption for these years. Our estimates may overstate consumption of fresh salmon and understate consumption of frozen salmon, especially for the earlier part of this period, because we assumed that all U.S. Pacific Northwest wild salmon production which was not canned was sold fresh (data on actual U.S. Pacific Northwest fresh and frozen production are not available). See Appendix C for further discussion.

Trends in Canned Salmon Consumption

Canned salmon is an important part of U.S. salmon consumption, although its share of total consumption is declining. Canned salmon accounted for 59 percent of estimated U.S. salmon consumption in 1989 and 15 percent in 2001. Canned salmon is an important product form for U.S. wild salmon, particularly pink and sockeye, in both domestic and export markets.

As noted above, almost all U.S. canned salmon consumption is of domestic wild salmon—primarily pink salmon. In recent years, estimated canned salmon consumption has fluctuated between 30 and 60 thousand metric tons—reflecting fluctuations in Alaska pink salmon harvests, pack and inventories—but showed no clear long-run trend.

Canned salmon sells into a very different market than fresh and frozen salmon and is bought by different consumers at different prices for different uses.⁸ Until very recently, relatively little farmed salmon has been canned and farmed salmon has had relatively little

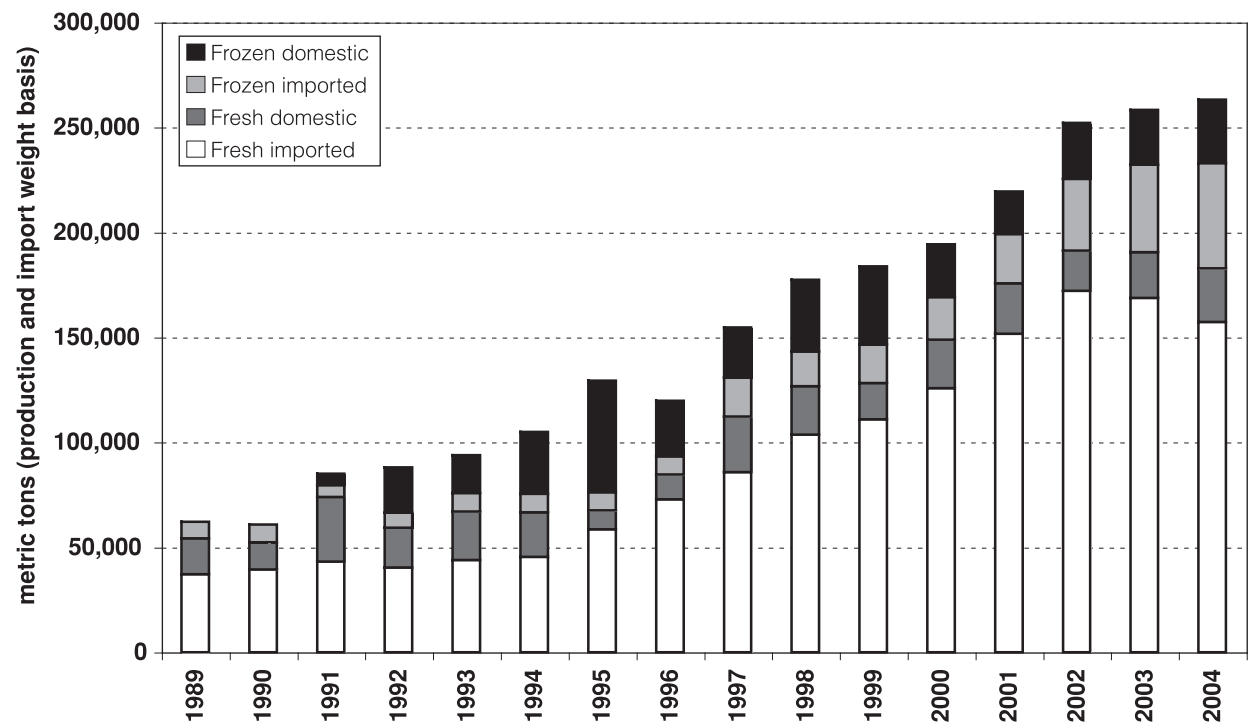
effect on canned salmon prices. In the remainder of this section, we limit our discussion to trends in U.S. consumption of fresh and frozen salmon.

Trends in Fresh and Frozen Salmon Consumption

United States consumption of fresh and frozen salmon increased rapidly after 1989. As shown in Figure VIII-2, this growth was driven primarily by growth in imports: of fresh salmon until 2002 and of frozen salmon after 2002. The share of imports in U.S. fresh and frozen salmon consumption increased from 54 percent for the period 1991-1995 to 80 percent for the period 2000-2004.

As shown in Figure VIII-3, until 2002 most of the growth in U.S. consumption of fresh and frozen salmon was driven by rapidly rising imports of farmed salmon. The share of farmed salmon in U.S. fresh and frozen salmon consumption increased from 49 percent for the period 1991-1995 to 78 percent for the period 2000-2004. Between 1989 and 2002, estimated U.S. annual

Figure VIII-2 Estimated United States Fresh and Frozen Salmon Consumption: Domestic & Imported



Source: Estimated using the United States Salmon Market Database described in Appendix C.

⁸ Historically, canned salmon consumption has been highest in the south among lower-income consumers.

average consumption of farmed salmon increased eight-fold, from less than 25,000 metric tons to more than 200,000 metric tons.

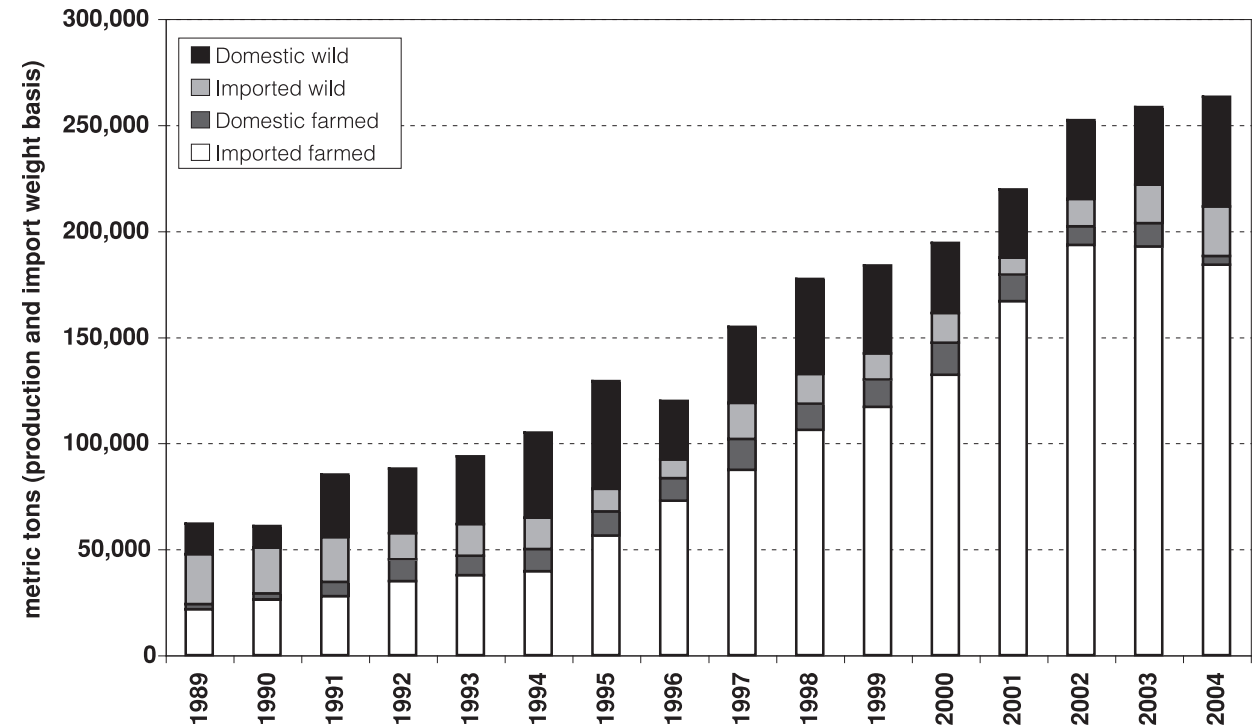
During this period U.S. wild salmon consumption also increased. Thus the growth in farmed salmon consumption was not driven by substitution by consumers of farmed salmon for wild salmon. Rather, it was driven by expansion in the fresh and frozen salmon market, in particular by introducing fresh farmed salmon to markets in which wild salmon had not been available, such as the U.S. Midwest.

As shown in Figure VIII-4, most U.S. farmed salmon consumption is imported fresh. Until 2002, most of the growth in U.S. farmed salmon consumption was in imported fresh fillets. However, imports of fresh salmon declined in 2003 and 2004, while imports of frozen farmed salmon (primarily fillets) continued to grow. Total U.S. farmed salmon imports (and consumption) declined in 2004. However this decline was temporary and farmed salmon imports grew to a new record of almost 200,000 metric tons in 2005.⁹ (In Chapter IX, we discuss the 2004 decline and the 2005 rebound in salmon imports in greater detail.)

As shown in Figure VIII-5, the United States and Canada produce most of the wild fresh and frozen salmon consumed in the United States. Since 1989, imports from Canada have declined, due to declining Canadian wild salmon catches. Since 2003, there has been rapid growth in imports of frozen fillets from China (much of which are reprocessed from frozen pink and chum salmon exported from the United States to China). Recall, as noted in the introduction to this chapter, that the estimates of consumption from imports are more reliable than the estimates of consumption from U.S. domestic production, because better data are available for imports than for domestic production.

As shown in Figure VIII-6, all five Pacific salmon species contribute to U.S. consumption of wild fresh and frozen salmon. Chum salmon accounts for the largest share. Estimated consumption for each species varies significantly from year to year, reflecting variation in wild harvests and production.

Figure VIII-3 Estimated United States Fresh and Frozen Salmon Consumption: Wild & Farmed

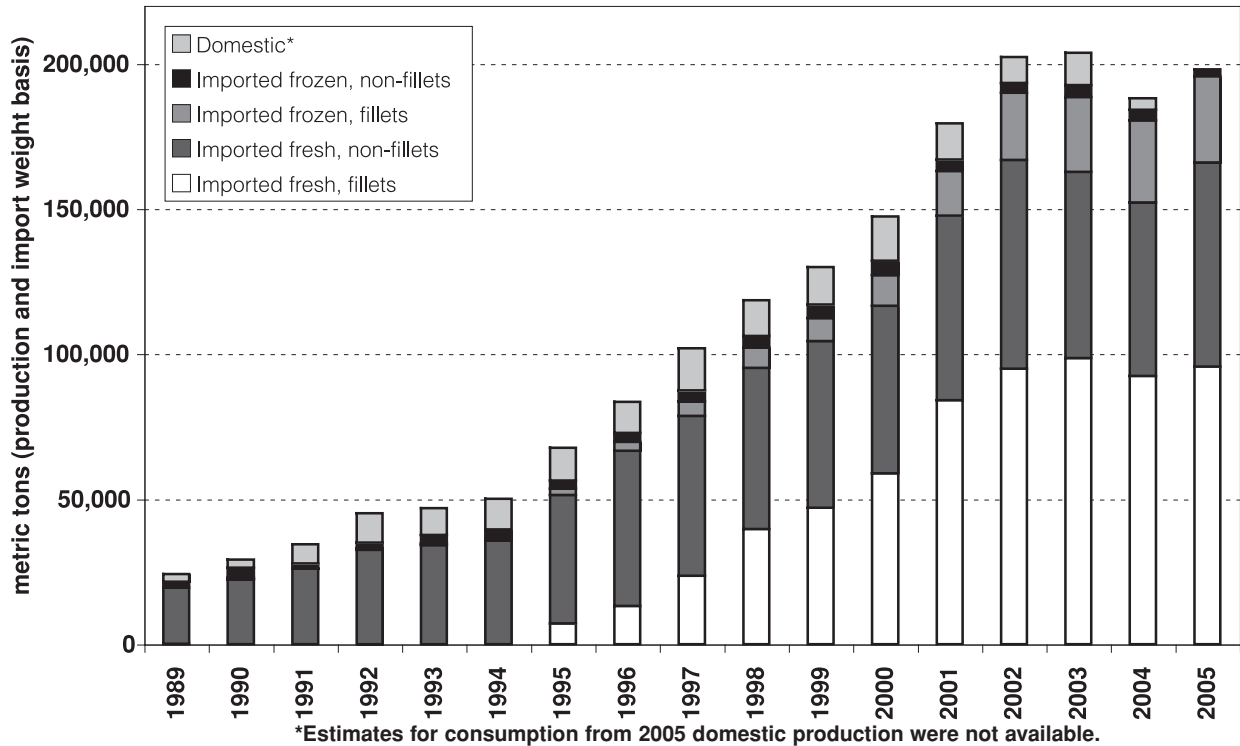


Source: Estimated using the United States Salmon Market Database described in Appendix C.

⁹ Figure VIII-4 shows estimated consumption through the year 2005, while earlier figures in this chapter show estimates only through the year 2004. The reason is that Figure VIII-4 is based primarily on import data, which were available through 2005. Data for domestic production were available only through 2004.

Figure VIII-4

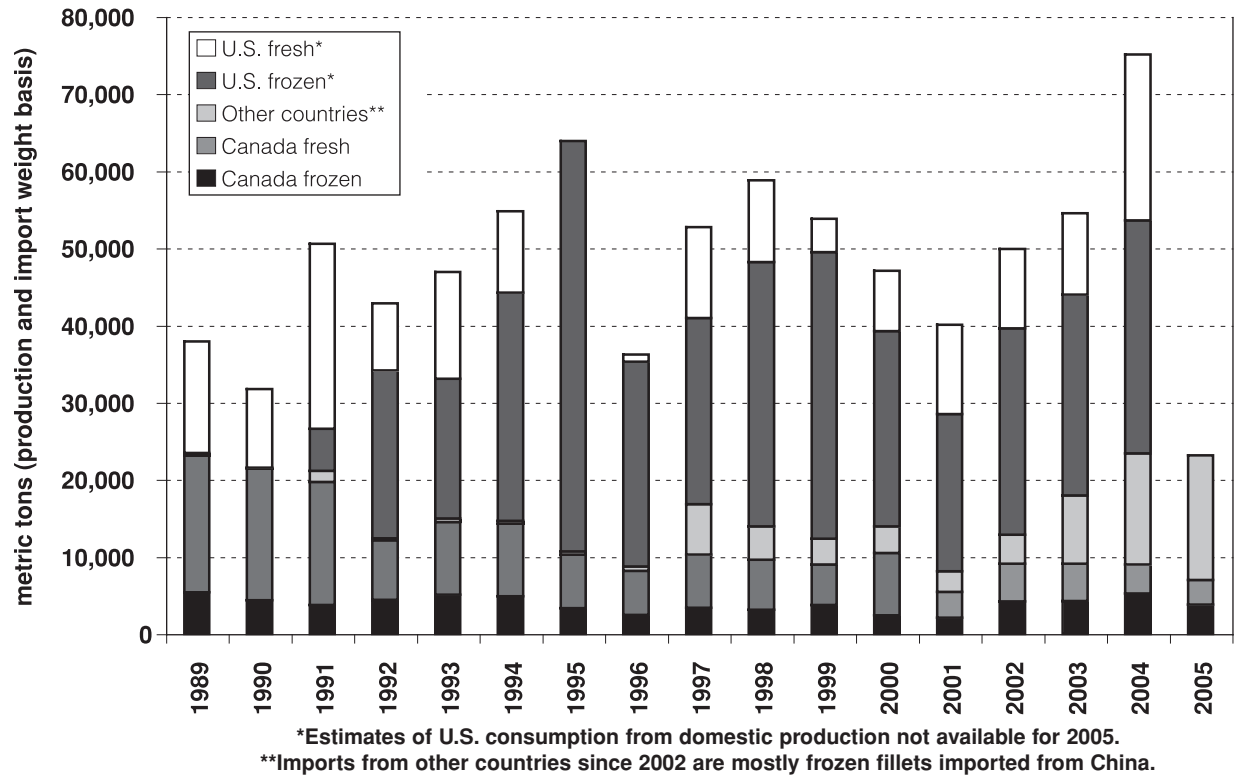
Estimated United States Farmed Salmon Consumption, by Product



Source: Estimated using the United States Salmon Market Database described in Appendix C.

Figure VIII-5

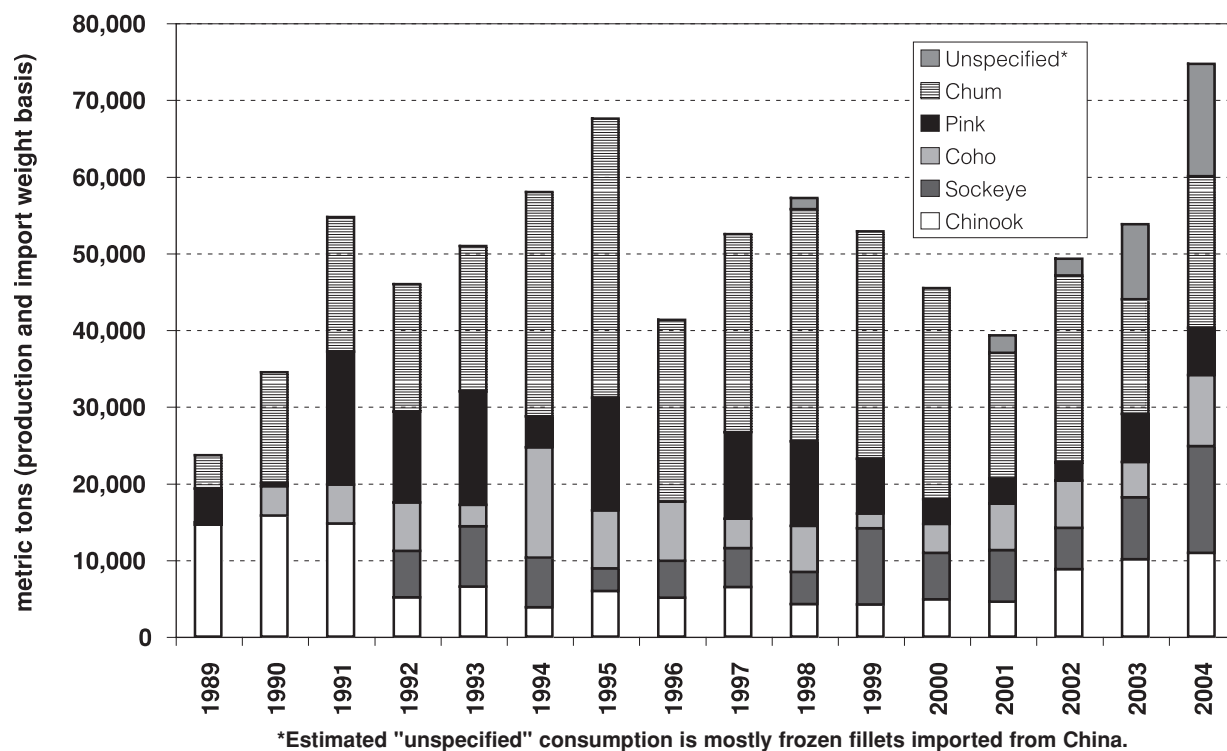
Estimated United States Fresh and Frozen Wild Salmon Consumption, by Country of Origin



Source: Estimated using the United States Salmon Market Database described in Appendix C.

Figure VIII-6

Estimated United States Fresh and Frozen Wild Salmon Consumption, by Species



Source: Estimated using the United States Salmon Market Database described in Appendix C.

U.S. Salmon Consumption in Context

Having reviewed important recent trends, it is useful to put U.S. salmon consumption in context by comparing it with consumption of other seafood products and other forms of protein.

Figure VIII-7 shows estimates of per capita fish consumption for the top seven species consumed in the United States. Since 2001, salmon (including canned salmon) has ranked third among fish species consumed in the United States, after shrimp (which has been increasing) and canned tuna (which has been decreasing). Since the early 1990s, consumption of salmon has passed that of cod, catfish and Alaska pollock. In 2004, salmon accounted for about 13 percent of U.S. fish consumption, compared with just five percent in 1989. Shrimp accounted for 25 percent of U.S. fish consumption and canned tuna accounted for 20 percent.

As shown in Figure VIII-8, U.S. per capita seafood consumption is low in comparison with meat and poultry. Per capita consumption of fish was only 16

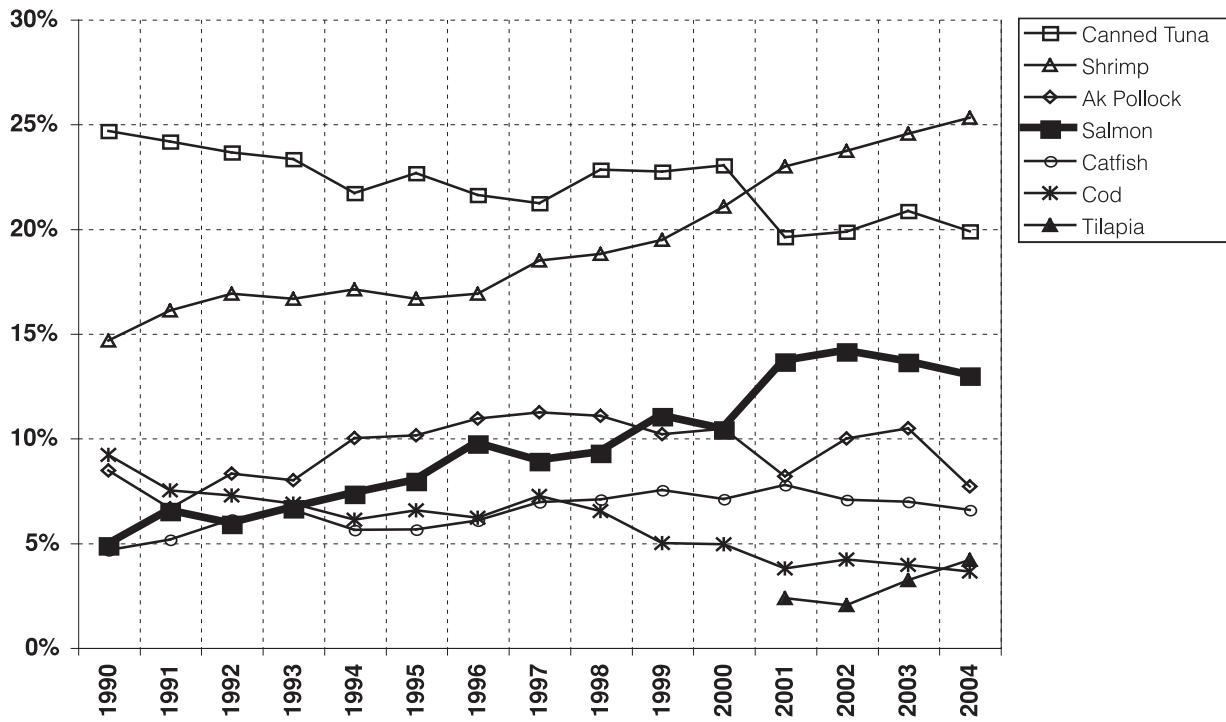
pounds per person in 2004, in comparison with 73 pounds for poultry, 63 pounds for beef and 49 pounds for pork, lamb and veal. Per capita consumption of salmon was only 2 pounds.

Put differently, all fish together represented less than 8 percent of total U.S. consumption of meat, poultry and fish in 2004, while salmon represented just 1 percent. Although U.S. salmon consumption is growing and the salmon industry is very important to those who make their living from it, salmon remains only a very small fraction of U.S. protein consumption.

It is instructive to contrast trends in salmon consumption with trends in poultry consumption. Annual consumption of poultry has been increasing steadily in the United States for the past half-century, as it has in other industrialized countries. The growth in poultry consumption is due to a combination of factors including lower prices, an increasing variety of convenient product forms and a trend among U.S. consumers towards a healthier diet. During the period 1988-2004, when U.S. per capita salmon consumption increased by 1.7 pounds, U.S. per capita poultry consumption grew by 20.7 pounds.

Figure VIII-7

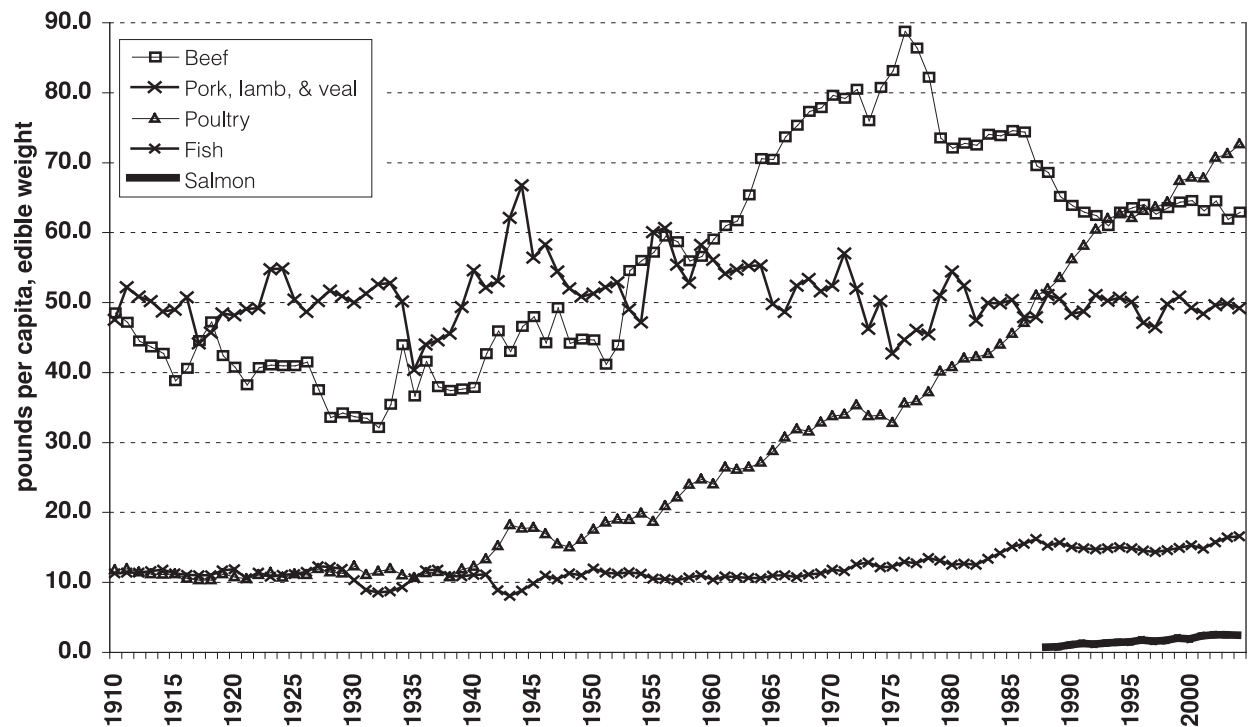
Estimated Shares of United States Fish Consumption: Top Seven Species (share of edible weight)



Sources: NMFS Fisheries of the United States 2004; NFI Per Capita Fish Consumption Estimates.

Figure VIII-8

U.S. Per Capita Consumption of Meat, Poultry and Fish (edible weight)

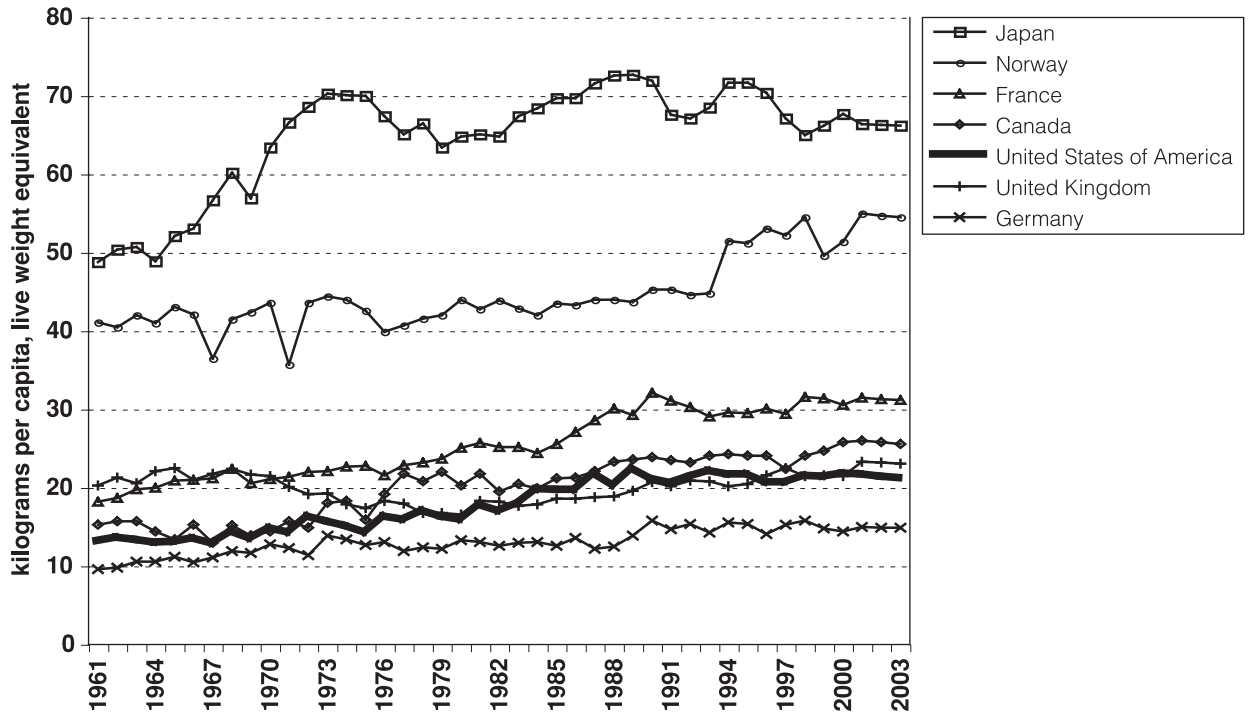


Source: USDA ERS Food Supply Data.

As shown in Figure VIII-9, U.S. per capita seafood consumption is far below that of traditional seafood consuming nations such as Japan, Norway and France, and is roughly comparable to levels in Canada and the United Kingdom. From one perspective, this might

suggest that Americans are meat eaters rather than fish eaters, implying that substantial growth in consumption of salmon and other fish is unlikely. From another perspective, it might suggest that consumption of salmon and other fish has ample room to grow.

Figure VIII-9 Per Capita Seafood Consumption in Selected Countries



Source: FAO FAOSTAT Food Supply Database.

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