

ASMI

Salmon

2000

Report

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SALMON 2000

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Dear Alaskan:

Last spring, the Alaska Seafood Marketing Institute embarked on a major research project to try and quantify the changes in the world's salmon markets. The project was prompted by a request from Alaska State Senator Dick Eliason of Sitka and was directed by a special committee of the ASMI Board of Directors.

For the past several years, the Alaska salmon industry has been competing more fiercely in the markets with Atlantic and Pacific salmon raised on 'farms'—ocean pens that raise salmon in densities up to 20 fish per cubic yard. The growth of salmon farming has been explosive. What began as experimental technology in Norway has now been exported to Scotland, the Faroe Islands, Chile, Canada, Australia, New Zealand, France, the U.S. and other countries.

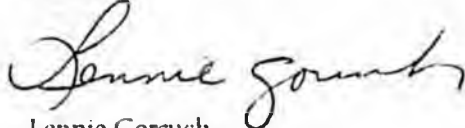
In 1980, salmon farmers produced about 1 percent of the world's supply of salmon. In 1990, salmon farmers produced about 30 percent of the world supply of salmon. In that same time frame, Alaska's share of the world production of salmon from our state's wild and natural stocks dropped from more than 40 percent to about 31 percent despite record salmon harvests in 1989 and 1990.

The Salmon 2000 project by ASMI examines what has happened in the last ten years and reviews what some experts expect will happen in the next ten years. While there is some original research, a large part of this report is the result of collating a great number of studies and reports and melding those findings into this report.

It is ASMI's hope that this information will be used by the industry, state policy makers and Alaskans to help craft our salmon marketing strategy for the future. Our marketing goals can only be reached through cooperative effort. Please don't hesitate to suggest ways to help us meet the large challenges ahead.

I look forward to your help.

Sincerely,



Lennie Gorsuch  
ASMI Executive Director

# SALMON 2000

Prepared by:

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# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b> .....	1
Overview .....	1
Foreign Markets .....	1
Overseas Markets .....	2
Worldwide Assistance .....	3
Allocation of Worldwide Funds .....	3
The Domestic Situation .....	4
Domestic Problems .....	5
Opportunities .....	7
Where Do We Go From Here? .....	10
Conclusion .....	11
<b>RESOURCE ANALYSIS</b> .....	13
Overview .....	13
The Salmon Cycle—Wild vs. Farmed .....	18
Farmed Salmon Production by Country .....	19
Norway .....	19
Canada .....	23
Chile .....	26
Scotland .....	29
Japan .....	31
Iceland .....	32
Farøe Islands .....	33
Ireland .....	33
Australia .....	33
New Zealand .....	34
United States .....	34
Others .....	35
Commercial Salmon Production by Country .....	35
United States .....	35
Canada .....	36
Japan .....	37
Soviet Union .....	38
<b>DOMESTIC MARKET</b> .....	41
Strategic Issues: An Overview .....	41
Salmon Category Size and Trends .....	43
Production by Species .....	48
Competition .....	52
Competition for Canned Salmon .....	54
Competitive Spending .....	55
Trade Featuring Lent Promotion .....	58
Trade Perceptions .....	59

Food Service Perceptions .....	60
External Factors—Seafood Inspection .....	60
Salmon Consumer .....	61
Demographics .....	61
Psychographics .....	62
Seasonality .....	63
Regionality .....	64
Purchasing Habits.....	65
Outlet Types for In-Home Purchases.....	65
Restaurant Types .....	66
Consumer Awareness of Seafood—Producing Regions .....	66
Awareness of Different Seafood .....	67
Awareness of Farmed Salmon .....	68
Current Awareness Campaign .....	69
Consumer Attitudes and Usage .....	69
Frequency of Use .....	70
Reasons for Use .....	70
Home Preparation .....	71
Fresh and Frozen versus Frozen Salmon .....	72
Attitudes Toward Canned Salmon .....	72
Attitudes Toward Fresh Versus Frozen Salmon .....	72
Perceptions of Alaska Salmon .....	73
Non-User Profile .....	73
Distributing and Selling Salmon .....	74
Marketing Strategies .....	76
<b>FOREIGN MARKET ANALYSIS .....</b>	<b>79</b>
Overview .....	79
Japan .....	80
United Kingdom .....	88
France .....	93
Belgium .....	96
The Netherlands .....	96
Germany .....	97
Italy .....	100
Australia .....	101
<b>QUALITY SURVEY .....</b>	<b>103</b>
Recent Studies.....	104
ASMI Trade Survey on Salmon Quality .....	106
Results Broken Down by Industry Segment .....	108
Brokers .....	108
Wholesalers .....	110
Restaurants .....	112
Retailers .....	114
Specialty Seafood Shops.....	117
Bibliography .....	120

# SALMON 2000

## Executive Summary

### OVERVIEW

#### **Alaska salmon is losing ground at an alarming rate**

After a decade of drastic change, the Alaska salmon industry is at a critical juncture. At the beginning of the decade, Alaska salmon harvests accounted for 41 percent of the world salmon supply. By the end of 1990, wild Alaska salmon accounted for just 31 percent of the world supply.

The decrease in Alaska's total market share occurred in spite of a 50 percent increase in Alaska's production during the same period. Alaska's dwindling market share is primarily due to the increase in production of farmed salmon, from 1 percent of world supply in 1980 to 30 percent today.

Pacific wild salmon faces many barriers, both domestically and overseas, to sustain or recapture an eroding market share. The biological resource is healthy—supply of wild Pacific salmon is abundant, stable, high in quality and value. But formerly secure markets for the product have slipped and continue to slip, and new ones must be developed.

### FOREIGN MARKETS

#### **Major Obstacles**

#### **Farmed salmon surges to dominance in quantity and quality perceptions**

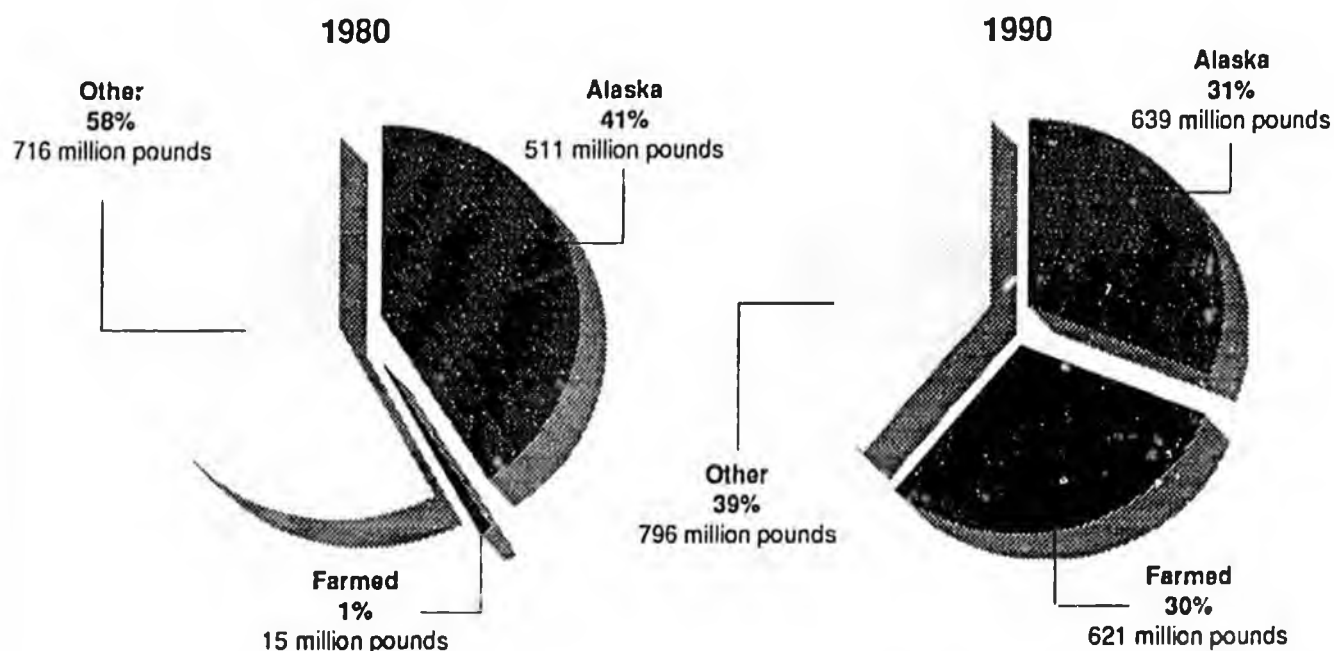
Farm-produced salmon is chiefly responsible for the irrevocable changes that have left the industry virtually unrecognizable. At the beginning of the 1980s, commercial production of salmon on farms constituted 1 percent of total world production (and Alaska salmon 41 percent). Within the last 10 years, annual farmed salmon production has grown 31-fold, to 30 percent of total world production.



The dramatic rise in production and growing acceptance of farmed salmon as a source of fresh salmon represents the single greatest threat to Alaska salmon. The consistent year-round availability and quality of fresh-farmed salmon has made wild Alaska salmon, with its short fresh season and quality and supply inconsistencies, a secondary choice.

### WORLD SALMON SUPPLY

Growth of Alaska and Farmed Relative to Total World Production



### OVERSEAS MARKETS

#### Alaska must target foreign markets now controlled by farmed producers

Overseas, Alaska salmon's market challenges are occurring in France, Japan and the UK/Ireland—the most important world markets for the product—which are being flooded with farmed salmon.

France is the largest salmon market in Europe and the world's third largest (behind Japan and U.S.). During the past three years, farmed salmon has taken over the French market with an 86% market share. French imports of Norwegian subsidized farmed salmon increased by 60 percent in 1988, and imports of Alaska salmon decreased by 40 percent that same year.

Japan is the largest salmon market in the world. While Alaska has been able to hold its own against farmed production in Japan, farmed salmon has made inroads nonetheless. In 1985, non-U.S. imports represented 11 percent of Japan's total



salmon imports. By 1989, however, non-U.S. imports had nearly tripled to 30 percent. Meanwhile, U.S. market share in Japan declined 10 percent.

The 1989 overseas canned salmon markets saw a dip in canned salmon consumption primarily due to price.

There are new market opportunities for salmon, but fresh-farmed producers will have first cut because of the year-round availability, consistency, and product form flexibility over wild fresh/frozen salmon.

## **WORLDWIDE ASSISTANCE**

### **Federal government increases assistance in Alaska's overseas battle**

Alaska salmon is exposed to an extremely high level of competitive promotion and marketing subsidies. Leading world producers of farmed salmon spent a combined \$20 million promoting their product in 1990, Norway alone investing more than \$11 million. In comparison, ASMI spent \$6 million to promote fresh/frozen and canned salmon in foreign markets.

The federal government, recognizing the trade barriers, unfair competition and the number of subsidized suppliers that Alaska salmon faces overseas, and the urgent need to maintain the strongest possible presence abroad, has allocated \$8.8 million to help Alaska experts promote salmon in foreign markets in 1991—a dramatic jump from the \$1.5 million first granted in 1987.

## **ALLOCATION OF WORLDWIDE FUNDS**

### **Alaska tailors special promotions to combat fierce competition overseas**

Federal funds are used for a variety of programs addressing the overseas barriers to Alaska salmon. These include trade and retail promotions, product labeling programs, in-store demonstrations, point-of-purchase and informational materials, point-of-sale identification (i.e., "as seen on TV"), television advertising with retail tie-ins, consumer and trade print advertising, direct mail, public relations and trade shows.

Methods and media vary based upon the specific challenges in a particular market—the form of salmon being marketed; competitive promotional activities in that market and for that product form; and cultural perceptions, purchasing and eating habits.

ASMI's general export program also uses federal funds to conduct market research (on which to base future promotions,) and to conduct evaluations of ASMI's promotional activities. These activities to date have affected a marked increase in the number of Alaska salmon retail promotions, and a jump in consumer awareness of Alaska salmon to 3.5 times its pre-campaign level.

*For a complete analysis of worldwide/foreign market issues, see Foreign Market Section.*

## THE DOMESTIC SITUATION

### Fresh/Frozen

#### **U.S. salmon consumption is up; imports capture the increase at Alaska's expense**

The federal government has doubled the funds available to market Alaska salmon in threatened overseas markets this year by authorizing an \$8.8 million campaign. It is important to note that there has been no corresponding increase of effort in the domestic market.

While total U.S. salmon consumption reached a record high in 1989 of 368 million pounds (a 33 percent increase since 1985), that increase has been swallowed by imports at the expense of domestically produced salmon. Imports of farm-raised fresh salmon are up a whopping 267 percent, while U.S.-produced fresh/frozen supplies have tumbled 28 percent. Farmed salmon imports have been led by Canada, followed by Norway and Chile.

Farmed salmon is now beating Alaska on its own turf. Ocean-caught salmon represents 82 percent of the U.S. supply, but farm-raised imports have increased from 7 percent in 1985 to 17 percent in 1989.

Fresh rather than frozen salmon consumption is increasing, as evidenced by import figures, trade response and consumer preferences. Four out of five consumers use fresh salmon. This preference is further supported by the fact that 84 percent of all seafood sales are in fresh form, while only 16 percent are frozen.

While Alaska can offer a wide variety of species in frozen form, imports have the decisive advantage of being able to supply fresh salmon during most of the winter and spring months. Most Alaska salmon that is not canned, is inventoried and distributed frozen during off-season.

#### **"In season" all year long— farmed imports have quality and freshness advantage**

Because of farming, salmon is no longer a luxury commodity, and the market can "pick and choose" based on quality and availability. Market share gains for imports are clearly a result of the availability of fresh salmon on a year-round basis, despite their pricing disadvantage. Foreign producers import mostly fresh salmon. Whereas Alaska wild salmon are harvested in summer months and frozen for consumption during the rest of the year, farmed salmon can be harvested and sold fresh year-round.

#### **Pricing: Situation is volatile**

Pricing of salmon domestically is volatile. Many factors influence the pricing of fresh, frozen and canned salmon of the different species. Marketing distribution channels are complex, with many processors and middlemen that affect end-user pricing. Additionally, Alaska salmon has a short window of time "in season" when it offers a price advantage over foreign competitors. Farmed imports can offer fresh supply during the winter and spring months.

## Canned

### **Consumption nose dived last decade; recent increase won't offset huge inventories**

Canned salmon represents 59 percent of all retail salmon volume. U.S. per capita consumption of canned salmon declined 60 percent from 1980 to 1989, at the same time that catches of pink salmon—the majority of which is canned—increased approximately 50 percent. Another banner season for this species predicted in 1991 means current high inventories of pink salmon will remain for the foreseeable future. Further, high value species have declined by 16 percent as a share of total harvest, while low-value pinks represent nearly half of the domestic harvest.

Canned salmon's eight percent share of the foodservice market has not helped the situation. Fifty-two percent of this miniscule trade usage is in the non-commercial side of the business (hospitals, colleges, schools and company dining facilities). On the commercial side (restaurants, hotels), the bulk of the business is in smaller non-chain operations and recreational feeding (e.g., Disneyland, theme parks). Upscale restaurants that bake, broil and grill fish do not use canned salmon.

## DOMESTIC PROBLEMS & OPPORTUNITIES

### **Dire straits at home and abroad—**

#### **Alaska salmon is in a dangerous position domestically**

Fresh farmed salmon has eaten steadily at the U.S. salmon market, just as it has taken a huge bite out of major foreign markets. Recognizing the danger to Alaska's premier seafood industry, government-supported worldwide promotions are in effect to combat this threat overseas. Now, Alaska salmon's slump on the home front urgently demands intensive domestic programs focused on increasing consumption of fresh/frozen and canned salmon.

Increasing domestic consumption can compensate for eroding foreign markets and offset both foreign and domestic losses. There are significant opportunities domestically to accomplish this by addressing those threats specific to U.S. salmon consumption. Some of these threats parallel the obstacles abroad, while others are indigenous to the domestic market.

## Major Obstacles

### **U.S. trade prefers fresh salmon; Alaska's fresh season restricted**

The trade's preference for fresh, based on perceived and actual consumer demand, places Alaska salmon at a disadvantage. The season for Alaska wild salmon is restricted to five months a year, and the trade prefers farm-raised salmon, available year-round. Import market gains reflect this preference. Both in-home and restaurant consumers choose fresh salmon over frozen. Since the bulk of Alaska salmon that is not canned is distributed in frozen form, negative perceptions regarding frozen salmon must be eliminated in order to survive competitive pressure from imported fresh salmon.

**Canned consumption  
declining at alarming rate**

Declining canned salmon consumption is another corrosive factor in the domestic market, since canned salmon represents half of Alaska salmon production. Canned salmon suffers from an "old-fashioned" image that limits its use to a few traditional dishes. Consumers do not seem to be aware of its nutritional value and both consumers and foodservice buyers perceive it to be inconvenient (bones and skin) and unappealing. Of the total salmon consumed in foodservice, only eight percent is canned.

Canned tuna is a formidable competitor. The per capita consumption of canned tuna has grown steadily over the past several years, and is currently over 10 times greater than canned salmon. In fact, tuna accounts for 25 percent of all fish and shellfish (U.S. per capita consumption) while canned salmon constitutes less than two percent.

An additional problem is the fact that distributors generally demand higher profit returns for canned salmon than for other types of canned seafood.

**Consumers unclear  
how to choose, cook, benefit from salmon**

Consumers lack knowledge in several areas which could make a difference in the demand for Alaska salmon domestically. This includes knowledge of the various salmon species and their qualities, preparation techniques and the superior health and nutritional benefits that Alaska fresh/frozen and canned salmon offer over other protein sources. Most consumers do not readily think of salmon when planning a seafood menu.

**Uneducated trade is  
missed opportunity to reach consumer**

Lack of education affects demand at the trade and retail levels as well. First, the trade is sensitive to the consumer's lack of awareness about Alaska fresh/frozen and canned salmon. Second, the trade has its own blind spots. Neither the retail nor foodservice trade are educated as to the best ways to maximize profit margins through effective merchandising, display, packaging and promotional campaigns.

**Farmed highly favored for  
quality/consistency; foodservice usage is twice that of frozen**

Negative quality perceptions present another potential barrier to increasing market share and consumption of Alaska salmon in the fresh/frozen category. Among the trade, the quality of farm-raised salmon is perceived to be superior to ocean-caught because it's harvested fresh year-round, offering consistent quality. This consistent quality is a result, in part, of mandatory grading standards in the farmed industry.

Some of the foodservice trade also negatively perceive how fresh/frozen Alaska salmon is handled from catch through distribution. While wild or ranched Pacific salmon are clearly at least equal in quality to farmed salmon when they are pulled

from the ocean, handling, packing and shipping can affect the quality of the product before it reaches its destination. For these reasons, foodservice favors fresh two-to-one over frozen.

Another obstacle is that consumers believe the taste of frozen is inferior to fresh salmon, despite flash-freezing techniques that protect the flavor and freshness and despite the fact that "fresh" fish may be several days old.

**Unpredictable wild harvests,  
export increases cause inconsistent supply**

Supply unpredictability obstructs the trade's view of fresh/frozen as an alternative to farmed. While fresh farmed salmon is available consistently all year round from a variety of foreign suppliers, unpredictable wild harvests have caused inconsistent domestic supplies.

Also affecting domestic supply are seasonal premium foreign market prices for higher-end Pacific species, which encourage Alaska producers to export instead of selling domestically. Exports have reached record levels and now represent almost half of the total domestic harvest. U.S. salmon exports have continued to grow since 1985, increasing by 22 percent. As a result, Alaska's available domestic product mix has not been consistently competitive with the abundant, year-round supplies of imported high-quality farmed salmon.

**Alaska salmon  
undistinguished by brand label**

As with other commodities where there is no "brand label", seafood brokers, distributors, importers and traders are not in the business of marketing "brands" of fresh/frozen salmon. As a result, there is no "consumer link" or identification between the product at the point of sale and its origin or "brand". Consumers looking for Alaska salmon therefore have a difficult time finding it at seafood counters or on menus.

*For a complete analysis of domestic market issues, see Domestic Market Section.*

## OPPORTUNITIES

**Domestic situation offers openings  
to address critical priority: increasing consumption**

Each of the previously-described barriers to strengthening the U.S market also represents an opportunity to build awareness of and demand for Alaska salmon, and to defend against foreign competition. With intensive informational/educational programs targeted to these opportunities, Alaska can stem the loss of consumer demand for its most abundant varieties and eventually take back its share of the domestic market.

## **Fresh/Frozen Opportunities**

### **Targeting consumer plus trade is opportunity for Alaska**

Raising general awareness of Alaska salmon and its superiority among trade groups and consumers is the most basic domestic opportunity. Alaska can target both groups to increase preference for Alaska salmon and build category consumption. Plus, Alaska can take the lead before other foreign competitors, such as Canada, begin to market aggressively in the U.S.

### **Wild salmon has positive image**

Consumers who *are* aware of salmon-producing regions have positive perceptions of Alaska salmon. Meanwhile, there is confusion over the perceived benefits of farmed salmon.

It appears that wild salmon has a better reputation overall with consumers and in the domestic market than with trade and in the overseas markets. Capitalizing on the "natural" image of wild salmon is an opportunity to increase domestic consumption of Alaska salmon. Also, consumer preference for fresh creates an opportunity to emphasize the natural, fresh flavor of ocean-caught.

### **Salmon could be new favorite among seafood users**

Targeting households that consume fish but not salmon represents a major opportunity. Salmon is consumed in only 40 percent of households. Tuna figures are much higher, with an estimated penetration of 98 percent of households.

### **Educate foodservice so they reach consumer**

While only 35 percent of all foodservice operators currently include salmon on the menu, this level is up from 28 percent in 1982. An overall increase in fish consumption at restaurants (up 11 percent) means there is an opportunity to fill new demand with salmon.

The key opportunity in the foodservice trade is to educate operators on the quality and freshness of fresh/frozen methods (i.e., the superiority of flash-freezing) to increase the number of operators menuing Alaska frozen salmon, while creating stronger preference for Alaska-caught salmon. This is an excellent way to reach non-users who will try something new at a restaurant, but might not otherwise experiment with salmon at home.

### **Untapped potential in regions with below-average consumption**

Several regions in the U.S. have very low usage of salmon compared to an average for the rest of the country. Once consumption of Alaska salmon among current users (canned and fresh/frozen) has been significantly increased, non-users represent a strong marketing opportunity, requiring specific programs to address their needs.

### **Appealing to a health-conscious America**

Since there is still low awareness of Alaska salmon's nutritional benefits, a major educational opportunity exists for both fresh/frozen and canned. The consumer can be made aware of specific benefits, such as the product's low fat and cholesterol content as well as Omega-3 fatty acids that lower the risk of heart disease.

### **Seafood safety: Alaska inspection is a benefit, given high levels of consumer concern**

Overall, seafood quality is a prime concern of the U.S. consumer. Unlike meat and poultry, fresh/frozen seafood does not undergo mandatory nationwide federal inspection. Alaska has what many in the industry consider to be a model seafood safety program—its own quality control programs directed by seafood safety experts. Stringent certification criteria must be met before operation and the programs have endorsement of the FDA, the agency responsible for most U.S. seafood inspection. Promotion of such programs can strengthen Alaska salmon quality perceptions among the trade and create some perceived advantage over foreign imports.

## **Canned Opportunities**

The second key opportunity is to revitalize canned salmon consumption, as it represents half of all Alaska production.

### **Untapped markets for canned**

The opportunity to develop consumption in additional markets is evidenced by the fact that only 22 domestic U.S. markets represent above or average consumption for canned salmon, and those 22 markets represent less than half the canned salmon sales volume. In other words, the few markets in which a lot of canned salmon is being eaten do not make up in volume for all the markets not consuming much canned salmon.

### **Canned has all the nutritional value of fresh/frozen**

Canned salmon has health benefits and nutritional value which to date have not been effectively communicated to consumers or the trade.

### **Among producers, canned is Alaska's domain**

The domestic canned salmon market is also an area where Alaska can dominate because canned salmon currently has little foreign competition. Therefore, increased consumption will benefit Alaska producers. This is an opportunity that needs to be addressed quickly, however, since several farmed salmon producers are beginning to experiment with canned processes.

### **Education is canned market's biggest opportunity**

Given the low awareness of canned salmon as a useful product, there is plenty of room to grow in the minds of consumers and trade. Consumers can be educated on



how to prepare canned salmon to encourage main-dish usage. Stressing its convenience and providing contemporary recipes can also attract non-salmon users.

On the trade side, foodservice operators need to be educated on the convenience benefits of the product, and given new recipe ideas and serving suggestions. As operator interest increases, so will that of the distributor—who will get the product on foodservice menus.

#### **Reach the restaurant, thus the consumer**

Foodservice is an important market for both fresh/frozen and canned salmon—not only for its size, but because many consumers try different seafood for the first time at restaurants. Further developing this market can increase home consumption.

#### **Canned is “Alaska brand”**

Canned salmon also provides ample opportunity for branding—a powerful means of linking the product to its source that proves to be much more of a challenge with fresh/frozen. This will benefit fresh/frozen as well, because any program that gets the Alaska name in front of the salmon consumer will benefit both forms. Therefore, an investment in canned is an investment in Alaska salmon markets overall.

#### **Promotional opportunities throughout the year**

Grocery trade promotion drives consumption of canned salmon from January through March—leaving the balance of the year, for the most part, under-developed and under-marketed. Promotions to fill in the gaps can make canned salmon a year-round staple, rather than a Lent specialty.

### **WHERE DO WE GO FROM HERE?**

An estimated 90 percent of Alaska's salmon production is either frozen or canned, so tackling the barriers facing these forms is critical to competitive, year-round distribution of Alaska product.

Foreign competitive efforts are focused on salmon exclusively, in contrast to Alaska's all-species approach. As a result, Alaska's salmon marketing impact is diluted and much lower than farmed producers on a spending-per-pound basis.

Below are key strategies that would work to increase domestic salmon consumption.

#### **Program objectives**

The goal of all programs is to establish a quality and value leadership position for Alaska salmon in all market segments—fresh/frozen, canned, foodservice and retail—and increase overall domestic usage.

#### **Key proposed strategies**

To increase trial and usage of Alaska salmon, we must implement a combination of targeted advertising, public relations and marketing programs. Year-round aware-

ness-building national media would target all salmon users—fresh, frozen, canned and restaurant. Preparation tips and recipes would be disseminated to foodservice and retail consumers through a variety of promotional methods and communicate health benefits of Alaska salmon.

Key program components would:

- Educate consumer on the quality and benefits of fresh/frozen Alaska salmon by focusing on natural flavor and health benefits.
- Educate trade that fresh/frozen is acceptable as an alternative to fresh.
- Build trade confidence that Alaska quality means profitability because the exceptional flavor of Alaska salmon enables premium pricing.
- Shift consumer perception of canned salmon from old-fashioned and inconvenient to contemporary and easy to prepare.
- Have menus identify and associate Alaska salmon with natural flavor, freshness and quality at the retail point of sale.

## CONCLUSION

The face of the salmon industry has altered and Alaska must take aggressive action in new directions to shape its future—at home as well as abroad. Price, product form, demographics, packaging, transportation, growing and harvesting technologies, competitive marketing in this industry and other protein-source industries, and environmental factors all promise to continue to change and bring new challenges. Consumer awareness and acceptance of farmed salmon is likely to continue its rise, with active trade acceptance and heavy promotion. Building consumer and trade awareness and preference for Alaska salmon will be a necessary defense against this competitive pressure.

# RESOURCE ANALYSIS:

## Worldwide Salmon Production

### OVERVIEW

#### **Rise of farming was leading factor in decade that altered industry**

At the beginning of the last decade, commercial production of salmon on farms was in its early stages. In 1980, just over 15 million pounds of salmon, mostly Atlantic salmon, were farm-raised.

The 15 million pounds of farm-produced salmon in 1980 constituted about 1 percent of the total world production of 1,242 million pounds. Alaska fishermen caught 511 million pounds in that year—41 percent of the total world production.

That was back in the days when "selling salmon was seen as more of an allocation to customers who clamored for the product," according to Michael Hunter of the Fisheries Council of British Columbia. But "that's not a luxury anymore," Hunter adds. Put most simply, it is not a luxury because of salmon aquaculture.

The National Marine Fisheries Service (U.S. Department of Commerce, NOAA) defines salmon aquaculture as "the partial or complete cultivation of the species in hatcheries or the sea. It includes at least two different processes: pen farming and ocean ranching. Pen farming is the commercial production to marketable size in total captivity. Ocean ranching is the private or government production of salmon in captivity to a certain stage at which it is released into the wild."

For the purposes of this report, the Alaska Seafood Marketing Institute will compare salmon capture fisheries (wild and ocean-ranching) with pen-farmed salmon production over the last decade, with some cautious predictions of production in the next decade.

#### **Overall production surge absorbed to increasing degree by farmed**

As the 1980s progressed, two general patterns emerged in the salmon industry. First, annual world production of salmon increased. The dismal production levels of the '70s were replaced in the '80s by a rising curve, beginning with a harvest level of more than 1,241 million pounds in 1980 and ending in 1989 with a harvest of 2,089 million pounds.

The second general pattern that emerged was the increase in production of farmed salmon—mostly Atlantics, but with some chinook and coho production as well. In 1980, 1 percent of world production of salmon was from farms. In 1989, 22 percent of world production was from farms and, in 1990, farmed salmon production almost matched the catch of Alaska wild salmon. Farmed production for 1990 is about 30 percent of total world production while Alaska production hovered around 31 percent of total world production.

**World Salmon Production**

	World	Alaska	Farmed	AK %	Farmed %
1971	875,000,000	139,000,000	2,000,000	16%	-
1976	878,000,000	245,000,000	4,000,000	28%	-
1977	1,029,000,000	307,000,000	5,000,000	30%	1%
1978	969,000,000	389,000,000	8,000,000	40%	1%
1979	1,261,000,000	442,000,000	10,000,000	35%	1%
1980	1,242,000,000	511,000,000	15,000,000	41%	1%
1981	1,379,000,000	612,000,000	26,000,000	44%	2%
1982	1,307,000,000	562,000,000	33,000,000	43%	3%
1983	1,595,000,000	493,000,000	48,000,000	31%	3%
1984	1,512,000,000	661,000,000	74,000,000	44%	5%
1985	1,948,000,000	671,000,000	102,000,000	34%	5%
1986	1,458,000,000	590,000,000	156,000,000	41%	11%
1987	1,390,000,000	494,000,000	210,000,000	33%	14%
1988	1,726,000,000	527,000,000	319,000,000	30%	18%
1989	2,089,000,000	714,000,000	479,000,000	34%	22%
1990	2,056,000,000	639,000,000	621,000,000	29%	28%

Within the last ten years, annual farmed salmon production has grown 31-fold, from just over the 15 million pounds in 1980 to 479 million pounds in 1989. And, while the Norwegians dominate farmed salmon production (representing more than half of all farmed salmon production in 1989), there has been dramatic growth of farmed salmon production in several other countries—including Chile, Canada, Scotland and Japan.

**Salmon Production by Major Producers (millions of pounds)**

	Norway	Scotland	Chile	Canada	U.S.	Japan
1980	9.1	1.3	0	.4	.86	4
1981	18.5	2.9	0	.46	1.9	2.5
1982	22.6	4.7	.4	.9	1.5	4.7
1983	37.4	5.6	.2	.68	.8	3.9
1984	49	8.6	.24	.68	2.7	11
1985	63	15	1.1	.9	4	14.1
1986	100.5	22.7	2.5	2.2	3	17.6
1987	123.6	27.9	2.6	6	5.5	26.8
1988	184	39.5	6.8	20	8.1	36
1989	252.7	68.2	18	38.8	12.3	40.9
1990*	330	77	41.8	51.2	16.9	57.2
1992*	286	94.6	58.3	72.6	na	na

**High production, falling prices prompt Norwegians to scale back, but farming worldwide expected to continue gains**

Toward the end of the 1980s, lower prices for farmed salmon caused some contraction in segments of the industry. Norwegian farmers shifted some production into frozen from fresh, and there has been consolidation of the industry in Canada and the United Kingdom (Scotland) due to business failures.

Early in 1990, the Norwegians began freezing farmed Atlantics so they could take some fish off the markets to shore up prices. The Norwegian Fish Farmers' Sales Organization also won government backing to limit production to 25kg of fish per cubic meter of water. It was reported that this would raise the average price by between NKR5.00 (about \$.95) and NKR10.00 (about \$1.80) during the year.

These recent actions were initiated because, while Norwegian salmon exports grew from 145 million pounds in 1988 to more than 209 million pounds in 1989, the average export value of the salmon fell from NKR46.39/kg (about \$8.80) to NKR36.39/kg (about \$6.90) for fresh, with some reports of ex-farm levels as low as NKR32.50/kg (about \$6.18). Norwegian industry officials also have announced plans to reduce farmed production from 330 million pounds in 1990 to 308 million pounds in 1991, and to 286 million pounds in 1992.

There is no indication, however, that other countries will curtail production at the same time the Norwegians are scaling back. In fact, production in other major salmon farming countries is increasing. The January/February 1991 issue of *Seafood Leader* predicts farmed salmon production could reach 1,100 million pounds by the year 2000—an amount nearly equivalent to 1980's total wild and farmed salmon production.

**Farming explosion last decade was unpredictable**

In academia and in the industry, there has been a reluctance to predict salmon market activity during the next several years, let alone to the year 2000. This reticence may be based in part upon the unpredictable changes of the last 10 years. Even as late as the mid '80s, prognosticators from the industry, fisheries bureaucracies and universities were underestimating the explosive dimensions of salmon farming growth.

An exhaustive review of reports written during the 1980s does not reveal any predictions regarding farmed salmon that accurately reflect the actual production levels reached by 1990. Some representative off-the-mark examples are:

- in November 1984, The National Marine Fisheries Service (NMFS) projected that by 1990 production of pen-reared salmon would reach 236 million pounds (this is less than half of most recent 1990 production estimates of nearly 621 million pounds);

- in March 1986, Patricia Lavin Riely and James Anderson of the University of Rhode Island predicted in a study for NMFS that total production of farmed salmon in 1990 would be 274 million pounds (this is also less than half of current 1990 production projections);
- in March 1988, the DPA Group of Vancouver B.C. predicted for the Department of Fisheries and Oceans in Canada that production of farmed salmon in 1990 would reach 379 million pounds (that prediction was shy of actual production by more than 220 million pounds);
- in April 1988, the Norwegian Ministry of Fisheries predicted that production of Atlantic salmon in Norway would be in the neighborhood of just over 220 million pounds in 1990 (1990 Norwegian production is now estimated to be 330 million pounds); and
- Dr. James Anderson of the University of Rhode Island in April 1988 estimated that world production of farmed salmon would be in the range of 411 to 489 million pounds by 1990 (his forecast for 1995 was between 452 to 534—still about 88 million pounds below what 1990 production will be).

While a review of these 1980s predictions may discourage further prognostication for the 1990s, some observations might still be made.

#### **Wild/ranched growth potential remains, but there are limits**

First, there are natural limitations on the harvest of wild and ranched salmon stocks. While nobody can say with certainty what those upper production limits may be, Peter Larkin of the University of British Columbia says ocean ranching could increase harvest of salmon using traditional means by up to 50 percent. He based that prediction on the success of the ranched Alaska pinks and Japanese chums.

British Columbia's Michael Hunter believes that B.C. and Alaska wild production will continue to improve over the production levels of the 1980s. He indicated in an early 1990 speech to an international gathering of salmon farmers (Salmon 90, held in Norway) that B.C. and Alaskan wild production could continue to grow another 20 to 25 percent during the 1990s.

In addition to growth in wild and ocean-ranched fisheries on the eastern edge of the North Pacific Rim, the Soviets expect growing harvests on the western edge. *Fishing News International* indicated in its June 1990 issue that the Soviet Union plans to increase enhancement efforts to boost total catch from 286 million pounds to 661 million pounds.

**Wild Salmon Harvests (In millions of pounds)**

	U.S.	Canada	Japan	U.S.S.R.	Alaska
1980					510.4
1981					611.6
1983	639.3				561
1984	691.4	110	373.4		660
1985	726.9	239.8	488.4		668.8
1986	658.5	220	409.2	176	589.6
1987	562	143	374		492.8
1988	606.1	189.2	374		525.8
1989	778.8	176	440	173.8	712.8
1990	na	191.4	484	286	700+(e)

There is, however, an upper limit on wild and ranched production. Nobody knows the carrying capacity of the North Pacific but some suggest it is not unthinkable (with the extensive ocean ranching programs of Alaska, the U.S., Canada, the Soviet Union, and Japan) that international discussions on ocean 'grazing' rights may be in the not too distant future.

**Farming's unlimited supply  
potential makes it permanent industry**

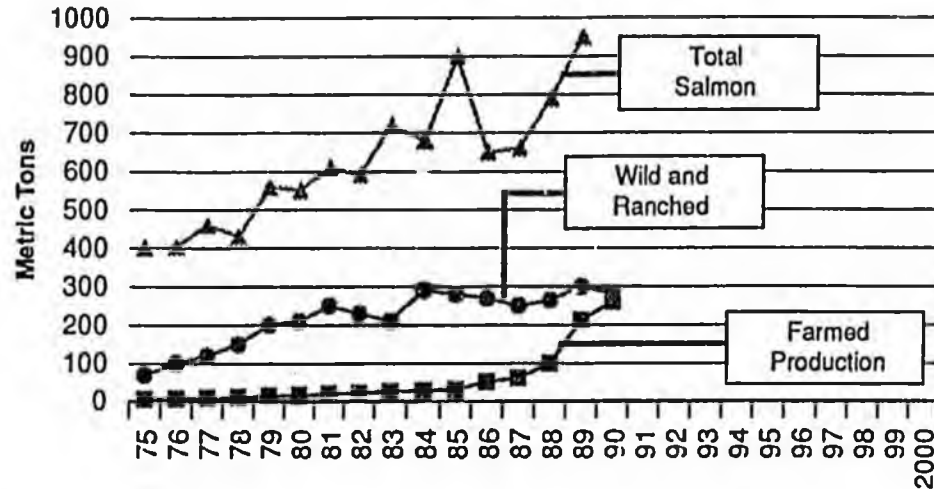
Larkin does not see outer limits to aquaculture. At the September 1990 Aquaculture International gathering in Vancouver, Larkin noted it is "absolutely clear that (farmed) production will grow." He believes that there will be few exotic species farmed, but that those species in production now will continue to grow and that technology and breeding will improve for those established species.

The limits Larkin foresees for farmers are environmental. However, he adds that improving technology will allow mitigation of farming impacts. These mitigation measures may include moving farms offshore as pen technology improves.

**World salmon supply—  
farmed and wild—booming overall today**

The increase in production and world supply of salmon during the past decade is not solely attributable to the increased production of farmed salmon. Production of wild salmon has increased at a pace that *matches* increased farm production during the last several years. Between 1984 and 1989, production of wild and ranched salmon grew 286 million pounds. In that same time period, production of farmed salmon grew a total of 284 million pounds.





The world supply of salmon in 1990 will reach about 2,056 million pounds. According to an analysis by one of the Japanese fish trading firms (as reported by the Alaska State Office in Tokyo), demand for this year's salmon will be between 1,543 million pounds and 2,028 million pounds (286 to 418 million pounds for canned; 264 to 330 million pounds for the European market; 220 to 330 million pounds for the North American market; 661 to 771 million pounds for the Japanese market; and 110 to 154 million pounds for other markets). If the average demand of about 1,763 million pounds is harvested, there will be an oversupply of 440 million pounds of salmon in 1990.

### THE SALMON LIFE CYCLE—WILD VS. FARMED

There are five commercially important Pacific species of salmon harvested in the wild (only negligible amounts of wild Atlantic salmon are harvested and marketed). Each Pacific species varies in size, shape, distribution, taste, texture and other attributes.

Species	Weight	Protein (grams)	Fat (grams)	Calories
Chinook	10-25	19	12	189
Coho	7-9	20	6	139
Sockeye	5-7	20	8	157
Chum	8-9	20	4	121
Pink	4-5	20	5	130

Adapted from: National Marine Fisheries Service and Alaska Fisheries Development Foundation, Commercial Fish Species of the Pacific West Coast and Alaska, Portland Or, 1982; Alaska Seafood Marketing Institute, Alaska Salmon, Juneau, AK 1982

Note: Protein, fat and calories are measured per 100-gram serving are average values for fresh/frozen and canned salmon.

The life cycle of the typical Pacific salmon includes the laying and fertilization of eggs in rivers and streams in summer and fall. Alevin (fry with yolk sacs) hatch in the gravel and emerge into the stream where they live and feed for varying amounts of time. The fry become smolt when they change biologically to allow them to exist in saltwater (pinks and chums migrate to the ocean much more quickly than sockeye, kings and cohos). Salmon typically feed in the ocean between one to five years (depending on the species) before returning to their native streams to begin the cycle again.

While the consumers and markets understand how commercial harvesting of wild and ranched salmon occurs, there is less general understanding of the processes involved in farming salmon.

Farmed salmon production occurs in three distinct phases—hatchery, smolt and “grow-out”. In some farmed salmon-producing regions, governments allow vertical integration of these three phases. In others, the government prohibits vertical integration.

The hatchery phase includes the fertilization, incubation and hatching of eggs. The process requires water with a temperature of about 46 degrees Fahrenheit.

Smolt farms raise the fry until the process of smoltification occurs (the stage at which the fry can adapt to and live in saltwater). The hardiest smolt are coho salmon, with Atlantic salmon more prone to mortality during this stage. Pacific salmon smolt used by farmers (coho and king) are raised for four to 18 months and Atlantics for 18 to 20 months during this stage.

In the grow-out phase, smolts are placed in pens (usually net pens anchored in the ocean) where they are fed until harvesting. Some farmers have increased the pen densities of salmon to up to 25 kilograms per cubic meter, but Herrmann notes that a body of scientists recommends about 8 to 10 kilograms per cubic meter. John Forster of Sea Farms of Washington has noted that 15 to 20 is probably optimal.

Smolt are usually ready for harvesting one or two years after purchase. Prior to harvesting, farmed salmon are starved for about three days. When harvested, salmon are anesthetized in carbon dioxide solutions, and their throats are cut so they pump out their own blood.

## FARMED SALMON PRODUCTION BY COUNTRY

### Norway

#### **Overview:**

**From infancy to current boom,  
ambitious Norway leads continued farming growth**

The lion's share of farmed salmon production over the past decade has been from

Norway. Norwegian salmon farmers dominated early in the decade and, even though several other countries have begun ambitious farming industries, the Norwegians by the end of the decade produced more than half of the world's farmed salmon. Because the Norwegians lead in the production of farmed salmon and are pioneers in pen-rearing technology, this report will deal extensively with the Norwegian experience and summarize other countries' production efforts.

Norway historically had a valuable wild Atlantic salmon fishery, but overfishing by high seas gillnetters and pollution depleted the wild runs. Farmed salmon proved to be an easy substitute, and by 1934 Norway was reportedly earning 17 percent of its fish revenues through salmon farms. By 1990, Norway had produced about 14 percent of the world salmon supply.

Fish farming in Norway goes back to 1912, when trout were first farmed in salt water. Norway's involvement with farmed salmon began in the 1960s. The Norwegian coast has optimal growing conditions because the gulf stream keeps temperature fluctuations in a rather narrow band and fjords provide protected waters for net pens. In addition to optimal environmental conditions, the farming, research and marketing structures created by the government encouraged steady and rational growth as well.

#### ***Government Involvement:***

#### **Ample government support for farming helped Norway to position of power in industry**

Norwegian fish farmers are eligible for a variety of loans and other benefits from different government agencies. A major loan source is a rural development assistance program in coastal areas, where depopulation is a government concern. Fish farming is the only industry which keeps people from leaving those regions.

Odd Steinsbo, managing director of the Norwegian Fish Farmers' Sales Association (FFSA), has noted that the production of salmon is regulated by Norwegian law, and cannot begin without a license issued to the farm owner by authorities. Norwegian salmon economist Trond Bjørndahl has written that "licenses are awarded on the basis of the character of the applicant rather than the site." The objectives are to achieve balanced growth and a decentralized industry which can adapt to existing business structures in coastal areas. This control keeps fish farming units relatively small and ensures that they are owned and operated by local residents.

The Norwegian government also limits horizontal and vertical integration to keep farms small and locally operated. This ensures that the operators have a direct stake in the operation's success, but denies certain opportunities of scale.

Patricia Lavin Riely noted in her doctoral thesis (*An Economic Analysis of the Market for Atlantic Salmon Aquaculture*) that the Norwegian government successfully tied the rights to its valuable offshore oil leases to scientific research in several other fields—including aquaculture. This, she added, accounts for oil companies like British Petroleum and Mobil having some interest in the field of aquaculture.

The government also supports the salmon farming industry through research, training, extension services, breeding research and veterinary services. In 1984, a tax exemption was granted which allowed fish in the water to be valued at zero for tax purposes—even though the farmer could borrow on the value of fish in the water. In 1985, the government declared aquaculture one of the top four priorities for industrial research funds, according to Mark Herrmann author of a 1990 doctoral thesis on world salmon supplies and prices.

The extent of government involvement in the salmon farming industry led recently to a preliminary 2.45 percent "countervailing duty" by the U.S. Commerce Department on imports of Norwegian salmon. The Commerce Department listed six instances in which they found the Norwegian government subsidized the salmon farming industry, thereby lowering the cost of fish production and the break-even price on the wholesale market. The department is now performing a full-fledged investigation into the subsidy issue, and a final finding may have been made by the time this report is published.

**Industry Outline:**

**Farmable conditions and resources brought**

**Norway to more than 30 times 1980's production levels**

In addition to government assistance, Norway has a large pool of skilled labor (Herrmann reports 80 percent of those involved in salmon farming are fishermen or former fishermen) and an excellent transportation system supporting the industry. About 12,000 Norwegians are employed in the salmon farming industry. These attributes, coupled with government programs, have contributed greatly to the rapid growth of the farmed salmon industry in Norway.

In 1980, Norwegian salmon farms produced 9 million pounds of Atlantic salmon. By 1985, production had grown seven-fold to 63 million pounds and by 1989 had quadrupled from the 1985 level to 253 million pounds. Harvests in 1990 were about 330 million pounds but Kirstin Hille Valla, the Norwegian minister for the environment, was recently quoted in a NMFS publication as saying that "environmental and other problems related to fish farming would have to be addressed before renewed expansion could be considered."

By the end of 1989, there were 790 fish farms with a growing capacity of 308 to 330 million pounds. There also were 690 hatcheries (a small number of them produce most of the volume—216 million smolt per year). Until 1985, smolt production limited expansion but that year the government removed the licensing requirement and by 1988 there was an overproduction of smolt. A recent NMFS assessment of the salmon farming infrastructure in Norway ("European and Canadian Fisheries Developments", issued 11/90 and citing the "Lenka" report prepared by Norway's ministries of fisheries and environment) noted Norway has the capacity to boost annual production of farmed Atlantic salmon to 1,587 million pounds.

Because of artificial limitations on the size and ownership of fish farms in Norway, the Norwegian industry has begun making investments in farms in other countries—including Scotland, the U.S., Canada and Chile—where farm sizes are not controlled.

This export of technology, Herrmann notes, has been encouraged by the Norwegian government. The Norwegian Export Council in 1986 began subsidizing by 50 percent those firms exhibiting farm equipment at international trade shows and conferences.

**Most of Norway's fresh farmed  
exported; supply to EEC is triple that of U.S.**

About 85 to 90 percent of Norway's production of salmon is exported, and the exports are generally fresh, top-quality Atlantic salmon. Herrmann reports, however, that Norwegians have now begun a limited canning operation in order to experiment in a new market niche. The European Economic Community is the largest importer of Norwegian farmed Atlantic salmon and EEC trade tariffs on value-added fish have helped ensure that limited value is added to Norwegian salmon exports.

The value of 1985 Norwegian salmon exports was \$152 million on exports of 85 million pounds. In 1988, Norway exported about 116 million pounds of fresh and frozen salmon to the EEC, about three times the amount of fresh and frozen salmon the U.S. exported to the EEC. In 1989, Norway exported about 220 million pounds of salmon worth \$585 million. France was the recipient of about 25 percent of Norway's exports, with Denmark close behind. Japan is growing rapidly as a client as well.

Norway's exports are highly seasonal, avoiding the peak Pacific salmon seasons while taking advantage of the holiday periods. Nearly 30 percent of Norway's fresh exports occur during November and December, while about five percent are shipped in August—the prime time harvest season for wild and ranched salmon.

During the past decade, exports of Norwegian salmon to U.S. markets have grown from a negligible amount at the beginning of the 1980s to more than 24 million pounds annually. The east coast of the United States absorbs most Norwegian imports, with the largest portion going to New York City.

**Norwegian industry is  
organized on pricing, marketing, grading**

The FFSA (Norwegian Fish Farmers' Sales Association) was created in 1978 by the Norwegian parliament, and its membership is mandatory, with farmers and buyers both paying a 1.25 percent sales tax. The organization has several functions, including advertising. Most recently, the FFSA was responsible for buying farmed salmon during over-production for freezing and future sales.

The FFSA also sets minimum prices for salmon exports (the government will subsidize farmers if the price falls below the minimums). The minimum pricing has caused some divisiveness within the organization prompted by the over-production prob-

lems of 1989-1990. Some farmers wanted controls on production rather than price adjustments, but the FFSA contended quotas were not as efficient as adjustments in the price floors, according to Herrmann.

Numbers provided by Norwegians at a New York seafood show in October 1989 indicate a 1989 Norwegian marketing budget of \$9.2 million. Unconfirmed reports suggest the marketing budget for 1990 is about \$9.5 million (to move more than 220 million pounds of export salmon). The Norwegians maintain marketing offices in France, Spain, Germany and the U.S., with an increasing presence in Japan.

Salmon quality is a primary concern in Norway. There are three grades of salmon—superior grade, ordinary grade and production grade. Exports, Herrmann reports, are restricted to superior and ordinary grades. In 1985, 89 percent of the supply was of superior grade and eight percent was ordinary.

Superior grade salmon is free of blemishes and meets color and shape standards. Fat content for superior grade must be between 15 and 20 percent. Ordinary grade salmon may have some scale loss, be slightly irregular in shape or have small cuts. Most salmon consumed in Norway is of the ordinary grade.

## Canada

### **Overview:**

#### **End of decade leap in production will bring farming to one-fourth of Canadian fishing industry**

Canada's involvement in salmon farming increased dramatically between 1987 and 1990. Farmed salmon production jumped from 5 million pounds in 1987 to 20 million pounds in 1988, 38 million pounds in 1989 and an estimated 51 million pounds in 1990. During the first seven years of the decade, production had increased gradually from 350 thousand pounds in 1980 to about 2 million pounds in 1986. A report from the Canadian Department of Fisheries and Oceans (DFO) predicts that aquaculture production in Canada will, by the year 2000, make up at least 25 percent of the total landed value of all Canada's commercial fisheries.

### **Government Involvement:**

#### **Government accepts, supports "inevitable" future of salmon farming in Canada**

The federal and provincial governments have been supportive of the farmed salmon industry. British Columbia and the federal government have designated aquaculture as a special emphasis area. Stephen White, an Alaska assistant attorney general, notes "political conditions in British Columbia seem to favor the industry. With a relatively small population and 60,000 miles of mostly wilderness coastline, salmon farming conflicts with few other marine users." White also notes that the commercial fishing industry has offered much resistance to salmon farmers.

Herrmann's thesis notes that a \$100,000 (Canadian) loan is available through the Aquaculture Incentive Program, with a five-year payback and the first three years

Interest-free. Other incentives include Economic Development Agency loans of up to \$150,000 (Canadian), new venture tax relief incentives and access to the British Columbia venture capital program with a 30 percent tax credit.

Herrmann also notes the difference in attitude between the United States and Canada when it comes to salmon farming. He quotes the president of the Prince Rupert Fishermen's Cooperative (a major fishermen's organization and B.C.'s second largest processor) who said "I think we're burying our heads in the sand if we think it (salmon farming) is going away. It's happening all around us." The co-op president added that aquaculture has great potential for small coastal communities.

**Industry Outline:**

**Eastern Canada projections:**

**overcoming constraints for modest steady growth**

In Atlantic Canada, the first significant salmon aquaculture development began in 1984 when a Norwegian firm, Stolt-Nielson Sea Farm A/S, built a \$2 million (Canadian) smolt hatchery in New Brunswick. The bulk of the salmon farming industry on Canada's eastern seaboard is centered on New Brunswick's Bay of Fundy. There are 49 salmon farms on the bay with a combined production capacity of 18 million pounds, although production in 1989 totaled 9 million pounds.

In Nova Scotia, there are 18 operating marine pen sites. However, only eight of these 18 grow a combination of salmon and rainbow trout and the other 10 grow only rainbows. Salmon production in this province totaled less than 330 thousand pounds in 1989 (up from 59 thousand pounds in 1988). Quebec and Prince Edward Island have one salmon rearing site apiece and both are land-based because of ice and winter water temperatures. The P.E.I. facility has experienced significant financial problems. Salmon aquaculture in Newfoundland is still experimental.

Canada's DFO estimates that the five eastern provinces will produce between 16 and 26 million pounds by 1995. The best prospects are in New Brunswick, followed by Nova Scotia and the other three provinces. By the year 2000, the DFO predicts production from eastern Canada at between 19 and 34 million pounds.

The DFO predictions for eastern Canada are premised on several assumptions. These assumptions are:

- current pen technology will remain prevalent (technological improvements would boost production);
- sites in New Brunswick will expand to an upper limit of 75 sites with a capacity of 28 million pounds;
- Nova Scotia will have a capacity of 1 to 4 million pounds by the year 2000; and
- by the year 2000, P.E.I., Quebec and Newfoundland will have a salmon capacity of between 1 and 3 million pounds.



Constraints the DFO sees for eastern Canada include:

- site availability and opposition from interest groups;
- low quality of smolts produced;
- production problems caused by disease; and
- financing constraints.

To balance constraints to expansion, proponents of the industry in eastern Canada believe they have numerous advantages: proximity to important salmon markets on the east coast of the U.S.; competitive labor prices and strong industrial support to lower production costs; and provincial and federal government regulations which are conducive to growth.

#### **Western Canada contracting after decade of accelerated farming expansion**

On Canada's west coast, the British Columbia farming industry has grown from four commercial farms in 1931 to 135 sites in 1989. Because of financial problems, the number of sites in 1990 dropped to about 120. In a U.S. Department of Commerce, National Marine Fisheries Service (NMFS) publication dated September 1990 (entitled *The Latest Developments in West European and Canadian Fisheries*), Dr. Ted Needham predicted that only 50 of the 80 salmon farming companies operating in British Columbia will survive 1990.

#### **Norwegian ownership of one-third of B.C. farming suggests region will be major player**

The NMFS publication does point out that the investment of about \$80 million (Canadian) by the Norwegians, or approximately one third of the \$250 million (Canadian) currently invested in salmon farming in B.C., illustrates the generally accepted belief in the industry's long-term viability.

In fact, B.C.'s growth in the mid-1980s is probably most attributable to the decision by Norwegian producers to seriously invest in the Pacific salmon aquaculture industry. With Norwegian involvement, the number of farms grew from four in 1981 to 36 in 1985 and jumped again in 1986 to 69 farms—10 with Norwegian backing. Most of the sites are along the Sechart Peninsula and on Vancouver Island. The farms generally employ three or four people and are capable of producing from 440,000 to 661,000 thousand pounds of salmon per year.

1989 production in British Columbia was approximately 27 million pounds, compared to 14 million pounds in 1988. Production in 1990 is expected to reach about 33 million pounds, though B.C. production for the first four months was ahead of predictions. Most of the B.C. production is chinook, with Atlantics running a distant second and coho far behind.

In British Columbia, king salmon mature in about 24 months, while cohos are ready to harvest after about 18 months. Herrmann notes the survival rate of B.C. Pacific salmon smolt is about 50 percent compared to a survival rate of Atlantic salmon smolt in Norway of about 70 percent. Plankton blooms are the largest cause of salmon loss in the province.

#### **Industry association keeps B.C. organized, promoted**

The British Columbia Salmon Farmers Association (BCSFA) was formed in 1984 to promote the province's salmon farm industry. The BCSFA represents 95 percent of the salmon farmers in the region, according to Herrmann, and administers functions that include egg allocation, husbandry workshops, communications, product identification, scientific research, quality programs and marketing programs. The budget for the BCSFA is reportedly \$1.5 million (Canadian) beginning in 1990, according to Herrmann.

Herrmann also reports the BCSFA has approved a seal of excellence which will have the words "Fresh Pacific Salmon Quality Approved by the British Columbia Salmon Farmers Association."

#### **Factors support B.C.'s success, but far from "the next Norway"**

Despite the rapid growth of salmon farming in British Columbia, the DFO describes the state of the industry as still developmental compared to Norwegian production. DFO is officially saying that the B.C. farming industry may be producing 132 million pounds by the year 2000.

Constraints on growth will be competition from other countries also trying to duplicate the Norwegians' success; control of production costs and profitability; blooms and disease problems; financing; and marketing competition.

On the other hand, the B.C. industry is close to one of the most important U.S. salmon markets, the B.C. coastline has many potential farm sites, there is a well-trained workforce, and a strong research/government support base for the industry.

## **Chile**

### **Overview:**

#### **After long history of cultivation attempts, Chile hits salmon jackpot with farming last decade**

For years Chile has been trying to develop local fisheries for salmonid species through stocking programs and enhancement efforts. Though climatic and environmental conditions for salmonids are excellent in Chile, salmonids are not native to Chile (or any other country south of the equator).

Beginning in 1905, trout and salmon were first introduced into Chile. The initial experiments with salmon were unsuccessful, but trout flourished. Rainbow trout were first farmed in 1975 and coho were cultivated beginning in 1979. Coho exports began in 1981 following a *one metric ton* harvest that year.

By 1986, production of farmed salmon in Chile had increased to 2 million pounds, and by 1989 production had grown to 16 million pounds. Production for 1990 is expected to be in the neighborhood of 41 million pounds—28 million pounds of coho and 13 million pounds of Atlantics.

Bill Atkinson's *News Report* (12/26/90) noted production in 1994 is expected to be in the neighborhood of 66 million pounds, with most of the expanded production coming from the cultivation of Atlantics. He indicated the Atlantics give the Chilean farmers year-round capability for exports.

**Government Involvement:**

**Relatively neutral policies neither help nor hurt industry**

Unlike other governments, Chile does not impose significant bureaucratic overhead, Herrmann reports. Herrmann also notes that there is little environmental opposition to salmon farms in Chile.

The Chilean government does not provide special incentives for farmers. The government agency in charge of fisheries is planning to enact administrative procedures to regulate the cultivation of salmon, including egg trade, diseases, smolts and salmon, according to Herrmann.

**Industry Outline:**

**Resources excellent, production low—  
but market distance may negate price advantage**

Fixed costs are reasonable in Chile, and protected and inexpensive sites for pens are readily available. Low labor costs also keep production costs down. Herrmann notes that in Chile, lower production costs translate into lower stocking densities, which in turn translate into "healthier and less stressed fish." Another major advantage is absence of the devastating algae blooms experienced by other salmon farming countries.

The greatest disadvantage for Chilean farmers is the country's distance from major salmon markets. The closest market is Los Angeles and if air transportation costs rise more quickly than ground traffic, British Columbia farmers will have a significant advantage over Chile in supplying U.S. West Coast markets—despite Chile's lower production costs. The U.S. Department of Transportation noted that the transportation differential between British Columbia and Chile was \$.75 per pound in 1989, before the price of fuel oil skyrocketed due to Mideast tensions.

Chile's southern hemisphere experiment is being watched closely in salmon aquaculture circles. Chilean farmers contend that they can culture salmon at lower costs than other countries, thanks to availability of numerous suitable and inexpensive sites and lower feed costs than other nations (Chile is the largest exporter of fish meal in the world).

**Expansion of species  
has given Chile a year-round market**

Most Chilean production of salmon is coho, though in the last few years production of Atlantics has leaped ten-fold from 370 thousand pounds in 1988 to more than 3 million pounds in 1989. Mastering the freshwater stage for Atlantics was a major impediment but, with the help of established European companies, that impediment is decreasing. Carlos Wurmman Gotfrit, director of marine resources for Fundacion Chile, predicts substantial farming of Atlantics—particularly after the 1990 season.

The Chilean farmers are also working with small amounts of chinook and cherry salmon (similar to pink salmon and indigenous to the Kamchatka Peninsula). In 1989, 127 thousand pounds of chinook were produced, and 33 thousand pounds of cherry salmon were harvested.

With the expansion of species under production, Chile has been able to supply salmon on a year-round basis. The coho are harvested between November and March (with heaviest production between December and February) and Atlantics and chinook are harvested all year long.

Up to 1989, about 320 sites belonging to 130 companies were licensed to grow salmon in either fresh or saltwater. From the licensed sites, around 170 are already working with sea pens, 34 are in juvenile production and seven are involved in ocean ranching. About two-thirds of the working farms plan for 661 thousand to 1 million pounds of production each year, while only five have plans to produce more than 2 million pounds per year.

Farmed salmon production is now centered on Chiloe Island. According to a report in *Seafood Business* (July/August 1990), the farms in Chile are carbon copies of farms in Norway, Scotland, the Faroe Islands and Iceland.

**Other farmed producers have  
commitment to Chile—as investors or importer**

Recent notable developments in Chile include the involvement of foreign firms in the production of farmed salmon in Chile. Nippon Suisan Kaisha acquired Salmenes Antartica from Fundacion Chile and processed more than 4 million pounds in the 1988-89 season—making it the largest producer in the nation. Other foreign investment from Scotland, Norway, the U.S., Canada and Denmark also has gravitated to the Chilean salmon farming industry or affiliated industries such as feed production, consulting and others.

Japan has not only made major investments in the industry but is now the primary market for Chilean farmed salmon. Almost 62 percent of Chile's cultured salmon output went to Japan in 1989, compared to 35 percent in 1988. During the same period of time, exports of Chilean salmon to the U.S. slipped from 52 percent to 29 percent.

### **Japan gets increasing portion of its frozen supply from Chile**

The shift in supply to Japan also has created a noticeable shift in product form from fresh salmon to frozen salmon—with the frozen salmon destined for the Japanese market. 1988 exports of fresh salmon comprised 57 percent of total exports, but only 31 percent was exported fresh in 1989. (Despite the drop in *percentage* of fresh salmon exported, increased Chilean production overall allowed exports of fresh salmon to increase 440 thousand pounds between 1988 and 1989.)

While the U.S. and Japan are the major markets for Chilean salmon, other markets also are reacting favorably to the Chilean product. Increased demand for aquaculture product and the strong reputation for the quality of Chilean coho is creating the demand. However, some U.S. markets reportedly question the reliability of supply because of the shift to the Japanese market.

Japanese imports of Chilean salmon for the first six months of 1990 totaled 20 million pounds, well ahead of projections that pegged Japanese imports from Chile at about 15 million pounds for the year. Chilean salmon farmers expressed concern to a *Seafood Business* writer about the world's oversupply situation and the fact that the Norwegians were targeting Japan, but were hopeful that the reddish flesh of their farmed coho would be more attractive to Japanese buyers.

### **Chilean salmon farmers closeknit, share pricing responsibility**

Chilean farmers work together, as do the Norwegians, to set prices. Herrmann notes they meet twice each week to set minimum prices and achieve uniform prices for buyers.

There also are restrictions on quality written by the Association of Chilean Salmon Farmers (close to 90 percent of the farmers belong to the organization). Quality seals are awarded prior to export of the salmon.

## **Scotland**

### **Overview:**

#### **Long history, significant growth place Scotland leadership close to Norway's**

Scotland ranks second—after Norway—in the production of farmed salmon, and the value of Scottish farmed salmon is now greater than the value of beef or lamb production in Scotland. The farms are located in western Scotland, and the Orkney and Shetland Islands. The industry has created 6,300 jobs in remote areas of Scotland.

Salmon farming has a longer pedigree in Scotland than in most other countries. Unilever built a salmon farm in Scotland in 1969, and in the last decade there has been steady growth in production from about 1 million pounds in 1980 to 68 million pounds in 1989. Production in 1990 is projected to be about 77 million pounds.

**Government Involvement:**

The British government has adopted beneficial financing regimes for salmon farmers. Under the Fish Farming Scheme of 1984, the government is allowed to grant farmers up to five percent of the cost of an aquaculture project. Grants also have been available to farmers in underdeveloped areas of Scotland through the Industrial Development Act of 1982, the Integrated Development Program for the Western Isles and the Highlands and Islands Development Board.

**Industry Outline:**

**Oversupply less an impact of dramatic production growth**

In 1989, there were a total of 66 Scottish companies operating more than 292 salmon farms. Saltwater pens produce the vast majority of salmon, though about 1 million pounds were produced in onshore systems using pumped seawater. Salmon smolt production was about 29 million pounds in 1989. A slight decrease in the production of smolt is expected this year.

Though Scotland's production of farmed salmon has grown dramatically in the past few years (salmon production in 1989 was 55 percent higher than in 1988), increased production costs and prices lower than those in 1989 will result in a 30 percent drop in revenues. Angus Morgan, chair of the Scottish Salmon Board, says the 30 percent increase in exports during 1989 helped the country's farmers weather the crisis in the salmon farming industry caused by "dumping" of Norwegian salmon on markets.

Morgan also noted there was a 15 percent increase in production costs for Scottish farmers. Seven Scottish salmon companies went into bankruptcy last year.

**Scottish farmed salmon experiences increasing European popularity**

Exports from Scotland are mainly to countries in the European Economic Community especially France which imported 16 million pounds in 1989 for an increase of about 40 percent over 1988. Scotland's salmon producers' association has a permanent promotions office in France. The Netherlands and Germany also are important overseas markets for Scottish salmon. Scotland's promotional budget is between \$5 and \$6 million for 1990.

Scottish fish farmers exported about 27 million pounds in 1989 worth about \$86 million. This is an increase of about 30 percent over 1988. Scottish salmon also increased sales in the UK, displacing about 4 million pounds of salmon imported from other countries worth \$11 million.

## Japan

### **Overview:**

#### **Japanese experiments lead to success in farming ventures**

The Japanese began experimenting with chum salmon culturing in 1876, and established the first chum hatchery in 1888—about the time cattle ranches and cowboys were flourishing in the western United States.

Though the salmon ranching program is well-established, salmon farming is relatively new. The Nichiro Fisheries Company cultured coho, chum, sockeye, pink, and chinook beginning in 1971, following loss of its salmon factory ship in a vessel reduction program.

In 1973, the company focused on coho because they were hardier than other species. In 1975, Nichiro turned to ocean pens after determining coho grew more slowly in freshwater and by 1978 the company had produced 992 thousand pounds of coho with an 80 percent survival rate from smolt to adult.

### **Government Involvement:**

#### **National commitment focused on well established wild ranching**

In 1951, the Japanese government established the Aquatic Resources Conservation Act, which mandates that the Ministry of Agriculture, Forestry, and Fisheries administer a fish hatchery program.

The program was established to ensure that the country did not again experience the salmon shortages faced when salmon stocks were overfished. The act has led to a national salmon ranching program and the fry and returning fish belong to the Japanese government. The act also provides subsidies to private hatcheries and requires salmon fishermen to contribute to the hatchery program.

The Japanese government does not offer financial incentives to salmon farmers.

### **Industry Outline:**

#### **More Japanese firms venturing in, but farming still tiny factor in export/domestic consumption**

Other companies besides Nichiro also began commercial farming of coho and the companies contracted out the production of salmon to about 350 firms in 1986 and 400 in 1987. The pen-raised coho are taken from the cages before the higher summer temperatures inflict crop mortality. Since summer also brings competition from other salmon and fish products (skipjack tuna and others), coho not marketed by early summer is often salted for sale in the fall. By 1986, less than 2 percent of the salmon consumed in Japan (between 771 and 881 million pounds annually) was produced in the nation's pens.



The Japanese market for Japan pen coho was in disarray in June of 1990, according to Bill Atkinson's *News Report* of July 4, 1990. He wrote that prices were expected to fall to about \$2.05 per pound because of high landings that year. Expected harvest of pen coho was 50 million pounds compared to 37 million pounds in 1989. Instead, prices held higher (between \$2.11 and \$2.32 for 4.5 pound and up) even though consumer demand was slow. To some extent, the prices holding high might be attributed to a typhoon that affected the availability of skipjack tuna and opened the way for farmed coho.

Production of pen coho is expected to reach 50 to 52 million pounds in the Sanriku region—significantly higher than the 37 million pounds in 1989. About 26 million pounds of this production was sold through the markets and the rest directly to users. In 1990, about 40 percent of the total landings of pen coho from this region was salted or frozen and the rest sold fresh. Production of pen coho in Iwate province was expected to reach 2 million pounds in 1990—a 10 percent increase over 1989 production.

A small amount of chinooks are being farmed and there are reports of experimentation with sockeyes. In addition, the Japanese government and Mitsubishi have begun a test project raising Atlantic salmon. Even though Japanese water conditions can become too warm for sensitive species, Atlantics were showing good survival rates.

## OTHER COUNTRIES

Farmed salmon are also being produced in other countries, though on a much smaller scale than in Norway, Canada, Scotland, Japan and Chile. In some of the other countries and regions, production has some history; others have established salmon farms just recently.

Ireland, the Faroes, Iceland, the U.S., France, Sweden, Finland, Spain, France, Italy, Australia, and New Zealand are all producing various species of salmon on farms with varying degrees of success.

Ireland, Iceland and the Faroes all produce approximately 22 million pounds. The U.S. produced about 17 million pounds in 1990. U.S. production has mainly taken place in Maine and in Washington state.

### Iceland

In Iceland, fish farming first began in the early 1980s. In 1984, a large land-based salmon farm was established as a joint Icelandic and Norwegian venture. The venture also produces smolt for its own use and for export.

The government of Iceland has not provided financial incentives to farmers, but loans are made through semi-public agencies and the Fisheries Development Fund.

Limiting factors for Iceland are the lack of protected fjords and the cold water temperatures during winter months.

Environmental conditions in Iceland have led to the world's largest dryland salmon farm, according to Herrmann. With the help of the Nordic Investment Bank, there are now about 15 dryland farms in the country.

### **Faroe Islands**

Salmon farming began in 1980 in the Faroe Islands and there now exist more than 50 farms. The Faroese Home Rule Government has supported the industry through technical assistance and investment loans.

Most Faroese salmon is exported to Denmark. The industry is guided by an eight-member board that reviews sites, governs the production of smolt, provides environmental oversight, and governs the limited fresh water reserves.

One of the problems facing the Faroes is a shortage of smolts to stock the pens. Since imports of smolts have been prohibited by the government, annual domestic production will have to increase. The Faroese have a domestic supplier of feed, so feed is not expected to be a problem.

### **Ireland**

Genetic characteristics peculiar to Ireland's farmed Atlantic salmon, coupled with the country's warm waters, are contributing factors to the higher percentage of small salmon, or grilse, produced in Ireland. Grilse is an Atlantic that undergoes the biological changes of spawning before reaching full size and seldom grows to six pounds. Norwegian joint ventures in Ireland have been working to lower the incidence of grilse.

The government does not provide incentives to salmon farmers, but does conduct research and licensing oversight. There is Norwegian investment in Ireland, and some Irish salmon is marketed through Norwegian companies. Ireland consumes about 20 percent of its domestic production; the rest is exported mainly to EEC countries, with a small amount going to the U.S.

Ireland's salmon production will ultimately be limited by the availability of suitable farming sites. There is environmental opposition to the utilization of many sites. Projections for 1990's harvest are about 30 million pounds.

### **Australia**

Australian farmed salmon production is located in Tasmania. A few years ago, salmon farming was viewed as an answer to Tasmania's economic problems. However, financial problems and overproduction encouraged by an enthusiastic government caused prices to slip as producers battled for market shares. Subsequently, the two largest salmon farmers (with 60 percent of the production) have agreed to merge.

The merger means that Noraqua of Norway ends up with 50 percent of the newly formed company (Tassal). Noraqua, a subsidiary of a large Norwegian construction

and engineering firm, decided that the Tasmanian operation is the only one with the long-term profit potential and has closed down all of its other fish farms around the world.

The U.S. Department of Commerce reports that Tasmania may be one of the most promising salmon farming sites in the world. An Atlantic salmon can grow out from 9 to 11 pounds in 27-30 months in Tasmania, as compared with 36-41 months in Norway.

The Tasmanian farmers have a huge advantage in the domestic (Australian) market because government health authorities require all imported fresh fish to be heat-treated in a manner that harras the taste and increases costs. This means there is no importation of fresh fish into the Australian markets. There is no similar requirement in Australia mandating heat treatment for fresh fish that are exported from Australia.

### **New Zealand**

New Zealand, like other southern hemisphere countries, does not have any indigenous salmon. Sockeyes and chinooks were originally introduced for a recreational fishery and Atlantics were also stocked in some lakes for recreational fishing.

Salmon farming in New Zealand was legalized in 1983 and production has increased steadily since then. Chinook has been the principal farmed salmon. To assist the establishment of a salmon farming industry, the government supplied farmers with two cycles of chinook smolts. Smolts are from the "wild" fishery and from the government hatchery.

New Zealand has several advantages in its salmon cultivation efforts—a good supply of unpolluted water and location in the southern hemisphere with seasons the reverse of northern hemisphere harvesting seasons. Distance from major markets is a major disadvantage. If Australia eliminated the import restrictions of fresh fish, New Zealand would be well placed for that market.

The New Zealand government does not provide special assistance to farmers other than the special tax benefits the government gives to all new industries. The government does, however, operate a salmon research station.

### **United States**

Growth of salmon farming in the U.S. has been slow but steady. On a commercial basis, salmon farming has been occurring in the Puget Sound area of Washington state since the 1970s. Coho and Atlantics are the primary crop. While the waters of Puget Sound are often described as ideal for salmon fanning, there have been permitting delays and resistance from adjacent landowners.

On the East Coast of the U.S., production is mainly by one firm. Atlantics dominate the crop.

Outside these two states (Washington and Maine) there are only sporadic attempts at pen-raising salmon. Hawaii and California are experimenting with aquacultured salmon, and Oregon and Idaho have a few pan-sized coho operations. Some salmon is now being farmed in abandoned quarries in Minnesota's Iron Range.

### Others

At this time, production in other countries is very low. France has just harvested the first crop of Atlantic salmon grown in a converted tanker off the coast. Other countries (Sweden, Finland, Spain, and Italy) are experimenting with farming technology as a possible prelude to engaging in the salmon farming industry.

## COMMERCIAL SALMON PRODUCTION BY COUNTRY

### United States

#### Alaska dominates domestic industry

Most salmon landed in the U.S. is landed in Alaska. (Note: commercially caught salmon consist of wild salmon and ranched salmon—hatchery salmon released to the wild.) Between 1980 and 1989, Alaska has accounted for between 87 percent (in 1987 and 1988) to 95 percent (in 1983 and 1984) of all U.S. salmon landings.

#### Percent of Alaska Landings vis-à-vis U.S. Landings

		Alaska	U.S.
1980	91%	512,000,000	560,000,000
1981	91%	611,000,000	672,000,000
1982	89%	562,000,000	629,000,000
1983	95%	621,000,000	652,000,000
1984	95%	660,000,000	694,000,000
1985	90%	669,000,000	747,000,000
1986	89%	606,000,000	678,000,000
1987	87%	490,000,000	563,000,000
1988	87%	527,000,000	607,000,000
1989	91%	714,000,000	787,000,000

In the 1980s, harvest of wild and ranched salmon in the U.S. ranged from a low of about 562 million pounds in 1980 and 1987 to a high of 787 million pounds in 1989. The 1980s were a vast improvement over the mid-1970s (1974-1977) when average salmon landings per year were about 262 million pounds. Alaska salmon harvests during the 1980s have ranged from 490 million pounds in 1987 to about 714 million pounds in 1989.

The vast majority of U.S. sockeye, pink and chum landings are from Alaska waters. During the last decade, Alaska also landed about 50 percent of the kings and 75 percent of the coho landed in the U.S.

**Alaska Catch by Species**

	<b>Reds</b>	<b>Pinks</b>	<b>Chums</b>	<b>Coho</b>	<b>Kings</b>
1980	187,000,000	217,000,000	71,000,000	22,000,000	12,000,000
1981	225,000,000	244,000,000	99,000,000	26,000,000	15,000,000
1982	109,000,000	219,000,000	90,000,000	46,000,000	16,000,000
1983	305,000,000	193,000,000	79,000,000	26,000,000	15,000,000
1984	222,000,000	276,000,000	104,000,000	44,000,000	12,000,000
1985	221,000,000	304,000,000	83,000,000	47,000,000	13,000,000
1986	196,000,000	259,000,000	93,000,000	46,000,000	11,000,000
1987	215,000,000	159,000,000	78,000,000	23,000,000	12,000,000
1988	185,000,000	176,000,000	121,000,000	33,000,000	10,000,000
1989	262,000,000	351,000,000	58,000,000	30,000,000	10,000,000
1990	309,000,000	265,000,000	58,000,000	33,000,000	10,000,000

British Columbia's Hunter, early in 1990, told salmon farmers in Norway that Alaska commercial catches would continue to grow during the coming decade. He predicted catches expanding by 20 to 25 percent by 2000. An economic model paid for by the Prince William Sound Aquaculture Association predicted increased salmon harvests of 10 to 20 percent from 1990 through 1998. That model was constructed by the Alaska Department of Fish and Game and the University of Alaska.

**Canada**

The harvest of wild and ranched Pacific salmon in Canada occurs along the coast of British Columbia. Generally, landings are differentiated along the coast by geographic areas: Queen Charlotte Islands; North Coast; West Coast of Vancouver Island; and the South Coast. Small amounts of salmon are harvested in Northern British Columbia in river systems that flow into Southeast Alaska (the Taku and Stikine Rivers).

The impact of hatchery-raised fish contributing to the commercial catch is much more limited than in Alaska or Japan where salmon ranching is much more developed.

During the mid-1970s, Canadian salmon harvests averaged about 123 million pounds per year (1974-1977). No harvest during that period exceeded 145 million pounds. During the 1980s, salmon harvests ranged from 110 million pounds in 1984 to 236 million pounds in 1985.

## Canadian Catch by Species

	Reds	Pinks	Chums	Coho	Kings	Total
1980	16,000,000	30,000,000	36,000,000	19,000,000	14,000,000	118,000,000
1981	46,000,000	84,000,000	13,000,000	16,000,000	13,000,000	173,000,000
1982	66,000,000	8,000,000	33,000,000	20,000,000	15,000,000	144,000,000
1983	31,000,000	87,000,000	10,000,000	23,000,000	11,000,000	164,000,000
1984	28,000,000	26,000,000	19,000,000	22,000,000	13,000,000	110,000,000
1985	69,000,000	83,000,000	52,000,000	19,000,000	12,000,000	236,000,000
1986	68,000,000	65,000,000	55,000,000	29,000,000	11,000,000	228,000,000
1987	33,000,000	59,000,000	22,000,000	17,000,000	11,000,000	143,000,000
1988	26,000,000	70,000,000	66,000,000	15,000,000	13,000,000	191,000,000
1989	72,000,000	63,000,000	19,000,000	17,000,000	11,000,000	185,000,000

As he predicted for the Alaska fishery, Hunter estimates that Canadian commercial catches will increase 20 to 25 percent by 2000. The University of British Columbia's Larkin notes that ocean ranching programs may increase commercial harvests by up to 50 percent, based on the success of Alaska's program.

### Japan

Japan's commercial harvest of salmon has changed dramatically in the past 15 years as Japanese fleets have been removed from traditional fishing grounds. Salmon formerly caught by Japanese motherships and driftnet fleets have been replaced, for the most part, by wild (and ranched) Pacific salmon imports from the U.S., Canada, and some farmed Atlantic and Pacific salmon—mostly from Norway and Chile.

The Japanese high seas salmon fishery has been operating in the northern and western Pacific, mainly targeting Soviet salmon. During the past several years, the Soviets have continued to reduce salmon allocations to Japan with the reported goal of completely phasing out all Japanese high seas salmon operations by 1992. All mothership operations have already been phased out with the land-based driftnet fleet participating for limited tonnage.

This year, the Japanese fleet operating within the Soviet 200-mile zone is mainly restricted to pink salmon areas only, according to Bill Atkinson's *News Report*. Atkinson reports that more and more boat owners are losing interest in the high-seas fishery due to heavy financial losses.

Since high-seas operations have been greatly reduced, the harvest of ranched chums in the coastal regions of Hokkaido and Honshu provides the bulk of the Japanese commercial catch in this late summer-fall fishery. At the beginning of the decade, the fall chum fishery constituted about 58 percent of the total Japanese catch. By the end of the decade, the fall ranched harvest averaged above 80 percent of the total Japanese commercial catch.

### Japanese Chum Catches

	Chum Catch	Domestic Landings	% of Chum catch
1980	166,000,000	284,000,000	58%
1981	224,000,000	344,000,000	65%
1982	197,000,000	314,000,000	65%
1983	251,000,000	367,000,000	68%
1984	255,000,000	359,000,000	71%
1985	350,000,000	460,000,000	76%
1986	313,000,000	389,000,000	80%
1987	303,000,000	397,000,000	76%
1988	330,000,000	373,000,000	88%
1989	377,000,000	478,000,000	79%
1990	363,000,000	—	—

The fall chum fishery is centered in two northern Japanese regions: Hokkaido and Honshu. They are mainly harvested in fixed nets as they return to spawn in the rivers in which they were released. The number of chums returning has increased dramatically. According to the Japanese External Trade Organization, 17.5 million fish returned in 1975, resulting in a harvest of 127 million pounds. By the mid-1980s, harvests of the artificially incubated chums had stabilized around the 308- to 374-million pound level.

H. Suzuki of the Nichiro Corporation (one of the three largest Japanese fishing companies) calls the fall chum catch fairly stable. He believes the fall chum fishery has reached its maximum production level, based on the escapement capacity of the river systems. He also expressed some concern about the price difference between males and females—especially dark males.

### Soviet Union

Relatively little is known about historical levels of Soviet salmon harvests.

Recently, the Soviets restricted Japanese salmon fleets operating in the Soviet 200-mile zone. Annual negotiations on salmon harvests in the Soviet zone between the Japanese and the Soviets usually end by May, so that fleets can begin operations. This year, the Japanese land-based fleet was restricted to pink salmon areas only. It is anticipated that by 1992, the Soviets will have excluded the Japanese fleet from Soviet waters and salmon catches will be reserved for domestic fishermen.

Reportedly, the Soviets harvested about 176 million pounds of salmon in 1986 (3 million pounds of kings, 11 million pounds of coho, 17 million pounds of sockeyes, 54 million pounds of chum and 89 million pounds of pinks). The harvest in 1989 was of a similar size to the 1986 harvest and the harvest in 1990 was expected to be about 286 million pounds, according to the Alaska State Office in Tokyo. Some fishery observers anticipate even greater Soviet harvests in the coming decade.



At a recent symposium hosted by the Sakhalinsk branch of the Soviet Institute of Fisheries and Oceanography, salmon stocks and salmon enhancement were the major focus. The Canadian Department of Fisheries and Oceans discussed salmon enhancement methods with Soviet counterparts.

According to the June 1990 issue of *Fishing News International*, the Soviets revealed at the symposium their plans to increase enhancement operations to boost Soviet salmon harvests to 661 million pounds per year (about 30 percent of current world salmon production and roughly the level of Alaska salmon production). That may be optimistic, but does signal that the Soviets intend to be aggressive players in the salmon markets.

# DOMESTIC U.S. MARKET:

## Situation Analysis

### STRATEGIC ISSUES: AN OVERVIEW

The following Domestic U.S. Salmon Situation Analysis is divided into ten core marketing issues, each of which is discussed at length in this study. Because they represent threats to U.S. salmon consumption, it will be critical to address them carefully to ensure an increase in the overall demand and preference for Alaska salmon.

#### ■ Trade preference for fresh

Because the season for Alaska wild salmon is restricted to five months a year, the trade prefers farm-raised salmon, which are available year-round. Import market gains reflect this preference.

#### ■ Consumer preference for fresh

Both in-home and restaurant consumers choose fresh salmon over frozen. Since the bulk of Alaska salmon not canned is distributed in frozen form, negative perceptions regarding frozen salmon must be eliminated in order to survive competitive pressure from imported fresh salmon. And because the fresh/frozen segment will likely constitute the majority of future consumption, this issue becomes vital.

#### ■ Declining canned salmon consumption

Because consumption of canned salmon, which represents half of Alaska salmon production, is on the decline, programs to increase usage need to be implemented. Canned salmon currently has little foreign competition; therefore, immediate increased consumption will primarily benefit Alaska producers (with the exception of Canadian canned salmon). It should be noted, however, that farmed producers are now beginning to experiment with canning.

#### ■ Consumer and trade education

Consumers lack knowledge of various species and their qualities, preparation

techniques and the benefits of Alaska frozen salmon. Overall there is low awareness of the superior health and nutritional benefits that fresh/frozen and canned salmon offer over other protein sources—namely, low fat and cholesterol content as well as Omega-3 fatty acids that lower the risk of heart disease. Canned salmon in particular suffers from an "old-fashioned" image that limits its use to a few traditional dishes.

Neither the retail nor foodservice trade are educated as to the best ways to maximize profit margins through effective merchandising, display, packaging and promotional campaigns. Foodservice operators in particular know little about the advantages of frozen fish, such as the limited product waste during preparation, as well as how to determine whole fish yields and plan flexible menus to accommodate unpredictable pricing changes. Tackling these trade issues is critical to competitive, year-round distribution.

■ **Low awareness**

Most consumers do not readily think of salmon when planning a seafood menu. Only 40 percent of all households consume fresh/frozen and canned salmon. Consumers who are aware of salmon-producing regions have positive perceptions of Alaska salmon, but general awareness of origin is low.

■ **Negative quality perceptions**

Among the trade, the quality of farm-raised salmon is perceived to be superior to ocean-caught. Some of the foodservice trade negatively perceives how fresh/frozen Alaska salmon is handled from catch through distribution. Consumers believe frozen is inferior to fresh salmon, despite flash-freezing techniques that protect the flavor and freshness. Consequently, trade groups and consumers need to be educated on the superiority of Alaska salmon in order to expand distribution.

■ **Canned salmon versus competition of tuna**

The per capita consumption of canned tuna has grown steadily over the past several years, and is currently more than 10 times greater than canned salmon. In 1989 it was 3.9 pounds per person compared to 0.3 pounds for salmon—the same as canned sardines. In fact, tuna accounts for 25 percent of all fish and shellfish (U.S. per capita) consumption, whereas canned salmon constitutes less than two percent. Replacing just a fraction of tuna usage with canned salmon represents sizeable potential.

■ **Limited regional and seasonal usage**

Several regions in the U.S. have very low usage of salmon compared to an average for the rest of the country. Additionally, grocery trade promotion drives consumption for canned salmon from January through March and for fresh/frozen from October through December—leaving the balance of the year, for the most part, under developed and under marketed.

■ **Limited canned salmon usage in foodservice**

Of the total salmon consumed in foodservice, only eight percent is canned. Current usage is mostly in the smaller non-chain operations, which do not account for a great deal of volume. Food service perceptions that need to be overcome include beliefs that canned salmon is inconvenient, due to the bones and skin, and that it has a low consumer appeal.

■ **Product unpredictability**

Unpredictable harvests and higher export prices for higher-end Alaska species have caused inconsistent domestic supplies. As a result, Alaska's available domestic product mix has not been consistently competitive with the abundant, year-round supplies of imported high quality farmed salmon. Many Alaska producers focus on export markets due to premium prices. To attract supplies and command higher prices, the perceived value of Alaska salmon and relative value of each species must be increased within the domestic market. This is essential to build domestic consumption and defend against foreign competition.

**SALMON CATEGORY**

This section provides an overview to the U.S. salmon market, including such factors as market organization, significant market trends, competitive positions and strategies, trade concerns and external market factors. The analysis covers retail, consumer, and foodservice market segments.

**Category Size and Trends**

**Exports represent half of market**

U.S. salmon harvests reached a record 785 million pounds in 1989, following weaker 1986, 1987 and 1988 levels (see chart below). Exports have also reached record levels (377 million pounds in 1989) and now represent almost half of the total domestic harvest. U.S. salmon exports have continued to grow since 1985, increasing by 22 percent (59 million pounds). This is largely due to attractive foreign market prices and the shrinking U.S. market share for domestically produced fresh/frozen salmon.

**Domestic Salmon Supply (Thousand Pounds)**

	1985	1986	1987	1988	1989	
Total U.S. Harvest	726,946	658,521	562,018	606,148	785,868	100%
U.S. Salmon Exports	308,710	371,068	305,596	327,015	377,790	48%
U.S. Harvest Sold in U.S.	418,236	287,453	256,422	279,133	408,078	52%

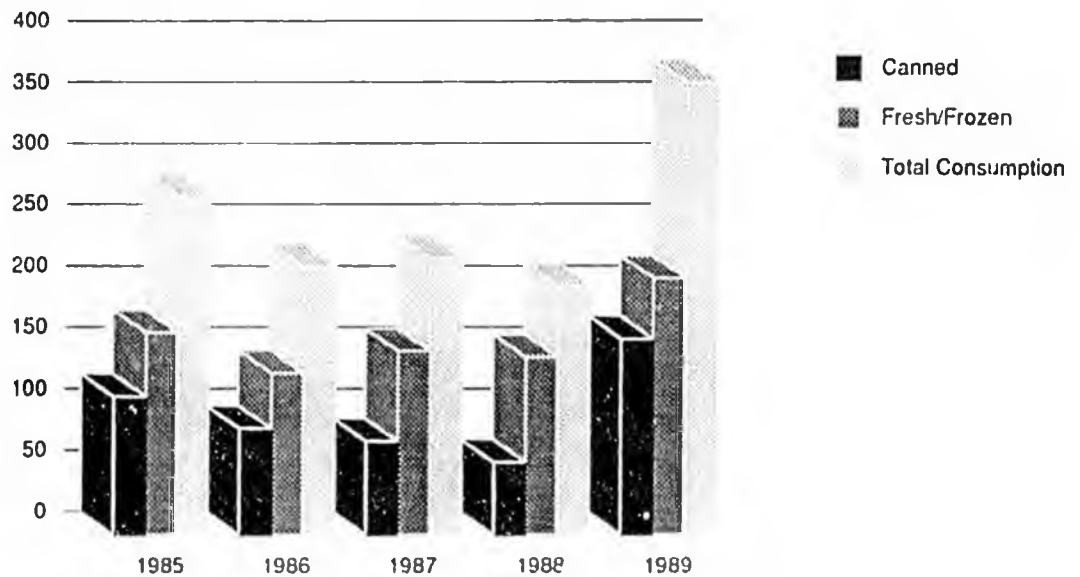
Source: National Marine Fisheries Service

**Imports making dramatic increases—canned consumption declining**

Total U.S. salmon consumption reached a record high in 1989 of 368 million pounds, an increase of 33 percent (91 million pounds) since 1985 (see following chart ). Of this total consumption, the fresh/frozen segment represents 57 percent (208 million pounds), with canned salmon representing 43 percent (159 million pounds).

Consumption of fresh/frozen salmon continues to increase (+20 million pounds since 1985). Imported fresh salmon has increased (+64 million pounds since 1985) at the expense of domestically produced salmon (-44 million pounds since 1985). Canned salmon consumption rose in 1989 after declines from 1986 through 1988. While the canned product increased during 1989, overall consumption per capita has declined since 1984.

**U.S. Salmon Consumption**  
(million pounds)

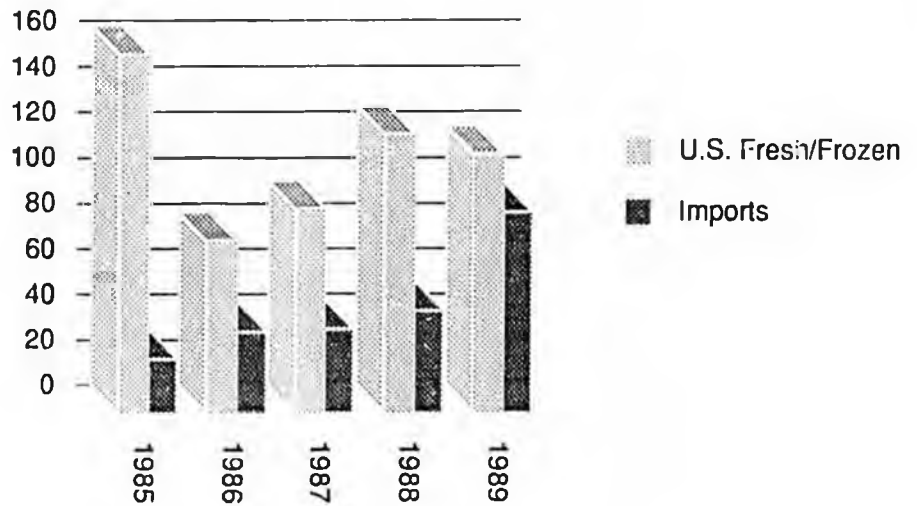


**U.S. Harvest, Supply and Consumption (000 points)**

	1985	1986	1987	1988	1989	4yr. Chg.
Total Alaska Harvest	651600	589600	489400	526400	713000	61400
Other U.S. Harvest	75346	68921	72618	79748	72868	-2478
Total U.S. Harvest	726946	658521	562018	606148	785868	58922
U.S. Salmon Exports	308710	371068	305596	327015	377790	69080
U.S. Pack (canned weight)	158953	141965	105206	88419	197044	38091
Canned Imports (canned wt.)	1958	4623	6652	3528	2943	985
Canned Exports (canned wt.)	48240	59434	35901	32900	40415	-7825
Canned Available for Consumption	112671	87154	75957	59047	159572	46901
Prior Year July 1 Carryover	734	735	1134	649	464	na
Current Year July 1 Carryover	735	1134	649	464	247	na
Net Change Inventory Carryover	1	399	-485	-185	-217	-218
U.S. Canned Consumption (fin. wt.)	112670	86755	76442	59232	159789	47119
U.S. Fresh/Frozen Production (prod wt.)	211596	102380	120285	164429	152203	-59393
U.S. Fresh/Frozen (adj for recvry @ 75%)	158697	76785	90214	123322	114152	-44545
Imports Fresh/Frozen (product weight)	27038	40549	41902	50144	98799	71761
Imports (adj for recvry @ 90%)	24334	36494	37712	45130	88919	64585
Fresh/Frozen Available for Consumption	183031	113279	127925	168451	203071	20040
January 1 Inventories (cold storage)	41259	60165	42197	21097	45164	na
December 31 Inventories (cold storage)	60165	42197	21097	45164	39657	na
Net change Fresh/Frozen Inventories	18906	-17968	-21100	24067	-5507	-24413
U.S. Fresh/Frozen (fin. wt.)	164125	131247	149025	144384	208578	44453
Total U.S. Consumption (fin. wt.)	276795	218002	225467	203616	368367	91572

In 1989, canned salmon contributed to total domestic salmon supply gains due to the record catch that year. More significantly, less demand for fresh/frozen resulted from increasing fresh salmon imports. Import supplies of fresh salmon have grown at a record pace since 1985 (up 267 percent, or 64 million pounds), while U.S. produced fresh/frozen supplies have declined (down 28 percent, or 44 million pounds (see chart below). Imports have been led by Canada, up 29 million pounds since 1985, followed by Norway (up 13 million pounds) and Chile (up 4 million pounds). The following chart further details fresh/frozen and canned salmon supply trends since 1985.

**U.S. Fresh/Frozen Salmon Supply**  
U.S. Produced vs. Imports (million pounds)



**Farmed imports increase to 17% of domestic supply**

Imported farm-raised salmon continue to gain share of the domestic market supply. While ocean-caught salmon and virtually all of Alaska and other U.S. production represents 82 percent of the combined fresh/frozen and canned U.S. supply, farm-raised imports have increased from 7 percent in 1985 to 17 percent of the total 1989 supply. Alaska has lost a significant share of supply to imports within the fresh/frozen market. Alaska's share is now 63 percent down from 78 percent in 1985, while imports have grown to a 26 percent share of the fresh/frozen segment in 1989.

Foreign producers import mostly fresh salmon. Whereas Alaska wild salmon are harvested in summer months and frozen for consumption during the rest of the year, farmed salmon can be harvested and sold fresh year-round. Canadian and Norwegian import market gains are a direct result of this year-round availability of fresh salmon. The following chart further details the share of supply trends.



Share of U.S. Salmon Supply

	All Salmon		Canned Salmon		Fresh/Frozen	
	1989	Chg. vs. 85	1989	Chg. vs. 85	1989	Chg. vs. 85
Alaska	74.7%	-8.8 pts	98.2%	-0.1 pt	63.0%	-15.6 pts
Other U.S.	7.6	-2.0			11.2	-1.7
<b>Total Domestic</b>	<b>82.3</b>	<b>-10.9</b>	<b>98.2</b>	<b>-0.17</b>	<b>4.2</b>	<b>-17.3</b>
Canada	9.1%	6.3 pts.	1.6%	0.3pts.	13.3%	9.9 pts.
Norway	6.1	2.6	0.1	-0.1	8.8	4.3
Chile	0.9	0.9			1.4	1.3
All Other	1.6	1.1	0.2	-0.1	2.4	1.8
<b>Total Imports</b>	<b>17.7</b>	<b>10.9</b>	<b>1.8</b>	<b>0.1</b>	<b>25.8</b>	<b>17.3</b>
<b>Total U.S. Supply</b>	<b>100%</b>		<b>100%</b>		<b>100%</b>	

Source: National Marine Fisheries Service

**Declining in-home consumption parallels canned salmon consumption**

In-home salmon consumption per capita has declined 12 percent since 1984 (from 2.4 to 2.1 eatings per year). This is due to a decline in canned salmon consumption (30 percent), while fresh/frozen consumption has increased significantly (+25 percent) during this period. While no specific data is available for restaurant salmon consumption per capita, we believe it has increased along with the overall increase in fish consumption at restaurants (up 11 percent from 12.7 to 13.9 eatings per year).

**Consumption Per Capita (eatings per 1000 capita)**

	1983/84	1989/90	5 year Chg.	(Index)
<b>In-Home</b>				
Fresh/Frozen	788	986	+198	(125)
Canned	1,580	1,108	-472	(70)
<b>Total Salmon</b>	<b>2,368</b>	<b>2,094</b>	<b>-274</b>	<b>(88)</b>
All Fish/Shellfish	37,181	39,978	+2,797	(110)
<b>Away From Home</b>				
Fish/Shellfish	12,714	13,870	+1,156	(111)

Source: Market Research Corporation of America MRCA, June through May

**Conclusion**

Farmed fresh salmon imports represent a significant competitive challenge. Alaska's primary objective is to build consumer acceptance for Alaska frozen salmon to compete with the year-round availability of imported farmed fresh salmon. As the leading U.S. market supplier, Alaska must increase fresh/frozen salmon consumption while defending against foreign competition.

A second key marketing objective is to revitalize canned salmon consumption, as it represents half of all Alaska production.

**PRODUCTION BY SPECIES**

**Increased exports/competitive pressure erode Alaska's share**

Pink salmon represents almost half of the total domestic harvest (48%) followed by sockeye (36%), chum (6%), coho (6%) and chinook (4%). Canned salmon production uses mostly pinks because they tend to cost less. Chinook, sockeye and coho tend to be higher value, and therefore are usually sold within the fresh/frozen market segment.

Pinks have increased significantly since 1980 as a percentage of the domestic harvest, while coho, chum and chinook have declined as a share of total harvest. Together, the three represent only 16%. Sockeye harvests have been volatile from year to year, yet have grown since 1980. Coho has remained stable as a percent of total harvests, but tonnage has grown as total harvest has increased. (Refer to the chart below.)

**U.S. Harvest By Species (000 Pounds)**

	1980	%II	1985	%II	1989	%II
Chinook	28533	5%	27187	4%	31500	4%
Coho	39270	6	52044	7	43800	6
Sockeye	207551	34	236077	32	274100	36
Chum	84916	14	92499	13	47500	6
Pink	253541	41	319139	44	367900	48
Total	613811	100%	726946	100%	764800	100%

Source: National Marine Fisheries Service

Coho harvests have increased slightly since 1980 while competitive imports have increased dramatically. Additionally, many Alaska producers are dependent upon exporting higher value species due to premium foreign market prices. As a result, the supply available for the domestic market has been limited and unpredictable.

**Conclusion**

Stable coho and chinook harvests, increased sockeye exports and increased competitive pressure from comparable high quality species have further eroded Alaska's share within the domestic fresh/frozen salmon market. Raising the value perception of Alaska salmon among U.S. consumers and the trade will increase domestic market demand, prices and thus profitability for Alaska producers.

**Market Segments and Trends**

**Retail only 32% of category—canned & fresh dominate**

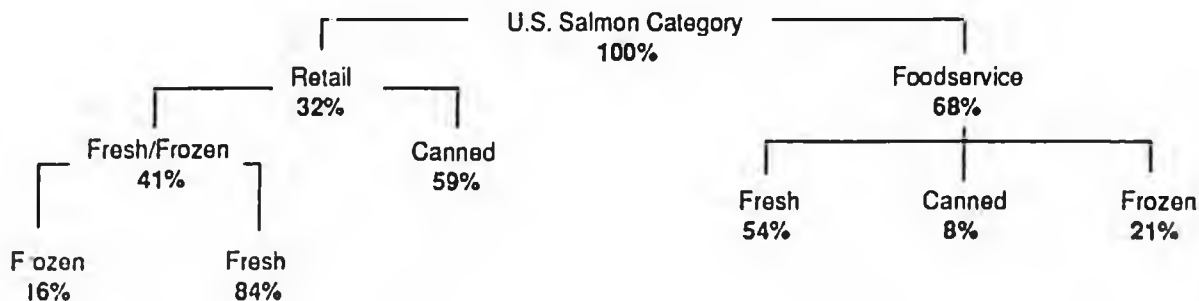
Sales through retail stores represent one-third (32 percent) of the domestic salmon category; the remainder is purchased through foodservice outlets. Two-thirds of the retail segment is purchased through supermarkets (62 percent), followed by fish markets (23 percent) and specialty outlets.

Fresh rather than frozen salmon consumption is increasing, as evidenced by import figures, trade response and consumer preferences. Four out of five consumers use fresh salmon. This preference is further supported by the fact that 84 percent of combined seafood sales are in fresh form, while only 16 percent are frozen.

The majority of farm-raised imports are distributed in fresh form, for the fish is harvested year-round, while Alaska salmon is inventoried and distributed frozen during off-season.

Canned salmon represents 59 percent of all retail salmon volume, and has experienced a decline in per capita consumption. Retail canned salmon consumption, however, fluctuates dramatically from year to year as supply and inventories vary depending on annual harvests. For example, during 1989 Alaska canned salmon production more than doubled as processors opted to "inventory" the record catch in canned form. Resulting trade price-cutting and heightened promotional activity drove canned salmon retail consumption up 46 percent (per Nielsen retail tracking). Despite these short-term volume increases, current canned salmon inventories remain high. The following chart estimates domestic salmon consumption by market segments:

**Domestic Salmon Consumption**



**Only 1/3 of foodservice operators menu salmon**

Foodservice represents 68 percent, or \$6.9 billion, of seafood manufacturer sales, which translates into 250 million pounds of salmon. The foodservice segment is organized as follows with the largest volume attributed to restaurants:

**% All Food Purchases**

Commercial		Non-commercial	
Restaurants	52%	Business & Industry	9%
Retail Stores	5	Vending	8
Recreation	3	Health Care	6
Lodging	3	Schools	5
Drinking Places	1	Universities	3
	64%	Airlines	2
		Military	2
		Other	1
			36%

Source: Technomic Group, Foodservice Industry Analysis

Of all foodservice operators, only 35 percent currently include salmon on the menu. However, this level is up from 28 percent in 1982. To increase the number of operators menuing Alaska frozen salmon, top priority should be given to full-service restaurants, which represent the majority of food and salmon consumption. Specifically, commercial restaurants represent over half of all foodservice consumption, and 75 percent of away-from-home salmon consumption is at specialty seafood and white tablecloth restaurants. (See below.)

% Currently Menuing Salmon		% Full Service Restaurant Consumption	
Full Service Restaurants	43%	Specialty	39%
Fast Food	5	White Tablecloth	36
Hotels/Motels	70	Family	22
Health Care	35		
Colleges	36		
Schools	11		
Employee Feeders	29		
All Operators	35%		

Source: Restaurants & Institutions, 1990 Caravan Study

As seen in the following breakdown, fresh salmon usage in foodservice is more than twice that of frozen.

**How Item Is Purchased**

	Fresh	Frozen	Canned
Total Menuing Salmon	54%	21%	8%

Source: Restaurants & Institutions, 1989 Menu Census

Overall, 42 percent of all foodservice operators purchase fresh fish fillets and 35 percent purchase frozen fillets (unbreaded). Because usage of fresh salmon increases with the check average, fresh salmon is more likely to be found on the menus of more upscale restaurants (see figures below).

**Index vs. Average**

	Fresh Fish Fillets	Frozen Fillets
<b>Commercial</b>		
Upscale Restaurant	151	90
Midscale Restaurant	92	112
Hotel/Motel	158	129
<b>Non-Commercial</b>		
Health care	78	165
Business/Industry	112	116

Source: Simmons Research 1989

**Canned salmon experiences very low foodservice penetration**

Another factor to consider is the low level of canned salmon usage in food service. Only eight percent of restaurants menuing salmon purchase canned salmon. Fifty-two percent of this current usage is in the non-commercial side of the business (hospitals, colleges, schools and company dining facilities). On the commercial side (restaurants, hotels), the bulk of the business is in smaller non-chain operations and recreational feeding (e.g., Disneyland, theme parks).

**Inconvenient image, perceived low appeal are barriers**

At the operator level, the key objections to canned salmon by non-users are that it has a strong smell and is inconvenient, due to bones and skin, and therefore of low appeal to consumers.

At the distributor level, the perception is that canned salmon suppliers and producers do not aggressively market their product, and that operators have a low interest in buying canned salmon. An additional problem is the fact that distributors generally demand higher margins for canned salmon than for other types of canned seafood. Margins for canned salmon range from 10 to 35 percent, while tuna fluctuates from five to 20 percent.

In the current foodservice business, usage is limited to a few recipes—salmon patties, salmon loaf, salmon croquettes. Most canned salmon commercial usage is in small operations such as delicatessens and individually-owned coffee shops/family restaurants, which offer fewer fish entrees. Upscale restaurants that bake, broil and grill fish do not use canned salmon.

### **Conclusion**

ASMI needs to educate upscale restaurants on Alaska frozen products versus imported farmed fresh salmon, as well as continue to expand frozen salmon in midscale restaurants and health facilities that are already familiar with the frozen product. Marketing efforts to increase menuing and usage of Alaska salmon need to target specialty, white tablecloth and family restaurants as well as the health care industry, as these segments represent large food volumes as well as opportunities to further increase the percentage of operators menuing salmon.

For canned salmon, operators need to be educated on the convenience benefits of the product, and given new recipe ideas and serving suggestions. Within the non-commercial segment, salmon burgers offer a large opportunity for schools. Within the commercial segment, family restaurants represent the biggest opportunity. As operator interest increases, so will that of the distributor. Foodservice distributors represent a small enough universe to make targeted marketing programs very effective.

In addition to its size, foodservice is an important market for both fresh/frozen and canned salmon because many consumers try different seafoods for the first time at restaurants. Further developing this market can increase home consumption.

## **COMPETITION**

### **Competition for fresh/frozen—farmed is biggest threat**

As farmed salmon quickly expands to a substantial share of the world's salmon production, Norway, Canada, and, to a lesser degree, Chile are Alaska's primary competitors in the fresh segment. Domestic producers, primarily Washington and Maine, also produce farmed salmon but collectively represent only eight percent of the domestic market and have been relatively stable since 1985.

While imports represent just 17 percent of total U.S. salmon consumption, they now have 26 percent of the fresh/frozen market. Share gains for these imports have directly impacted Alaska's market share. Marketing efforts must consider foreign-farmed competition as they have quickly captured a dominant share of the domestic fresh/frozen market. Alaska still dominates the domestic salmon market supply; therefore, increasing total consumption should be an additional priority.

## **COMPETITIVE MARKETING STRATEGIES**

### **Norway's efforts focus on trade**

The following foreign marketing programs may lend insight into how to compete effectively.

**Norway:** Overall, extensive marketing efforts consist of trade-directed programs, including co-op advertising, trade incentives, public relations, and trade print advertising to raise awareness of the quality and availability of Norwegian salmon. Programs are all built around fresh salmon. Trade education efforts are aimed at improving retail and foodservice perceptions of quality control and selling techniques through recommendations to buy Norwegian fresh salmon. The retailer co-operative advertising program is aimed at securing trade featuring. The following highlights Norwegian strategies:

***Importers/Distributors***

- Launch Norway "identification" program via trade shows, newsletters, trade advertising.
- Educate trade media on issue of emergency handling of fresh salmon.
- Build Norway awareness/education by providing materials free or at cost—e.g., brochures, aprons, press kits, menus, videos.
- Offer two price promotions during 1990.
- Arrange for Norway Sales and Marketing Council (NSMC) speakers.
- Produce three videos to educate the trade on Norway's quality control.

***Supermarket Trade***

- Advertise in trade magazines.
- Emphasize value-added products, quality control and availability through editorial contact.
- Put together a training package with quality videos and "How to Sell Norwegian Salmon" training courses.
- Establish a Norwegian Sale concept including advertising and point-of-purchase materials with a flagship supermarket chain.
- Send invitations to seafood buyers at "pro-Norwegian" restaurants where chefs sell the concept of the "most asked for."
- Participate in FMI, Food Marketing Institute trade show.
- Set up a co-operative advertising program at three percent retailer purchases; NSMC matches 50 percent of retailer's advertising costs.

***Foodservice***

- Trade magazine advertising and systematic editorial contact.
- Direct mail to promote quality and availability benefits.
- Seminars
- Restaurant newsletter for recipe, kitchen concepts, new restaurant information, etc.
- Initiate and sponsor chef seminars.
- Promote "Norwegian salmon weeks" with hotels and restaurant chains and exporters.
- Waitperson education program to develop recommendations and preference.
- National Restaurant Show participation.



**Public Relations**

- Video news releases to increase awareness of farming, quality control, and preparation targeting public television channels.
- Norway invitations to consumer press.

**Canada:** No apparent marketing efforts in the U.S. All efforts appear to target foreign markets such as Australia and France.

**Chile:** Trade magazine advertising targeting retailers, in addition to distribution of retail recipe booklets. Public relations events (e.g., at Trump Castle) to demonstrate recipes and gain editorial media coverage. No foodservice, consumer awareness or brand preference-building efforts.

**Scotland:** Limited regional efforts support Atlanta and Denver markets with consumer-directed radio, newspaper and magazine advertising. Retail trade-directed newsletters, point-of-sale materials and price promotions. Recipe cards and in-store demonstrations educate consumers and encourage trial usage.

**Conclusion**

Norway's plan does not include consumer-directed education and preference-building efforts. Instead, their strategy lies in gaining consumer acceptance through trade for recommendations. Alaska has the opportunity to target both the trade and consumer to build preference for Alaska salmon and build category consumption. Plus, Alaska can take the lead before foreign competition, such as Canada, begins to market aggressively in the U.S.

**COMPETITION FOR CANNED SALMON**

**Limited within salmon category—  
tuna, other proteins are bigger issues**

Although currently there is limited canned salmon competition from imports (less than 2 percent of the domestic supply), significant competition from other protein sources include canned tuna, canned chicken and convenience-oriented, value-added turkey and chicken products.

Tuna is a sizeable competitor. As seen in the chart below, per capita consumption has increased over the past few years and is 10 times greater than canned salmon (3.9 pounds per capita versus salmon's 0.3 pounds).

**Canned Seafood Consumption Per Capita (pounds per capita)**

	1985	1986	1987	1988	1989
Tuna	3.3	3.6	3.5	3.6	3.9
Salmon	0.5	0.5	0.4	0.3	0.3
Sardines	0.3	0.3	0.3	0.3	0.3

Source: National Marine Fisheries Service

### Other proteins outspend salmon

Other protein alternatives to both canned and fresh/frozen include beef, chicken, turkey and pork. Because salmon competes for consumers' protein choices, these should be viewed as competition. In an effort to increase consumption of their respective products, industry councils are aggressively pursuing consumers. Heavy advertising spending on both national and regional levels has helped to hold the consumption of pork steady, but has not boosted beef consumption. Beef, however, is still served by more households and more often than poultry or seafood. While salmon is significantly more expensive than these other alternatives, it has been minimally supported with advertising to educate consumers as to its value.

### Advertising Spending and Consumption

	Advertising Spending (\$Mil.)			U.S. Consumption per Capita (lbs.)		
	1988	1989	1990 Est.	1988	1989	Chg.
Beef Council	na	\$27.0	\$28.0	72.6	66.7	-5.9
Pork Council	6-7.0	6-7.0	7.0	63.0	62.8	-0.2
Poultry	-	-	-	81.7	83.6	+1.9
Dairy Board	58.0	58.0	58.0	na	na	na
U.S. Seafood Council	-	-	6.5	15.2	15.9	+0.7
Alaska Seafood/Salmon	1.0	1.1	1.3	0.8	1.5	+0.7

Source: Leading National Advertiser, Broadcast Advertising Reports, Frost & Sullivan, California Beef Council, National Broiler Council, National Beef Council.

### Value-added products offer more competition

With the introduction of branded, value-added turkey products and the transformation of turkey from a seasonal to year-round item, consumption has risen from 13.3 pounds in 1986 to 16.9 pounds in 1989 (USDA). This increase is due in part to the use of turkey products in patties and burgers, and pre-cut conveniently sized portions.

Similarly, chicken producers are developing a number of convenience-oriented, value-added products such as chicken breasts in marinated seasoning packets from Hormel and Foster Farms, seasoned breasts and drumsticks from ConAgra, and pre-packaged, roasted chicken breasts from Tyson. These trends continue to keep chicken and salmon in competition.

## COMPETITIVE SPENDING

### Norway outspends on per pound basis

Foreign competitive efforts are focused on salmon exclusively in contrast to Alaska's all seafood species approach. As a result, Alaska's salmon marketing impact is diluted and much lower than Norway's on a spending-per-pound basis. The following

compares Norway's salmon with Alaska's all-seafood spending:

**U.S. Marketing Spending Per Pound of Salmon (1990)**

	Marketing Spending (\$Mil.)	U.S. Salmon Supply (lbs.)	\$ Spending/Pound
Alaska	\$3.7 (All Seafood)	370,240,000	\$0.01
Norway	\$1.5	30,059,000	\$0.05
Chile	na	4,593,000	na
Canada	-	44,993,000	0

Source: Norwegian Salmon Marketing Council, National Marine Fisheries Service

**Pricing**

**Seasonal Alaska salmon is at a disadvantage**

Pricing within the domestic salmon category is volatile. Many factors influence the pricing of fresh, frozen and canned salmon as well as species within each of these segments, such as the size and species mix of annual ocean-caught harvests, supplies of farm-raised fish, foreign market demands (particularly in Japan where prices tend to be premium to domestic markets), as well as processor and distributor inventories and anticipated future harvests.

Marketing distribution channels are complex, with many processors and middlemen that affect end-user pricing. The following chart compares average wholesale price trends per pound during the summer Alaska season.

**"In Season" July (6-9lbs. Chum, Coho, Sockeye; 11-18 lbs. Kings; 2-4 lb. Pinks)**

	1986	1987	1988	1989	1990	
Atlantics (Norway 5-6kg.)		3.55	5.75	5.60	3.60	4.35
Farmed Coho (Canada)		na	3.40 <sup>1</sup>	4.35	2.70	3.60 <sup>2</sup>
Wild Coho (Fresh)		2.10	2.60	3.65	2.25	2.30
Wild Coho (Frozen)		2.05	2.45	3.75	2.40	na
Farmed King (Canada)		na	4.40 <sup>2</sup>	4.25	2.80	3.15
Wild King (Fresh)		2.15	3.25	3.95	3.05	2.90
Wild King (Frozen)		1.90	3.60	4.30	2.00 <sup>2</sup>	na
Sockeye (Fresh)		2.90	3.15	4.40	3.50	2.60
Sockeye (Frozen)		3.00	3.35	4.80	4.75 <sup>2</sup>	na
Churn (Fresh)		1.45	1.60	2.65	1.70	1.55
Chum (Frozen)		1.40	1.50	2.70	1.30	na
Pink (Fresh)		na	1.20	na	1.10	1.10
Pink (Frozen)		.80	1.15	1.65	na	na

<sup>1</sup> March 1987 prices

<sup>2</sup> April prices

<sup>3</sup> September 1989 prices

**Fresh imports have advantage in winter and spring**

In-season, Alaska salmon is available fresh and has a price advantage over foreign competition. Another advantage is that little competition exists for sockeye, chum and pink during this period. When Alaska salmon is not readily available, prices for frozen Alaska coho are higher than Canada fresh, yet have an advantage over Norway fresh Atlantics. While Alaska can offer a wide variety of species in frozen form, imports have the decisive advantage of being able to supply fresh salmon during most of the winter and spring (see next chart).

**"Off Season" February (6-9 lbs. Chum, Coho, Sockeye, Pink; 11-18 lb. Kings)**

	1986	1987	1988	1989	1990
Atlantics (Norway 5-6 kg.)	4.35	4.65	5.20	4.35	4.20
Farmed Coho (Canada)	na	3.40	4.20	3.90	3.50
Wild Coho (Fresh)	2.10	3.75	na	-	3.50
Wild Coho (Frozen)	1.80	2.45	3.65	3.35	na
Farmed King (Canada)	na	4.00	4.15	4.05	3.80
Wild King (Fresh)	4.75	3.75	na	-	3.50
Wild King (Frozen)	1.70	2.65	3.70	3.55	na
Sockeye (Frozen)	2.90	2.90	3.80	4.75	na
Chum (Fresh)	1.60	2.40	1.60	2.25	na
Chum (Frozen)	1.40	1.30	2.55	1.85	na
Pink (Frozen)	1.05	1.25	1.75	2.05	na
November Prices					

(NOTES: When a different month is used—other than July or February—it is closest month quoted by Umer Barry. NA is not available primarily due to fact that inventory was exported so quickly, Umer Barry did not track prices.)  
Source: Umer Barry Publications

**Alaska fresh below competition, when available**

As seen below, the average price per pound for Alaska fresh salmon has remained below foreign competition when it is available. This is further evidence that market share gains for imports are a result of the availability of fresh salmon on a year-round basis, despite their pricing disadvantage.

**Price per Pound (July)—Domestic vs. Norwegian**

	Fresh Troll-Caught Coho (4 to 6 lb. FOB Seattle)	4 to 5 Kilo	Norwegian Fresh Difference
1987	\$2.20	\$5.20	-\$3.20
1988	3.50	5.20	-1.70
1989	1.85	3.50	-1.65
1990	2.60	4.25	-1.65

Source: Umer Barry Publications

**Conclusion**

Despite higher wholesale prices, imports have still achieved significant volume and market share gains into the U.S. market. Foreign producer advantages and product benefits such as the availability of fresh salmon on a consistent, year-round basis have resulted in market gains. Alaska producers are at a disadvantage during November through May when fresh fish is not available.

**TRADE FEATURING LENT PROMOTION BOOSTS CONSUMPTION**

Trade featuring has a significant impact on retail consumption of canned salmon. For example, during the promotional period for Lent in February/March 1990, featuring increased from its annual average of 15 percent to 40 percent of all retailers featuring canned salmon. Consumption for this period increased 58 percent over the prior year in contrast to an annual average increase of 45 percent. Canned salmon prices were eight percent to 14 percent below average during the February/March period. From October to December, featuring levels dropped to 11 percent, and prices increased as a result.

Canned salmon prices at the retail supermarket averaged \$2.77 per tall can of pink salmon in 1989. Pricing for pinks fluctuated from \$3.40/3.74 during the September/October period to \$2.38 during the peak Lenten promotional period in March. Prices for the remaining months were relatively stable.

**Canned Salmon Pricing/ Impact of Retail Featuring (Index vs. Average)—1990**

	Average Retail Price 48 Oz. Pink Talls		% Retail Featuring	% Chg. Consumption vs. Year Ago
February	\$2.55	(92)	19%	+58%
March	2.38	(86)	40	+1000+
October-December	2.99	(108)	11	+39
Annual Average	\$2.77	(100)	5%	+45%

Source: Nielsen Marketing Research 8/90

**Conclusion**

Canned salmon consumption can be boosted by increasing trade featuring. One way is to increase trade featuring through more frequent canned salmon promotions throughout the year.

## TRADE PERCEPTIONS

### **Farmed seen to have many benefits**

While price is not perceived to be an issue for wild salmon (many see it as having a price advantage over farmed), lack of consistent supply, availability and quality level are key trade concerns. Most view the quality of farmed fresh salmon as consistently higher than wild fresh salmon. The trade prefers fresh farmed salmon to frozen wild salmon because of its availability and consumer preference. For the most part, only specialty fish retailers currently perceive wild salmon as offering a taste advantage over farmed salmon. Others perceive that taste is essentially the same for both.

Trade perceptions have been summarized in a study entitled "How Do the Checkbooks Vote? A Review of Some Factors Affecting the Demand and Prices of Fresh/Frozen Salmon in the U.S." In it, Drs. Mittlehammer, Herrmann and Lin found the following:

"King, coho and sockeye remain competitive with imported Atlantic salmon through a price advantage. The Pacific species are losing the market battle with respect to:

- consistent quality;
- consistent supply;
- delivery time;
- shelf life;
- appearance (king and coho); and
- handlers having little or no experience with farmed salmon consider the wild-caught Pacific species superior in taste, texture and color to farmed salmon. However, increasing experience with farmed salmon changes opinion to the point where superiority is no longer clear-cut.

It seems advisable for fisherman and processors to research ways to mitigate the perceived advantages that farmed Atlantic salmon has over Pacific species. To remain competitive, maintain market share and support prices, attributes of Pacific species must be improved with respect to consistent quality, consistent supply, delivery time, shelf life and appearance."

### **Conclusion**

Conflicting flavor perceptions among the trade between farmed fresh and ocean-caught fresh salmon, coupled with the fact that most consumers do not perceive a difference between farmed and wild salmon, suggests that ASMI must convince and educate the trade that fresh/frozen Alaska salmon is equal in quality to fresh unfrozen varieties.

## FOODSERVICE PERCEPTIONS

### **Fresh is first consideration**

The ASMI survey among restaurants found that farmed salmon is perceived to have excellent quality, while ocean-caught is thought to have good, but slightly lower quality. Farmed salmon has the edge due to its perceived consistent quality and year-round availability. Another study shows that foodservice operators prefer Alaska salmon over Norwegian, yet "fresh" is the most important factor.

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#### **% Operators Menuing Salmon Stating "Most Agree"**

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I Prefer Fresh Salmon	37%
I Prefer Alaska Salmon	24
I Prefer Norwegian Salmon	20
I Prefer Farm-raised to Wild Salmon	4

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*Source: Restaurants & Institutions, Caravan Study 6/90*

### **Conclusion**

The key opportunity in the foodservice trade is to educate operators on the quality and freshness of fresh/frozen methods while creating stronger preference for Alaska-caught salmon.

## EXTERNAL FACTORS—SEAFOOD INSPECTION

### **Alaska inspection a successful partnership of government and industry**

Seafood quality is a prime concern of the U.S. consumer, as reports of a disproportionate number of seafood-related food-borne diseases are reported to health authorities. Consumers are also becoming acutely aware of other factors affecting seafood such as ocean dumping, ocean burning, oil spills, shore development and acid rain. Unlike meat and poultry, fresh and frozen seafood are not subject to mandatory nationwide federal inspection.

Canada and Norway both have opted for a federally managed mandatory inspection program at the harvesting and processing levels. Norway is marketing its program to prospective buyers through extensive public relations efforts aimed at educating both the trade and consumer about the quality of their seafood. While research has shown that many U.S. consumers are under the impression that seafood in this country is under continuous mandatory inspection, this is not the case. Current thinking within the industry is that the U.S. will likely see mandatory seafood inspection in some form in the near future—it is not a question of whether it will happen, but when and what form it will take.



Alaska has what many in the industry consider to be a model seafood safety program. In order to process seafood in the state, a plan of operations must be submitted to the Department of Environmental Conservation's seafood division for review. A number of stringent criteria must be met to obtain *certified* approval to operate. The state is also a member of the federally managed Shellfish Sanitation Program and works closely with the National Food Processors Association (NFPA) to continually improve a voluntary strategy for safeguarding the canned salmon pack under the Canned Salmon Control Plan. This plan has the endorsement of the Federal Food and Drug Administration, the agency responsible for most of the seafood inspection conducted in the United States. Seafood companies operating in Alaska have gone beyond these requirements by instituting their own quality control programs directed by trained seafood safety experts.

### **Conclusion**

Programs like the NFPA have the potential to strengthen Alaska salmon quality perceptions among the trade and, if promoted, can create some perceived advantage over foreign imports.

## **SALMON CONSUMER**

This section includes a detailed analysis of the domestic U.S. salmon consumer as understanding consumer demographics is key to increasing consumption. Marketing implications are presented throughout.

### **Salmon consumer demographics**

***In-Home Fresh/frozen Users are Upscale***—Fresh/frozen salmon consumers tend to be slightly older than all-seafood consumers, with fewer children in these adult households. (Refer to next chart.) They tend to be more educated, having a higher percentage of college and post-graduate degrees, and hold occupations in professional, technical, managerial and sales fields. They command higher household incomes, particularly in the \$55,000+ range.

***In-Home Canned Users Are Older, Have Lower Incomes***—Canned salmon users tend to be female and much older than fresh/frozen users. In fact, almost half (45 percent) are age 55 and older. They have fewer children and tend to be one-person households. Unlike fresh/frozen consumers, they are less educated; many are homemakers and retirees. Incomes are lower, with \$35,000 as an average.

**Restaurant Users Similar to Fresh**—The restaurant salmon consumer shares a similar demographic profile to the fresh/frozen user, except in age where they are more similar to the all-seafood consumer (age 25-44).

Overall, they tend to be adult couples without children and are above average in college education. Incomes are higher (\$45,000+), with occupations in the professional, technical, managerial and sales fields. Efforts to increase consumption should target all age groups 25+.

**In-Home Users vs. Restaurant Users**

	Fresh/Frozen	In-Home Canned	All Seafood Consumers	Restaurant Order Salmon
<b>Age of Head of Household</b>				
18-24	6%	4%	7%	5%
25-34	25	11	25	23
35-44	20	21	25	26
45-54	18	16	15	16
55-64	16	23	12	14
65+	13	22	14	13
<b>Household Income</b>				
\$25,000	17%	31%	25	16%
25-34,999	17	21	20	15
35-44,999	16	16	17	15
45-54,999	12	11	10	13
\$55,000 +	26	10	15	28

Sources: Market Research Corporation of America (MRCA) Manu Census, 8/90.

**Conclusion**

While increasing fresh/frozen usage among primary users (ages 35+) should be an ongoing effort, targeting the age 25 to 34 group could also further increase consumption. Targeting the younger consumer, ages 35 to 54, as well as the primary group (55+), can increase canned salmon usage.

**Psychographics**

**Fresh/frozen users are successful/curious consumers**

Fresh/frozen salmon consumers are divided into "actualizers" and "fulfilled". "Actualizers" are individuals with high self-esteem, leadership qualities and a wide range of social and intellectual activities. Image is important as an expression of independence and character. This segment is quality conscious and quick to try new

products. The "fulfilled" consumers are mature, self-assured and well-informed. They are open to new ideas, seek challenges and are influential social leaders. Prestige and image are unimportant; they are practical consumers concerned with product function and value.

While specific psychographic profiles are not available for restaurant salmon consumers, we believe they have attitudes similar to in-home fresh consumers, as their demographic profile is much the same.

**Canned users are older**

Canned salmon consumers tend increasingly toward "empty nesters" and "grandpa/grandma" segments, but have well-below-average representation in "busy households" (working couples under age 55 with children) and "young/kidless" (couples over age 18 with no children).

Canned salmon usage could be significantly increased by targeting younger families and couples. Specifically, the large 25- to-44 age group represents a sizeable opportunity.

**Seasonality**

**January-March strongest for canned/weakest for fresh/frozen**

Most in-home canned salmon is consumed from January through March (39 percent) and October through December (28 percent). Canned salmon consumption is below average during April through September. Fresh/frozen salmon is consumed throughout the year. The following chart details in-home consumption seasonality:

**% In-home Salmon Consumption**

	Fresh/Frozen	(Index*)	Canned	(Index*)
January-March	20%	70	39%	134
April-June	23	115	17	85
July-September	26	113	16	70
October-December	31	111	28	101

\*Index is the measurement versus average salmon eatings, 100 being average.  
Source: MRCA Menu Census

For Alaska salmon, there are two selling seasons: the "in-season fresh" period during the summer and fall harvest months; and the "off-season frozen" period from November through June. Farm-raised salmon has an advantage in that they are harvested and sold during Alaska's off-season.

**Conclusion**

Canned salmon consumption can be increased by targeting primary users (those ages 55+) throughout the year to encourage all-season consumption. Reaching sometime and new canned users (younger families ages 25 to 55) during the peak months of February through April can also be effective.

Fresh/frozen salmon consumption can be increased by augmenting awareness of its year-round high-quality availability, particularly during April through December among primary (more affluent, ages 35+) and secondary (ages 25 to 34) consumers.

**Regionality**

**National marketing efforts are needed**

All regions but the Pacific represent growth potential for fresh and frozen salmon; for canned, it's all but the West/South/Central and East/South/Central areas. A few regions could be "cross-developed". For example, canned salmon could be touted in the Pacific, which has well-above-average fresh/frozen salmon consumption. Conversely, the East/South/Central region, which has above average canned consumption (index 195), could use a boost in the fresh and frozen salmon market (index 36). See the following chart.

**Regional Development - Salmon Eatings Index vs. Population**

	Mature	Index	Development I	Index	Development II	Index
Fresh/Frozen	Pacific	295	West N. Central	168	East N. Central	27
			West S. Central	161	Mid Atlantic	70
			South Atlantic	168	East S. Central	36
					Mountain	32
					New England	26
Canned	West/	196	South Atlantic	143	East N. Central	92
	S. Central				Mountain	90
	East/	195			Pacific	65
	S. Central				Mid Atlantic	27
		West N. Central	22			

Source: MRCA Menu Census

Index is regional consumption divided by national consumption; Index of 100 represents average consumption

The opportunity to develop consumption in additional markets is further evidenced by the fact that only 22 domestic U.S. markets have above or average consumption indexes for canned salmon (index 100 or above). Yet these markets represent only 48 percent of the canned salmon sales volume.

**Canned Salmon Sales Volume (37-oz. cases)**

	Mature Mkts.	Development II Mkts.	Development III Mkts.
# Markets	13	9	28*
% Canned Volume	29%	19%	11%

\*Nielsen reported markets  
 Source: Nielsen Marketing Research, 8/90

**Conclusion**

Marketing efforts to increase both fresh/frozen and canned salmon consumption among current and potential salmon consumers should be national in scope, with heavier efforts targeting "development" markets.

**Purchasing Habits**

**Restaurants top home consumption**

Most consumers prefer to eat seafood at a restaurant (54 percent) rather than home (34 percent). The remainder say "both". The main reasons for restaurant preference is "they prepare it for you/ I enjoy eating out" (23 percent) and "it's properly prepared" (16 percent). The main reasons for in-home seafood preference is "I can prepare it the way I like" (18 percent). See following chart for other findings.

	Restaurant	Home	Both
Preference	54%	34%	9%
<b>Reasons</b>			
They Prepare/Enjoy Eating Out	(23%)	Can Prepare Way I Like	(18%)
Properly Prepared	(16)	Know It's Fresh	(6)
Makes the House Smell	(5)	Know What I'm Getting	(5)
Don't Like to Cook Seafood	(4)	Cheaper to Eat at Home	(5)

Source: Market Position/Tracking Study

**Conclusion**

Among those preferring to eat seafood at home, consumption is much higher than at restaurants. In order to increase salmon consumption, "ease of preparation" education must be aimed at the large population of current restaurant consumers.

**Outlet Types for In-Home Purchases**

**Price not only factor in choice**

Most fresh/frozen salmon for in-home use is purchased at supermarkets. The second choice, specialty fish markets, feature fresh, while all others sell both fresh and frozen forms. The primary reason for purchasing a particular seafood in a retail outlet is that it is a "favorite", followed by "in-store special". Over two-thirds of consumers purchase salmon for other than price-related reasons. See following chart for specifics.

**Purchasing Locations and Behavior**

Retail Store Type for Fresh/Frozen Salmon Purchases		Usual Reasons for Purchasing a Particular Seafood	
Supermarket	62%	Favorite	68%
Fish Market	23	In-Store Special	17
Live Market	2	Newspaper Ad	8
Takeout Restaurant	1	Other	7
Varies	12		

Source: U.S. Salmon Consumer Survey, 8/89/ Canadian Department of Fisheries and Oceans

**Restaurant Types**

**Customers order their "favorite"**

Most salmon is purchased at specialty seafood or other white tablecloth restaurants. Like retail, reasons for ordering seafood at a restaurant are that it is a "favorite" (69 percent), and the "restaurant's specialty" (13 percent). See following figures. According to the survey, waitperson recommendations or price considerations do not appear to influence purchase behavior. However, based on trade feedback, we believe waitperson recommendations do play an important role in seafood selection.

Restaurant Type for Fresh Salmon		Usual Reason for Ordering a Particular Seafood	
Specialty Seafood	39%	Favorite	69%
Other White Tablecloth	36	Specialty of Restaurant	13
Family	22	On Fresh Sheet	8
Ethnic	3	Daily Feature	6
Fast Food	0	Recommended by Waitperson	2
		Other	2

Source: U.S. Salmon Consumer Survey/Canadian Department of Fisheries and Oceans, 8/89

**CONSUMER AWARENESS OF SEAFOOD-PRODUCING REGIONS**

**Alaska as a region lacks high awareness**

Generally, consumer awareness is low regarding all seafood-producing regions. When asked, "Which seafood region first comes to mind?" New England (17 percent first mentioned/28 percent total mentioned) tallies higher than Alaska (7 percent first mentioned/23 percent total mentioned), California (7 percent first mentioned/21 percent total mentioned) and the Gulf of Mexico (5 percent first mentioned/21 percent total mentioned).

When asked, "When you think of fresh salmon, what country or region outside the lower 48 comes to mind?", consumers have a greater awareness of Canada than Alaska as a salmon producer. (See following chart.) Although Norway has less awareness among consumers, it is well-recognized among the trade who, we believe,

will educate consumers over time. Also, Norway has launched an on-package, point-of-sale campaign to increase awareness of Norway as a salmon producer.

**Consumer Awareness of Seafood Producing Regions**

	% total mentioned
Canada	37%
Alaska	28
Norway	9
Japan	7
Others	3% or Less Mentioned

Source: U.S. Salmon Consumer Survey/ Canadian Department of Fisheries and Oceans, 8/89

**AWARENESS OF DIFFERENT SEAFOOD**

**Shrimp, lobster and tuna top salmon**

On a first-mentioned basis, consumer awareness for salmon is also low at only five percent. Specifically, when asked, "What seafood first comes to mind?", shrimp, lobster and tuna are mentioned—in that order—more readily than salmon. (Refer to following chart.) Salmon is, however, a recognized seafood (80 percent have heard of fresh or frozen salmon; 88 percent have heard of canned salmon).

**% Consumers Aware**

	First Mention	Total Mention	Aided
Shrimp	28%	60%	N/A
Lobster	14	45	N/A
Tuna	7	27	N/A
Fresh Salmon	5	19	80%
Crab	4	18	78 (King Crab)

Source: Market Position/Tracking Study, 5/90

Overall, there is a minimal consumer awareness about different species of salmon. Even among consumers who are familiar with the names of a few salmon species, there is little knowledge of specific attributes and differences between each. Canned salmon consumers, however, have some slight species awareness, since red, sockeye or pink are specified on the labeling. Red is considered to be better and more flavorful, and more expensive, than pink.

**Conclusion**

Salmon is familiar to most consumers, but is not readily remembered when it comes to choosing seafood. Awareness of Alaska as a major producer of salmon needs to be heightened to strengthen Alaska salmon's positioning among consumers. Before the advantages of Alaska salmon over competitors can be effectively communicated, awareness needs to reach at least a 50 percent level.

**AWARENESS OF FARMED SALMON**

**Wild salmon has positive image/ farmed image is mixed**

Overall, there is confusion over the perceived benefits of farmed salmon. Based on focus group research and the Canadian Department of Fisheries and Oceans U.S. Salmon Consumer study, consumer awareness for farmed salmon is relatively low (26 to 41 percent are aware in New York and San Francisco, respectively). More than two-thirds of consumers do not perceive farmed to be different than wild salmon, despite the fact that wild salmon, such as Alaska, feeds off natural stocks, while farmed fish are raised on pellets and chemicals. Further, among those who are aware of farmed, there are confused notions—some positively perceive both farm-raised and ocean-caught as being "natural and healthy", but others believe farm-raised to be artificial and chemically tainted. See following chart.

**Consumer Perceptions**

	Ocean Caught	Farm-Raised
Positives	Natural/Healthy Cold Clear Waters Fresh Untainted Alaska-Big	Natural/Healthy Clean Waters Fresh Untainted Controlled Word "Farmed" Cheaper
Negatives	Frozen Wild Expensive	Uncontrolled Artificial Chemicals

Source: ASMI Focus Group Research, 1990.

**Conclusion**

Consumer awareness and acceptance of farmed salmon is likely to continue to rise due to active trade acceptance and promotion touting its fresh aspect. Building consumer awareness and preference for Alaska salmon is crucial now as a strong defense against this competitive pressure.



## CURRENT AWARENESS CAMPAIGN

### Advertising boosts Alaska awareness

Overall, 1990 advertising focusing on the theme of "Alaska Seafood, Far and Away, the World's Finest" has increased consumer awareness of Alaska seafood as well as perceptions of Alaska as the "best seafood" producing region.

As the following chart indicates, when compared to pre-advertising period levels, Alaska was mentioned more often (23 percent versus 17 percent pre-advertising). Alaska was also mentioned more often as "the region for best seafood" (11 percent versus 8 percent pre-advertising). While advertising focused on all types of Alaska seafood, awareness of salmon increased dramatically from 9 to 31 percent, and those who are aware are twice as likely to have purchased Alaska seafood as those who are not.

### % Consumers First-Mention

	Pre-Advertising (12/89)	Post (4/90)
Alaska Seafood	17%	23%
Alaska Seafood Advertising	11	15
Alaska as "Best Seafood" Region	8	11

Source: Market Position/Tracking Study, 5/90

### Conclusion

The current Alaska all-species advertising approach has helped to increase awareness, but it is still low. A separate, focused effort highlighting salmon can build awareness levels and consumer preference for Alaska salmon.

## CONSUMER ATTITUDES AND USAGE

### Household penetration— less than half of households eat salmon

While nearly all households consume some fish or shellfish (MRCA estimates 99 percent), salmon is consumed in only 40 percent of households. Tuna figures are much higher, with an estimated penetration of 98 percent. (See following chart.) Targeting households that consume fish but not salmon represents a major opportunity.

	% of Eatings (all foods)	Household Penetration
Tuna	36%	98%
Fish Sticks	8	29
Shrimp	7	40
Salmon	5	40
All Other Seafood	13	N/A

Source: MRCA

**FREQUENCY OF USE**

**Salmon consumers big seafood eaters**

Salmon consumers eat seafood more often than non-salmon seafood consumers. Two-thirds of fresh and frozen salmon consumers eat seafood once a month or more, and about one-third eat it once a week or more. By contrast, about half (44 percent) of the non-salmon seafood consumers eat seafood once a month or more.

Salmon consumers also eat seafood at restaurants more often; two-thirds (63 percent) eat out at least once a month compared to 44 percent for non-salmon seafood consumers. While salmon users eat seafood more frequently, salmon is eaten infrequently compared to other fish.

**Conclusion**

It would be beneficial to encourage upscale non-salmon seafood users to try salmon as a substitute. Additionally, fresh and frozen salmon consumers should be encouraged to eat salmon more often.

**REASONS FOR USE**

**Non-salmon users think it's expensive**

Most salmon consumers eat fish and seafood for taste and health/nutrition reasons. However, among non-salmon seafood consumers, these benefits are rated lower, and salmon is perceived to be more expensive compared to other seafoods and meats. (See following chart.)

Reasons for Eating Fish/Seafood		Attributed Rating for Fresh/Frozen Salmon (1=disagree, 10=agree)		
		Salmon Users	Non-Salmon	
Like the Taste	39%	Salmon Has High Nutrition	8.1	6.8
Health/Nutrition	36	Is Easy to Prepare at Home	7.9	5.9
Adds Variety to Diet	15	Mild, Delicate Flavor	7.5	5.3
Makes Light Meal	4	Has Few Bones	7.1	5.8
Easy to Prepare	3	Attractive Appearance	6.5	5.2
Good Value	1	Undesirable Fish Odor	6.4	4.9
		Consistently High Quality	6.3	5.2
		Is Readily Available	6.1	5.5
		Inexpensive vs. Other Seafood	4.3	4.1
		Inexpensive vs. Other Meat	4.2	4.0

Source: U.S. Salmon Consumer Survey; Canadian Fisheries

**Conclusion**

Marketing and communications efforts must present salmon as a value that offers taste and nutrition well worth the extra cost. Additionally, aggressive promotional programs to gain trade featuring support (for frozen salmon in particular) can strengthen value perceptions.

**IN-HOME PREPARATION**

**Fresh salmon for dinner, canned for lunch**

Salmon is considered to be appropriate for a family meal, not just "special occasions." Most is consumed during the week (78 percent), and typically eaten by family members rather than guests (88 percent family only). Dinners account for most usage (74 percent), followed by lunches (20 percent) and breakfasts (6 percent).

Canned salmon is used mostly at lunch, while fresh is used more for dinners and on weekends. Canned salmon is usually considered an ingredient and fresh/frozen a main dish.

For fresh/frozen, broiling (37 percent) and baking (27 percent) are the most common methods of preparation, followed by poaching (10 percent), frying (9 percent) and barbecuing (9 percent). Few use a microwave for preparation (5 percent).

**Conclusion**

Consumers need to be educated on how to prepare canned salmon to encourage dinner and main dish usage. Stressing its convenience and providing recipes can also attract non-salmon users. Fresh/frozen consumption can be increased by touting weekday family and weekend use, as well as providing microwave cooking instructions for preparation convenience.

**FRESH AND FROZEN VERSUS CANNED USAGE**

**Fresh/frozen users not canned users and vice versa**

Fresh or frozen salmon is eaten four out of 10 times within the in-home segment (37 percent). Consumers prefer fresh over frozen—four out of five purchases are fresh. Canned salmon represents about half (53 percent) of total in-home salmon eatings, while other forms, including smoked salmon, represent 10 percent. The following chart details consumption and purchases:

% of In-Home Salmon Eatings*		% Purchased Most Often in Retail Outlets			
Canned	53%	Fresh Steaks	39%	Frozen Fillets	11%
Fresh/Frozen	37	Fresh Fillets	30	Frozen Steaks	6
Other	10	Fresh Whole	10	Frozen Whole	2
	100%	Total Fresh	79%	Total Frozen	19%

\*Source: MRCA

\*Source: U.S. Salmon Consumer Survey; Canadian Fisheries; totals of fresh and frozen combined less than 100 percent due to excluding 5 percent prepared entrees

Consumers do not usually use both fresh and canned salmon. Eighty percent who use fresh or frozen salmon do not tend to use canned, and 74 percent of canned users do not tend to use fresh or frozen forms. (See chart below.)

**% Using Other Forms**

	Fresh Users	Canned Users
Fresh	80%	15
Frozen	11	3
Canned	2	74
Smoked	.	.

Source: Market Position Tracking Study 5/90

**Conclusion**

Marketing efforts must target each of these user groups separately.

**ATTITUDES TOWARD CANNED SALMON**

**Users/non-users have different perceptions**

Consumers who prefer canned salmon consider it to be nutritious, healthy, convenient and an "old family favorite". Those who do not use it see it as an expensive ingredient that can be substituted by tuna, and as a product with an out-of-date image, according to ASMI focus groups. Additionally, non-users do not appear to recognize the health benefits of canned salmon.

**ATTITUDES TOWARD FRESH VERSUS FROZEN SALMON**

**Consumers prefer fresh**

Consumers have a strong preference for fresh over frozen salmon. This is due to the belief that freezing adversely affects the flavor and texture. As salmon is viewed as having a short shelf life, freshness is a very important attribute at the retail level and at home. Most believe the salmon they buy is fresh, not previously frozen, since much of frozen is thawed.

Most salmon purchases are in fresh form and consumed the same day. If not, some consumers will freeze it for later use.

**Conclusion**

Overall, consumers do not believe frozen or previously frozen is as good as fresh salmon. But positive, limited consumer feedback on the concept of freezing "within hours of catch to lock in flavor" suggests that this should be further explored. Further evaluation of positioning statements is needed. The current, most frequently used statement "previously frozen" is strongly rejected by consumers as it connotes staleness and an alternative, "frozen for top quality," contradicts consumer perceptions.

Canned salmon needs to be positioned as an ingredient for contemporary recipes, as well as a healthy choice, among both high and low consumption targets.

**PERCEPTIONS OF ALASKA SALMON**

**Alaska seafood enjoys positive image**

Where awareness of Alaska salmon exists, consumers are positive about the association between Alaska and salmon—i.e., the pure, clean waters of Alaska and a high-quality, better-tasting product. It is perceived as more expensive, which reinforces a quality image but may also be considered a drawback to some non-salmon users.

Consumers believe Alaska seafood to be different from that of other places: it “tastes better” (22 percent) and “is fresher” (21 percent). The current advertising campaign is building on these positive perceptions and we believe these associations with Alaska seafood carry over to Alaska salmon.

First-Mentioned Impressions of Alaska Seafood Rank		How Is Alaska Seafood Different From Other Places		
			Pre-Advertising	Post-Advertising
Salmon	1	Tastes Good/Enjoy It	22%	22%
Crab	2	Fresh/Fresher	21	
Good Quality	3	Good/Better Quality	7	8
Freshness	4			
Expensive	8			
Cold, Clear Waters	10			

Source: Market Position Tracking Study 5/90

**Conclusion**

Marketing efforts should leverage Alaska's favorable image through continued consumer-directed advertising. Reinforcing the belief that Alaska seafood is superior will protect consumer demand for Alaska's salmon against increasing foreign farmed salmon competition.

**NON-USER PROFILE—VERY YOUNG OR OLDER**

Those who do not eat salmon tend to be under age 18 or over age 65 and fit into the “young single” and “young kidless” lifestyles. (Users fit the “empty nester” and “grandpa/grandma” profiles.) Like salmon users, non-user households have fewer children; they also tend to be less educated.

Pockets of non-salmon users do exist in higher-use areas. Specifically, the Pacific, South/Atlantic and West/North/Central regions have a high presence of both salmon users and non-users.

### Conclusion

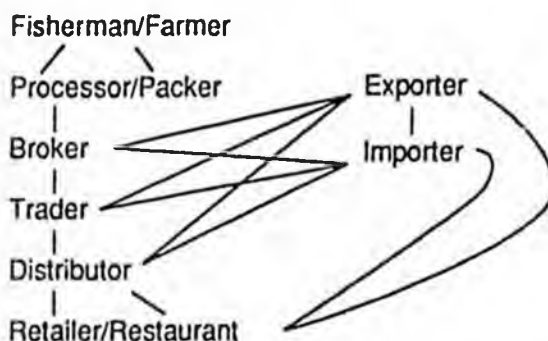
Once consumption of Alaska salmon among current users (canned and fresh/frozen) has been significantly increased, non-users represent a strong opportunity, requiring specific programs to address their needs.

## DISTRIBUTING AND SELLING SALMON

### Multi-layered system leaves marketing up to individual companies

The system that moves salmon from catch to end-user is complicated. Processors, importers, brokers, traders and distributors are involved in a structure that demands flexibility, since the distribution from fisherman/farmer to end-user is not a linear process. Each layer can, and often does, bypass the consumer to take on a different distribution flow. Businesses can also change roles—i.e., distributors may also be brokers, and vice versa.

### Salmon Distribution Flow



Even though minimum attention to seafood is given by the retailers, seafood's profitability is still impressive. Once salmon arrives at the supermarket, most of it is sold in seafood departments adjacent to meat departments by personnel trained in the meat department. The majority of retailers say that seafood counters are necessary to build the overall image of the store, but the benefits appear to go beyond seafood-as-image. Seafood counters now account for 4.5 percent of total retail profits, according to *Seafood Leader*.

### "Branding" of fresh/frozen is difficult

Within this complicated distribution channel, the focus is on pricing and moving salmon inventories. As with other commodities where there is no "brand label", seafood brokers, distributors, importers and traders are not in the business of marketing "brands" of fresh/frozen salmon. Any marketing support through the channel is generally for canned salmon by manufacturers and their assigned broker network. Unlike canned salmon, where each processor promotes his respective brand, there are no established brands in fresh/frozen. As a result, there is no

"consumer link" or identification between the product at the point of sale and its origin or "brand".

**Commodities use sales force to "brand" product**

While ASMI's promotions have been readily accepted by the trade, promoting Alaska as an origin to build brand identity and value will require a more broad scale point-of-sale program. To ensure the execution of these programs through retail and foodservice channels, other commodity councils rely on four to five field sales personnel.

Below is a list of other commodity groups and the sales forces they each employ.

**Sales Force Comparison**

California Strawberry Board	5 regional reps
California Cling Peach	5 employed regionally; 1 Canadian
New Zealand Kiwi Fruit	5 regional reps - subcontracted via rep firm
California Iceberg Lettuce Commission	4 employed regionally
Idaho Potato Commission	4 regional merchandising reps
California Olive Industry	2 employed nationally
National Pork Producers	1 nationally

Establishing a sales force has allowed these commodity groups to maintain/increase point-of-sales presence in a majority of the stores/restaurants of the major retail and foodservice chains throughout the United States. The point-of-sales presence of these commodities has been accomplished by fulfillment of the following standard sales force responsibilities:

- Contact key decision makers at chains with a market share of at least 5 percent and notify them of the point-of-sale programs and materials available; encourage them to advertise and properly display product and point-of-sale materials during promotional periods.
- Provide a report for each chain contacted, detailing the reaction of the retailer to promotional programs and POS materials.
- Report any significant trends or market changes mentioned by key contacts.
- Check stores in each market and report back:
  - price of their product and competitive product;
  - promotional activity;
  - brands carried;
  - display position;
  - display size;
  - point-of-sale being used; and
  - comments

Creation of an AMSI sales force to fulfill similar responsibilities to those described above would result in an ASMI point-of-sale presence to ensure that an "Alaska" brand identity and high quality/value are communicated to the consumer.

### **Conclusion**

To create added value and a preference for Alaska salmon, there must be origin identification and promotion at the point of sale. To ensure these programs are implemented fully, a national sales/marketing force is recommended.

## **MARKETING STRATEGIES**

The following recommends key marketing strategies that address core issues, obstacles and opportunities to increase domestic salmon consumption. These strategies prioritize marketing resources and set direction for developing specific marketing programs.

### **Overall marketing objectives**

- Establish a quality and value leadership position for Alaska salmon in all market segments—fresh/frozen, canned, foodservice and retail.
- Achieve quality, value leadership and volume growth by:
  - building a preference for Alaska salmon while developing an acceptance for frozen salmon among all trade segments and end-use consumers;
  - revitalizing retail and foodservice consumption of canned salmon; and
  - increasing overall domestic usage of Alaska salmon.
- Increase total awareness of Alaska salmon from its current 19 percent to 33 percent.

### **Key strategies: Positioning**

Consumer: Educate the consumer as to the high quality of Alaska salmon, unequalled in flavor because it is ocean-caught. This flavor difference supports frozen forms because it is "fresh frozen" to capture flavor, and canned because it is "packed" to capture the natural flavor.



- Trade: Build confidence among retail and foodservice trade that the exceptional flavor of Alaska salmon adds value which enables premium pricing and maximum profitability.
- Product: Educate retail and foodservice trades on the species and benefits of the natural Alaska salmon product line.

### **Merchandising**

Identify and associate Alaska salmon with natural flavor, freshness and quality at the retail point-of-sale and on foodservice menus.

### **Advertising**

Build consumer awareness for Alaska salmon via year-round national media that:

- targets all salmon users—fresh, frozen, canned and restaurant;
- targets primary as well as secondary users to build usage;
- provides regional efforts in development markets; and
- delivers preparation tips and recipes to foodservice and retail consumers.

### **Promotion**

- Consumer: Increase trial and usage of Alaska salmon through promotion that:
- educates consumers on additional uses for canned salmon, and delivers preparation ideas for fresh and frozen salmon; and
  - communicates health benefits of Alaska salmon.

- Trade: Maximize trade featuring/menuing and in-store merchandising of consumer-directed promotions. Target all retail and key foodservice segments that offer maximum growth opportunity: specialty, white tablecloth, family restaurants, and the health care industry.

### **Public relations**

Educate consumers and trade on the acceptability and advantages of frozen salmon, while encouraging increased usage through preparation ideas and recipes.

### **Spending**

Allocate budgets year-round at levels that increase total Alaska salmon consumption by effectively changing consumer and trade perceptions.

# FOREIGN MARKET ANALYSIS

## OVERVIEW

### **Leading markets will maintain control**

The major salmon markets are in the northern hemisphere—specifically Japan, the U.S., Canada, and western Europe. Potential markets exist elsewhere, but these four large salmon markets still will dominate at the end of the next decade.

### **Demographics**

Forces within these major markets will bring changes that challenge salmon marketers. These forces include consumption patterns; nutrition and health concerns; quality; and population dynamics that include population size, growth, income, aging, household sizes and other demographics.

### **Price**

The most important variable in the salmon markets is price. Production will help set prices, as will quality, packaging and product forms.

### **Technology**

Also at play in the next decade's market equation is improved technology—both in the capture of wild and ranched salmon and in the production of farmed salmon. Researchers are reviewing traditional pen technology. Other scientists are altering feed compositions to custom produce salmon for specific market niches (increasing Omega-3 oils and producing specific flesh tints are two of the customizing techniques). One researcher predicts that consumers will be able to choose from a variety of customized salmon in the same way they select a wine.

### **Transportation**

Transportation advances will change the markets. A review of the history of the salmon industry reveals a chronology of transportation improvements that have expanded salmon markets. Salmon has progressed from salted barrels to cans and from freezing to air shipments of fresh fish around the world.

### **Product form**

Product form will play a major role in market changes. Shipment of whole fish, both fresh and frozen, will continue but value-added packaging of steaks, roasts, smoked, salmon mousse, dips and other products will affect markets. Canned salmon should continue to be a staple as well.

### **Other protein sources**

Situations external to traditional seafood markets impact how salmon is sold and how much salmon is sold. The marketing efforts of competing protein sources (beef, pork, poultry and others) will help determine the parameters of the salmon markets.

As we review the foreign markets in this section, it is especially important to remember that what is true today will not necessarily be the case by the year 2000. Each of the above factors (demographic changes, pricing, packaging, transportation, product forms, harvesting technology) as well as others like diseases, global warming and other environmental factors will shape markets of the future.

The following market analysis of dominant salmon-consuming nations describes in general terms the industry and market changes that have occurred during the last several years and summarizes the views of some market observers about the future of the worldwide salmon markets.

## **JAPAN**

### **Fishing, import and consumption leader: fish/seafood a Japanese staple**

Japan is the world's largest fishing country, with domestic landings of 28,218 million pounds of seafood in 1988. Japan is also the world's largest importer of marine produce, with 1989 imports of 5,070 million pounds worth \$10.5 billion. Japan, as the previous figures would indicate, leads the world in per capita consumption of fish and shellfish at 189.6 pounds per year.

The volume of fish and shellfish consumed, however, may be masking some demographic changes that have occurred during the past several decades. From 1974 to 1986, the average nominal family income in Japan rose more than 300 percent (real income increased about 47 percent). As the average family income increased, food expenditures also increased.

### **More Japanese dining out, eating pre-cooked; at home preparation/consumption stabilizing**

Yet food as a *percentage* of the cost of living in Japan dropped from 32.2 percent to 25.5 percent during the years from 1974 to 1986. As the Japanese family has become better off, food expenditures have dropped from about one-third of the family income to one-quarter of the family income. Pre-cooked food rose from 3.6 percent of total food expenditures in 1970 to 6.7 percent in 1986 while eating out rose from 8.9 percent to 14.8 percent during the same period.

The highest expenditures on fish and shellfish are in the older age brackets (40-59) and expenditures on pre-cooked meals are roughly the same across all age groups. With the exception of the over-55 age group, the expenditures for eating out are significantly higher than expenditures for other food categories. Although consumers age 40-44 spend more on eating out than any other age group, consumers 25-29 spend the highest *percentage* of their total food expenditures eating out—nearly 20.1 percent.

Younger Japanese consumers spend more on pre-cooked food than do older Japanese consumers. As the current group of younger consumers mature, it should not be assumed that they will adopt the older group's consumption patterns.

The above consumption synopsis is from the 1986 *Report on the Family Income and Expenditure Survey* as outlined in the April 1989 Canadian DFO study on the Japanese markets. The survey excluded one-person households which have dramatically different food expenditure patterns (for example, one-person households spend more than half their food expenditures dining out). When one-person households are included in the survey data, the tendency of younger people to spend a high percentage dining out is further reinforced.

When expenditures on salmon are expressed as a percentage of total seafood expenditures, it is shown that the under-24 age group spends the highest share on salmon. Although younger people eat seafood at home less frequently than older Japanese consumers, they prefer salmon when they do. This may be because salmon is sold cleaned and packaged into fillet portions that are easy to prepare.

There also is a strong regional preference for salmon in Japan. Hokkaido region residents consume nearly seven pounds of salmon per person. The region is the primary producer of chum salmon and fish is an important part of the regional diet. The Shikoku, Kyushu and Okinawa region residents consume less than one pound per person per year.

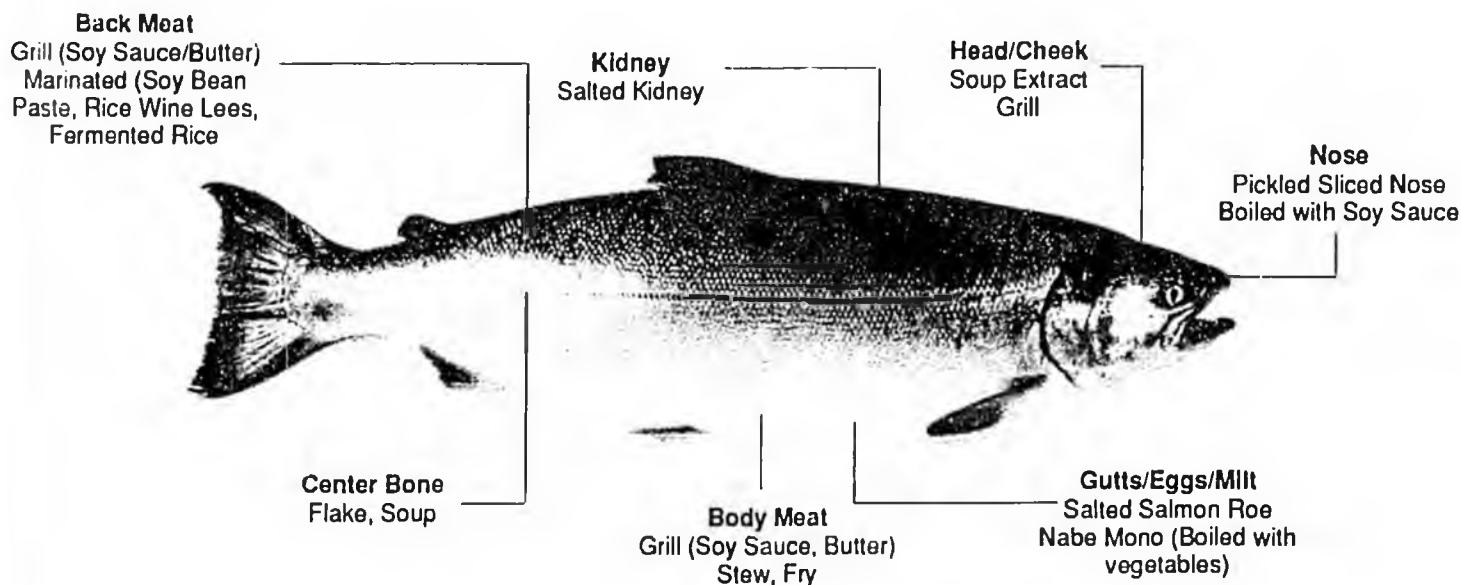
The DFO report suggests the Japanese consumer may be moving toward more convenience and variety. That data shows that expenditures on pre-cooked foods and dining out have increased while home consumption has stabilized. A small but significant portion of the population has increased its consumption of western-style food, in which meat is likely to be more prominent than seafood.

Another researcher, Yuko Kusakabe (a research assistant at the University of Rhode Island), found in a recently completed study of Japanese salmon markets that the markets were relatively stable over the past decade. She noted that consumption of seafood and meat maintained similar proportions over the last ten years, though she also identified a trend toward ready-to-eat foods and dining out.

**Salmon is Japanese favorite at home; consumer is exacting connoisseur of species**

Salmon is the most commonly consumed fish in the Japanese home. Kusakabe's review of product forms showed that current salmon consumption breaks out at 64 percent salted (though recent indications are that consumers are moving toward salted salmon that is less salty than in the past), 7 percent smoked, 19 percent fresh and 10 percent other. Kusakabe also noticed that the percentage of salted salmon consumed in the home dropped significantly between 1986 and 1989—from 74 percent to 64 percent. While most salmon is customarily consumed during the winter, there is a trend now toward year-round consumption.

**How Salmon is Consumed in Japan**



Broken down by variety of fish, the Japan External Trade Organization (JETRO), estimated Japanese consumption of salmon at 179 million pounds for sockeyes; 307 million pounds for chums; 84 million pounds of coho; 12 million pounds of kings; and 39 million pounds of Atlantic Salmon and sea trout. Another 87 million pounds of farmed trout were consumed.

Sockeyes are the preferred salmon, especially in western Japan where consumers often will buy nothing else, according to JETRO. Because of the seasonality of supply

for sockeyes, domestic-caught chums are a substitute but are considered inferior in terms of color, oil and general quality. Coho enjoy considerable popularity and are the right color and size for the consumer. They are considered next-best to sockeyes by most consumers.

Consumption of salmon increases toward the end of the year because of the fall chum salmon harvests in northern Japan. These harvests make up close to 50 percent of Japanese consumption. There also is a large increase in the purchase of whole, salted salmon in December, spurred by the custom of seasonal gift-giving. A whole salmon is a popular gift (salted salmon, liquor and salted herring roe are other popular gifts).

### **Japanese choose wide variety of processing, preparation and serving options**

Salted salmon usually is cut into fillet portions weighing between 80 and 130 grams. These are sold at retail stores, supermarkets and department stores. The salmon is available in several degrees of saltiness. The salted salmon is grilled at home without elaborate preparation and usually served with steamed white rice for breakfast or lunch. Use for dinner is infrequent.

Other traditional forms of salmon preparation include cooking in a pot with vegetables, pickling in sake lees and "sake chazuke" (a bowl of cooked rice with salted, dried and flaked salmon meat doused in hot tea). Salmon also is being prepared more often as westerners would prepare salmon. In recent years, salmon has been eaten raw in sushi and sashimi dishes.

About 22 million pounds of salmon were smoked in Japan in 1989, according to JETRO. Japanese consumers prefer smoked sockeyes, but also like smoked Yukon kings and Canadian cohos.

The salmon sold in department stores is of greater species variety and is processed in different ways. In addition to salted salmon, salmon marinated in rice wine lees (sediment from the wine fermentation process), fermented rice, and bean paste are available. This salmon also is grilled at home.

Fresh salmon is available at retail stores. Until recently, salmon was likely to be pre-frozen except during the domestic harvest season. Now, domestic aquaculture and farmed salmon imports make fresh salmon more readily available.

There are several lines of salmon products which use low-value salmon. These include canned salmon, salmon flakes in air-tight containers, frozen salmon nuggets, and dehydrated salmon flakes.

### **Restaurant goers choose Atlantic salmon; Pacific is "common" home fare**

Restaurants don't serve much Pacific salmon. It is hypothesized that Japanese diners don't want a dish they have frequently at home. They view salmon as easy to prepare and they want a restaurant dish that requires the skills of a chef.

On the other hand, Atlantic salmon are served at many Japanese restaurants and restaurant menus clearly distinguish Atlantic salmon from Pacifics. The appeal of Atlantic is that consumers are relatively unfamiliar with the product and restaurants can emphasize that the salmon they serve is different from what their customers are accustomed to at home.

The Canadian DFO report on Japanese salmon markets indicates the majority of the fresh aquaculture salmon has been distributed through the restaurant sector but the report authors believe there will be more fresh aquaculture salmon entering the retail sector. The restaurant sector is showing a decided preference for Chilean coho and Norwegian Atlantics.

### Japanese Imports of Farmed Salmon

	Norway	Chile
1980	-	-
1981	NA	-
1982	94,000	-
1983	293,000	-
1984	637,000	-
1985	963,000	-
1986	1,700,000	73,000
1987	2,800,000	182,000
1988	6,600,000	2,400,000
1989	12,500,000	8,700,000
1990	NA	26,400,000

### Japan distribution unique to world markets; importers deal with traders

The fish distribution system in Japan is complex and radically different from North American and European distribution systems. Direct access to the markets by fish importers is nearly impossible. Trading companies control about 70 percent of all Japanese imports. The vertical integration of the large trading companies reduces the flow of salmon through the wholesale markets. The product form of salmon usually changes at each distribution stage.

Bill Atkinson predicts there may be changes imminent in the Japanese marketing and distribution system over the next year or so. In his newsletter dated October 10, 1990, Atkinson says changes may be mandated by the rapid increase in interest rates in Japan.

In the past, the fishing industry has been able to borrow money at attractive rates which enabled purchase of product to hold in reserve until market conditions improved if necessary. According to Atkinson, the low rates also facilitated the rapid shift from domestic production to imports.

But Atkinson says the days of low rates for the Japanese fishing companies may be over. Heavy interest costs, in addition to rising costs for raw material and storage, indicate change. Most recently, importers of frozen sockeyes began a mini-dumping action to reduce inventory costs in September of 1990. September is the six-month midpoint of the fiscal year for Japanese companies.

Atkinson notes the situation affects more than importers: crab processors also were reportedly offering to sell frozen crab, purchased earlier in 1990, to meet their processing needs. They apparently are trying to free up money in inventory due to high interest costs. Atkinson predicts the industry will become more conservative in the future and buy only to meet short-term needs.

Improvements in freezing technology and freezer transportation have opened up routes which bypass the traditional wholesale markets. A portion of the frozen salmon now moves through "out market" routes. Large supermarkets can use these "out market" routes effectively. There are few tariff barriers to imported fish products.

Product identification at the retail level is minimal. In most retail fish stores and supermarkets, species and degree of saltness consist of the product identification. Country of origin is not usually specified.

Japanese salmon imports have increased dramatically since the inception of the Magnuson Act (in 1974, Japan imported 18 million pounds of salmon; in 1989 Japan imported more than 17 times that amount). Japanese fleets have been shut out of salmon-rich areas off the U.S. and Canadian coasts and imports from the United States (primarily Alaska) and Canada have increased dramatically over the past 15 years.

More recently, the U.S.S.R. has restricted Japanese high seas salmon fishing in Soviet waters. In 1990, Japanese fishermen within 200 miles of the Soviet coast were restricted to areas that yield mainly pink salmon. *Seafood Leader*, in its May-June 1990 issue, reported that the Soviets would end Japanese salmon catches in Soviet waters by 1992.

In 1989, the Japanese produced 421 million pounds of salmon (less than 10 percent from the high seas, 10 percent by aquaculture means and the rest through coastal fisheries—mostly ranched chums). Mr. H. Suzuki of Japan's Nichiro Corporation estimates the maximum yield of Japan's fall chum production is about 330 million pounds. In 1989, Japan imported 315 million pounds of salmon.

During the 1980s, Japanese production of salmon and Japanese imports have stabilized to meet the annual demand by Japanese consumers of about 661 to 771 million pounds of salmon. In 1989, the Japanese consumed about 35 percent of all world production of salmon—wild and farmed.



**Farming opens door for Japan to stabilize imports, meet needs domestically**

While imports to Japan have stabilized, and Suzuki reports that Japanese production of fall chums has reached its maximum level, Japan's salmon alternatives are growing. Japan's production of farmed salmon has increased from 4 million pounds in 1980 to about 57 million pounds in 1990. Additionally, world farmed salmon production has grown to a level that now matches Alaska's production of wild salmon. Further, the Soviets will attempt to catch and export salmon formerly caught in Soviet waters by Japanese fleets. Canada has also expanded its imports to Japan (the salmon most highly valued by Japanese consumers, according to several surveys, is Canadian troll-caught sockeyes).

These expanded salmon alternatives make quality, price and product form paramount in the Japanese markets. Consumer substitution for traditional supplies of wild salmon will revolve around these three attributes.

Kusakabe noted the trade's resistance to farmed salmon seems to be dissipating. In 1988, 50 percent of the traders said farmed salmon was not a substitute for wild salmon but more recently that percentage seems to be dropping. Kusakabe believes consumers are even less finicky about farmed and wild than are the traders. She notes that some consumer taste tests in Japan show that consumers prefer the taste of farmed chinook and Atlantics.

Bill Atkinson also has noted that the market brokers are changing their attitudes toward farmed salmon. In his newsletter dated April 11, 1990, he pointed out that while sockeyes used to be the main source of "red"-fleshed salmon, the consumer is growing used to both domestic and imported farmed cohos, Atlantic salmon and ocean-farmed trout. He adds that while Alaska salmon still plays an important part in the Japanese market, it is no longer the only major source of product.

Apparently, as more consumers are exposed to farmed salmon through restaurants and as farmed salmon marketing efforts increase in the world's largest salmon market, consumers have shown they can shift between species. Suzuki even noted a rise in the consumption of farmed rainbow trout as consumers substituted trout for sockeyes when the price of sockeyes jumped.

**Imported farmed fills niche as Japanese "work out bugs" domestically**

Some impediments to farmed salmon in Japan include: the relatively poor reputation of penned Japanese cohos; the ingrained consumer preference for sockeyes (it is often noted that Japanese consumers shop with their eyes and the color of sockeyes is optimal for shoppers); and the need for freezing technology which will protect the quality of farmed salmon without dramatically raising production and handling costs.

Clinton Atkinson notes that frozen farmed salmon becomes competitive only when the average price for wild salmon exceeds the break-even point for farmed because

the production and handling costs for farmed are high and inflexible. He cites an example of this break-even point: in 1988, Alaska sockeye prices were abnormally high and some Japanese companies turned to farmed salmon.

Clinton Atkinson also notes that farmed salmon from Japan, New Zealand, Chile and Europe have found niches in the large Japanese markets. Frozen farmed salmon is even arriving from northern Europe via the Trans-Siberian Railroad to compete price-wise with imports from Alaska and Canada. Bill Atkinson noted in his October 3, 1990, newsletter that projections for sales of Chilean farmed coho were 13 million pounds in 1990. That has now been revised to 26 million pounds with prices similar to prices paid for Alaska sockeyes.

Price competition will be closely tied to foreign exchange rates. Clinton Atkinson points out that every point increase in the rate of foreign exchange (i.e., from 150 to 151 yen per dollar) means a decrease of about \$.02 per pound in FOB price. When the yen is fluctuating vis-a-vis the dollar, farmed salmon will control the extent of any price increase for wild Alaska salmon.

Perhaps the most disturbing Japanese market observation was made by Bill Atkinson in his newsletter dated January 9, 1991. He noted that the Bristol Bay sockeye fishery is being blamed by some for a large carryover of salmon from 1990 to 1991 (some project a 330- to 407 million-pound salmon carryover). The large harvest in 1990 had a definite effect on the increased supply. Atkinson said some Japanese processors believe there is no reason to pay for grades and products not easily marketable in Japan and are calling for a drastic reduction in the FOB price in 1991 to control the fishing effort in Bristol Bay.

**As farmed and wild go head-to-head on quality/cost, Japanese will need branding to identify product origin**

Suzuki foresees increased competition between farmed and wild salmon as the years progress with the key factors being quality and cost. He predicts more value-added processing prior to salmon exports to Japan (fixed salt, semi-dressed, dressed and filleted, portion cut, smoked, etc.). He also notes that as quality becomes more important there will be a need to brand salmon at the consumer end so that consumers can connect quality to product.

There also may be increased competition in Japan between salmon and other food products. Meat is becoming a more common part of the Japanese diet. JETRO notes some Japanese market experts believe there may be a relationship between the demand for high-grade fish such as salmon and trout and the price of beef. According to a study by the Ministry of Agriculture, Forestry and Fisheries, nearly two-thirds of the Japanese housewives surveyed indicated that if the price of beef fell by 20 to 30 percent they would increase their purchases of beef. A third of these housewives indicated they would cut back on their purchases of fresh fish to increase their purchases of beef.

**Percentage Share of Protein Intake by Seafood In Total Animal Protein Intake In Japan**

		1965	1970	1975	1978	1983	1988
Seafood	(grams)	16.4	16.6	18.1	17.9	17.8	18.9
	(percent)	61%	52.2%	50.7%	46.5%	44.3%	41.9%
Others	(grams)	10.5	15.2	17.6	20.6	22.4	26.2
	(percent)	39%	47.8%	49.3%	53.5%	55.7%	58.1%

Also, breakfast cereals are becoming Japan's fastest growing food product. In 1988, cereal sales shot up more than 60 percent, and Kellogg Co., General Mills and Nestlé are all getting in on the boom. Cereal substitution for the traditional Japanese breakfast fare of rice and salmon could impact salmon sales.

**UNITED KINGDOM**

**The world's major canned consumer has opened to fresh and frozen**

The British market for seafood has seen steady growth over the past decade. A January 1990 analysis for the American Embassy in London expects growth in real terms of 2.2 percent annually by 1993.

The domestic fishing fleet supplies about 60 percent of the seafood consumed in the United Kingdom. In 1987, there were 17,000 regularly employed fishermen in the UK with another 5,400 seasonally employed.

The UK is considered a primary market for canned salmon and a large market for fresh and frozen salmon. Recently, the salmon market exclusive of canned salmon has been undergoing considerable expansion, fueled primarily by a growing farmed salmon industry in Scotland.

**Trends In Consumption of Non-Canned Salmon In the United Kingdom and Sources of Supply, 1981-1987 (in metric tons)**

Type/Source of Salmon	1981	1983	1985	1987
Scottish Production	2,000,000	5,000,000	15,000,000	28,000,000
Wild Landings	3,000,000	3,000,000	2,000,000	3,000,000
Imports, Fresh/Frozen	16,000,000	16,000,000	17,000,000	18,000,000
Exports, Fresh/Frozen	2,000,000	3,000,000	8,000,000	14,000,000
Balance of Domestic Consumption and Further Processing	20,000,000	24,000,000	26,000,000	36,000,000

**Salmon overall is a growth market in U.K.**

The total salmon market in the UK, based on AGB market figures presented at Salmon '90 in Trondheim, has been growing. Sales were up two percent in 1989 over 1988 and an additional eight percent growth was expected in 1990. Canned salmon accounts for 94-96 percent of all salmon sales but sales of fresh salmon have doubled from two percent to four percent during the past two years. Sales of smoked and frozen have been relatively stable during the past three years.

Significant changes are occurring in UK meal patterns. Dining out has become more popular and the consumption of meat, poultry and dairy products by volume has dropped while seafood consumption is up. Canned fish, according to an AGB study conducted for ASMI, accounts for 36 percent of all fish products sold in the UK (though tuna has overtaken salmon as the top-selling canned fish product). Between 1988 and 1989, sales of fresh salmon grew 50 percent by volume and 37 percent by value. During the same period, fresh salmon prices have fallen eight percent, while frozen (+14 percent), smoked (+7 percent), and canned salmon (+31 percent) prices have risen.

Sales of smoked and fresh salmon in the UK peak from Christmas to Easter, and again in the summer when prices are lowest.

**Expanding fresh market absorbing Scottish farming boom**

Herrmann reports that much of the non-canned salmon consumption has been taken over by domestic (Scottish) farmed salmon. Both consumers and smokers prefer smoked Atlantics to smoked Pacifics and, in 1984, the 65 Scottish smokers mostly switched from Pacifics to Atlantics.

Fresh salmon, Herrmann said, is still expensive in the UK but he expects consumers to absorb the large increase in Scottish salmon production. He notes that fresh salmon consumption was about .66 pounds per person in 1988.

**Health awareness, increasing influence make less expensive/more accessible salmon a growing grocery favorite**

Decreasing prices and increased availability are moving fresh and frozen salmon into the mass markets in the UK. Supermarkets are beginning to recognize the sales potential and are adding fresh and frozen salmon to product lines.

The trading manager for fish for the Argyll Group (with 400 stores expected by 1991 and the main chain being Safeway) notes that salmon is a star performer, and consumption of salmon (excluding canned) hit 72 million pounds in 1990. He credits healthy eating trends and increasing affluence of the general populace, coupled with the drop in fresh salmon prices, for salmon's increased popularity.

The trading manager reports that supermarket availability and an increasing choice of product form is less intimidating for the "underconfident" fish user. Marketing strategies that include packaging and recipes will also encourage the new customer.

**Diversifying product form and packaging will further fresh and frozen growth in U.K.**

The trading manager also believes that salmon will undergo an evolution similar to the product diversification for chicken. Chicken can be purchased in quarters, wings, drumsticks, thighs and breasts; with bone in and skin on; in boneless fillets with skin off or on. There are 22 product lines for chicken in the UK Safeway stores. Currently, he notes, the only cuts of salmon available are steaks and fillets with skin on and bones in. This year Safeway has expanded to boneless steaks, skinless-boneless fillets, salmon strips that are skinless and boneless, and salmon chunks that are skinless and boneless.

Product forms for salmon are increasingly diverse. Smoked salmon, steaks and fillets packaged in individual sizes, and fresh and frozen prepared dishes are common. The catering markets almost exclusively use fresh salmon purchased whole. Retail sales are mostly in individual portion sizes.

Marie Christine Monfort, a European seafood consultant familiar with salmon, reports that domestic consumption of salmon in 1980 (excluding canned salmon) totalled about 14 million pounds. By 1988, that figure had nearly tripled with consumption pegged at 40 million pounds. Per capita consumption of salmon (other than canned) in the UK is about 320 grams.

Argyll's trading manager for fish projects that fresh/frozen/smoked salmon consumption will exceed 66 million pounds in 1990. Monfort notes that salmon consumption over the past decade has increased at a much greater rate than consumption of other fish products. Annual growth in salmon consumption from 1980 to 1988 was 13 percent. If the trend continues, she adds, consumption for fresh/frozen/smoked salmon will reach 107 million pounds in 1995. That will be about 850 grams per person.

The retail salmon industry, historically based on wild Pacific salmon, is now turning to farmed salmon. There is a high degree of substitution between origins if prices differ dramatically.

The bulk of salmon sold fresh and frozen in the UK is salmon farmed in Scotland. By 1987, the U.N.'s 1989 *Globefish* report showed Scottish salmon has 60 percent of the fresh/frozen market. *Globefish* also reported that the quantities of Pacific salmon imported remained static between 1980 and 1987. Gains by Scottish salmon farmers in the domestic markets are apparently coming at the expense of imported Atlantic salmon from Norway. In 1989, Scottish salmon reportedly displaced about 4 million pounds of imported Norwegian salmon worth \$11 million.

In 1989, Monfort reports, less than 17 million pounds of salmon (other than canned) were imported by the UK. About 9 million pounds were fresh farmed salmon (5 million pounds from Norway), 2 million pounds were from the U.S. and 1 million pounds were from Canada.

**Some U.K. markets resist fresh/frozen, but large majority willing to try it**

Expansion of the markets for fresh/frozen salmon is occurring even though a large segment of the UK population has never bought salmon other than canned. An AGB consumer survey of 1,007 shoppers revealed that 72 percent of the shoppers surveyed had never purchased salmon except for canned salmon. Of the 28 percent who have bought fresh/frozen salmon, less than half had made a purchase within the last three months.

The survey was broken out by sex, age, social class and region. Meshing with the assumption that salmon has a "top-end" image, the AGB survey showed the most frequent buyers of fresh salmon were those in the higher social classes.

But there were also strong regional differences. Fresh salmon sold best in London and Lancashire. These two regional areas account for 32 percent of the UK population, but 53 percent of fresh salmon consumption. London and southern England account for 29 percent of the UK population, but 64 percent of the sales of smoked salmon.

There was price resistance to fresh/frozen salmon, especially among women over the age of 55. Those least concerned with price were upper middle class young men.

While the AGB study revealed a very high percentage of shoppers who had never tried salmon that was not canned (72 percent), the study also showed that two-thirds of this group were willing to try salmon. This means that 6 million households have tried fresh or frozen salmon while another 16 million homes represent a wide-open marketing opportunity.

AGB notes that if one in ten of the people who has never tried fresh or frozen salmon could be persuaded to add fresh/frozen salmon to their diet, the market for fresh and frozen salmon would increase by 25 percent.

Fresh fish in the UK is generally sold through fishmongers or market stalls. Fishmongers account for about 50 percent of all fresh fish sales and market stalls account for another 16 percent. Supermarkets, though, are taking an increasing share of the fresh fish market, largely at the expense of market stalls. The UK's Sea Fish Industry Authority (SFIA) projects that by 1992 supermarkets will overtake market stalls and account for 18 percent of fresh fish sales.

The UK's five leading supermarkets, according to SFIA, now account for about half of frozen fish sales with freezer centers accounting for about 20 percent of frozen fish sales.

Globefish reports that the UK fresh/frozen salmon market represents one of the best prospects for increasing salmon consumption given current low levels of consumption coupled with growth sectors. The U.N. organization, however, believes that the

market will be supplied mainly by its local industry—the Scottish salmon farming industry.

**U.K. is canned import leader; U.S. share has declined**

Consumption of canned salmon is very high in the UK, with an estimated 42 million pounds imported during 1989. Price increases of up to 44 percent were recorded in the canned salmon market that year.

In 1988, fully one-half of the total U.S. canned salmon pack was shipped to the UK. By the end of the 1980s, however, U.S. market share in the canned salmon markets had declined from 60 percent to 32 percent. This drop was attributed to Canadian trade practices, rising prices, competition from competing seafoods, and declining pack.

**U.K. favors canned seafood; tuna has price edge over salmon**

Herrmann reports that 12 percent of all consumed seafood in the UK is consumed in canned form. In a 1989 survey for ASMI by AGB, canned tuna was the most frequently mentioned seafood purchased, with 59 percent of surveyed shoppers reporting they had purchased canned tuna. Canned salmon was the second most frequently mentioned fish product purchased, with 45 percent of surveyed shoppers mentioning purchase of canned salmon. Fresh or frozen fish products trailed well behind canned tuna and salmon (frozen fish in batter or bread crumbs tied with canned sardines at 39 percent). Canned salmon purchasers are generally older and of the middle social classes. Canned tuna seems to be strongest in younger age groups, homes with children, and with middle and upper class shoppers.

Canned salmon is viewed strongly, according to AGB's ASMI survey, as being suitable for special occasions. A large proportion of those surveyed also believe that canned salmon is versatile and can be used in sandwiches and salads. However, most surveyed also believe that canned salmon is expensive (88 percent) while canned tuna was viewed as inexpensive (only seven percent thought tuna was expensive). More viewed tuna as an ideal snack than viewed salmon as an ideal snack.

One third of those sampled bought canned salmon at least once a month, with frequency highest in the middle and lower end social classes. Close to 30 percent purchased canned salmon only as regularly as every fourth month. Purchase of canned salmon seems to be stable, however, with 89 percent of the sample indicating they would buy the same amount of salmon over the next year.

Recognition of Alaska salmon as a source of canned salmon is relatively low in the UK. On an unprompted basis, only four percent of those surveyed identified Alaska as a source for canned salmon. Canada garnered a 36 percent recognition rate, while Scotland scored 23 percent.



Argyll's trading manager for fish and AGB both note a general trend among food shoppers in the UK which will affect all types of salmon as well as other food products. They say the UK shopper is much more alert to "food scares" than in the past. Reports of nematodes in cod and herring, salmonella in eggs, listeria in patés and cooked meats, and the "mad beef" phenomenon have all been catastrophic in the UK food markets. The trading manager also notes an increasing trend by UK shoppers to shop environmentally—considering food packaging, ozone layers, food chemicals and hormone additives.

## FRANCE

### **Largest in Europe—third largest in world—France is major salmon market force**

With over 1 million tons of seafood consumed in 1988, France is one of the European Economic Community's largest seafood markets. Monfort notes that with growth in seafood demand during the past 20 years, and French seafood landings relatively stable, France relies to an increasing extent on imports.

Consumption of fresh and frozen seafood in France in 1988 was estimated to be 18.4 kilograms per person. Consumption of salmon per person was about .95 kilograms per person, compared to 1.9 kilograms of cod per person.

France now is the largest European market for salmon and the world's third largest salmon market (trailing Japan and the U.S.). Salmon demand in France has grown dramatically due to availability of the product and relative price drops. Only very small amounts of imported salmon are processed and then exported, so imports accurately reflect French demand.

French demand for salmon grew from 39 million pounds in 1982 to 113 million pounds in 1989, according to Monfort. Most of that demand is for fresh, frozen and smoked salmon.

France has very limited demand for canned salmon. None is produced domestically, and less than 10 million pounds were consumed in 1989. As in other countries, Monfort reports, canned salmon is not perceived to be as nutritionally wholesome as fresh/frozen or smoked.

In 1982, the ratio of Pacific salmon to Atlantics imported by France was about 3:1. By 1989, the ratio of Pacific to Atlantics imported was about 1:5. The growth in French salmon consumption has been fueled almost entirely by imports of Atlantic salmon.

	1982	1984	1986	1988	1989
Total (mp)	40	51	71	91	113
Atlantic	10	16	33	61	94
Pacific	30	35	40	30	19



The market share for Pacific salmon dropped from 74 percent in 1982 to 17 percent in 1989 while demand for Atlantics increased tenfold during the same period, according to Monfort. Most of the Atlantics are from Norway, but the most prized Atlantics are of Scottish origin and Scottish salmon commands a small price premium over Norwegian. Clearly, increased salmon demand in France has not been covered by France's traditional suppliers—the U.S. and Canada—but by farmed salmon newcomers like Norway and Scotland and more recently Ireland and the Faroes.

**U.S. imports maintain some French preference, despite onslaught of farmed**

*Globefish* attributes Norwegian marketing efforts for much of the French increase in salmon consumption. The U.N. agency notes that fresh farmed salmon competes with turbot, sole, sea bass and hake and with frozen Pacific salmon that is usually offered at lower prices in freezer centers and retail outlets. *Globefish* notes, however, that while price is a key issue in substitution between Pacific and Atlantic, there is a market for those who prefer Pacific.

Monfort does not believe the Norwegian salmon incursions are irreversible. She notes that some of the recent shipments of Norwegian salmon did not meet quality expectations. She also notes that U.S. imports have at least three major advantages: the fish is red; the fish is wild; and French importers are familiar with Pacific salmon.

On the other hand, Monfort notes, both Norway and Scotland salmon producers opened offices in France in 1988. Promotional efforts involve regular and direct contact with importers, processors and distributors. Both offices have two permanent employees. The Norwegians have a budget of four to six million French francs, and Scotland's budget is two to three million French francs.

France also is farming salmon and harvested about 3 million pounds in 1990. The marketing approach for this salmon apparently will emphasize its French origins.

**Smoked salmon is French staple; 43% of imports, half of Pacific, destined for smoking**

In 1988, 43 percent of all salmon imports went into the smoking market. Fresh salmon imports (46 million pounds) were distributed to retail markets (40 percent), the catering sector (40 percent) and the smokers (20 percent). All 14 million pounds of imported frozen Atlantics went to smokers. About 50 percent of the imported frozen Pacifics (30 million pounds) went to the smokers in 1988, with 40 percent going to other processors and 10 percent to retail markets.

The market for smoked salmon in France, where it is usually served sliced with lemon and warm toast, seems almost limitless. Consumption of smoked salmon is seasonal with high demand at the end of the year and, to some extent, at Easter.

In 1989, Monfort notes, French smokers absorbed between 39 and 50 million pounds of salmon and produced 26 to 33 million pounds of smoked salmon. The

smoked salmon is marketed in whole sides, both fresh and frozen, and in small, mostly fresh packs of slices. Traditional smoked salmon markets were small food outlets and delis, but more recently the trend is toward vacuum-packed smoked salmon through other retail markets—mainly multiples.

Smoked Atlantic salmon is considered high-end and is sold through delis and restaurants. Smoked Pacific salmon is mostly marketed through the multiples. *Globefish* cautions that smoked Pacific consumption must be analyzed carefully, since some of that consumption includes high-value king and coho salmon by consumers with a taste preference for both species.

Other salmon processing has occurred to meet the demand for convenient prepared dishes. This segment has grown with the demand for healthy and low-calorie meals. Growth in this sector also has been more apparent since salmon became available year-round and at lower prices.

Fresh salmon is sold through retail outlets in several product forms: whole, head on, gutted or not (the trend has been toward gutted and away from the traditional not-gutted); in 100-gram to 200-gram fillets; and in 100-gram to 200-gram steaks. *Globefish* notes that the market for fresh salmon is less seasonal than in many other countries, and less seasonal than sales of smoked salmon.

#### **Seafood demand—and salmon demand— projected to continue surge until mid-1990**

Because of a relative price drop, salmon has been replacing other high-profile fish like turbot, sea bass and sole in the catering sector. Usually salmon penetration in restaurants has been in the high class restaurants. To improve their image, some commercial restaurants favor fresh salmon and use Atlantics almost exclusively.

Growth potential for salmon consumption in France is high, Monfort notes. Observers have noted the general increase in seafood consumption and that seafood consumption growth, to this point, has been confined to a relatively limited portion of the population. If prices remain competitive with other species, salmon will be an important part of the processing industries' seafood products.

*Globefish*'s analysis of the French market led to the conclusion that the French market is more species-conscious and knowledgeable with respect to salmon than other European markets.

A recent study cited by Monfort foresees that demand for seafood will increase annually in France by about 2.2 percent until the year 2000, while population growth will be in the neighborhood of .3 percent per year. With this growth at this rate, it can be expected salmon consumption would reach about 132 million pounds per year by the year 2000.

But examination of the growth of salmon consumption since the beginning of the 1980s shows that the rate of salmon consumption has grown annually by 11.9

percent—far higher than projections based on overall seafood consumption. If salmon consumption keeps growing at the rate evident since 1982, consumption of salmon will reach 238 million pounds by 1995.

## BELGIUM

### **Small nation with large salmon appetite; smokers have dominated; fresh/farmed is increasing**

Consumption rates for salmon are relatively high in this small nation, with per capita consumption estimated to be about 600 grams. That translates to about 13 million pounds per annum.

The domestic smoking industry takes about half of all imports (a large portion of which is Pacific salmon). Both Pacifics and Atlantic salmon are sold in the smoked markets, with a premium paid for Atlantic salmon. Fresh salmon from Norway, and increasingly from Scotland, goes to markets where it is sold whole (often steaked at the selling point) or in fillets.

During the past decade, there has been a decrease in frozen salmon imports and a large increase in fresh salmon imports. Smoked salmon imports have remained relatively stable.

	1980	1984	1986	1989
Fresh (t p)	742	2,572	5,216	10,000
Frozen	4,296	4,188	3,847	2,425
Smoked	899	575	656	1,285

The market in Belgium is relatively well-developed. Demand is growing regularly and is expected to continue to do so. If demand does grow as expected, Monfort predicts consumption of salmon in the neighborhood of about 26 million pounds by 1995. *Globefish* believes the salmon market expansion prospects for Belgium are similar to prospects in the UK, France and Germany, with growth to be spurred by rising incomes and falling salmon prices.

## THE NETHERLANDS

### **Salmon consumption jumped last decade, but limited growth predicted**

Demand for salmon in the Netherlands has more than tripled during the past decade, from about 2 million pounds to about 7 million pounds. Per capita consumption is about 220 grams per year.

The bulk of imports is used for smoking (about 70 percent) with the rest going into the retail fresh market. Pacifics are usually diverted into the smoking sector while Atlantic salmon are used both for smoking and for fresh sales.

Consumption in the retail sector presently occurs almost entirely during the Christmas period, largely because of price. Salmon is viewed as a luxury item. Dutch smokers have found export markets easier and more profitable to develop.

*Globefish* notes the increase in consumption is based on imports of farmed salmon in fresh form. Imports of Pacific salmon, however, seem to be holding their own.

Compared to other EEC countries, prospects for growth in the salmon markets are limited, according to Monfort. Seafood consumption growth in the Netherlands is lower than other countries. Average seafood consumption growth is expected to be about .6 percent annually to the year 2000. During the past decade, growth in salmon consumption has been about 11 percent per year. If that trend continues to 1995, salmon imports would reach about 14 million pounds.

## GERMANY

### **Big reduction in commercial production boosts seafood imports; consumers favor prepared/preserved**

Landings of seafood in Germany have fallen dramatically, from about 1.5 billion pounds in the early 1970s to 440 million pounds in 1987. This cutback is mainly attributable to restriction of access in waters traditionally fished by the Germans. Germany is a net importer of seafood.

Average consumption of seafood was 13.2 kilograms in 1989 (up from 11.8 kilograms in 1987, when there was a drop due to a national concern about fish worms). The market in Germany is dominated by prepared and preserved seafood such as canned, marinades and smoked. These market sectors constitute about 65 percent of sales. Frozen products take 20 percent of sales with fresh seafood accounting for about 15 percent.

### **Most salmon is imported fresh, consumed smoked; demand grows in static seafood market**

About 80 percent of salmon imports are purchased in fresh form, Monfort says. In 1989, Germany imported 32 million pounds of salmon. Average per capita consumption was about 240 grams. About half of the salmon consumed is smoked; the rest is fresh.

German demand for salmon in the 1980s grew at an annual rate of 13 percent. *Globefish* notes this increased demand for salmon has happened in spite of a relatively flat market for seafood in general. If current trends continue, demand in 1995 will be about 74 million pounds, according to Monfort. That will be about 560 grams per person.

Fresh Atlantics are sold through fishmongers and in wet fish counters in multiples. They are displayed whole, head on and gutted. Interest in pre-packaged is reportedly growing.

Smokers buy both Atlantics and Pacific. The high quality smoked products are usually Atlantics, as is the case in France. Demand for smoked fish peaks at the end of the year with 30 to 40 percent of all sales occurring at that time. There is another small peak near Easter.

A larger percentage of fresh sales of salmon are in the restaurant rather than the retail sector, according to *Globefish*. The agency notes, however, that interest in fresh salmon in the retail markets is increasing. Retail outlets include specialty fish retailers, most department stores and some supermarkets with fish counters.

Salmon are imported into Germany primarily by specialty importers in the Hamburg and Bremerhaven areas or by large wholesalers. The catering sector is usually supplied by regional wholesalers, as are the specialty fish retailers. Some of the larger retail groups buy directly from importers. There is no central fish auction market as there is in the UK and France.

**Atlantic growth, Pacific decline parallels overall European import trend**

Over the past decade, imports of Pacific salmon have dropped, while there has been dramatic growth in the import of Atlantics. About 60 percent of all salmon in 1980 were Pacifics but that market share dropped to 11 percent in 1989. Norway supplied the bulk of salmon to Germany in 1989.

	1980	1984	1986	1989
Pacifics (mp)	5.8	5	3.2	3.5
Atlantics	3.7	7.1	12.6	28.6

*Globefish* reports that promotional efforts by the Norwegians, very high real incomes, extension of sales in supermarkets, and increased availability of quality salmon will contribute to a growing salmon market. The U.N. agency also believes that competition from Pacific salmon is not perceived as a threat to Atlantics given the "growing preference for Atlantic salmon in the smoking sector and low quality image of Pacific salmon."

Demand for seafood is not likely to grow that rapidly. However, the need for convenient food forms (processed and ready-to-eat dishes) should continue to grow. The processing industry may turn to salmon to fulfill that growing niche provided salmon prices remain competitive. *Globefish* reports the market for frozen prepared meals grew by 50 percent between 1980 and 1987 and there appears to be some room for salmon dishes in this market.

## SPAIN

**Salmon is growing segment of Europe's number one seafood market**

The Spanish seafood market is the largest in Europe, with 2,645 billion pounds of product sold in 1988. Per capita consumption of seafood is more than 30 kilograms per year.

The demand for fresh fish is especially high (68 percent of total consumption in 1989) but demand for frozen fish is also increasing. Frozen fish sales grew from 440 million pounds in 1987 to 551 million pounds in 1988.

Demand for salmon in 1989 amounted to 24 million pounds, Monfort reports. That translates to a per capita consumption rate per year of about 280 grams. While demand for salmon has increased threefold over the past decade, very little of that demand is satisfied with Pacific salmon. Very small quantities of Atlantic salmon are farmed in Spain.

	1980	1984	1986	1989
Pacific(mp)	.6	1.6	.3	.8
Atlantic	.4	2	5.8	24.4

More than half of the salmon goes to the smoking industry while the remainder is sold fresh in restaurants. Only marginal amounts are sold in retail outlets, according to Monfort.

Farmed salmon is handled by importers who supply wholesalers in the main fish markets. In some cases, importers are smokers who sell small portions of their purchases through the fresh fish system.

**Norwegian farmed has stronghold on Spain's current and projected salmon increases**

Norway is the dominant supplier of salmon, with 20 million pounds in 1989. Scotland provided about 1.5 million pounds that year. Success of Norwegian marketers, traders report, is based on successful marketing by the Norwegian Farmed Fish Marketing Association. Spain's entry into the European Community and the resulting reduced tariffs on salmon also contributed to the growth in salmon consumption.

A relatively high population growth, growth in personal income and a demand for high profile foods are expected to contribute to growth in salmon imports. *GlobeFish* notes that a static supply of fish species consumed from the wild fishery will also contribute to a growth in the consumption of imported salmon.

The number of supermarkets in Spain is growing rapidly and the larger supermarkets have extensive fresh fish counters. Salmon is very substitutable with turbot, hake and

bass, according to *Globefish*, and decisions to purchase are made based on price and the relative availability of other species.

Seafood consumption is expected to increase by about 1.9 percent per year till 2000. Salmon consumption is expected to grow as well, though predictions are difficult. The 39 percent growth rate for salmon in the 1980s may be misleading because of the very small amounts consumed in the early part of the decade.

Monfort assumes a growth rate for salmon in the neighborhood of about 15 percent per year, which translates to total salmon consumption in 1995 of about 66 million pounds. That represents less than two percent of total fish consumption. She bases her prediction on similar growth rates in other EEC countries.

*Globefish* outlines the case for a favorable salmon market in Spain because of Spain's increasing interest in northern European products. Also, increasing competition from within Europe is likely to improve the variable quality of Spanish smoked salmon, and seasonality of sales will even out as supermarkets handle more salmon and stimulate consumption. Increasing promotional efforts of salmon producers—especially the Norwegians—will also be a factor.

## ITALY

### **Salmon is currently small player in large Italian seafood market**

Demand for seafood in Italy is high at about 2.2 billion pounds per year. Nearly 70 percent of Italian demand is supplied by Italian fishermen, with 30 percent imported. Per capita seafood consumption is about 14.3 kilograms, most of which is consumed in fresh form.

According to Monfort, Italian demand for salmon is very light. Less than 11 million pounds were consumed in 1989, which translates to about 90 grams per person annually.

Kings and cohos are used in the domestic smoking industry and an additional 5 million pounds of smoked salmon were imported in 1989. *Globefish* reports that there seems to be a preference for fairly hard smoked sockeyes from wild Pacific fisheries, but that preferences may be changing with the rise in availability of smoked Atlantics. Smoked Atlantics seem to dominate in the upscale markets.

While some Atlantics are smoked, the majority go into the retail markets as fresh fish. Fresh Atlantics are perceived as a substitute for higher-profile sea bass and other species. Very little is currently used in the catering sector but that is expected to change in the future.

Norway is the dominant supplier of Atlantics. The market buys mainly ungutted salmon, with a preference for 2- to 3-kg and 3- to 4-kg fish; larger fish have been difficult to sell, according to *Globefish*.



Salmon is a relatively new product in the Italian market, so sales have not had a demonstrable effect on other species. As in France and Spain, the main competition is likely to be from sea bass and sea bream.

Most sales are during the Christmas and Easter seasons. The ratio of sales, according to *Globefish*, is 60:40 catering to retail.

**Salmon expected to match or surpass projected seafood increases**

Demand for seafood in Italy is expected to grow at a rapid clip—about 2.4 percent annually until 2000. Monfort expects the demand for salmon will grow at an even faster rate, since Italy is characterized by rapidly increasing levels of personal income.

Monfort expects growth in salmon consumption will be about 15.2 percent per year, with 1995 consumption reaching 30 million pounds. Growth in the catering section (especially in northern Italy) will be most dramatic.

## AUSTRALIA

**Trade barriers limit Australian imports to canned**

The Australian market has been a traditional canned salmon market for Alaska pink salmon and sockeyes. There is no fresh or frozen market for salmon, other than for farmed Tasmanian salmon, because of artificial trade barriers imposed on all imports of fresh and frozen fish.

Canned salmon suppliers include John West (out of the United Kingdom) and other suppliers, as well as generic brand suppliers and "others". The "others" category includes high seas salmon canned in Asian countries and commonly referred to as outlaw salmon.

John West buys through the UK and supplies UK outlets and Australian outlets. They recently bought two other canned salmon brands selling in Australia. In spite of the company's expansion, sales of canned pinks dropped about 10 percent between September 1989 and September 1990. Canned sockeye sales rose about 6.8 percent during that year—an anemic increase considering that prices dropped about 20 percent. Market gains have been captured in the Australian canned salmon market by the outlaw salmon importers.

There have been some efforts—most recently by Canadians—to eliminate the trade barriers for fresh and frozen salmon. Removal of the barriers would clearly provide opportunities, since Australians are already familiar with salmon through the canned sales.



# QUALITY SURVEY

## **As competition escalates, quality becomes chief marketplace concern**

There is an obvious link between product quality and product success in the marketplace for salmon. In the increasingly competitive world of salmon marketing, quality is central to the advertising campaigns of the Chileans, Norwegians, Canadians, Shetland Islanders and other producers of farmed salmon.

## **Leading farmed producers jump on "quality" marketing bandwagon**

During the late 1970s, Norwegian salmon importers in the U.S. built an identity for their farmed salmon by marketing—to the trade—the twin attributes of quality and consistent supply. The Norwegians now say their quality control is the "strictest in the world", the Chileans maintain they inspect every fish, and the Canadians claim to raise quality salmon in the unpolluted waters of British Columbia.

## **Farmed and wild on equal ground when caught**

Quality also is being marketed by handlers of wild Pacific salmon. It is clear that wild or ranched Pacific salmon are at least the equal of farmed salmon when they are pulled from the waters of the North Pacific. The quality of wild and ranched salmon can change, however, after the fish comes over the transom.

## **Trade favors farmed salmon's consistent quality and availability**

Martin Warp, a vice president of the Oregon Lox Company, wrote a letter recently to the *Alaska Fisherman's Journal* noting his belief that a farmed Atlantic salmon can't "hold a candle to well-handled commercially caught Pacific salmon." But he continues:

*"I think it's arrogant to promote Alaskan, B.C. or Washington wild salmon as superior to any other salmon if they're only superior when they first come out of the water. Although it stirs my patriotism to hear how wonderful wild Alaskan Pacific*

*salmon are when they leave the water, what matters to us, and companies like us, is what they look like when they get here, dressed and frozen."*

**Wild Pacific salmon will lose  
against farmed if quality issue not addressed**

Mr. Warp believes there needs to be a greater level of cooperation between fishermen, contract tenders and processors if wild Pacific salmon are to compete favorably against farmed salmon. He contends: "If the color of wild fish is better but they are badly bruised, people will buy Atlantics. If the taste of a wild fish is better but they're soft and split, people will buy Atlantics. If wild fish are aesthetically more appealing but are belly-burned, people will buy Atlantics."

Mr. Warp's assessment is shared by others in the marketplace. The manager of seafood marketing for a chain store with 160 outlets in Texas was quoted in the *Alaska Fisherman's Journal* as saying "I'm very sold on aquaculture product. For consistency in price, consistency in quality, consistency in availability, nothing touches the fresh product out of the Northeast. I don't even consider Alaska product anymore."

Because quality is the foundation for many farmed salmon producers' advertising campaigns, and because some in the trade are critical of the quality of wild salmon they receive, ASMI staff reviewed some recent assessments of salmon markets—especially the quality components of those assessments. Also, in the summer of 1990, ASMI's quality coordinator conducted a survey of the salmon trade to assess trade attitudes toward farmed and wild salmon.

This section of the Salmon 2000 report provides a quick glance at previous market surveys that reviewed quality characteristics, as well as an overview of the results of the ASMI-conducted survey. Additional survey data is available from ASMI staff.

## RECENT STUDIES

**Farmed Atlantic imports will grow in U.S.**

In a study titled "The Marketing Relationship between Pacific and Pen-Reared Salmon" (1986), Ronald Rogness and Biing-Hwan Lin surveyed top seafood wholesalers handling salmon. They concluded that the number of distributors and the volume of imports of pen-raised Atlantic salmon would continue to grow in the U.S. They found a significant number of the companies they spoke to would likely substitute fresh Atlantic salmon for fresh Pacific salmon.

They also concluded that since the majority of harvested Alaska salmon is marketed frozen, the expected growth in pen-raised Atlantic salmon markets over the short term might impact only a small portion of the total U. S. salmon industry. However, they added, if and when a glut in the supply of pen-raised salmon occurred, the marketing relationship between Atlantic and Pacific salmon would change.

Four years later, the pair did a follow-up survey ("U.S. Salmon Markets: A Survey of Seafood Wholesalers", 1990) to more closely examine farmed and wild salmon substitution. Consistency in supply *and quality* were identified by the majority of respondents as the main advantages of farmed salmon over wild Pacific species.

James Anderson looked at price impacts of farmed salmon on traditional Alaska salmon markets ("World Markets for Salmon: Pen-reared Salmon Impacts", 1988). He states:

*"For all markets, the most significant anticipated change is the dramatic increase in supply of premium quality salmon as farming increases. This study and market survey data from a number of other sources indicates that many new customers are entering the salmon market due to increased consumer awareness and the consistent quality and year-round availability of fresh farmed salmon."*

Anderson's findings in part support an axiom within the seafood industry: across all regions and types of buyers, quality is the most important factor. According to Anderson, the key to improved sales is a consistent supply of high-quality fish.

#### **U.S. consumer doesn't distinguish farmed and wild—but echoes trade demands**

Canada's Department of Fisheries and Oceans (DFO) commissioned a study aimed at measuring American consumer attitudes on fresh and frozen salmon ("U.S. Salmon Consumer Survey", David Egan and Gordon Gislason, 1989). Since most marketing surveys traditionally target the trade, results of this research are especially interesting, as they provide insight into salmon purchasing behavior by the end user.

A portion of the consumer survey was devoted to anecdotal comments by the consumers. Quality was clearly the single most important issue for many consumers. Survey subjects ranged from obviously sophisticated salmon consumers ("There is a large variation in salmon—i.e. coho, Copper River king etc., and the quality of these fish varies much more than my favorite—swordfish"; or "Because of the lack of grading standards for fish, I am getting hesitant to purchase or consume any fish") to the less sophisticated ("Sometimes fresh and frozen fish is not fresh here in Texas—I'd like more North Atlantic or Pacific varieties over Gulf varieties").

In addition to anecdotal comments, the surveyors identified three additional items of interest. First, among American consumers surveyed, there is a higher preference for fresh salmon than for frozen, both at the retail and restaurant levels ("I consider fresh fish to be tastier" or "Salmon has always been my favorite and I eat it every chance I get—but always fresh"). Second, fresh salmon is normally purchased by consumers in some semi-processed form and not in whole form. Finally, the DFO survey concluded that the majority of American consumers do not perceive a difference between farmed and wild salmon.

## ASMI TRADE SURVEY ON SALMON QUALITY

### Trade at all levels relates experience with farmed vs. wild

ASMI's quality program staff developed a survey questionnaire targeting various levels of the seafood trade. The purpose of the survey was to collect anecdotal information from retailers, wholesalers, restaurateurs, seafood brokers and specialty seafood shops about their buying experiences with wild and farmed salmon, based on a set of quality attributes described in the questionnaire (which follows this document).

The anecdotal findings are useful for several reasons. First, the opinions about salmon quality from these seafood handlers serve as a source of market information for Alaska seafood suppliers. Second, areas for further quantitative research in seafood quality are identified. Finally, ASMI identifies trade contacts with potentially new markets.

Originally, 100 key trade people were to be contacted and interviewed by telephone. Lists were developed from the National Fisheries Institute (NFI) Blue Book register of the top 50 foodservice companies and top 50 restaurants and wholesalers. No effort was made to segregate the companies by geographic region.

Wholesalers, restaurants and foodservice companies were selected based on gross earnings—the bigger the firm, the more likely it would be included in the survey. Specialty seafood shops were randomly selected out of regional phone books. After numerous attempts to reach a significant portion of companies by phone proved unsuccessful, mail questionnaires were developed and sent to the people identified earlier for the phone survey.

Three questionnaires were included per packet. One was for respondents handling both farmed and wild salmon. This was referred to as the "top form". Separate questionnaires were included for handlers of only wild salmon or only farmed salmon. All companies and respondents were kept confidential to ensure full disclosure.

The survey had an overall response rate of 30 percent.

### Breakdown of Industry Segments Contacted in Survey

	Total Contacted	# Respondents	Percent
Brokers	20	6	20%
Wholesalers	25	5	20%
Restaurant	20	5	20%
Retail	25	10	40%
Specialty	10	4	40%
	100	30	

*The survey had an overall response rate of 30%.*

Of those who completed and returned the survey, 17 percent of the responding brokers said they only handled wild salmon. Of the responding wholesalers, 20 percent also said they handled only wild salmon. Ten percent of the retailers, 40 percent of responding restaurateurs and 25 percent of specialty seafood shops handled farmed salmon only.

Results from the respondents who only handled wild or farmed salmon, but not both types, were not used in the overall analysis but were included for purposes of determining why one type of salmon was used to the sole exclusion of the other.

### **Assumptions**

Four assumptions were developed prior to initiating the project, based on what has been printed in leading seafood publications; comments reported at trade shows attended by ASMI; and ASMI institutional knowledge on the subject:

- Restaurants will prefer farm-raised salmon due to its consistently high quality.
- Overall, companies surveyed will handle mostly fresh salmon, and will identify high prices and lack of consistent supply as barriers to greater wild salmon consumption in these markets.
- Wild salmon will win out over farm-raised in the "taste" category.
- Overall, farm-raised salmon will be the buyers' choice at all levels of the trade due to:
  - competitive pricing
  - consistently high quality
  - consistent supply/availability

### **Results compared to assumptions**

Assumption #1: This was not clearly supported. Quality was rated "essential" by all restaurateurs. The consistency of farmed salmon quality was rated "excellent" by a majority of respondents, yet two thirds of respondents also rated wild salmon as having very good and consistent quality.

Assumption #2: This assumption was partially supported. All segments of the trade did handle mostly fresh salmon. However, only restaurateurs cited higher prices for wild salmon as a negative for greater purchasing of wild salmon.

All other segments said that not only were higher prices not a problem with wild salmon, but its competitive price in fact served as a positive factor in a buyer's consideration. The lack of consistent supply of wild salmon was, however, a major barrier to all segments except brokers in the decision to handle more wild salmon.

Assumption #3: This assumption was not supported. Only specialty shop operators gave a taste advantage to the wild salmon. All other segments surveyed indicated that "taste" was essentially the same for both wild and farmed.

Finally, assumption #4: This assumption was partially correct. On competitive pricing, brokers and retailers rated pricing about the same; wholesalers and specialty shops rated wild salmon slightly better; and restaurateurs rated farmed salmon as having more competitive pricing. All segments surveyed unanimously agreed that farmed salmon had a consistently higher quality than wild salmon.

Brokers scored wild and farmed salmon about the same in the category of consistent supply, with a very small advantage for farmed. All other segments of the trade clearly felt consistent supply was an advantage for farmed salmon.

**Quality and supply are unanimously agreed to be barriers to wild in U.S.**

Overall, all groups agreed that major barriers to handling more wild salmon in the domestic market include a lack of consistent supply and consistent quality of wild salmon sold in the U.S. marketplace.

## RESULTS BROKEN DOWN BY INDUSTRY SEGMENT

### Brokers

Six brokers completed the questionnaire. Five handled both wild and farmed salmon, while one handled only wild. Species handled by the brokers included Atlantics, kings, sockeyes, chums, and coho. None of the responding brokers handled pink salmon.

Most brokers ranked quality of the salmon they handle as an essential attribute (the other ranked quality "very important"). Freshness, product form and price were all important for both farmed and wild, but less so than quality.

**Brokers give farmed slight edge in quality and supply, but wild wins on price**

Overall, the responding brokers appeared satisfied with the salmon they were handling—whether wild or farmed. Generally, the brokers tended to slightly favor the farmed salmon in the areas of consistent quality and supply. Most also noted that the price of wild salmon was more competitive.

## Broker Experience With Salmon by Attribute (%)

	Farm Salmon				Wild Salmon			
	EX	VG	Mg	P	EX	VG	Mg	EX
Color	25	50	25		25	75		
Texture	25	75			25	75		
Taste	25	75			50	50		
Shelf Life	25	75				100		
Packaging	25	50	25			75	25	
Lack of Bruising	25	75				25	75	
Consistent Quality	25	75				50	50	
Consistent Supply	20	50	25				75	25
Competitive Price		25	50			50	50	

KEY: EX=Excellent; VG=Very Good; Mg=Marginal; P=Poor

All brokers said their preferred product form was whole fish; they did not have a packaging preference. Two of the respondents had a preferred shipping weight—one for 50-pound boxes and the other for 25- to 40-pound boxes. Forty percent said they further processed the salmon after purchase into steaks and fillets.

The broker handling only wild salmon felt that the wild held advantages over farmed salmon in the categories of color and taste. Most broker respondents, though, felt farmed salmon offered several quality advantages, including: lack of bruising, consistency in quality, and longer shelf life. They also mentioned farmed advantages of better packaging, consistent supplies, color, texture, and consistent pricing.

#### Brokers will choose wild when conditions are ideal; if not, it's farmed or nothing

Brokers were asked to provide written comments describing "best case" and "first option" purchase scenarios. Those written comments include:

##### Brokers' Ideal Purchasing Scenario

- "Troll kings, 11 pounds and up, from specific salmon runs . . . boxed whole and belly iced."
- "Fresh, iced, cleaned, whole-body salmon."
- "Product from Alaska—when it arrives on time in excellent condition without transportation problems."
- "Fresh, iced and cleaned whole salmon greater than six pounds sent in 50-pound cartons. Either farm-raised or wild, depending on availability."

##### First Option Scenario (When "ideal" is not available)

- "I do not need to have (wild) salmon as a special—when all else fails I can run farmed salmon."
- "I'll survey the market for the next closest quality, etc."
- "Do without it."

Other comments from brokers included the need to improve communications from the West Coast to the East Coast; the need for air cargo improvements; and a desire for a commitment to price one month in advance.

**Wholesalers**

Five wholesalers responded to the questionnaires, including four who handled both wild and farmed salmon and one who handled wild only. In this group of five, all species of wild Pacific salmon were handled in addition to farmed Atlantics (though individual wholesalers did not necessarily handle all species).

As a group, the wholesalers were pretty much united when asked to describe buying determinants. The most important determinants included quality, species, product form and price. Less important determinants were where the salmon originated or whether the salmon was fresh, frozen, farmed, or wild.

**All things equal except quality and supply—farmed wins again, with wild's only edge in price**

The wholesalers handling both farmed and wild salmon were asked to rate the salmon attributes. Wild and farmed matched closely in color, texture, taste and shelf life attributes. Farmed were rated higher in packaging, lack of bruising, consistent quality and consistent supply. Wild edged farmed salmon in the pricing attribute.

**Wholesaler Experience with Salmon by Attribute(%)**

	Farm Salmon				Wild Salmon			
	EX	VG	Mg	P	EX	VG	Mg	EX
Color	25	50	25		25	75		
Texture	25	75			25	75		
Taste	25	75			50	50		
Shelf Life	25	75				100		
Packaging	25	50	25			75	25	
Lack of Bruising	25	75				25	75	
Consistent Quality	25	75				50	50	
Consistant Supply	20	50	25				75	25
Competitive Price		25	50			50	50	

KEY: EX=Excellent; VG=Very Good; Mg=Marginal; P=Poor

Most responding wholesalers preferred handling whole salmon. One said he also purchased steaks and one said he bought only fillets. Wild salmon was purchased in weights of 6 to 9 pounds and 9 pounds and up by each respondent. Most of those handling farmed salmon preferred the 4- to 5-kilogram fish, though some preferred the smaller fish.



Unlike the brokers, the majority of wholesalers did not process their salmon further after purchase. One who did add value produces fillets. The three who indicated a packaging preference use vacuum packed product. There was no unanimity on carton sizes, with preferences ranging from "less than 30-pound containers" to 50- and 100-pound containers.

The one wholesaler who handled only wild salmon dealt with chum salmon. When asked why he did not deal in farmed, his response was "price/color". This wholesaler did find wild salmon grading terms confusing but ranked the quality of the salmon as very good.

### **Wholesalers use fresh and frozen in variety of forms; again farmed often favored only when wild supply and quality falls short**

Wholesalers, like the brokers, also were asked to provide written comments about their best case and first option purchasing scenarios. The comments include:

#### *Wholesalers' Ideal Purchasing Scenario*

- "We use high-quality frozen salmon, both pre-portioned and whole, and also buy fresh, iced salmon for some reprocessing."
- "Only fresh, whole/gutted with gills attached."
- "Our customers prefer seasonal supplies of frozen salmon for overseas; domestic customers like fresh farmed salmon served in restaurants."

#### *First Option Scenario*

- "We take an inventory position."
- "We use farm-raised salmon when fresh wild salmon is not available or is inconsistent in quality or availability."
- "We do not carry salmon (then)."
- "We'll find a close substitute."

### **One wholesaler points to typical quality predicament with wild**

Quality was targeted by one of the wholesalers who took the time to write additional comments. He noted:

*"I would like to mention a particularly upsetting problem we experienced the last few years, with emphasis on this year. Many people look forward to the Copper River King opening as an excellent way to market a high-quality, fresh Alaska salmon. Due to the press this opening has received, the fish can really command a higher price to the consumer. Unfortunately, the quality of all the Copper River salmon we handled this year was very poor due to improper handling by the fishermen and others in the distribution chain.*

*We had several complaints from some of our major restaurant customers, one of whom said he experienced the same quality problems from three different Seattle-based distributors and (the restaurant) refused to serve (Alaska salmon) the remainder of the opening. This type of problem can destroy a marketing plan that has taken years to develop.*

*We purchased one-third of what we did the previous year at a time when our fresh fish sales were up .35 percent over the same time period. Our only means to combat this are complaints to suppliers and using our purchasing dollars for other products."*

**Restaurant**

Five restauranteurs responded to the questionnaire, three of whom handled both wild and farmed salmon and two who handled only farmed salmon. Those who served wild handled reds, cohos, pinks and chums; those who handled farmed served Atlantics, kings and cohos.

Purchasing decisions by those who handled both farmed and wild were similar to those of other trade segments. Quality was rated essential by the restauranteurs who handled both. Farmed or wild was not as important a determinant as product form or species. Freshness was a higher rated value than frozen.

**Restauranteurs echo other segments: farmed for quality/supply, packaging and appearance; wild for price**

The restauranteurs handling both wild and farmed salmon, like other trade segments, rated the attributes of both. Wild and farmed were closely matched in the attributes of color, texture and taste, but farmed was rated higher in packaging, shelf life, lack of bruising, consistent supply, consistent quality, and price. With the exception of price, these ratings are similar to the ratings given by brokers and wholesalers. Brokers and wholesalers generally gave the pricing nod to wild salmon.

**Restaurant Experience with Salmon by Attribute**

	Farm Salmon				Wild Salmon			
	EX	VG	Mg	P	EX	VG	Mg	P
Color	33.4%	66.6%			33.4%	66.6%		
Texture		100%				100%		
Taste		66.6%	33.4%			66.6%		33.3%
Shelf Life	66.6%	33.4%				66.6%	33.3%	
Packaging	33.4%	66.6%				66.6%	33.3%	
Lack of Bruising	66.6%	33.3%				33.3%	33.3%	33.3%
Consistent Quality	66.6%	33.3%				66.6%	33.3%	
Consistent Supply	66.6%	33.3%					33.4%	66.6%
Competitive Price	33.3%	33.3%	33.3%				100%	

KEY: EX=Excellent; VG=Very Good; Mg=Marginal; P=Poor

Two of the three restauranteurs handling both wild and farmed salmon thought the grading terms were confusing. One noted "Due to the (grading) terminology, the average buyer does not understand the difference in fish, quality, etc., and, hence, is probably not receiving what he thought he ordered. Some people use these terms to commit economic fraud."

When asked to list preferred product forms, most said they preferred whole salmon, while those who handled only farmed preferred headed and gutted. One added he also purchased steaks, while another said he bought only fillets. The wild salmon was purchased, generally, in weights of 6 to 9 pounds and 9 pounds and up. Two of the three who served farmed preferred the 3 - to 4-kilogram size fish, while the other preferred 4 - to 5-kilogram fish. The farmed-salmon-only purchasers preferred the larger 4-5s and 6-7s.

The restaurateurs generally processed their salmon further after purchase. Of those who served both wild and farmed, one made steaks, the other fillets and the last "other portions".

Those serving only farmed rated farmed salmon as superior from top to bottom in all attributes, including pricing. Those who served both wild and farmed were split on color, taste, texture and shelf life.

#### **Restaurateurs demand a variety of forms; freshness is only constant**

As with other segments of the salmon trade, restaurateurs were asked to comment on their "best case" and "first option" purchasing scenarios. The comments include:

##### *Restaurateurs' Best Purchasing Scenario*

- "We use salmon so many different ways, it depends on the particular need at the time."
- "Fresh, headed and gutted with plenty of ice."
- "Fresh, boneless fillets and fresh steaks."

##### *First Option Scenario*

- "We always get what we need."
- "We only serve fresh year round."

#### **Restaurateur points to opportunity in "natural" rather than "wild" label**

Additional comments from restaurateurs ranged from improving the flavor to raising the profile of wild salmon. One wrote:

*"We will use wild salmon when it is available—if [it is] not, we will buy farmed salmon. As for frozen salmon versus fresh farm-raised: the farmed advantage is due to the consumer perception that frozen is not as good as fresh, even if the quality of frozen is better. Saying "wild" salmon is a lousy marketing tool—it denotes "gamier" taste in product and customers won't buy that. Also, some people perceive farm-raised fishing as less cruel than capturing wild fish. Suggest too that you use the word "natural" instead of "wild" in your advertising. Of course, the biggest disadvantage to farmed salmon are antibiotics, steroids etc., so using "natural" for your product is a BIG positive."*

Another noted:

*"We cannot commit our national program to Alaska Pacific salmon primarily because of irregularity in supply. We need to set national specifications for our company, which means using farmed Atlantic for their continuity of product and consistent supply. We also get about two extra days shelf life on our single gill cut fish slaughtered at a plant versus killed at the pen site."*

**Retailers**

Ten retailers responded to the questionnaire—nine handled both farmed and wild salmon, while one handled farmed salmon only. All five species of Pacific salmon as well as the farmed Atlantic were handled within this group of ten. Farmed kings and cohos and wild kings and cohos were part of the product mix.

Quality and freshness were two major factors affecting purchasing decisions by retailers. Species, origin, whether a salmon was wild or farmed, price, and product form were less important buying determinants.

When quantifying attributes of the wild and farmed, retailers generally favored wild for color, texture and taste—though not by much. Farmed salmon were rated highly on the attributes of shelf life, packaging, lack of bruising, consistent quality, and consistent supply. Wild and farmed were rated equally on competitive pricing.

**Retailer Experience with Salmon by Attribute (%)**

	Farm Salmon				Wild Salmon			
	EX	VG	Mg	P	EX	VG	Mg	P
Color	29	14	47		37.5	50	12.5	
Texture	12.5	50	37.5		12.5	75	12.5	
Taste	12.5	75	12.5		22	78		
Shelf Life	37.5	50	12.5		12.5	50	37.5	
Packaging	25	62.5		12.5	12.5	50	37.5	
Lack of Bruising	22	78				62.5	37.5	
Consistent Quality	25	75				37.5	62.5	
Consistant Supply	37.5	62.5				12.5	75	12.5
Competitive Price		75	25			75	25	

KEY: EX=Excellent; VG=Very Good; Mg=Marginal, P=Poor

The terms used to grade wild salmon prompted several comments. Most (75 percent) felt the terms were confusing. Written comments were pertinent, and factors referenced ran the gamut from lack of consistency in grading to knowing the supplier. One wrote:

*"The color designations of chum salmon are very inconsistent. Silver bright, semi-bright, darks and pale refer primarily to skin coloration. But what is really important is the meat color. The current grading system causes a lot of problems in identifying exactly what you want. Perhaps a flesh color chart—like a spectrum—with a numerical grading system could be established so the confusion would be*

*taker out of the picture. Right now we have to inspect everything, and half of it is not what we want."*

Another echoed the sentiment that meat color, not skin color, is most important, noting that "at retail we sell steaks, and the color of meat is the critical part—not the skin!"

Nearly half of the retailers (45 percent) preferred purchasing their salmon in steak or fillet form. Whole salmon were preferred by a third, and roasts by 12.5 percent. Only 12.5 percent of those buying wild salmon preferred fish above nine pounds. The preferred weight for farmed was 3 to 4 kilograms.

Most retailers prefer vacuum-packed product, but one used poly-wrap. Also, most preferred receiving their salmon in cartons of less than 50 pounds (five preferred the 25- to 40-pound cartons while three accepted only 10- to 20-pound cartons).

When asked if they felt a buying advantage existed between frozen wild salmon and fresh farmed salmon, four of the seven who answered believed there was an advantage to farmed, two believed frozen wild had the buying advantage and another said there was no competitive advantage between the two.

#### **Retailers insist on fresh or nothing**

Under the "best case" and first option purchasing scenarios, the retailers were more responsive than other members of the trade. The comments included:

##### *Retailers' Ideal Purchasing Scenario:*

- "We buy what we need when we need it. There is no need to go to the freezer when we can get the best—fresh."
- "Fresh, iced, H&G or head-on packed 1/50 lbs."
- "Purchase product steaked or filleted in vacuum pack with our label already on it . . . shelf ready. If fillets are twice frozen, then I'll buy farmed salmon."
- "Fresh, iced, cleaned, whole-body salmon for reprocessing."
- "Fresh, iced, whole-body salmon; USDC-inspected Grade A-equivalent quality."
- "High quality frozen steaks and fillet portions vacu-packed in 10-pound cartons."

*First Option Scenario*

- "We always get what we ask for . . ."
- "I go with another species or protein source."
- "We just don't place an order then."
- "We won't offer salmon then."
- "Find another supplier."
- "We buy from another supplier and base our decision on quality and price—or simply be out of the product."

The retailers were especially garrulous when they reached the "Other Comments" section. Their unedited responses included:

- "Yeah, get doing more and better marketing for frozen salmon. Your domestic market is dying!"
- "Talk about quality and "freshness" in your promotions—don't talk refrigeration/frozen stuff . . . customers need a clear nutritional picture on value of salmon versus other sources of protein."
- "Shelf life is critical at retail—same thing with quality. You people do too much blending of #1's and #3 salmon and we get burnt!"
- "Too many of us retailers have put a meat man in charge of the seafood section, and they sell and handle the product like it was chicken, beef or pork."
- "Transportation/logistics is our #1 concern. You must have adequate flights from Alaska and Seattle to handle the volume of salmon during the fresh season. Eastern U.S. customers have been consistently "short-changed" on deliveries received for advertised supermarket features. Until this problem has been resolved (with) the carriers (i.e. UPS, United, Eastern, Continental, and TWA) there will not be a viable WILD salmon business on the East Coast."
- "More standardization in grading and an emphasis on packing product for retail sale: pre-cut steaks and fillets."

- "Develop reliable grading system for your chums."
- "We've been providing our customers with information about Pacific salmon life history, harvesting times, gear types and salmon quality attributes for over five years. Our statewide mailout with this information goes to more than four million customers along the coast."
- "I do not want to have to purchase twice frozen fillets . . . my customers complain about the product."

**Further comments suggest U.S. suppliers not cooperative on variety of retailer needs**

The retailer who handled only farmed salmon said he needed "fresh salmon in whole, pre-cut fillets and steaks." He added that with wild salmon it is impossible and when he does get it "the quality is suspect." His other comments included:

"Meet our needs. Foreign suppliers go out of their way to do this in the areas of delivery, packaging and transportation. Handling practices along the distribution chain in the U.S. are deplorable. When will U.S. suppliers start using the styro-boxes provided to us by the Norwegians, where we get product to arrive in excellent condition?"

"Nobody from up there ever comes to us to discuss cooperative advertising to promote the currently available species. Finally, you should do more to promote your sole and other whitefish—not just salmon—and look into experimenting with new product forms for the market."

**SPECIALTY SEAFOOD SHOPS**

Four operators of specialty seafood shops answered the quality questionnaire. Three handled both wild and farmed salmon, while one handled farmed only.

Quality, price, species and product form were important to the specialty seafood operators. Fresh versus frozen was also important. Origin and whether the fish was wild or farmed were of secondary importance.

Of those who handled both wild and farmed salmon, wild was rated better in the attributes of taste and price, but farmed was more highly rated in the attributes of color, texture, shelf life, packaging, lack of bruising, consistent quality and consistent supply.

**Specialty Shop Experience with Salmon by Attribute (%)**

	Farm Salmon				Wild Salmon			
	EX	VG	Mg	P	EX	VG	Mg	P
Color	66.6%	33.3%				66.6%	33.3%	
Texture	100%					33.3%	66.6%	
Taste	33.3%	66.6%			66.6%		33.3%	
Shelf Life	100%					33.3%	33.3%	33.3%
Packaging	33.4%						66.6%	33.3%
Lack of Bruising	66.6%	33.3%				33.3%	33.3%	
Consistent Quality	100%						100%	
Consistent Supply	33.3%	66.6%				33.3%	33.3%	33.3%
Competitive Price		66.6%	33.3%		33.3%	66.6%		

KEY: EX=Excellent; VG=Very Good; Mg=Marginal; P=Poor

**Grading surfaces again as wild salmon negative**

Only one of the specialty seafood operators found wild salmon grading terms understandable. Two found the terms "confusing" and one wrote back that wild salmon are "inconsistently graded."

Three said they preferred purchasing whole salmon and said they further processed whole salmon into fillets. Two also said they made steaks and one smoked some salmon. There was no expressed preference for packaging.

Wild salmon was purchased in weights of 6 to 9 pounds by three specialty seafood operators, and one bought 9 pounds and up. With farmed salmon, three preferred the 3- to 4-kilogram fish; and one preferred 2- to 3-kilogram fish and 4 to 5-kilogram fish.

When asked if they felt that there were any competitive advantages between a fresh farm-raised salmon and a fresh wild Pacific salmon, all specialty shop operators said farmed had the advantage.

**Fresh dominates specialty's must-have list**

As with others in the trade, specialty shop operators were asked to outline their "best case" and "first option" purchasing scenarios. The comments were as follows.

*Specialty Shops' Ideal Purchasing Scenario*

- "Fresh, iced whole salmon."
- "Fresh, iced, cleaned whole body salmon for reprocessing."

*First Option Scenario*

- "Same as (a) above. . ."
- "(We) do not sell salmon if we don't get the ideal."
- "We only serve fresh year round."



Other comments echoed those made by other trade segments including the complaint about lack of consistency and honesty in grading. This respondent also noted there is a lack of grading knowledge among suppliers and there are "unethical distributors confusing the marketplace."

It was interesting to note that one of the specialty seafood operators said "I think Alaska salmon are, quality-wise, the best fish as of now." This same operator did not support his assertion in the direct question portion of the survey.

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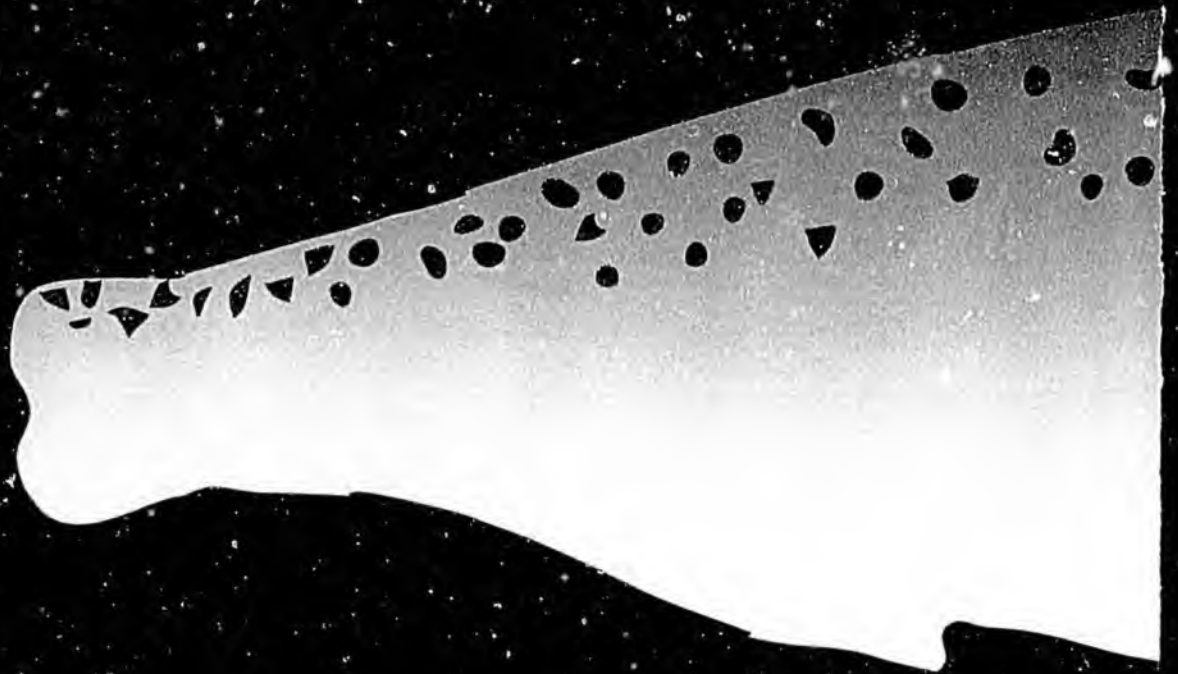
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- speeches made earlier this year at Salmon 90 in Trondheim, Norway;
- notes from speeches at Aquaculture International in Vancouver, British Columbia in early September this year;
- articles from the fishing press;
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