

HB

542

Alaska State Legislature  
House of Representatives

INTERIM

3111 C Street  
Anchorage, Alaska 99503  
(907) 561-2032



SESSION

P.O. Box V  
Juneau, Alaska 99811  
(907) 465-2995

Representative Dave Choquette

To: House Resources Committee

From: Representative Dave Choquette

Date: March 25, 1992

Re: HB 542, relating to fishing vessel fish hold inspections  
HB 543, relating to fish grading standards

As a former commercial fisherman and processor, I have long realized and fought for quality control standards within the fishing industry in Alaska. Given the fine seafood we have in our waters, I have been and remain convinced that if we set minimum standards for quality control on boats, tenders, and processors, we will consistently see quality fish at the market level. As fish brokers and the public begin to realize that Alaskan fish and seafood are premium quality, we will receive better prices and consistent markets, two major concerns of the industry.

In recent months, several articles, including the Consumer Reports article, have raised concerns about the safety of our seafood products. As a result of this national interest in seafood safety, it is likely federal legislation will be introduced which will institute a seafood inspection program. My bills lay the groundwork for the state to step in and implement a quality control program.

House Bill 542 would have the Alaska Department of Environmental Conservation (ADEC) inspect vessels to ensure that fish quality problems don't arise. They would only inspect vessels at the fishermen's request, and can issue either a one, two, or three year certificate. Inspections would be mandatory, and fishermen would be required to submit a certificate to the Commercial Fisheries Entry Commission (CFEC) with their vessel license renewal paperwork. The bill is modeled after the Canadian program which has been in effect since the 70s.



ADEC currently inspects processors and tenders. They conduct some inspections in Seattle, and would develop schedules and inspection sites to ensure that fishermen would not lose fishing time.

As with any comprehensive program, there would be enough lead time for the agency to inform fishermen what requirements they would need to meet, and how much time they had to meet them.

Provisional certificates could be issued, and if a vessel failed the inspection, an appeal process would ensure a timely, unbiased reinspection.

Right now, I plan on adding an amendment to charge a nominal fee to fishermen, based on a sliding fee schedule to cover the costs of the program. ADEC has included the fee schedule in their fiscal note preparation. I also intend to remove the University program. While education remains an important aspect of fish quality, ASMI and ADEC will continue to provide fishing groups with educational information. CFEC is also willing to send notices with their renewal packets to fishermen.

The second bill, HB 543, would establish grading standards for salmon, modeled after the federal standards. I have since found out there are problems with the federal standards, but the Alaska Seafood Marketing Association's "Premium Quality Standards," could be used as a starting point. I envision separate standards for net fisheries and troll fisheries.

Both bills will take into consideration regional differences and needs. These bills represent a starting point.

**STATE OF ALASKA**  
**1992 LEGISLATIVE SESSION**

**BILL NO. HB542**

Introduced: 2/18/92  
 Title: Fish Vessel Hold Standards/  
 Fish Quality  
 Sponsor: Rep Choquette  
 Requestor:

Department Affected: UNIVERSITY OF ALASKA  
 BRU: Public Service  
 Component: School of Fisheries

Component Serial No: 1588

**EXPENDITURES/REVENUES: (Thousands of Dollars)**

OPERATING	FY93	FY94	FY95	FY96	FY97	FY98
PERSONAL SERVICES	104.2	41.8	41.8	41.8	41.6	41.6
TRAVEL	32.0	32.0	32.0	32.0	32.0	32.0
CONTRACTUAL	40.0	14.0	14.0	14.0	14.0	14.0
SUPPLIES	1.0	1.0	1.0	1.0	1.0	1.0
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
<b>TOTAL OPERATING</b>	<b>177.2</b>	<b>88.6</b>	<b>88.6</b>	<b>88.6</b>	<b>88.6</b>	<b>88.6</b>
<b>CAPITAL</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>REVENUE FD SOURCE</b>						

**FUNDING: (Thousands of Dollars)**

GENERAL FUND	177.2	88.6	88.6	88.6	88.6	88.6
FEDERAL FUNDS						
OTHER FUNDS						
<b>TOTAL</b>	<b>177.2</b>	<b>88.6</b>	<b>88.6</b>	<b>88.6</b>	<b>88.6</b>	<b>88.6</b>

**POSITIONS:**

FULL-TIME						
PART-TIME	2	2	2	2	2	2
TEMPORARY	8	8	8	8	8	8

Estimate of current year impact: -0-

ANALYSIS (Attach additional pages as necessary)

See Pages 2 and 3

Prepared by: Marsha Hubbard, Director  
 Division: Statewide Budget Office

Phone: 474-7593  
 Date: 3/2/92

Approved by: Brian Rogers, Vice President for Finance  
 Agency: University of Alaska

Date: 3/2/92

Distribution (by preparer): Legislative Finance, Legislative Sponsor, Requestor, OMB, & Impacted Agency(ies)

FISCAL NOTE  
HB542 - Fish Vessel Hold Standards/Fish Quality

FY93 Object Code Expenditure descriptions:

PERSONAL SERVICES

- 32,500 - Education Specialist for first six months of project
- 15,000 - Temporary secretarial support for project duration
- 52,900 - Eight instructors for eight weeks each. First four weeks would be devoted to classroom/laboratory instruction while the second four weeks would be used for local on-site instruction within the following regions:
  - Prince William Sound
  - Southeast Alaska
  - Kuskokwim
  - Cook Inlet
  - Bristol Bay
  - Northwest Alaska
  - Aleutian Chain
  - Interior Yukon

- 3,800 - Media Specialist to assist with the production of publications, slides, and a training video.

104,200 - Total FY93 Personal Services

TRAVEL

- 32,000 - Travel costs associated with training at a central location as well as to regional sites.

CONTRACTUAL

- 16,000 - Production and distribution of publications and slides
- 18,000 - Production and distribution of a training video
- 6,000 - Communications, postage, etc.

SUPPLIES AND MATERIALS

- 1,000 - Supplies and materials

FISCAL NOTE  
HB542 - Fish Vessel Hold Standards/Fish Quality

FY94-FY98 Object Code Expenditures Descriptions

PERSONAL SERVICES

15,000 - Temporary secretarial support for project duration  
26,600 - Eight instructors for four weeks each which would be used for local on-site continuing education instruction within the regions previously mentioned:

41,600 - Total Personal Services

TRAVEL

32,000 - Travel costs associated with training at a central location as well as to regional sites.

CONTRACTUAL

8,000 - Production and distribution of publications and slides

6,000 - Communications, postage, etc.

14,000 - Total Contractual

SUPPLIES AND MATERIALS

1,000 - Supplies and materials

FISCAL NOTE

STATE OF ALASKA  
1992 LEGISLATIVE SESSION

BILL NO. HB 542

Revision Date: 3/25/92

Department Affected: Fish and Game

Title: Fishing vessel hold inspection and fisheries product quality control

BRU: Commercial Fisheries

Component: Commercial Fisheries

Sponsor: Representative Choquette

Requestor: House Resources  
Expenditures/Revenues: (Thousands of Dollars)

COMPONENT SERIAL NO. 

4	5	9
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OPERATING	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98
PERSONAL SERVICES	0	0	0	0	0	0
TRAVEL	0	0	0	0	0	0
CONTRACTUAL	0	0	0	0	0	0
SUPPLIES	0	0	0	0	0	0
EQUIPMENT	0	0	0	0	0	0
LAND & STRUCTURES	0	0	0	0	0	0
GRANTS, CLAIMS	0	0	0	0	0	0
MISCELLANEOUS	0	0	0	0	0	0
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0

CAPITAL	0	0	0	0	0	0
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REVENUE FUND SOURCE:	0	0	0	0	0	0
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FUNDING: (Thousands of Dollars) \*

GENERAL FUND	0	0	0	0	0	0
FEDERAL FUNDS	0	0	0	0	0	0
OTHER FUND SOURCE:	0	0	0	0	0	0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

Estimate of current year impact: None

ANALYSIS: (Attach a separate page if necessary.)

Prepared By: Geron Bruce G.B.

Phone: 465-4100

Division: Commissioner's Office

Date: 3/24/92

Approved by Commissioner: [Signature]

Agency: Department of Fish and Game

Date: 3/25/92

Distribution (by preparer): Leg. Fin., Legislative Sponsor, Requestor, OMB/DBR, Gov. Legis. OSC., & Impacted Agency(ies).

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### FISCAL NOTE

STATE OF ALASKA  
1992 LEGISLATIVE SESSION

BILL NO. HB542

Revision Date: March 25, 1992  
Title: Fish Vessel Hold Standards/Fish Quality

Department Affected: University of Alaska  
BRU: Public Service  
Component: School of Fisheries

Sponsor: Rop Choquette  
Requestor:

Component Serial No. 1566

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY93	FY94	FY95	FY96	FY97	FY98
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL	40.0	0.0	0.0	0.0	0.0	0.0
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
<b>TOTAL OPERATING</b>	<b>40.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

CAPITAL						
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REVENUE						
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FUNDING: (Thousands of Dollars)	FY93	FY94	FY95	FY96	FY97	FY98
GENERAL FUND	40.0	0.0	0.0	0.0	0.0	0.0
FEDERAL FUNDS						
OTHER						
<b>TOTAL</b>	<b>40.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

POSITIONS:	FY93	FY94	FY95	FY96	FY97	FY98
FULL-TIME						
PART-TIME						
TEMPORARY						

Estimate of current year impact: None

ANALYSIS: (Attach a separate page if necessary.)	
Creation of Video Program	16.0 Production & Distribution of publications and slides
	18.0 Production and distribution of a training video
	6.0 Communications, postage
	40.0

Prepared by: Marsha Hubbard, Director Phone: 474-7593  
 Division: Statewide Budget Office Date: 3/25/92

Approved by: Wendy Redman  
 Agency: University of Alaska Date: 3/25/92

Distribution (by preparer): Legislative Finance, Legislative Sponsor, Requestor, OMB, & Impacted Agency(ies).

STATE OF ALASKA  
1992 LEGISLATIVE SESSION

BILL NO. CSHB 542(Res)

Revision Date: April 22, 1992 Department Affected: Environmental Conservation  
 Title: Fishing Vessel Hold Inspection. BRU: Environmental Health  
 Component: Seafood Industry

Sponsor: Representative Choquette

Requestor: (H) Resources

COMPONENT SERIAL NO. 

0	6	4	9
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EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98
PERSONAL SERVICES	51.4	102.8	154.2	154.2	154.2	154.2
TRAVEL	7.0	14.0	21.0	21.0	21.0	21.0
CONTRACTUAL	4.5	9.0	13.5	13.5	13.5	13.5
SUPPLIES	1.3	3.0	4.5	4.5	4.5	4.5
EQUIPMENT	2.5	2.5	2.5	0.0	0.0	0.0
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
<b>TOTAL OPERATING</b>	<b>66.9</b>	<b>131.3</b>	<b>195.7</b>	<b>193.2</b>	<b>193.2</b>	<b>193.2</b>

CAPITAL						
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REVENUE						
FUND SOURCE:	66.9	131.3	195.7	193.2	193.2	193.2

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER FUND SOURCE: Receipts	66.9	131.3	195.7	193.2	193.2	193.2
<b>TOTAL</b>	<b>66.9</b>	<b>131.3</b>	<b>195.7</b>	<b>193.2</b>	<b>193.2</b>	<b>193.2</b>

POSITIONS:

FULL-TIME	1	2	3	3	3	3
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

Estimate of current year impact: \_\_\_\_\_

ANALYSIS: (Attach a separate page if necessary.)

Prepared By: Kit Ballentine, Acting Director Phone: 465-5280

Division: Environmental Health Date: \_\_\_\_\_

Approved by Commissioner: Quinn Adams for John Sander

Agency: Environmental Conservation Date: 4/22/92

PACKETS FOR HB 542

Fiscal Note from Alaska Dept. of Environmental Conservation (ADEC)  
based on fee for service

Fiscal Note from Commercial Fisheries Entry Commission (CFEC)  
FY 93 53.6

ADEC Fishing Vessel Inspection and Permit Program

Canadian regulations for Fishing Vessel Inspection Program

Alaska Seafood Marketing Institute (ASMI) , Alaska Salmon Survey  
Executive Summary, Summer 1991

ASMI Recommended Salmon Quality Guidelines, For Fishing Tendering  
and Processing Operations, 1986.

Marine Advisory Program, Index, Care and Handling of Salmon,  
The Key to Quality, by John Doyle, Professor of Fisheries,  
University of Alaska, Fairbanks, March 1992.

FISCAL NOTE

STATE OF ALASKA  
1992 LEGISLATIVE SESSION

BILL NO. HB 542

Revision Date: \_\_\_\_\_ Department Affected: Environmental Conservation  
 Title: Vessel Inspection BRU: Environmental Health  
 Component: Seafood Industry  
 Sponsor: Representative Choquette  
 Requestor: (H) Resources COMPONENT SERIAL NO. 

6	4	9
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EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98
PERSONAL SERVICES	154.2	154.2	154.2	154.2	154.2	
TRAVEL	21.0	21.0	21.0	21.0	21.0	
CONTRACTUAL	13.5	13.5	13.5	13.5	13.5	
SUPPLIES	4.5	4.5	4.5	4.5	4.5	
EQUIPMENT	7.5	0.0	0.0	0.0	0.0	
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	200.7	193.2	193.2	193.2	193.2	

CAPITAL						
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REVENUE						
FUND SOURCE: Program	200.7	193.2	193.2	193.2	193.2	

Receipts  
FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER FUND SOURCE: Program Receipts	200.7	193.2	193.2	193.2	193.2	
TOTAL	200.7	193.2	193.2	193.2	193.2	

POSITIONS:

FULL-TIME	3	3	3	3	3	
PART-TIME	0	0	0	0	0	
TEMPORARY	0	0	0	0	0	

Estimate of current year impact: NONE

ANALYSIS: (Attach a separate page if necessary.)  
ATTACHED

Prepared By: Kir Ballentine, Acting Director Phone: 465-5280

Division: Environmental Health

Date: \_\_\_\_\_

Approved by Commissioner: [Signature]

Agency: Environmental Health

Date: 3/23/92

ANALYSIS OF BILL/PROGRAM EFFECTS  
HB542  
FISHING VESSEL FISH HOLD INSPECTION

Seafood quality has become a significant enough national issue that Congress is considering a mandatory federal inspection program. One component of the proposed legislation is evaluation of fishing vessels. It is the Department's goal to enhance the existing State of Alaska seafood inspection program to ensure attainment of a level equivalent to any federal inspection program which may be adopted. A vessel inspection program is the key element which is absent in the Alaskan inspection program. For these reasons, the Department supports a vessel inspection program designed to identify construction and handling practices which will maximize fish quality.

If the proposed legislation is adopted, DEC would develop a vessel inspection program patterned on the Canadian model, already in place. Vessels would be inspected annually, biannually or triannually depending upon vessel construction (i.e. fiberglass, aluminum, wood, etc.) and condition of the vessel. DEC inspectional staff would be available on a scheduled basis at designated ports to conduct vessel inspections. The inspection would include evaluation of fish, fish handling equipment and ice storage areas for sources of product contamination, sanitation and fish handling practices including cooling practices. Although all fishermen would be encouraged to ice fish, vessels which lacked the ability to chill the catch would not be prohibited but rather would be required to deliver fish within a set time limit to tenders or processors.

Following completion of an inspection, vessels meeting the requirements would be issued an unconditional certificate for either one, two or three years depending on the vessel construction and age. Provisional certificates would also be available for vessels which could not meet all the requirements but met minimum standards. Information and training would be developed by DEC to explain requirements and provide technical assistance how to comply with regulations.

Three additional Environmental Health Officers, and associated support costs, would be required to implement a statewide vessel inspection program. A fiscal note is attached detailing these costs. The Department proposes to fund the total cost of the inspection program through a sliding scale user fee collection system. The highest fee assessed would be \$25.00 to vessels exceeding 64' in length. An analysis of revenue projections is attached. This analysis supports the supposition that the

program could be self supporting while assessing fees which would not create an economic burden on the fisherman.

Legislation would be implemented in two phases: Phase one would consist of formation of a vessel inspection task force, chaired by DEC, and composed of representatives from various fishing groups, industry and governmental agencies. The purpose of the task force would be to define key elements of a vessel inspection program. DEC would then develop regulations to implement the inspection program which would commence no sooner than January 1, 1993.

**PROPOSED VESSEL INSPECTION - PROJECTED REVENUES**

Vessels by Hull Type	Number of Annual Inspections	Fee	Annual Projected Revenue	Number of Inspections Every 2 Years	Fee	Annual Projected Revenue	Number of Inspections Every 3 Years	Fee	Annual Projected Revenue
<b>VESSELS &lt; 19'</b>									
Aluminum/liberglass	0	\$10.00	\$0.00	29	\$10.00	\$145.00	4	\$10.00	\$13.20
Steel	227	\$10.00	\$2,270.00	333	\$10.00	\$1,665.00	33	\$10.00	\$108.90
Wood/cement	199	\$10.00	\$1,990.00	0	\$10.00	\$0.00	0	\$10.00	\$0.00
<b>SUBTOTAL</b>	<b>426</b>		<b>\$4,260.00</b>	<b>362</b>		<b>\$1,810.00</b>	<b>37</b>		<b>\$122.10</b>
<b>VESSELS 19 - 64'</b>									
Aluminum/liberglass	0	\$20.00	\$0.00	8188	\$20.00	\$81,880.00	360	\$20.00	\$2,376.00
Steel	433	\$20.00	\$8,660.00	328	\$20.00	\$3,280.00	404	\$20.00	\$2,666.40
Wood/cement	2990	\$20.00	\$59,800.00	0	\$20.00	\$0.00	0	\$20.00	\$0.00
<b>SUBTOTAL</b>	<b>3423</b>		<b>\$68,460.00</b>	<b>8516</b>		<b>\$85,160.00</b>	<b>764</b>		<b>\$5,042.40</b>
<b>VESSELS &gt; 64'</b>									
Aluminum/liberglass	0	\$25.00	\$0.00	2568	\$25.00	\$32,100.00	222	\$25.00	\$1,831.50
Steel	89	\$25.00	\$2,225.00	98	\$25.00	\$1,225.00	3	\$25.00	\$24.75
Wood/cement	228	\$25.00	\$5,700.00	0	\$25.00	\$0.00	0	\$25.00	\$0.00
<b>SUBTOTAL</b>	<b>317</b>		<b>\$7,925.00</b>	<b>2666</b>		<b>\$33,325.00</b>	<b>225</b>		<b>\$1,856.25</b>
<b>TOTAL</b>	<b>4166</b>		<b>\$80,645.00</b>	<b>11544</b>		<b>\$120,295.00</b>	<b>1026</b>		<b>\$7,020.75</b>

**TOTAL  
PROJECTED  
ANNUAL  
REVENUES**           **\$207,960.75**

NOTE: Total projected fees for biannual and triannual inspections were divided by 1/2 & 1/3, respectively.

## PROPOSED FISHING VESSEL AND TENDER INSPECTION AND CERTIFICATION PROGRAM

### VESSEL REQUIREMENTS:

#### \* Protection of fisheries products and ice:

- \* Provide protection from sun, weather, heat and physical damage.
- \* Product and ice is protected from possible contaminants, including fuels, hydraulics, cleaners, animals, etc. during catch and delivery.

#### \* Construction of fish and ice storage areas and equipment:

- \* Vessel are constructed of smooth and easily cleanable materials, such as fiberglass or aluminum. Steel or wood is properly sealed to provide an easily cleanable surface which will not serve as a source of contamination or adulteration to the product.
- \* Fish handling equipment, such as chutes, conveyors, and tables are constructed of smooth, non-absorbent, noncorrosive, and easily cleanable materials which are free from cracks and crevices.
- \* Provide hydraulic line hose fittings with catch basins to collect any leakage.
- \* Single wall fuel lines do not run through fish holds.

#### \* Fish chilling equipment and insulation:

- \* A reliable source of product chilling, capable of maintaining product at 34° F or below, such as icing, refrigerated salt water, etc., is available onboard the vessel or tender.
- \* Vessel, without chilling capacity, delivers unrefrigerated product is within specified time to tender or processing facility.
- \* Storage areas are separated from engine compartments and other heated areas by watertight, insulated bulkhead and wall surfaces.

#### \* Operating procedures:

- \* A schedule is established for proper cleaning and sanitizing of equipment and storage areas.
- \* Only approved cleaners and sanitizers are used.

## CERTIFICATION AND INSPECTION PROGRAM

- \* Vessels and tenders are inspections<sup>ed</sup> prior to issuance of a certificate.
- \* Provisional certificates will be issued to vessels which are not in full compliance to allow for upgrade of vessel.
- \* Reinspection and certificate renewal based upon the type and condition of vessels.
- \* Reinspection and certificate renewal schedule is as follows:
  - \* ANNUAL: Wooden vessels/tenders and other vessels/tenders in poor condition.
  - \* EVERY TWO YEARS: Fiberglass and aluminum boats in fair to good condition.
  - \* EVERY THREE YEARS: New fiberglass and aluminum boats.

More frequent inspections would result from lack of compliance or for vessels holding provisional certificates.

STATE OF ALASKA  
1992 LEGISLATIVE SESSION

BILL NO. HB 542

Revision Date: \_\_\_\_\_ Department Affected: Department of Fish and Game  
 Title: Fishing vessel hold inspection and fisheries product control BRU: Commercial Fisheries (Limited) Entry Commis:  
 Component: Limited Entry Program  
 Sponsor: Representative Choquette Administration \_\_\_\_\_  
 Requestor: Representative Choquette COMPONENT SERIAL NO. 

	4	7	1
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EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88
PERSONAL SERVICES	42.6	21.3	21.3			
TRAVEL						
CONTRACTUAL	5.3	2.8	2.8			
SUPPLIES	.7	.7	.7			
EQUIPMENT	5.0					
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	53.6	24.8	24.8			

CAPITAL						
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REVENUE FUND SOURCE:	GF 1004	GF 1004	GF 1004			
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FUNDING: (Thousands of Dollars)

GENERAL FUND	53.6	24.8	24.8			
FEDERAL FUNDS						
OTHER FUND SOURCE:						
TOTAL						

POSITIONS:

FULL-TIME						
PART-TIME	2	1	1			
TEMPORARY						

Estimate of current year impact: \_\_\_\_\_

ANALYSIS: (Attach a separate page if necessary.)

SEE ATTACHED

Prepared By: Roger Kolden Phone: 789-6160  
 Division: Commercial Fisheries (Limited) Entry Commission Date: 03/24/92  
 Approved by Commissioner: Frank McLellan  
 Agency: CFC Date: 4/25/92

# STATE OF ALASKA

COMMERCIAL FISHERIES ENTRY COMMISSION

WALTER J. HICKEL, GOVERNOR

5800 GLACIER HIGHWAY, #100  
JUNEAU, ALASKA 99801  
(907) 789-6150 Licensing Co's  
(907) 789-6160 Other C/FEC Co's  
(907) 789-6170 FAX

## FAX TRANSMITTAL SHEET

TO: NANCY HEMENWAY

DATE: March 25, 1992

Representative Dave Choquette

FAX#: 465-3242

PAGES: 3  
(following this page)

FROM: Frank Homan

Commissioner

### MESSAGE:

For your information. This will be presented at the House Resources Committee Hearing on HB 542 at 3:00 p.m. on Thursday, March 26, 1992. Please let me know if you have any comments.

Thank you.

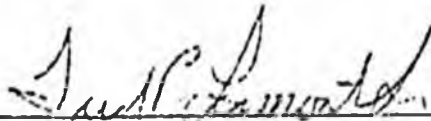



## CITY OF PILOT STATION

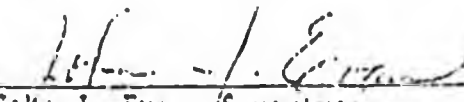
P.O. Box 5040 • Pilot Station, Alaska 99650 • (907) 549-3211


March 25, 1992

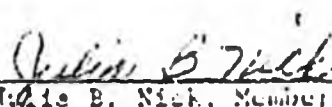
We, the City Council of Pilot Station support Governor Hickel's veto of SB 16 and support of the alternative Bill to allow non-retention of tenured teachers for fiscal emergencies.

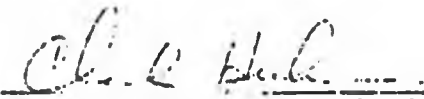
  
Fred Lamont, Sr., Mayor

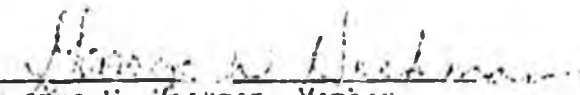
  
Cynthia Fancyboy, Vice-Mayor

  
John J. Evan, Secretary

  
Anita M. Myers, Member

  
Julie B. Nick, Member

  
Charles Heckman, Sr., Member

  
George W. Heckman, Member

### Analysis of Program Effects:

Sec. 3 of HB 542 requires the CFEC to withhold a fishing vessel license until proof of a DEC certificate of compliance is presented. This presents the following problems for the agency:

1) In cases where the vessel license cannot be issued correspondence will be required, and in most cases, refunds will have to be issued through the State AKSAS system since all fees received must be deposited immediately upon receipt. Payments and applications cannot simply be returned without explanation. Furthermore, many payments received by CFEC are to cover several vessel licenses and/or permits, often for different individuals.

2) CFEC regulation 20 AAC 05.425(d) requires that the vessel designated on the permit application must be licensed in order for the permit card to be issued. If vessel licenses must be withheld due to lack of proof of compliance, it will also mean withholding permits, requiring additional correspondence and refunding of fees.

3) AS 16.05.530 provides that vessel licenses may be renewed for one year or two years at a time; approximately 11% of vessel owners take advantage of 2 yr renewal to minimize paperwork, which also improves agency efficiency. HB 542 would impede this process since the second year license could not be issued without proof of compliance from DEC.

4) Experience with fishermen and regulatory requirements (regulatory changes in particular) has demonstrated a very high percentage of problems due to confusion, ignorance and omission. HB 542 will definitely require a significant amount of CFEC staff time to deal with telephone calls and correspondence explaining the program, refunding of fees and last minute attempts to verify proof of compliance and get vessel licenses issued prior to imminent fisheries. Given the fact that permit and vessel license issuance is handled by only four full-time employees, the impact on the licensing section is considerable.

### Amendments Proposed:

Sec. 3 could be eliminated as well as and the fiscal note if a visible sign of compliance (such as a sticker affixed to the vessel, or a certificate to be presented upon request) was required instead. This would allow enforcement to be carried out during the course of routine boardings and license checks by the Division of Fish and Wildlife Protection.

Position Title Commercial Fisheries Permit Clerk II		No. of Positions 2	Range / Step 10A	Bay Unit X
Time Status S	Staff Months 14	Location Jureau		Election District
<b>TYPE OF EXPENDITURE</b>		<b>Amount</b>		<b>Justification</b> These positions are required to process the additional correspondence necessary to prove compliance with IM 542. It is estimated 50% of the 17,580 (FY91) of vessels licensed would fail to submit the required proof of inspection. At 15 minutes correspondence for each application this totals over 14 months of correspondence.
Salary	14.5	29.0		
Benefits	6.8	13.6		
Premium Pay				
Other				
Total Personal Services		21.3 42.6		
<b>Travel</b>				
Contractual		5.3		
Commodities		.7		
Equipment		5.0		
Other				
Total Cost		53.6		
<b>FUNDING SOURCE FOR TOTAL COST</b>				
Federal Receipts	1002			
G. F. Match	1003			
General Fund	1004	53.6		
LA Receipts	1007			
CIP Receipts	1061			
Other				
				<b>Support Costs</b> Contractual Services costs include telephone (.3/month), postage (.1/month) for seven months and advertising costs of 2.5 for newspaper and radio spots. Additionally, \$50/staff month in commodities (.7) and two personal computers at 2.5 each in equipment would be needed for correspondence work. It is estimated after the first year the correspondence work would be 25% and no further advertising or equipment costs would be incurred. Since the bill sunsets after three years continuing costs no longer exist beyond that time.

**Request For  
New Position**

AGENCY Department of Fish and Game

BRU Commercial Fisheries (Limited) Entry  
Commission

COMPONENT Limited Entry Program Administration

**FY 93**

Page 1 of 1

Revised Date: \_\_\_\_\_

## Fishing Vessel Inspection and Permit Program

A regulatory fishing vessel permit and inspection program is one of the key elements in improved product quality and minimized product adulteration.

Minimum requirements:

### Fishing vessels

1. The vessel must be constructed of cleanable materials, such as fiberglass or aluminum. Steel and wood must be properly sealed so as to be adequately cleanable and must not pose as a source of contamination or adulteration of the product.
2. Fish handling equipment, such as chutes, conveyors, tables, must be constructed of smooth, non-absorbent, non-corrodible, easily cleanable materials, and must be free from cracks and crevices.
3. Hydraulic line hose fittings must be provided with catch basins to collect any potential leakage, and any leaking lines must be promptly repaired or replaced.
4. The vessel must provide a reliable source of refrigeration on board, such as ice, refrigerated salt water, etc., or deliver its catch within a specified period of time to a tender or processing facility.
5. The vessel must have a set schedule for cleanup and sanitizing fish holds and decks, and must use approved cleaning and sanitizing compounds.
6. Product must be protected from possible contaminants, including fuel, hydraulics, cleaners, etc., during catch and delivery.
7. Single wall fuel lines not allowed to run through fish holds.

### Tender Vessels

1. The vessel must be constructed of cleanable materials, such as fiberglass or aluminum. Steel and wood must be properly sealed so as to be adequately cleanable and must not pose as a source of contamination or adulteration to the product.

2. Hydraulic line hose fittings must be provided with catch basins to collect any potential leakage, and any leaking lines must be promptly repaired or replaced.
3. The vessel must provide a reliable source of refrigeration on board, such as ice, refrigerated salt water, etc.
4. The vessel must have a set schedule for cleanup and sanitizing fish holds and decks, and must use approved cleaning and sanitizing compounds.
5. Product must be protected from possible contaminants, including fuel, hydraulics, cleaners, etc., during catch and delivery.
6. Single wall fuel lines not allowed to run through fish holds.

#### **Permit and Inspection Program**

1. All vessels must be inspected before being issued a permit.
2. After receiving a permit, inspections would be conducted according to the following schedule:
  - a. Wooden vessels, or vessels in poor condition would be inspected annually,
  - b. fiberglass or aluminum vessels in fair to good condition would be inspected once every two years, and
  - c. new vessels of fiberglass or aluminum construction would be inspected once every three years.
3. Lack of compliance would result in more frequent inspections, and provisional permits.
4. Permits would be issued at inspection frequency.

## Set Net Site Requirements

1. Totes used for transporting product must be constructed of smooth, non-absorbent, non-corrodible material, free from cracks and crevices, and constructed to be easily cleanable
2. Fish must not be allowed to lay on the beach for long periods of time (> 30 min), subject to sunlight and contamination from bird activity, etc.
3. Totes and fish handling equipment must be cleaned and sanitized before and after use, using approved chemicals.
4. Covers must be provided for totes, to protect product from contamination, fly activity, etc.
5. A reliable source of refrigeration (most commonly ice) must be available at the site, for the fish as they are being picked, or time must be limited between picking fish from the net delivery to the processor.
6. Care must be taken in product handling at the set net site, to prevent contamination or damage of the product by walking on it, excessive bruising due to throwing of fish, and use of pughs.
7. Animals must be restrained from the net picking sites and totes of fish.
8. Product inspected at the site for contamination.

Processing facilities and tender vessels are currently required to meet all requirements listed for product handling, temperature control, sanitation, and equipment construction of the fishing vessels and at set net sites, in accordance with 18 AAC 34.

50. Protective hand coverings worn by employees in the dressing, filleting and packaging areas shall be disinfected at each break during the work shift.

51. Employees engaged in a fish processing operation, shall wear clean outer garments and headgear of a type approved by the Minister.

52. All floors shall be kept clean and floors in wet working areas shall be thoroughly washed at intervals of 2 hours or at such shorter intervals as may be deemed necessary by an inspector.

53. (1) Utensils that come in contact with fish that is being processed, other than packaged fish, shall be cleaned and disinfected at least once during and at the end of each work shift by a method approved by the Minister.

(2) At the end of each working day, the utensils referred to in subsection (1) shall be air-dried and stored in a sanitary manner.

54. Equipment, including filleting machines, conveyor belts and tables, that comes in contact with fish that is being processed, other than packaged fish, shall be cleaned and disinfected at intervals of 2 hours or at such shorter intervals as may be deemed necessary by an inspector.

55. Pickled, spiced and marinated fish establishments and all equipment and utensils used in the operations of such establishments shall be kept in good repair and in a clean and sanitary condition.

50. Les gants protecteurs que portent les employés dans les aires d'habillage, de filetage et d'emballage du poisson doivent être désinfectés à chaque interruption au cours du poste.

51. Les employés affectés aux opérations de traitement du poisson doivent porter des vêtements de dessus propres, ainsi qu'une coiffure d'un type approuvé par le Ministre.

52. Tous les planchers doivent être tenus propres et ceux des aires humides de travail doivent être lavés à fond toutes les 2 heures ou plus souvent si un inspecteur le juge nécessaire.

53. (1) Les ustensiles qui, au cours du traitement, entrent en contact avec le poisson, sauf le poisson emballé, doivent être nettoyés et désinfectés au moins une fois au cours de chaque poste, ainsi qu'à la fin de chaque poste, selon une méthode approuvée par le Ministre.

(2) A la fin de chaque jour de travail, les ustensiles mentionnés au paragraphe (1) doivent être séchés à l'air et rangés de façon hygiénique.

54. Le matériel, y compris les machines à fileter, les courroies transporteuses et les tables, qui, au cours du traitement, entrent en contact avec le poisson, sauf le poisson emballé, doit être nettoyé et désinfecté toutes les 2 heures ou plus souvent si l'inspecteur le juge nécessaire.

55. Les établissements de traitement du poisson saumuré, épicé et mariné, ainsi que tout le matériel et les ustensiles servant à leur exploitation doivent toujours être bien entretenus, propres et dans un état hygiénique.

### SCHEDULE III

(s. 18)

#### REQUIREMENTS FOR VESSELS USED FOR FISHING OR TRANSPORTING FISH FOR PROCESSING

1. Areas where fish and ice are stored shall

(a) have covers to protect the fish and ice from the sun and weather;

(b) be provided with drainage to effectively remove ice melt water and ensure that fish and ice do not come into contact with bilge water or other contamination; and

(c) where it is necessary to prevent physical damage to the fish, be divided into pens, which shall be shelved vertically at intervals of 90 cm or less.

2. Subject to item 3, fish and ice storage areas shall be of non-absorbent, non-corrodible materials, other than wood, and so constructed as to preclude physical damage to the fish and facilitate cleaning and any surfaces that contact fish shall be smooth and free from cracks and crevices.

### ANNEXE III

(art. 18)

#### EXIGENCES APPLICABLES AUX BATEAUX UTILISES POUR LA PÊCHE OU LE TRANSPORT DU POISSON À TRAITER

1. Les aires d'entreposage du poisson et de la glace doivent:

a) être couvertes afin que le poisson et la glace soient protégés contre le soleil et les intempéries;

b) être dotées d'un système d'écoulement visant à évacuer efficacement l'eau de fonte de la glace et à garantir que le poisson et la glace n'entrent pas en contact avec les eaux de cale ou d'autres sources de contamination; et

c) au besoin, être divisées en compartiments munis d'étagères distantes de 90 cm ou moins, afin d'éviter la détérioration du poisson.

2. Sous réserve de l'article 3, les aires d'entreposage du poisson et de la glace doivent être faites de matériaux autres que le bois, qui sont non absorbants et résistants à la corrosion, et doivent être aménagées de façon à en permettre le nettoyage et à empêcher la détérioration du poisson, et les surfaces entrant en contact avec le poisson doivent être lisses et exemptes de fissures ou de crevasses.

3. In the case of vessels built prior to September 15, 1982 and vessels having no below deck storage areas, built-in fish and ice storage areas shall be so constructed as to preclude physical damage to the fish and may be of wood, if the surfaces are smooth, free from cracks and crevices and coated with a durable, light coloured paint or coating of a type approved by the Minister.

4. Boxes for fish other than live shellfish shall be of smooth, non-absorbent, non-corrodible material, other than wood, free from cracks and crevices, and so constructed as to provide drainage and protect the fish from damage by crushing when the boxes are stacked.

5. Fresh fish storage areas shall be separated from engine compartments and other heated areas of a vessel by watertight, insulated bulkheads and wall surfaces, bulkheads and deckheads in frozen storage areas of a vessel shall be well insulated.

6. Fish handling equipment, such as chutes, conveyors, fish washers, tables and utensils, shall be of smooth, non-absorbent, non-corrodible material, other than wood, free from cracks and crevices and so constructed as to facilitate cleaning.

7. Forks, pumps, tools or other equipment and practices that pierce, tear, or otherwise damage or contaminate the edible portion of fish shall not be used.

8. Fish, while on board a vessel used for fishing or transporting fish, shall be

(a) preserved by the use of finely divided ice sufficient to reduce and hold the temperature at 4°C or lower, and such ice shall be made from water from a source approved by a fish inspection laboratory; or

(b) preserved by such other methods as the Minister may approve.

9. Where chilled water systems are installed on a vessel, such systems shall be of materials approved by the Minister, be constructed to facilitate proper cleaning and be capable of holding fish at -1°C.

10. Freezing facilities on a vessel shall be capable of freezing the daily catch of fish at a rate equivalent to at least the freezing rate of a 25 mm thick block of fish when the temperature of the thermal centre is reduced from 0°C to -20°C in two hours or less.

11. (1) Fish on board a vessel shall be frozen at a freezing rate not less than the rate prescribed by item 10.

(2) In the case of a packaged fish product on board a vessel, the time required to reduce the thermal centre of the packaged product to -20°C shall not exceed 36 hours.

3. Dans le cas des bateaux construits avant le 15 septembre 1982 et des bateaux non munis d'une cale d'entreposage, les aires aménagées pour l'entreposage du poisson et de la glace doivent être construites de manière à empêcher la détérioration du poisson, et peuvent être faites de bois, à la condition que leurs surfaces soient lisses, exemptes de fissures ou de crevasses et recouvertes d'une peinture durable et de couleur claire ou d'un autre revêtement approuvé par le Ministre.

4. Les caisses destinées au poisson, sauf les frigos de mer vivants, doivent être faites d'un matériau autre que le bois, qui est non absorbant, résistant à la corrosion, lisse et exempt de fissures ou de crevasses, et être aménagées de manière à permettre l'écoulement de l'eau et à protéger le poisson contre tout risque d'écrasement lorsqu'elles sont empilées.

5. Les aires d'entreposage du poisson frais doivent être séparées de la salle des machines et de tout autre secteur chauffé du bateau, par des cloisons étanches et isolées et les surfaces des murs, les cloisons et le plafond des aires de congélation doivent être bien isolés.

6. Le matériel de manutention du poisson, notamment les glissières, les convoyeurs, les machines à laver, les tables et les ustensiles, doit être fait d'un matériau autre que le bois, qui est non absorbant, résistant à la corrosion, lisse et exempt de fissures ou de crevasses, et doit être construit de manière à en permettre le nettoyage.

7. Les méthodes et les instruments tels les fourches et les pompes, qui risquent de percer, de déchirer, d'endommager ou de contaminer la partie comestible du poisson ne doivent pas être utilisés.

8. Le poisson qui est à bord d'un bateau servant à la pêche ou au transport du poisson doit

(a) être conservé dans de la glace finement concassée faite d'eau provenant d'une source approuvée par un laboratoire d'inspection du poisson, qui permet de maintenir la température à un maximum de 4°C; ou

(b) être conservé par une autre méthode approuvée par le Ministre.

9. Lorsqu'un bateau est doté d'un dispositif à eau réfrigérée, ce dispositif doit être fait de matériaux approuvés par le Ministre, être construit de façon à en permettre le nettoyage et être capable de maintenir le poisson à une température de -1°C.

10. Les installations de congélation d'un bateau doivent être capables de congeler les prises quotidiennes de poisson à une vitesse au moins égale à celle requise pour abaisser la température du centre thermique d'un bloc de poisson de 25 mm d'épaisseur, de 0°C à -20°C en deux heures ou moins.

11. (1) Le poisson à bord d'un bateau doit être congelé à une vitesse au moins égale à celle prescrite à l'article 10.

(2) Dans le cas des produits de poisson emballés qui se trouvent à bord d'un bateau, le temps requis pour abaisser à -20°C la température du centre thermique d'un produit emballé ne doit pas dépasser 36 heures.

12. (1) Except for brine frozen fish, the thermal centre of the fish on board a vessel shall be reduced to a temperature of  $-20^{\circ}\text{C}$  or lower before the fish can be removed from the freezer to the cold storage area.

(2) In the case of brine frozen fish on board a vessel, the thermal centre of the fish shall be reduced to  $-12^{\circ}\text{C}$  before the fish can be removed from the freezer to the cold storage area.

13. After freezing, fish on board a vessel shall be glazed or packaged to protect it against dehydration and oxidation.

14. Storage areas in which frozen fish is held on board a vessel shall be maintained at a temperature of  $-26^{\circ}\text{C}$  or lower.

(b) 15. At least once daily, fish receiving areas and all equipment, containers and utensils used in the handling of fish on board a vessel shall be thoroughly cleaned with water from a source approved by a fish inspection laboratory and disinfected.

16. Following the discharge of fish from a vessel, all equipment and utensils used in the handling of fish and the storage areas, chilled water system, fish containers, pen-boards and shelfboards shall be forthwith thoroughly cleaned with water from a source approved by a fish inspection laboratory and disinfected.

17. A storage record of the fish catch shall be kept on all fishing vessels and the identity of each day's catch shall be maintained.

18. Handwashing and marine type toilet facilities shall be provided on vessels 13.7 m or more in overall length that have sleeping accommodation and shall be maintained in a clean and sanitary condition.

#### SCHEDULE IV

(s. 19)

#### REQUIREMENTS FOR ESTABLISHMENTS STORING FROZEN FISH

(a) 1. Rooms in which frozen fish is stored shall be maintained at a temperature of  $-26^{\circ}\text{C}$  or colder.

2. (1) Each storage room shall be equipped with an accurate thermometer or other temperature measuring device that is located in such a place that it indicates the average air temperature of the room.

(2) Temperatures in a storage room shall be read, recorded and dated at least once each day and a record of such temperatures shall be maintained for a period of not less than 12 months.

3. Frozen fish shall be protected to minimize rises in the temperature of the fish when it is outside a refrigerated area.

4. No odoriferous substance shall be stored with fish in holding or storage rooms.

12. (1) La température du centre thermique de tout poisson sauf le poisson congelé en saumure, doit être abaissée au moins à  $-20^{\circ}\text{C}$  avant que le poisson soit retiré du congélateur et placé dans l'aire d'entreposage frigorifique.

(2) Dans le cas du poisson congelé en saumure, la température du centre thermique du poisson doit être abaissée à  $-12^{\circ}\text{C}$  avant que le poisson soit retiré du congélateur et placé dans l'aire d'entreposage frigorifique.

13. Le poisson doit une fois congelé, être givré ou emballé pour éviter sa déshydratation et son oxydation.

14. Les aires d'entreposage du poisson congelé à bord d'un bateau doivent être maintenues à une température d'au moins  $-26^{\circ}\text{C}$ .

b) 15. Les aires de réception du poisson et le matériel, les conteneurs et les ustensiles utilisés pour la manutention du poisson doivent, au moins une fois par jour, être nettoyés à fond avec de l'eau provenant d'une source approuvée par un laboratoire d'inspection du poisson et être désinfectés.

16. Après le déchargement du poisson du bateau, les appareils et les ustensiles de manutention du poisson, les aires d'entreposage, le système d'eau réfrigérée, les conteneurs à poisson, les cloisons et les étagères des compartiments doivent être immédiatement nettoyés à fond avec de l'eau provenant d'une source approuvée par un laboratoire d'inspection du poisson et être désinfectés.

17. Un registre sur l'entreposage du poisson capturé doit être tenu par chaque bateau de pêche et l'identification des prises de poisson doit être fait tous les jours.

18. Sur les bateaux d'une longueur hors tout de 13,7 m ou plus qui sont munis de cabines, des lavabos et des toilettes de bateau doivent être installés et tenus dans un état propre et hygiénique.

#### ANNEXE IV

(art. 19)

#### CONDITIONS APPLICABLES AUX ENTREPÔTS DE POISSON CONGELÉ

1. La température des salles d'entreposage du poisson congelé doit toujours être de  $-26^{\circ}\text{C}$  ou plus froide.

2. (1) Chaque salle d'entreposage doit être munie d'un thermomètre précis ou d'un autre instrument de mesure de la température, placé de façon à indiquer la température moyenne de l'air ambiant.

(2) Au moins une fois par jour, la température d'une salle d'entreposage doit être relevée et inscrite dans un registre ainsi que la date, et le relevé de cette température doit être conservé au moins 12 mois.

3. Le poisson congelé doit être protégé de manière à éviter le plus possible les hausses de température du poisson lorsqu'il se trouve en dehors d'une aire réfrigérée.

4. Aucune substance odorante ne doit être entreposée avec le poisson dans les salles de détention ou d'entreposage.

SCHEDULE V

(ss. 20 and 21)

REQUIREMENTS FOR VEHICLES AND EQUIPMENT USED FOR UNLOADING, HANDLING, HOLDING AND TRANSPORTING FRESH FISH FOR PROCESSING

1. Forks, pumps, tools or other equipment and practices that pierce, tear or otherwise damage or contaminate the edible portion of fish shall not be used.

2. Fish handling equipment, such as chutes, conveyors, fish washers, tables and utensils, shall be of smooth, non-absorbent, non-corrodible material, other than wood, free from cracks and crevices and so constructed as to facilitate cleaning.

3. (1) Fish shall be transported in covered containers approved by the Minister or enclosed vehicle bodies.

(a)

(2) The contact surfaces of fish storage areas in vehicles and of containers used for transporting fish shall be smooth, free from cracks and crevices and made of non-corrodible material.

4. (1) The containers and vehicle bodies used to hold or transport fish shall be filled to a level no higher than 90 cm of its depth.

(2) The body of a vehicle used for transporting fish in bulk shall be divided at intervals of 1 m along its length.

5. (1) Fish held prior to being transported shall be iced or chilled after unloading from a vessel and be protected from the sun and weather and from contamination.

(2) Fish shall be iced or chilled while being transported.

6. Water used for unloading, washing or transporting fish shall be clean and obtained from a source approved by a fish inspection laboratory.

7. Offal and other refuse shall be disposed of in a manner satisfactory to an inspector.

8. Areas where fish is landed or handled and all surfaces that come into contact with fish during unloading, handling, holding and transportation shall be maintained in a clean and sanitary condition.

ANNEXE V

(art. 20 et 21)

CONDITIONS APPLICABLES AUX VEHICULES ET A L'EQUIPEMENT SERVANT AU DECHARGEMENT, A LA MANUTENTION, A L'ENTREPOSAGE ET AU TRANSPORT DU POISSON FRAIS A TRAITER

1. Les méthodes et les instruments, tels les fourches et les pompes, qui risquent de percer, de déchirer, d'endommager ou de contaminer la partie comestible du poisson ne doivent pas être utilisés.

2. Le matériel de manutention du poisson notamment les glissières, les convoyeurs, les machines à laver, les tables et les ustensiles, doit être fait d'un matériau autre que le bois, qui est non absorbent, résistant à la corrosion, lisse et exempt de fissures ou de crevasses, et doit être construit de manière à en permettre le nettoyage.

3. (1) Le poisson doit être transporté dans des conteneurs fermés approuvés par le Ministre ou dans des caisses de véhicules fermées.

a)

(2) Les surfaces des aires d'entreposage du poisson dans les véhicules et celles des conteneurs utilisés pour le transport du poisson doivent être lisses, exemptes de fissures ou de crevasses et faites d'un matériau résistant à la corrosion.

4. (1) Les conteneurs ou les caisses de véhicule utilisés pour le transport ou l'entreposage du poisson doivent être remplis à une capacité ne dépassant pas 90 cm de la hauteur du conteneur ou de la caisse.

(2) La caisse d'un véhicule utilisé pour le transport du poisson en vrac doit être divisée à intervalles de 1 m sur la longueur.

5. (1) Le poisson débarqué d'un bateau doit, avant d'être transporté, être gardé dans la glace ou réfrigéré, et être protégé du soleil, des intempéries et des sources de contamination.

(2) Le poisson doit être gardé dans la glace ou réfrigéré pendant le transport.

6. L'eau utilisée pour décharger, laver ou transporter le poisson doit être propre et provenir d'une source approuvée par un laboratoire d'inspection du poisson.

7. Les viscères et autres déchets doivent être jetés d'une façon satisfaisant l'inspection.

8. Les aires où le poisson est débarqué et manipulé et toutes les surfaces qui entrent en contact avec le poisson durant le déchargement, la manutention, l'entreposage et le transport doivent être propres et hygiéniques.

## EXECUTIVE SUMMARY

The 1991 Alaskan Salmon Quality Survey was conducted in two phases by The Dittman Research Corporation of Alaska and GRAYSTAR Pacific Seafood, Ltd.

The first phase included three individually designed questionnaires, mailed to 2,000 commercial salmon fishing permit holders, approximately 600 salmon tender operators, and over 200 on-shore salmon freezer-processors, during the spring of 1991. A total of 982 questionnaires were completed and returned and the high overall response rate (36%) should be considered strongly indicative of current fish handling procedures in the Alaska salmon industry.\* An additional research component was initiated in November 1991 and surveys were mailed to 107 floating processors. By January 1992, 36 floater surveys were received and the data was tabulated and incorporated into the final report for analysis.

The second phase of the survey was a program of on-site fieldwork, performed in the summer of 1991. In-person interviews were conducted, with salmon fishermen, salmon tender operators, and on-shore salmon processing plants, in Bristol Bay, Kodiak, Cook Inlet, Southeast, and Prince William Sound. General observations of quality handling practices were also made during the fieldwork.

\*NOTE: Response rate for self-administered surveys vary widely from approximately 1/2 of 1% up to 50% in some exceptional cases. Normally, a response rate of 10-25% may be expected, while 30-40% is very good and usually indicates an important topic, a high degree of interest, up-to-date lists and an attractive incentive.

## EXECUTIVE SUMMARY

The 1991 Alaskan Salmon Quality Survey was conducted in two phases by The Dittman Research Corporation of Alaska and GRAYSTAR Pacific Seafood, Ltd.

The first phase included three individually designed questionnaires, mailed to 2,000 commercial salmon fishing permit holders, approximately 600 salmon tender operators, and over 200 on-shore salmon freezer-processors, during the spring of 1991. A total of 982 questionnaires were completed and returned and the high overall response rate (36%) should be considered strongly indicative of current fish handling procedures in the Alaska salmon industry.\* An additional research component was initiated in November 1991 and surveys were mailed to 107 floating processors. By January 1992, 36 floater surveys were received and the data was tabulated and incorporated into the final report for analysis.

The second phase of the survey was a program of on-site fieldwork, performed in the summer of 1991. In-person interviews were conducted, with salmon fishermen, salmon tender operators, and on-shore salmon processing plants, in Bristol Bay, Kodiak, Cook Inlet, Southeast, and Prince William Sound. General observations of quality handling practices were also made during the fieldwork.

\*NOTE: Response rate for self-administered surveys vary widely from approximately 1/2 of 1% up to 50% in some exceptional cases. Normally, a response rate of 10-25% may be expected, while 30-40% is very good and usually indicates an important topic, a high degree of interest, up-to-date lists and an attractive incentive.

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The survey respondents were categorized according to the geographic area they fish, tender or process in. The following geographic areas were used in the crosstabulations for regional analysis and comparisons:

Fishermen:           Cook Inlet  
                          Kodiak  
                          Western Alaska  
                          Southeast Alaska  
                          Bristol Bay  
                          Prince William Sound  
                          Yakutat  
                          Chignik  
                          Alaska Peninsula

On-Shore  
Processors:           Cook Inlet  
                          Kodiak  
                          Western Alaska  
                          Southeast Alaska  
                          Bristol Bay  
                          Prince William Sound  
                          Alaska Peninsula

Floating  
Processors:           Western Alaska  
                          Southeast Alaska  
                          Bristol Bay  
                          Gulf of Alaska  
                          Combination

\*NOTE: Several floating processors indicated two or more geographic areas where they locate during the fishing season. These combinations included: Cook Inlet & Kodiak, Bristol Bay & Prince William Sound, and Bristol Bay and Kodiak. Tenders were not categorized by location due to the nature of their business.

Some highlights of the mail-out survey are --

Notes

Fishermen

- ◆ Approximately three-out-of-four fishermen (78%) deliver their catch at least daily.
- ◆ Most (67%-88%) salmon fishing vessels have hatch covers, in-hold sumps, hatch combings, a watertight bulkhead on their hold, and bin boards or dividers in the hold; about half of the vessels have insulation in their holds.
- ◆ Well over half (61%) of the fish holds are lined with fiberglass.
- ◆ Nearly nine-out-of-ten fishermen (86%) said that their fish are never exposed to fuel, hydraulic fluid, bilge water, or exhaust fumes.
- ◆ Two-out-of-three fishermen (65%) said that their fish are not exposed to heat sources, such as from the engine, exhaust or living quarters; but 29% said that the fish are exposed to the sun.
- ◆ Approximately two-thirds of the fishermen (64%) remove the fish from the net or hook by hand; and 85% said that they handle the fish by the head.
- ◆ Almost half (45%) of the fishermen use brailers to hold fish in the hold; and 74% of those fishermen load the brailers to 500 - 1,200 pounds.
- ◆ Over half (57%) said that they do not chill their fish.
- ◆ Of the fishermen who do chill their fish, 53% use ice; and most get the ice from the processing plant.

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Fishermen - continued

- ◆ Fewer than one-out-of-five (17%) of the fishermen who do not chill the fish said that they plan to install a chilling system in the future; of those, 37% plan to install Refrigerated Sea Water, and 36% plan to use ice.
- ◆ Four-out-of-five (81%) said that they clean their holds after each delivery; most rinse (73%) and scrub (68%) the holds; half use a detergent (Joy brand dishwashing soap most frequently); and 41% use a sanitizing agent.
- ◆ One percent of the fishermen report using phenol-based cleaners on their fish-contact surfaces.

Tenders

- ◆ Approximately two-thirds (64%) of the tenders report using brailers to unload fish from fishing boats, either alone (33%), or in combination with pumps (24%) or by hand (7%).
- ◆ The most common weight of the tenders' brailers is between 800 - 1,200 pounds.
- ◆ When off-loading from the tenders to the processing plants, two-thirds (68%) of the tenders use pumps, either alone (60%) or in combination with brailers (8%).
- ◆ Half of the tenders (49%) report handling the fish individually.

Tenders - continued

- ◆ Nearly three-out-of-five (59%) of the tenders do not take the temperature of the fish on board the fishing boat.
- ◆ Two-thirds (68%) of the tenders use RSW chilling systems, while 6% do not chill the fish.
- ◆ Over half of the RSW tenders (55%) pre-chill their tanks to 31-32 degrees F.
- ◆ Almost three-out-of-five (58%) of all tenders monitor the temperature of the fish in their hold continuously; 28% check the temperature every two hours.
- ◆ Tenders allow RSW-equipped fishermen to hold fish longer than fishermen who do not chill fish.
- ◆ About half of the tenders (48%) said that they are required to deliver to the plant every 2 - 3 days.
- ◆ Most tender vessels have quality-related accessories: hatch covers (93%), sumps in the hold (91%), watertight bulkhead (84%), hatch combings (83%), and divided holds (67%).
- ◆ After each delivery to the plant, most tenders flush with clean water (87%) and sanitize (76%) their fish holds.
- ◆ The most frequently-named cleaning solution is Jov (23%); the most frequently-named sanitizing solution is Clorox (14%).
- ◆ Three percent of the tender operators report using phenol-based cleaners on their fish-contact surfaces.

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Tenders - continued

- ◆ More than half of the tenders obtain the cleaning solutions (54%) and sanitizing agents (58%) from processors.

On-Shore Processors

- ◆ Overall, on-shore processors said that nine-out-of-ten trollers (91%) are likely to chill their fish, compared to seiners (59%), driftnetters (16%), and setnetters (15%).
- ◆ One-out-of-five (20%) of the plants require deliveries twice each day; while 44% require daily deliveries.
- ◆ Most on-shore processors provide fish handling instructions (83%) and ice (72%) to their fishermen; while slightly less than half (48%) provide cleaners and sanitizers.
- ◆ The most common device used to off-load fish from tenders is the fish pump (84%), though other methods were used, as well: including totes (27%), by hand (24%), and brailer bags (24%).
- ◆ Two-out-of-five plants (41%) allow two days to elapse between the time that the fish are captured to the time they arrive at the plant; and another 39% allow three or more days to elapse.
- ◆ Almost all on-shore processors provide fish handling instructions (100%) and cleaners and sanitizers (97%) to their tenders.

On-Shore Processors - continued

- ◆ Most plants require the tenders to keep records of fish history: time of delivery to the tender (84%), and tender hold temperature (81%).
- ◆ About two-thirds of the plants require tenders to inspect the fishermen's holds (68%), or to record the time of capture (62%).
- ◆ The vast majority (94%) of the plants evaluate the quality of the fish as it arrives at the plant; with 85% evaluating fish quality all the time.
- ◆ The evaluation of fish quality is usually performed by personnel who are familiar with regulatory requirements (89%); who are trained in-house (43%) or on-the-job (29%).
- ◆ Regarding incentives for better quality -- one-third (33%) of the processors suggest buying only chilled fish, while others prefer paying more money for better quality (28%), or less money for poorer quality (28%).
- ◆ Over two-thirds of the plants (68%) report they have a regular quality education program for their employees; of those, 62% conduct the training on-site at the plant.
- ◆ Three-quarters of the plants (77%) have a written cleaning program; of these, 81% had updated the program within the past year.

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On-Shore Processors - continued

- ◆ Roughly half (56%) of the on-shore processors desire the fish to be frozen in less than 12 hours from the time it arrives at the dock; but some will allow one day (44%) or two days (22%) to pass before they require the fish to be frozen.
- ◆ Almost three-fourths (73%) of the plants report monitoring the core temperature of the fish; of these, almost all (83%) maintain -5 degrees F or colder.
- ◆ More than half of the on-shore processors (56%) monitor the temperature of their freezers every hour; and most (81%) use a remote temperature probe.
- ◆ When the freezers are filled to capacity, 59% of the plants said that the fish took eight hours or less to freeze, 20% between 9 and 16 hours, and another 8% reported freezing took longer than 21 hours.
- ◆ On-shore processors are evenly split (48% to 48%) on the question of whether mandatory seafood quality inspection would improve the quality of salmon.

### Floating Processors

- ◆ Overall, approximately half of the floaters surveyed (56%) reported being a catcher-processor.
- ◆ Floating processors are evenly split regarding when fish must be delivered to them -- half (50%) require fishermen to deliver twice each day, while the other half (50%) require a daily delivery.
- ◆ Nearly nine-out-of-ten floaters (88%) provide their fishermen with instructions on proper fish handling techniques and two-out-of-three (69%) provide cleaners and sanitizers. One-out-of-four (25%) said they also provide ice.
- ◆ Two-out-of-five floaters (42%) reported using tenders. Of those that do, 60% said the maximum amount of time they will allow to pass between when fish are captured and when they arrive "on-board" is one day or less.
- ◆ The most common device used to off-load fish from tenders is fish pumps (60%), followed by totes (20%) and brailer bags (20%). Seven percent reported they off-load by hand.
- ◆ Almost all floating processors provide fish handling instructions (93%) and cleaners and sanitizers (87%) to the tender operators.

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Floating Processors - continued

- ◆ Most floaters (86%) check the fish history when they arrive "on-board" and nine-out-of-ten (93%) require tenders to keep records of hold temperatures. However, less than half require records of time of capture (47%) and expect tenders to inspect fishermen's fish holds (47%).
- ◆ Almost all the floating processors surveyed (89%) evaluate fish quality as the fish are received, which occurs continuously (91%). Four-out-of-five (81%) go further to say fish are evaluated by personnel familiar with regulatory requirements, who receive their training on the job (38%), by a Quality Assurance Manager (15%) or by industry literature (15%).
- ◆ On the subject of providing incentive for delivering high quality fish, two-out-of-five (44%) suggested increasing the price paid for higher quality fish and 31% recommended buying only iced or refrigerated fish.
- ◆ One-out-of-two floaters hold regular seafood quality education programs for employees; of those, seven-out-of-ten (70%) instruct employees on the floor.
- ◆ More than half (58%) have a written cleaning program, which was updated within the past year in most cases (86%).

Floating Processors - continued

- ◆ Almost all of the floating processors surveyed said their fish go to either fresh or frozen markets. Roughly half (53%) said they make every effort of freeze their fish in less than 12 hours, while 61% said they would allow up to one day maximum.
- ◆ Nearly three-out-of-five floaters (58%) monitor the core temperature of the fish; of those, 54% monitor temperature when the fish are ready to be glazed. Sixty-four percent (64%) reported the average core temperature to be minus 5 degrees F or lower at the time fish were removed from the freezer.
- ◆ Over half (56%) monitor freezer temperature on an hourly basis, using remote temperature probes the majority of the time (58%).
- ◆ Asked how long it would take to freeze fish under full freezer capacity, 47% said it would take eight hours or less, while 39% gave no answer.
- ◆ Floaters had mixed feelings on holding mandatory seafood quality inspection programs -- 47% felt it would improve fish quality, and 53% felt it would not.

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Perceptions of Quality

- ◆ When asked how they believe consumers perceive the quality of Alaskan salmon, virtually the same percentages (61 - 68%) of fishermen, tenders, and processors say that consumers rate it either high or very high quality. On the other hand, floaters had a significantly different opinion -- only 53% felt consumers rated Alaska salmon as either high or very high quality.
- ◆ When asked which country produces the highest quality salmon, fishermen (54%), tenders (46%) and floaters (39%) most frequently mentioned Alaska; but on-shore processors are more likely to give the advantage to Norway (33%).
- ◆ However, when asked which country produces the lowest quality salmon, all four industry sectors rate Chile as poorest (29 - 44%), and Alaska as second-poorest (12-28%).

Perceptions of ASMI

- ◆ Tender operators (61%), on-shore processors (71%) and floating processors (64%) are quite familiar with ASMI's quality control program; but more than half of the fishermen, (51%) are not familiar with ASMI.
- ◆ Only half of the fishermen (50%) have read ASMI's Recommended Salmon Quality Handling Guidelines; compared to 61% of the tenders, 72% of the on-shore plants and 64% of the floaters.

On-Site Observations

- ◆ There does not appear to be any uniformity in the quality-related requirements or incentives given by processors to fishermen; this was said to be a result of competition for the fish among shore-based plants, floaters, and cash buyers.
- ◆ The trend of some fishing boats and most tender vessels to RSW chilling systems is welcomed by most respondents, but many say that salmon are often held too long on those RSW vessels (i.e. - even though a vessel might have an RSW system, it still might not deliver frequently enough).
- ◆ Further, it is unclear if the RSW systems are of adequate size (horsepower) to chill the amount of fish that are actually packed in the holds.
- ◆ Mixed-species salmon fisheries put the fish at greater risk of thermal and mechanical damage than single-species fisheries do, because of the additional handling that is done on sorting tables onboard the tenders -- the fish are out of refrigeration for a longer time, they undergo an additional handling step, and they are often handled roughly (dropped 6-10 feet into deep metal baskets or onto the deck, left lying on deck where they are kicked or stepped on, etc.) at the time of sorting.

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On-Site Observations - continued

- ◆ Some Bristol Bay fishermen hold the opinion that RSW systems can be installed on 32-foot driftnet boats. In fact, one such fisherman reports that his group of 10-12 drifters, each with "older" fiberglass or aluminum boats, have all installed RSW in their holds -- he said that they bought the systems as a group, they fish and deliver as a group, and get a premium price.
- ◆ During the on-site fieldwork, it was impossible to verify the statements that the fish on a given fishing boat are not exposed to heat from the engine or exhaust. For example, a few fishermen would say that the fish are not exposed to heat, but would later mention that that was because of frequent deliveries, rather than because of insulation in the hold (i.e. - there was no insulation).
- ◆ When the fish are delivered to the dock by a tender (rather than by the fishermen), it is usually impossible for the processor to know which fishermen produced the good fish and which produced the bad fish, because the fish are mixed onboard the tender.

On-Site Observations - continued

- ◆ Onboard chilling is practiced by many fishermen, but some tenders, processors, and fishermen say that there are still three kinds of problems --
  - Some ice boats only top-ice the fish (rather than layer-ice).
  - Some RSW boats and tenders either do not pre-chill their systems, or do not turn on the systems until shortly before delivery, in order to qualify for the chilling-bonus price.
  - For competitive reasons (i.e. - to get enough fish), some processors pay the chilling-bonus price, even if the fish are not chilled at all.
  
- ◆ At the end of a short fishing period , most driftnetters deliver their catch to the dock, rather than to a tender; however, because of considerations of large tide ranges and restricted dock space, the boats anchor away from the dock, so that the fish are lightered to the dock by skiffs (not tenders). The skiffs are not equipped to lift brailers out of a fish hold, so the fish are handled individually (tossed), and the handlers stand on the fish during this off-loading.

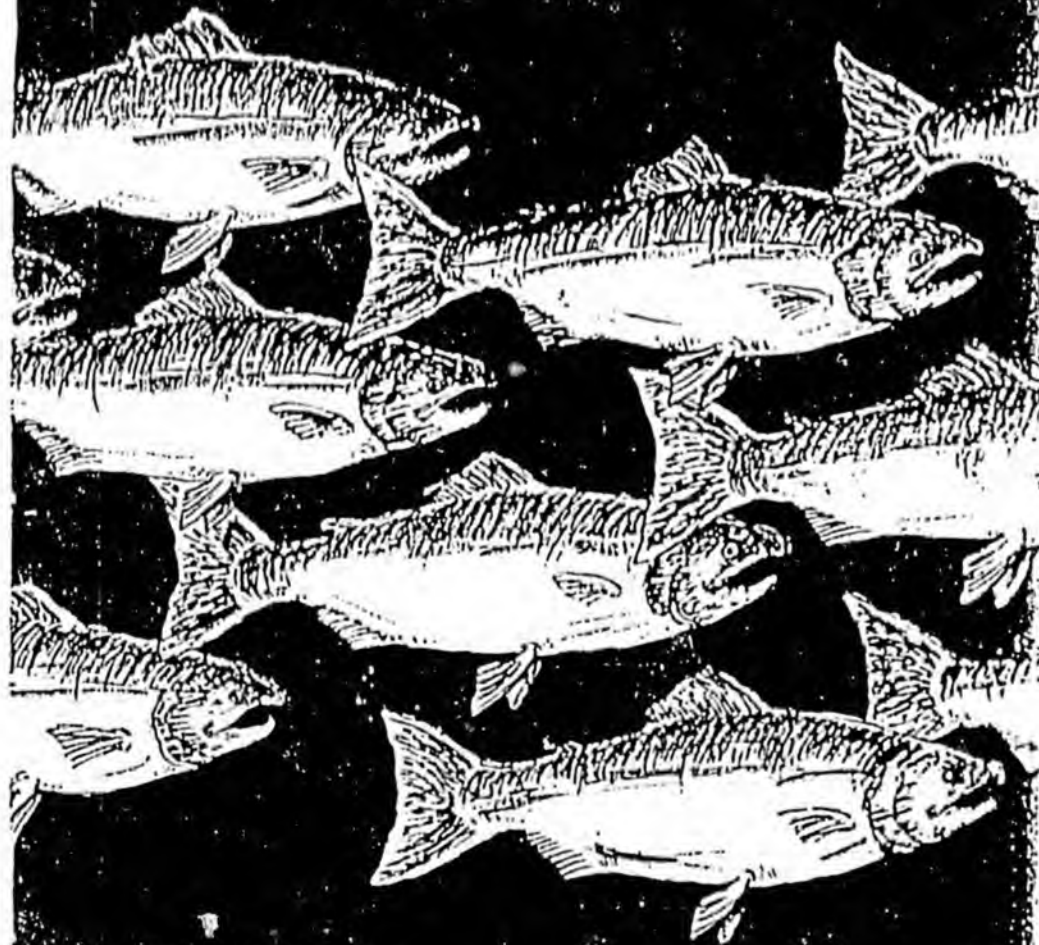
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On-Site Observations - continued

- ◆ Many processors say that their customers have complained about internal damage caused by winding the fish onto the gillnet reels, picking the fish up by the tail, or throwing the fish so that it bounces off the wheelhouse before falling into the hold; some of these processors display photographs (taken by the customers) of this damage, for the fishermen to see.
- ◆ In brailers, the critical factor seems to be the depth of the fish, rather than the total weight of the fish in the brailer. Fish coming from tall, thin brailers (of 400 pounds in weight) appear to be more compressed than those coming from wide, flat, shallow brailers (of as much as 2,000 pounds).
- ◆ In response to the question: "Where do you think that the most damage to the fish occurs?" -- many fishermen criticized other fishermen rather than tender operators and processors. They report incidences of rough handling, lack of chilling, long holding times, or exposure to heat or contaminants (bilge water, etc.).
- ◆ In a few plants, processed fresh fish were observed to fall on the floor, and then get picked up and put back on the line, with no cleaning or rinsing.
- ◆ Some RSW tenders over-pack their holds, which impedes the circulation of cold water.

# Recommended Salmon Quality Guidelines



For Fishing,  
Tendering and  
Processing Operations

# Recommended Salmon Quality Guidelines

For Fishing, Tendering  
and Processing Operations



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## Preface

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Salmon is Alaska's single most valuable seafood resource. The complexities of harvesting, processing, transporting and distributing salmon from remote points along Alaska's 34,000 miles of coastline and extensive inland river system create challenges for all those who participate in this fishery. One of these challenges is the consistent production of high quality salmon products.

Consumer surveys show that the approximately one billion pounds of Alaska seafood produced and distributed annually have a favorable reputation with respect to quality. But these products are faced with ever-increasing competition in today's marketplace. The Alaska Seafood Marketing Institute (ASMI) recognizes the critical role quality plays in consumer purchase decisions, and is committed to maintaining and improving the quality of Alaska seafood products so that all members of the industry will benefit from the economic advantage of a consistent, high quality product image in the world marketplace.

The production of high quality seafood requires the collective efforts of fishermen, processors, distributors and resource managers. The ASMI Quality Assurance Program is designed to unite representatives from these industry and government sectors into an effective partnership. ASMI believes this cooperation will be helpful in shaping educational programs aimed at improving seafood quality, and is vital to the future of the state of Alaska and the seafood industry.

## Notice to Users

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These recommended guidelines for Pacific salmon have been developed by ASMI to assist fishermen, tender operators and processors in producing high quality salmon products. The guidelines are not intended to replace the advice of trained and experienced technologists concerning the construction, operation and maintenance of vessels, facilities or equipment, or regarding operating procedures in specific geographic areas. These guidelines are also designed for reference by public service agencies. This information should not, in any way, be construed as replacing existing local, state or federal regulations.

ASMI recognizes the limitations inherent in general guidelines of this type. The reader should be aware that certain guidelines may not apply to all fishing, tendering and processing operations, vessels and facilities in all regions of the state, due to variations in vessel construction, facility design, tides, air or water temperatures, intrinsic characteristics of the fish, or other factors.

Nothing contained in these guidelines is intended to be, or shall be construed to create or form, the basis for any liability on the part of ASMI, its officers, employees or agents, for any injury or damage resulting from the failure of the person who engages in operations or activities subject to the provisions of, or guided by, these guidelines to comply with their provisions, or by reason or in consequence of any act or omission in connection with the implementation or enforcement of these guidelines on the part of ASMI by its officers, employees or agents.

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## Scope

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These guidelines apply to all five species of Pacific salmon (*Oncorhynchus* sp.) that are harvested, transported or processed in Alaska and which may be offered for sale in many styles, including, but not limited to:

- a) Round
- b) Eviscerated, head-on
- c) Eviscerated, head-off
- d) Heads, fins and tail removed
- e) Steaks or portions
- f) Split sides, backbone removed
- g) Fillet, skin-on
- h) Fillet, skin-off
- i) Canned

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## Definitions

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**Belly burn** is the softening and discoloration of the interior belly wall, caused by enzymatic activity in the body cavity, which may occur between the time the fish dies and when the viscera is removed.

**Chilled sea water (CSW)** is a type of cooling system, sometimes referred to as "slush ice," which uses a mixture of sea water and ice for chilling and holding chilled fish. If compressed air is bubbled through the mixture of sea water and ice for circulation, it is called a champagne system.

**Contamination** means direct or indirect transmission of objectionable matter to the fish.

**Cold storage facility** is any facility, whether a shore-based establishment or on a vessel, in which fish are kept cold by the use of ice or mechanical refrigeration. A cool room is any facility where fish are held at a temperature of 40° F or below. A cold storage room is any facility where fish are held at a temperature of zero degrees F or below.

**Dry vessels** are fishing or tendering vessels which are not using ice, chilled sea water (CSW) or refrigerated sea water (RSW) systems to chill the fish.

**Extrinsic quality** is a term which refers to the condition of a fish due to factors which affect the fish during and after it is harvested. Extrinsic quality defects are caused by improper catching, handling, processing and storage procedures.

Fish refers to Pacific salmon everywhere it is used in these guidelines.

Hatch coaming is the raised area on the deck of a vessel around a hatch, and is designed to prevent runoff from the deck from entering the fish hold.

Intrinsic quality is a term which refers to the inherent physical characteristics of a fish before it is harvested, including but not limited to: species, size, sex, physiological condition, and presence of parasites or disease.

Prepare means to kill, eviscerate, dress, clean, cut or divide round fish.

Process means to can, cure, freeze, cook or otherwise preserve fish, at any temperature.

Processing facility is any facility, whether shore-based or aboard a vessel, where fish is either prepared or processed for human consumption.

Refrigerated sea water (RSW) is a type of system which uses seawater that is cooled by mechanical refrigeration for chilling and holding fish.

Sanitize means to treat surfaces so that the number of microorganisms is substantially reduced.

Unwholesome fish are those of such poor quality that they are unfit for human consumption, as defined by U.S. Food and Drug Administration regulations.



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## General Information About Fish Quality

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Although there are many factors that fishermen, tender operators and processors must consider when defining "high quality" as applied to fish products, two major ones are: 1) the intrinsic quality of the fish before it is harvested, and 2) the extrinsic quality of the fish as it is delivered to the tender, processor, and ultimately, the consumer.

The intrinsic quality of the fish is determined by its physical condition at the time of harvest, and is affected by species, size, sex, stage of maturity and other physiological characteristics. These characteristics are inherent to a particular fish, and will not be significantly altered by handling methods.

Extrinsic quality is determined by the methods employed in the harvesting, handling, processing and storage of fish. Proper handling procedures will result in fish of high extrinsic quality; improper handling methods will result in a loss of extrinsic quality.

Deterioration of extrinsic quality is also caused by the action of microorganisms and enzymes, and by other chemical changes that take place in the fish after death. The flesh of a live fish is normally considered to be sterile, but bacteria naturally can be found living on gills, skin and in the fish's gut. These bacteria flourish after the fish dies, multiplying rapidly as temperatures elevate.

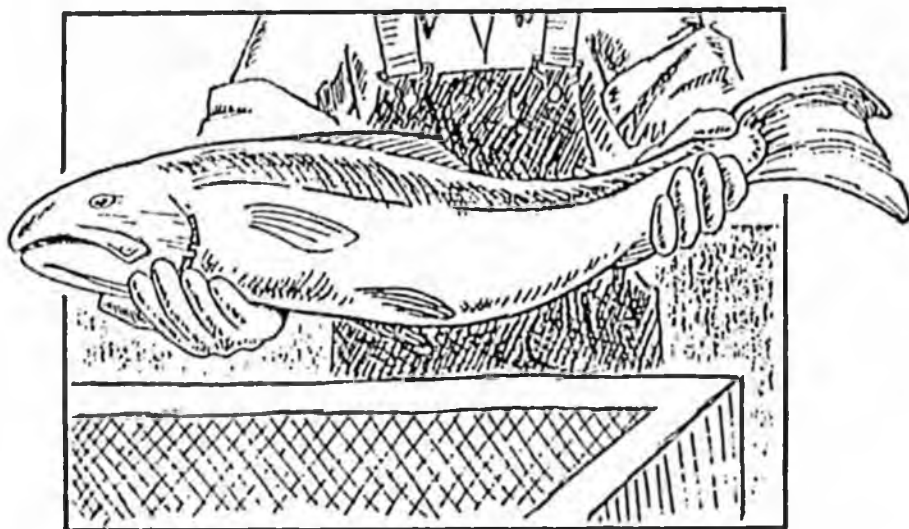
Enzymes are secreted into the fish's digestive tract so that it may digest and utilize the food it eats. After the death of feeding fish, enzyme activity continues, but is not controlled as it was during the fish's life. Digestive enzymes will leach out of the stomach and intestines and begin to attack the proteins in the flesh of the fish, resulting in what is commonly called "belly burn."

This digestive action by enzymes is part of the decomposition process, causing undesirable changes and making it easier for bacteria to invade the flesh of the fish. Spoilage occurs more rapidly as a result of this enzymatic activity.

Biochemical changes also contribute to deterioration. The progress of these changes is most evident as the muscles of the fish change from soft and flexible to hard and rigid as *rigor mortis* sets in, and as they later return to a relaxed state.

The deterioration of fish and fish products caused by bacteria, enzymes and other chemical actions cannot be stopped, but it can be slowed down. To delay deterioration, you should:

- a) Control temperatures to keep bacterial and chemical activity at the slowest rate possible, i.e. chill the fish as quickly as possible to a range of 32° to 35° F;
- b) Prevent unnecessary contamination through good sanitary practices and proper design and construction of equipment and facilities; and
- c) Handle the product in a manner which minimizes physical damage.



Careful handling reduces risk of physical damage to fish.

## Fishing Vessels and Operations

### A. Vessel Guidelines

#### General Design

The design and construction of a fishing vessel must take into consideration both efficiency and performance as a seaworthy harvest unit, as well as capabilities necessary to deliver a high quality catch to the processor. Design and construction must therefore ensure:

- a) Rapid and efficient handling of fish;
- b) Adequate facilities for proper storage and temperature control; and
- c) Use of materials and design that will facilitate cleaning and disinfection, and prevent damage or contamination of the catch.

Due to the limited space available on a fishing vessel, there is a high potential for contamination of the fish with bilge water, sewage, fuel, oil, grease, smoke, chemicals or other objectionable substances. Design and layout must consider these potential problems in the organization of space, functional areas and facilities.

These recommendations provide guidance for design, construction or retrofitting to ensure that vessels are adequately equipped for the proper handling and consistent delivery of a quality catch.

## *Deck Areas and Fish Holds or Tanks*

All vessels should have a suitable holding area for storing the catch, whether it is below or on-deck. Plastic totes with drainage capability are acceptable for use as fish containers when properly sheltered or covered.

Fish holds should have watertight bulkheads designed to protect the fish from contaminants such as bilge water, fuel and lubricants.

Fish holds on dry vessels should have removable floor boards or some other system to facilitate drainage from the hold.

Fish holds should have pumps and sumps with the capability to pump the hold dry.

Fish holds should be adequately insulated to control the transfer of heat from engine, living quarters or heated pipes.

Fuel and hydraulic lines running through fish holds should be enclosed to protect the fish in case of line failure, and insulated where necessary to prevent heat transfer.

Vessels should have hatch coamings high enough to prevent the flow of contaminants from the deck to the fish holds.

Vessels should be equipped with sufficient hatch covers or suitable covering material to eliminate the exposure of fish to sunlight or airborne contaminants. Hatch covers should be watertight to protect fish from salt or fresh water intrusion.

All lights in fish handling areas should be shatterproof or have protective coverings which will prevent product contamination should breakage occur.

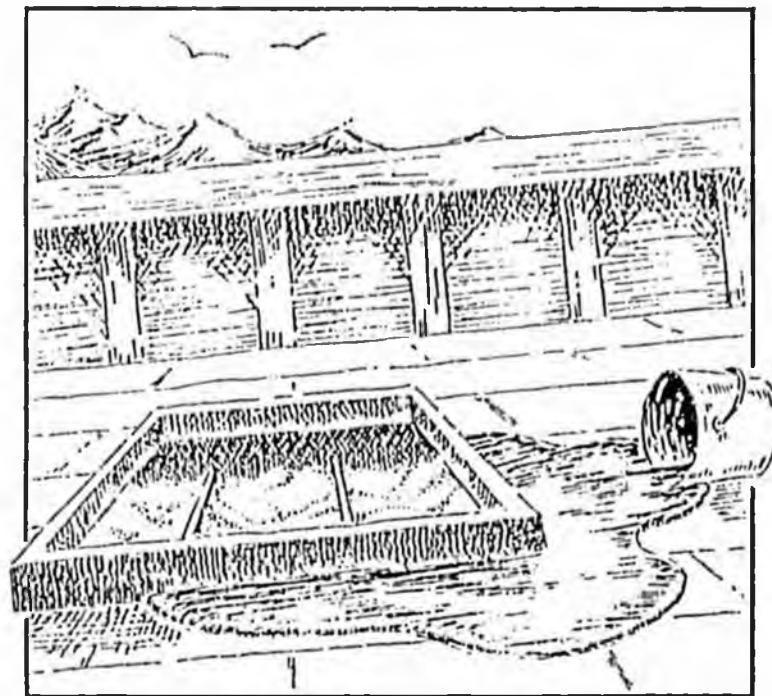
There should be no exposed ribs or untreated wood on surfaces in the fish hold or in fish handling areas on deck. The hold lining should be smooth and watertight. A plywood-lined hold, caulked with non-toxic seam compound and coated with a suitable paint or covering is acceptable. Ideally, holds should have an impermeable lining with rounded corners and no obtrusions. Holds should be conducive to easy and complete cleaning to prevent build-up of bacteria.

Fish holds or tanks should be insulated to minimize heat transfer into fish storage areas. A minimum "R" factor of 10 is recommended for chilled storage areas, or a factor of 20 for frozen storage areas. Insulation should be installed so that it is completely sealed, to prevent water, blood and slime from entering; and reducing its effectiveness.

On vessels with refrigeration systems, equipment should be in good operational condition, and capable of chilling a full load of fish to a range of 30° to 35° F within a reasonable amount of time. RSW vessels should limit loads to a maximum of 45 pounds of fish per cubic foot of hold space.

On vessels with freezing systems, equipment should be fully operational and capable of reducing the core temperature of a full load of fish to zero degrees F or lower within a reasonable amount of time.

Tanked vessels and freezer vessels should be equipped with recording thermometers which accurately measure and record the temperature of the hold, freezers or cold storage area. Vessels which do not have tanked holds should be equipped with bi-metal thermometers which accurately measure the internal temperature of the fish.



*Care should be taken to prevent contaminants from coming into contact with fish.*

## B. Recommended Operating Procedures for Fishermen

### *General Guidelines for All Gear Types*

The best designed and constructed vessel or equipment will do little to ensure delivery of a high quality catch if fish are not handled and stowed properly. These recommendations will assist you in delivery of a quality catch: Handle fish carefully at all times. This includes, but is not limited to the following steps:

- a) Remove fish from gear gently;
- b) Do not handle fish by the tail;
- c) Do not throw, kick or step on fish;
- d) Protect fish from damage in shaft alley or any other part of the vessel.

Note that pulling a fish by the tail stretches the backbone, breaking blood vessels along the spine. Blood seeps into the surrounding tissue and forms a bruise that cannot be seen until the salmon is filleted or split.

No pugles, forks, picks, hooks or pumps which damage fish should be used.

Fish should be protected from heat, sunlight, air-drying and inclement weather.

Fish should be protected from bilge water, gas, diesel oil, hydraulic fluid, grease and other contaminants.

On vessels with below-deck holds, chutes or other devices should be used to convey fish into the hold gently, to reduce handling and prevent damage caused by throwing or dropping fish into the hold.

Fish held in bulk on vessels without tanked holds should be shelved at no greater than 35-inch intervals.

On tanked vessels, fish holds should be divided, as necessary, to prevent damage to fish due to the vessel's motion.

No pets should be permitted on vessels used for catching or transporting fish.

Live fish should be stunned in the water or as soon as they are brought on board.

Feeding colts and kings should be eviscerated and washed as soon as they are brought on board.



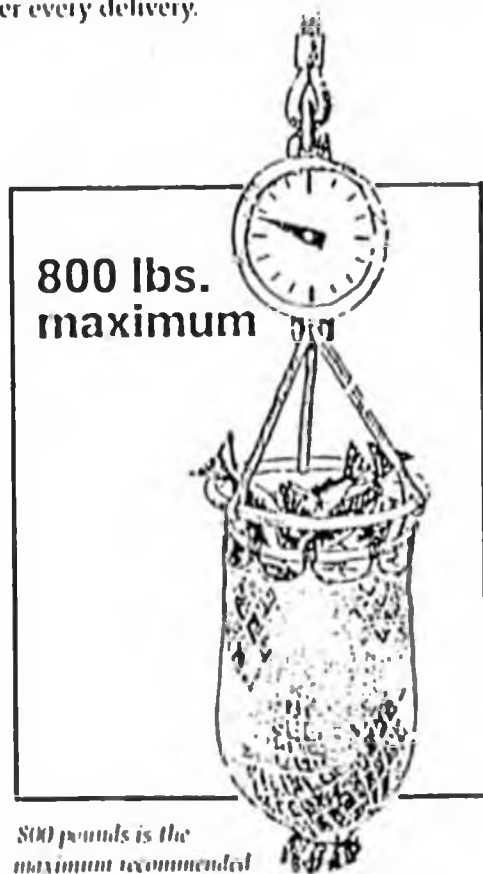
*Handling fish by the tail may result in backbone separation and bruising of the meat.*

Round and eviscerated fish should not be intermingled in the holding area. A separate bin or on-deck totes should be used to store eviscerated fish on vessels carrying both round and eviscerated fish.

Fish should be delivered to tenders or processing facilities as rapidly as possible. All fish should be chilled as soon as possible after being caught.

Fish should be held and unloaded in a manner which minimizes physical damage. Use of knotless, small mesh brailers or cargo nets is recommended. No more than 800 pounds of fish should be loaded in a brailer and/or cargo net.

The holds, bin boards and decks should be thoroughly cleaned and sanitized in accordance with the Fishing Vessel Sanitation Procedures described later in these guidelines. The vessel should be cleaned after every delivery.



800 pounds is the maximum recommended weight load for transferring fish with brailers.

### *Additional Guidelines for Drift Gill Net Operations*

Drift gill net sets should not be longer than two hours.

Drift gill nets should not be wound onto the reel until all fish have been picked from the net.

### *Additional Guidelines for Set Gill Net Operations*

Set gill net sets should not be longer than six hours.

Do not drag set nets on the beach unless all fish have been picked from the net.

Salmon should be removed from set nets before gear is exposed at low tide.

Burlap used to protect fish from exposure to sun and air should be washed in salt water after every use and should be replaced often.

Fish must be protected from fecal contamination by pets and other animals.

Fish should be thoroughly washed in salt or fresh water as soon as possible after catching, and should be stored in clean containers until delivery to a tender or processor.

## C. Chilling and Chilled Storage During Fishing Operations

### *General Guidelines for Round Fish*

Temperature is the single most important factor affecting the keeping quality of fish. The rate of bacterial growth, and therefore the speed at which fish spoil, depends on temperature. The lower the temperature, the slower the process occurs. It is not possible to completely stop bacterial growth by chilling fish, but the rate of growth and spoilage can be significantly reduced by keeping fish chilled to temperatures as close to freezing as possible.

All fishermen should use ice or some other method of chilling their fish. Whatever method is used, fish should be chilled as soon as possible after catching.

Ice is an excellent, inexpensive medium for cooling and storage of chilled fish, capable of maintaining fish at slightly above 30° F. The amount of heat which must be absorbed from fish to melt ice is approximately 72 times as great as is necessary to increase the temperature of cold water by two degrees.

If all of the cooling capacity of ice could be applied to the fish, one pound of ice could cool seven pounds of fish from 55° to 32° F. In practical use, however, much of the cooling capacity of ice is used up on the air and other materials in the fish holding area, making it necessary to use approximately one pound of ice per two pounds of fish. Even at this ration, ice is still over twenty times more efficient than cold water.

If ice is chosen as the chilling and storage medium, enough ice should be used to reduce and hold the temperature of the fish at a range of 32° to 35° F. Finely divided ice cools most efficiently by providing the most surface contact with the fish. All ice used for chilling fish must be made with clean water from an approved source.

Refrigerated sea water (RSW) and chilled sea water (CSW) or slush ice, are often used for cooling and storage of fish. The primary difference between the two systems is that RSW uses mechanical refrigeration and CSW is cooled by adding ice to the water. RSW offers the advantages of rapid cooling, lower holding temperatures and less pressure on fish. The disadvantages are salt and water uptake, potentially greater protein loss, and anaerobic spoilage.

If a chilled (CSW) or refrigerated (RSW) sea water system is used, the fish should be maintained at 30° to 35° F. All tanks should be prechilled to 30° to 32° F before loading fish.

All sea water used in CSW and RSW systems should be obtained from open waters, away from populated areas or fresh streams.

The internal temperatures of iced fish and/or the temperature of the hold on vessels with CSW or RSW systems should be monitored and logged at regular intervals, preferably every six hours. Bi-metal thermometers should be used to measure the internal temperature of the fish. The thermometer should be carefully inserted in the anal vent of the fish until the reading stabilizes, or for approximately one minute.

### *Additional Guidelines for Dressed (Eviscerated) Fish*

Dressed fish should be iced in plastic tubs, boxes or small removable bins as soon as possible after evisceration. Drainage capability should be provided for these containers.

Neither CSW nor RSW systems should be used for holding eviscerated fish.

## D. Freezing and Frozen Storage Aboard Fishing Vessels

Fish should be frozen in either a pre- or post-rigor condition, when the fish is flexible, to avoid tissue damage and/or gaping.

Freezing systems should be tested by measuring the core temperatures of several average-size fish with a thermocouple while the freezer units are operating with full loads of fish.

Fish should be positioned straightly on freezer trays. Overlapping of belly flaps will result in damage after freezing is complete.

Fish should not be removed from freezers until the core temperature has been reduced to a maximum of five degrees F, and preferably to zero degrees F.

If brine freezers are being used, core temperatures may be slightly higher, provided that the fish are immediately placed in cold storage and held at zero degrees F or below.

The core temperature of fish in storage should remain at zero degrees F or lower.

Fish should be frozen and held at a constant temperature. Temperature fluctuations should be minimal. The temperature of freezers and storage areas should be monitored at regular intervals.

Fish should be glazed as soon as possible after freezing to prevent dehydration and oxidation.

## E. Fishing Vessel Sanitation

### *General Information*

Fish stored in an unsanitary hold will be contaminated with bacteria and will have a greatly reduced storage life. Fish slime and blood make excellent food for bacteria and should be removed as soon as possible after fish have been unloaded from the vessel.

Refrigeration systems are easily contaminated because the circulating water includes considerable amounts of slime and blood that can accumulate in the piping, heat exchangers and other equipment. All RSW systems should be designed to permit proper cleaning and sanitizing of the sea water piping and the heat exchangers. Back-flush lines and cleaning loops are recommended.

### *Cleaning and Sanitation Procedures*

The following steps should be followed when cleaning and sanitizing a fishing vessel:

- a) Flush all fish contact surfaces with clean fresh water or clean sea water;
- b) Scrub all fish contact surfaces with a brush or a high pressure washing system, using a detergent solution;
- c) Rinse with cold fresh water or sea water;
- d) Sanitize with a solution containing chlorine or iodine; and,
- e) After five to 10 minutes, rinse off the sanitizing solution.

Wooden boats should not be steam-cleaned. Fatty and proteinaceous materials (fish slime and gurry) can be forced into the wood, making the job of thorough cleaning almost impossible.

As soon as possible after fish have been removed from an RSW system, the sea water piping and heat exchangers should be cleaned, sanitized and rinsed, using an alkaline solution as the cleaner and iodine as the sanitizer.

### *Detergents and Sanitizers*

The cleaner used should be one suited to removal of fish gurry. Alkaline detergents are best for removal of fat and protein materials. Most common household detergents are mixtures of alkaline phosphates and a wetting agent, and are suitable for use on a fishing vessel.

A sanitizing agent containing either chlorine or iodine should be used to kill bacteria left after the vessel has been cleaned. Liquid chlorine solutions (five percent hypochlorite) are suitable, provided they have been properly diluted. Use these preparations according to the labeled instructions. An iodine sanitizer can also be used; it is less corrosive to metal parts of the vessel, but costs about twice as much.

Under no circumstances should sanitizers containing phenols (such as Lysol and Pinesol) be used in a fish hold or on fish handling surfaces. Most phenols are insoluble in water and impart strong, undesirable odors which may affect fish taste.



Clear water should be used to rinse all fish contact surfaces before and after scrubbing and sanitizing.



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## Tendering Vessels and Operations

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### A. Vessel Guidelines

#### *General Information*

All tendering vessels should be designed for rapid and efficient handling of fish and ease of cleaning and sanitation. They should be constructed, operated, and maintained so as to prevent contamination and minimize physical damage and deterioration of fish.

All vessels should have a suitable fish holding area for storing the catch, whether it is below or on-deck. Plastic totes with drainage capability are acceptable for use as fish containers when properly sheltered or covered.

Fish holds should have watertight bulkheads designed to protect the fish from contaminants such as bilge water, fuel and lubricants.

Fish holds on dry vessels should have removable floor boards or some other system to facilitate drainage from the hold.

Fish holds should have pumps and sumps with the capability of pumping the hold dry.

Fish holds should be adequately insulated to control the transfer of heat from the engine, living quarters or heated pipes.

Fuel and hydraulic lines running through fish holds should be enclosed to protect the fish in case of line failure, and should be insulated where necessary to prevent heat transfer.

Vessels should have hatch coamings high enough to prevent the flow of contaminants from the deck to the fish holds.

Vessels should be equipped with sufficient hatch covers or suitable covering material to eliminate the exposure of fish to sunlight or airborne contaminants. Hatch covers should be watertight and designed to protect the fish from fresh or salt water intrusion.

All lights in fish handling areas should be shatterproof or have protective coverings which will prevent product contamination should breakage occur.

There should be no exposed ribs or untreated wood on surfaces in the fish hold or in fish handling areas on deck. The hold lining should be smooth and watertight. Holds should have an impermeable lining with rounded corners and no obtrusions, and should be insulated. Hold construction should be conducive to easy and complete cleaning to prevent build-up of bacteria.

On vessels with refrigeration systems, equipment should be in good operational condition and capable of chilling full loads of fish to a range of 30° to 35° F within a reasonable amount of time. Circulation systems should be adequate to ensure an even temperature throughout the hold.

Tanked vessels should be equipped with recording thermometers which accurately measure and record the temperature of the hold. Vessels which do not have tanked holds should be equipped with bi-metal thermometers which accurately measure the internal temperature of the fish.

Vessels with below-deck holds should be equipped with chutes or other devices designed to convey fish into the holds with a minimum of damage.

## B. Recommended Operating Procedures Aboard Tenders

### General Guidelines

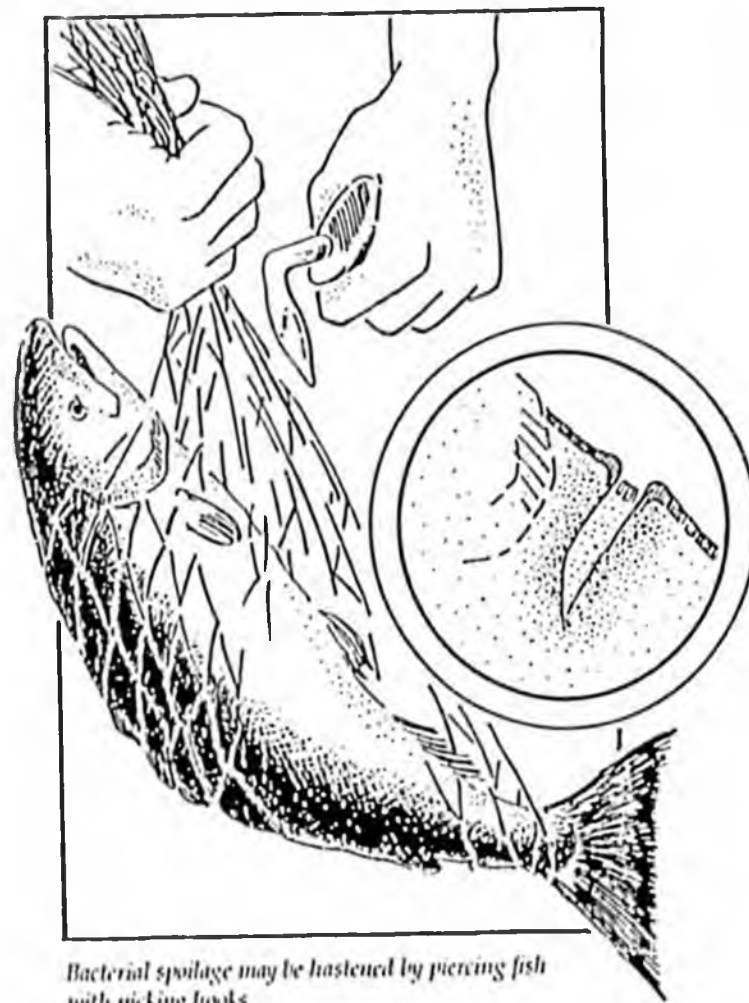
Fish should be handled carefully at all times. This includes, but is not limited to these practices:

- a) Do not handle fish by the tail;
- b) Do not throw, kick or step on fish;
- c) Protect fish from damage in the shaft alley or any other part of the vessel.

While receiving fish from a fisherman, do not overload equipment.

On vessels with below-deck holds, chutes or other systems should be used to convey fish into the hold. This will reduce handling and prevent damage. Fish should not be dropped into the hold or on hard surfaces such as the deck. If loading into a tanked hold, lower brailers close to the surface of the water in the hold before releasing fish.

Pughs, forks, picks, hooks or pumps which damage fish should not be used. Alaska regulations prohibit the pugging of fish.



Bacterial spoilage may be hastened by piercing fish with picking hooks.

Fish should be protected from heat, sunlight, air-drying and inclement weather.

Fish should be protected from bilge water, gas, diesel oil, hydraulic fluid, grease and other contaminants.

Fish held in bulk on vessels without tanked holds should be shelved at intervals of no more than 35 inches.

On tanked vessels, fish holds should be divided, as necessary, to prevent damage to fish due to the vessel's motion.

No pets should be permitted on vessels used for transporting fish.



*The presence of pets aboard fishing vessels and in processing plants is unlawful.*

Round and eviscerated fish should be kept apart in the holding area. A separate bin or on-deck totes should be used to store eviscerated fish on vessels carrying both dressed and round fish.

Fish should be chilled and delivered to processing facilities as rapidly as possible.

Pumps, brailers or elevators used for unloading fish should be operated in a manner that minimizes physical damage to fish, and in accordance with the manufacturer's instructions. The recommended maximum load per brailer is 800 pounds. Use of small mesh, knotless brailers is recommended.

Tender vessel holds, bin boards and decks should be thoroughly cleaned and sanitized in accordance with the Tendering Vessel Sanitation Procedures described later in these guidelines. The vessel and equipment should be cleaned after every delivery.

## *Fish Quality Evaluation Procedures*

Both the intrinsic and extrinsic quality of all fish should be evaluated as received. Evaluation of general fish condition should be logged if fish are of questionable quality. The evaluation should include, but need not be limited to:

- a) Correct species identification;
- b) External appearance of eyes, gills, scales, and skin;
- c) Odor;
- d) Internal fish temperature; and,
- e) Sexual maturity.

The internal appearance of viscera, kidney and belly walls may also be noted.

Deterioration of quality caused by refrigeration system failure, adverse weather conditions, contamination by bilge water, fuel, lubricants, phenols (lysol) or other contaminants, or any other adverse conditions, should be documented.

Fish suspected of being unwholesome or contaminated should be segregated from all other fish on the tender, and the condition of the fish noted.

Fish found during evaluation to be unwholesome or contaminated by bilge water, fuel, lubricants, phenols or other undesirable substances should not be accepted by tenders.

## **C. Chilling and Chilled Storage Aboard Tenders**

### *General Guidelines for Round Fish*

All tender operators should use mechanical refrigeration or some other method of chilling fish. Whatever method is used, fish should be chilled as soon as possible after being loaded on the tender.

If ice is used, the fish should be stored in enough finely divided ice to reduce the temperature of the fish to a range of 32° to 35° F within a reasonable amount of time and to hold it within that range. Finely divided ice will ensure the greatest surface contact with the fish. All ice used for chilling fish must be made with clean water from an approved source.

If a chilled (CSW) or refrigerated (RSW) sea water system is used, the fish should be maintained at 30° to 35° F. All tanks should be prechilled to 30° to 32° F before receiving fish.

All sea water used in CSW and RSW systems should be obtained from open waters, away from populated areas and fresh water sources.

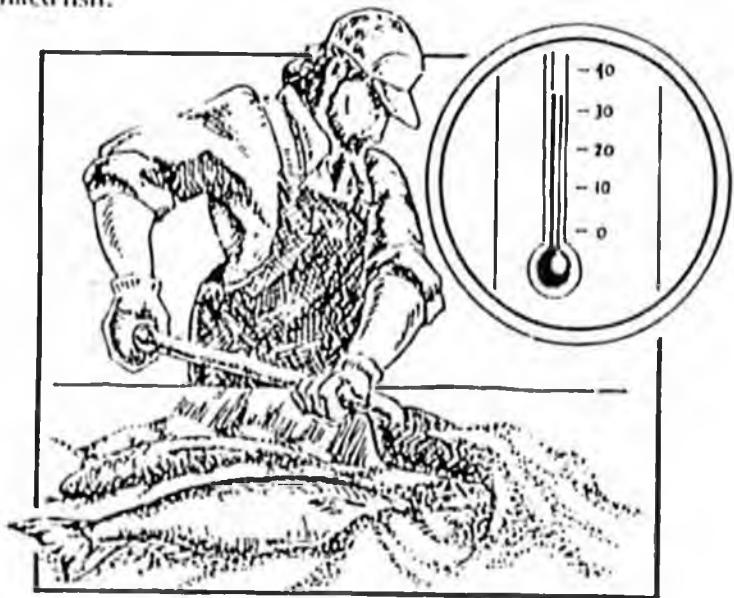
The internal temperatures of iced fish and/or the temperature of the hold on vessels with CSW or RSW systems should be monitored and logged at regular intervals, preferably every six hours. Hold temperatures can be monitored with a recording thermometer. Bi-metal thermometers should be used to measure the internal temperature of the fish. The thermometer should be carefully inserted in the anal vent of the fish until the reading stabilizes, or for approximately one minute.

RSW tenders should limit their loads to a maximum of 45 pounds of fish per cubic foot of hold space.

#### *Additional Guidelines for Dressed (Eviscerated) Fish*

Dressed fish should be stored in ice, either in impermeable tubs with drainage capability, or in boxes or small removable bins.

Neither CSW or RSW systems should be used for holding eviscerated fish.



*When using ice to chill fish, it should be finely divided and maintain a temperature range of 32° to 35° F.*

## D. Tendering Vessel Sanitation

### *General Information*

Fish slime and blood make excellent food for bacteria and should be removed as soon as possible after fish have been unloaded from the vessel.

Refrigeration systems are easily contaminated because the circulating water includes considerable amounts of slime and blood that can accumulate in the piping, heat exchangers and other equipment. All RSW systems should be designed to permit proper cleaning and sanitizing of the sea water piping and the heat exchangers. Back-flush lines and cleaning loops are recommended.

### *Cleaning and Sanitation Procedures*

The following steps should be followed when cleaning and sanitizing a tendering vessel:

- a) Flush all fish contact surfaces with clean fresh water or clean sea water;
- b) Scrub all fish contact surfaces with a brush or a high pressure washing system using a detergent solution;
- c) Rinse with cold fresh water or sea water;
- d) Sanitize with a solution containing chlorine or iodine; and,
- e) After five to 10 minutes, rinse off the sanitizing solution.

Wooden boats should not be steam cleaned. Fatty and proteinaceous materials can be forced into the wood, making the job of thorough cleaning almost impossible.

As soon as possible after fish have been removed from an RSW system, the sea water piping and heat exchangers should be cleaned, sanitized and rinsed, using an alkaline detergent solution followed by a suitable sanitizer.

### *Detergents and Sanitizers*

The cleaning agent used should be one well-suited to removal of fish gurry. Alkaline detergents are best for removal of fat and protein materials such as fish slime. Most common household detergents are mixtures of alkaline phosphates and a wetting agent and are suitable for use on a fishing vessel.

A sanitizing agent containing either chlorine or iodine should be used to kill bacteria remaining after the vessel has been cleaned. Liquid chlorine solutions (five percent hypochlorite) are suitable if properly diluted. Prepare these solutions according to the directions provided on the label. Iodine sanitizers can also be used. Iodine solutions are less corrosive to metal parts of the vessel, but cost about twice as much as chlorine sanitizers.

Under no circumstances should sanitizers containing phenols (such as Lysol and Pinesol) be used in a fish hold or on fish handling surfaces. Most phenols are insoluble in water and impart strong undesirable odors which may affect fish taste.



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## Shore-Based and Floating Processing Facilities and Operations

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### A. Facility and Equipment Guidelines

#### *General Information*

All vessels, vehicles and equipment used in the transportation, unloading or processing of fish should be constructed, operated and maintained so as to minimize physical damage to and deterioration of the fish, and prevent contamination of the fish.

Many aspects of fish processing operations, including facility requirements, equipment and utensils, plumbing, sanitary facilities, water supply and ice, thermal processing and waste disposal are regulated by the Alaska Department of Environmental Conservation and the U.S. Food and Drug Administration. The guidelines and procedures outlined in this section are intended to be complementary to applicable state and federal regulations and should not, in any way, be construed as replacing or conflicting with such regulations.

All aspects of salmon canning in Alaska should meet the requirements of the current Canned Salmon Control Plan, a voluntary cooperative agreement between the canned salmon industry, the National Food Processors Association and the U.S. Food and Drug Administration.

## General Guidelines

The facility should be large enough to accommodate processing operations without interfering with proper sanitary practices. Floors, walls and ceilings should be constructed of materials that can be kept clean, sanitary and in good repair.

Each room should have natural or artificial lighting that is adequate for the operations to be conducted there, and to provide adequate visibility for cleaning and sanitary inspection.

All lights must be shatterproof or have a protective covering which will prevent product contamination should breakage occur.

Ventilation should be sufficient to prevent mold growth, objectionable odors or the accumulation of excessive condensates.

Toilet facilities should be totally enclosed, well-lighted, and ventilated to the outside. They should be adequately screened and equipped with self-closing doors. Facilities should be adequate, operational and in compliance with local and state codes.

Adequate handwashing facilities should be provided, and should be equipped with soap, running water at suitable temperature(s) and drying facilities. Directions should be posted which instruct employees to wash hands thoroughly before reentering the processing area. Where practicable, portable hand clips containing a sanitizing solution should be provided and employees instructed in their use.

Equipment which comes in contact with butchered fish should be constructed of smooth, non-toxic, corrosion-resistant metal or other nonabsorbent material capable of being sanitized, or should be covered by another material with equivalent characteristics and which does not contaminate the fish.

Where applicable, grounds surrounding the plant that are under the control of the operator should be free from conditions incompatible with sanitary food manufacturing, processing, packing or holding operations. Such conditions include, but are not limited to: litter, refuse, tall weeds or inadequately drained areas that could contribute to contamination of food products by providing a place for insects, rodents or microorganisms to generate.

All outside conveyors and flumes for transporting round fish should be protected so as to prevent fecal contamination by birds and other animals.

Outside holding bins and outside conveyors used to transport butchered fish should be protected so as to prevent fecal or other contamination by birds, insects or other animals and contamination by airborne dust and dirt.

Cloth should not be used at water outlets or on slining tables.

## Water Supplies

The natural water supply intake should be located so as to avoid pollution from shore facilities, marine vessels or processing residuals.

There should be no cross-connections between potable and nonpotable water. For example, a cross-connection can occur when the end of a potable water hose is placed below the surface level in a wash tank full of water, and a cross-connection occurs when a potable water service pipe is directly connected to prime a nonpotable water pump. Cross-connections may occur under other circumstances, and care should be taken to avoid creating circumstances where cross-connections are possible.

Natural water which comes in contact with fish being processed should be sanitized unless the water source is currently approved by a federal state or local agency.

Natural water may be used for unloading, fluming or refrigerated holding of round fish only if:

- a) It has been effectively sanitized;
- b) It has been approved by a federal, state or local agency; or
- c) If the fish are rinsed with effectively sanitized water before entering storage bins and/or tanks.

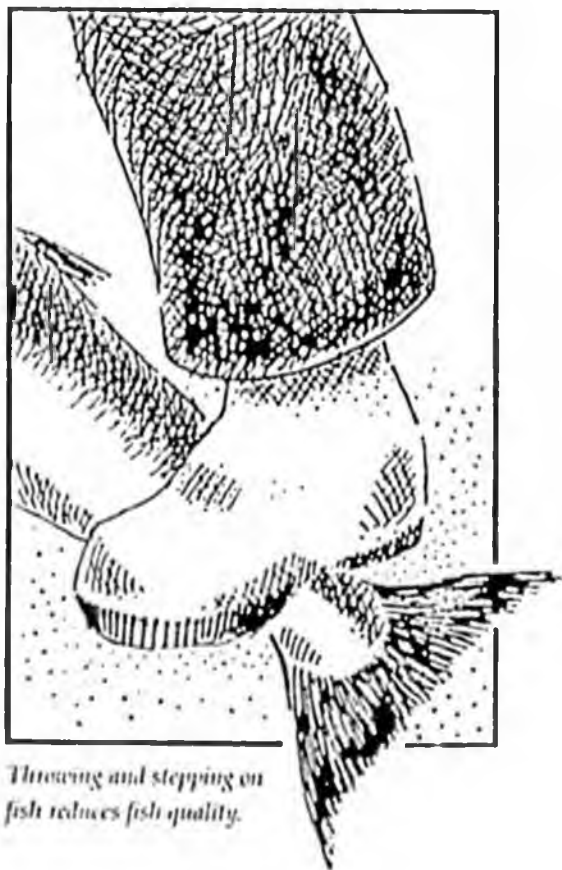
Ice should be made from clean water from an approved source. It should be manufactured, handled, stored and used in a sanitary manner. It should not be reused.

## B. Recommended Operating Procedures for all Shore-based and Floating Processors

### *Employee Education*

All processing workers should be instructed as to the need to handle fish with care at all times. This includes, but is not limited to:

- a) Handling fish gently;
- b) Not handling fish by the tail;
- c) Not throwing, stepping on, or in any way abusing fish; and,
- d) Not handling fish carelessly.



*Throwing and stepping on fish reduces fish quality.*

### *Unloading Fish*

Unloading of fish from tenders or fishing vessels should be accomplished with as little delay as possible, while taking care to avoid damaging the fish. Mechanical unloading equipment such as properly designed conveyors, fish pumps or other similar equipment should be used if possible.

All pumps, including the suction end, tubing and discharge end, should be designed and operated so as to avoid physical damage to the fish. The discharge end of wet and dry pumps should deliver fish to containers, bins or conveyors without causing the fish to drop excessive distances. All pumps should be cleaned and sanitized daily.

The recommended maximum individual brailer- or tote-load is 800 pounds.

Elevator buckets and drive mechanisms should be maintained and operated so as to avoid physical damage to the fish. They should be cleaned after every delivery.

Fish should not be allowed to drop excessive distances upon being discharged from a flume, conveyor belt or other transport system, or after being handled on sorting tables. Equipment used in transport and sorting should be cleaned and sanitized at least once a day.

Wagons, totes and bins should be designed and operated so as to facilitate drainage, and should be cleaned and sanitized at least once a day.

### *Fish Evaluation Procedures at the Processing Facility*

Both the intrinsic and extrinsic quality of all fish should be evaluated as the fish is received at the processing plant.

Fish should be evaluated by experienced personnel familiar with regulatory agency requirements, species and company grade specifications.

Fish should be evaluated according to each company's individual grade standards using the general criteria described later in these guidelines.

Any fish which are unwholesome (i.e., do not meet minimum standards for human consumption as established by the U.S. Food and Drug Administration) must be disposed of in an approved manner.

Fish of differing quality should be separated, identified and clearly labeled during all phases of processing operations.

### *General Guidelines for All Processing Operations*

All fish should be kept iced and/or refrigerated before and during processing operations. If ice is used, the fish should be stored in a sufficient amount of finely divided ice to reduce and hold the temperature of the fish within a range of 32° to 35° F. If a mechanical refrigeration system is used, the fish should be maintained at 30° to 35° F. All mechanically chilled holding tanks should be prechilled to 30° to 32° F before receiving fish.

Raw fish should be stacked or stored no more than 35 inches deep in clean, well-maintained containers before and during processing operations. It may be necessary to exceed this depth in holding bins.

Any salmon that accidentally fall on the floor immediately should be picked up by the head and nape, and thoroughly rinsed before further processing.

Only authorized persons should be allowed in processing areas. Effective measures should be taken to exclude pests and pets from processing areas and to protect against contamination of fish in or on the premises by all animals, including but not limited to dogs, cats, birds, rodents and insects.

Cutting boards used at butchering or sliming tables should not be made of wood or other porous material. Boards should be sanitized daily and replaced or reconditioned annually (more often if necessary) to remove gouged or otherwise worn surfaces.

All utensils and surfaces which come in contact with fish should be cleaned as frequently as necessary to prevent contamination of the fish. The surfaces of equipment which does not come in contact with fish during processing operations should be cleaned as frequently as necessary to minimize the accumulation of dust, dirt, food particles and other debris.

The exterior of fresh fish should be washed and rinsed with clean, chlorinated water prior to evisceration, and the fish should be washed both externally and internally after evisceration.

Each facility should have a written cleaning program which includes the use of appropriate detergents and bactericides. The program should provide for intermediate clean-up, sanitizing of equipment at the end of each processing day, and a washdown of equipment each day prior to processing. Plant personnel should be familiarized with these procedures. (Refer to later sections of this publication for a complete description of processing facility sanitation procedures.)

## C. Recommended Operating Procedures for Freezing Plants

### *Freezing Operations*

Freezing and frozen storage cannot improve the quality of fish, but it can maintain fish quality at much the same level as it was prior to freezing. Fish should be frozen as soon after harvest as possible and before quality begins to deteriorate.

Fish should be clean, correctly identified, gently laid straight on clean freezer trays or racks, and promptly sharp frozen. Quick freezing rates must be maintained to prevent protein denaturation and tissue damage. Operators should be aware of the factors which affect freezing times, which include:

- a) Freezer type;
- b) Operating temperatures;
- c) Product type;
- d) Product temperatures;
- e) Product thickness; and,
- f) Contact between the product and the freezing surface.

Fish should not be removed from freezers until the core temperature of the fish has been reduced to five degrees F or lower. Core temperatures may be higher if brine or vertical block freezers are utilized.

After freezing, fish should be gently removed from freezer trays or racks and immediately glazed or shrink-wrapped and/or packaged to prevent dehydration and oxidation.

## Glazing Operations

Glazing protects fish from quality loss due to dehydration and oxidation. When the product is in frozen storage, sublimation of the glaze will occur, rather than the sublimation of water from the frozen tissue.

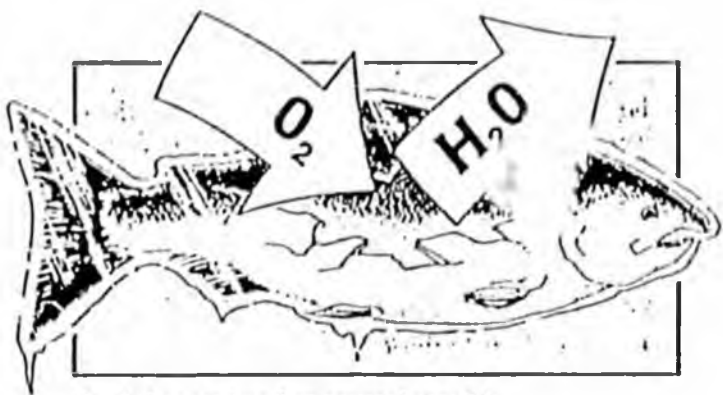
Glaze water should be chilled.

The fish should be completely submerged in glaze water, or sufficiently sprayed so as to provide equal coverage of the fish surface.

Glaze water may contain approved additives and should be changed frequently to prevent microbial build-up.

The glaze should be renewed as necessary during cold storage at the facility.

Frozen products which have been glazed should be handled carefully. If the glaze cracks, or a portion of this protective covering is lost, the fish will be susceptible to quality loss.



Cracked or missing glaze exposes frozen fish to dehydration and oxidation.

## Cold Storage Operations

Frozen fish should be stored at zero degrees F or lower, with minimal temperature fluctuations.

Sufficient space should be provided in cold storage rooms to allow adequate circulation of cool air; above, below and around all containers.

While in control of the processor, owner or bonded warehouse, frozen fish glaze and/or packaging should be checked periodically and replaced as necessary.

## D. Fish Quality Evaluation Criteria

### Quality Evaluation Criteria for Fresh Fish

All salmon, while fresh, should exhibit the following characteristics prior to processing in order to be categorized as No. 1:

- a) Eyes should be normal in appearance;
- b) Gills should be normal in appearance and should smell sea-fresh (practically odorless);
- c) Skin should be shiny, and wrinkles should not remain when fish is bent slightly. Methods of catch may mark the skin;
- d) Skin color should be characteristic of fresh fish of the same species, stage of sexual maturity, place of harvest (fishing district), and approximate date of capture;
- e) Viscera and eggs should be acceptably colored, intact and smell sea-fresh (practically odorless);
- f) Interior walls of the belly cavity may have only minimal appearance of tissue breakdown due to enzymatic action or careless handling. Slight breaks (less than one inch) or slight reddening (blushing) of the flesh are permitted in the No. 1 grade;
- g) Flesh should be resilient when subjected to finger pressure;
- h) Flesh color should be characteristic of fresh fish of the species, harvest location (fishing district) and approximate date of capture;
- i) Physical shape should be characteristic of the species and stage of sexual maturity;
- j) Scale adherence should be reasonably uniform; some scale loss due to the method of catch and subsequent handling procedures is to be expected, but fish displaying substantial scale loss should be carefully examined, as such losses may indicate poor handling practices; and,
- k) Odor should be sea-fresh (almost no odor) and be characteristic of the species. There should be no odor indicating decomposition or contamination.

These evaluation criteria are excerpted from the Alaska Seafood Marketing Institute's *Premium Quality Specifications for Fresh and Frozen Pacific Salmon*. Copies of the specifications are available from ASMI.

## E. Processing Facility Sanitation

### *General Information*

A suitable periodic cleaning schedule should be established for each plant, and should conform, where applicable, with state and federal regulations.

A chlorinated alkaline detergent should be used where needed to clean protein material (fish slime and blood) from fish contact surfaces.

Either gaseous chlorine or a hypochlorite compound can be used as a sanitizing agent (see below).

Under no circumstances should sanitizers containing phenols, such as Lysol or Pinesol, be used in a fish hold or on fish handling surfaces.

### *Detergents and Sanitizers*

Different types of detergents or cleaning compounds are designed specifically for different types of soil and cleaning problems. Alkaline detergents (with a pH greater than seven) are best suited for the removal of fats and proteins, while acid cleaners (with a pH under seven) are best for removing mineral deposits. Chlorinated alkaline detergents are most effective for the removal of proteins which accumulate as a result of fish gurry.

The three most common types of sanitizing agents used in commercial sanitizers are chlorine, iodine and phenols.

Sanitizers which contain phenols such as Lysol, Pinesol, cresol or hexachlorophene must not be used in areas where food or materials, including packaging materials, are handled or stored. Fish, ingredients and packaging will readily absorb the flavor and odor of phenols, rendering the exposed products unfit for human consumption, and unmarketable.

Chlorine is available in two basic forms, gaseous chlorine and hypochlorite compounds. Hypochlorite compounds are available in liquid, powder, granular and pellet forms. The free chlorine content of these products ranges from four to 70 percent.

Chlorine is a very effective sanitizer if used properly. The most common misuse of chlorine occurs when solutions are improperly diluted. Chlorine is very effective in solutions with a low pH (eight or below), but the effect of the chlorine diminishes as the pH rises. Solutions of 25 to 100 parts per million (.0025 to .01 percent) are most effective when using hypochlorite for sanitizing.

The old adage "If a little is good, more is better," is not true when using hypochlorite solutions because as the solution becomes more concentrated, its pH rises, lowering the effectiveness of the chlorine. To avoid this problem all sanitizers should be used in accordance with labeled instructions.

Gaseous chlorine is recommended as the most economical (on a long-term basis) and most effective type of chlorine to use in fish processing plants.

Iodine is an effective sanitizer, but is more expensive to use than chlorine. Use of iodine is recommended when the corrosive effects of chlorine may damage or reduce the life of equipment such as RSW systems, heat exchangers, etc.

All processors must use U.S. Department of Agriculture (USDA)-approved detergents and sanitizers as listed in USDA Miscellaneous Publication Number 1419, *List of Proprietary Substances and Nonfood Compounds Authorized for Use Under USDA Inspection and Grading Programs*.

## Recommended References

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### *State and Federal Regulations:*

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2. *Fish Inspection Regulations*, Title 18 AAC, Chapter 34, State of Alaska, Department of Environmental Conservation, 1984.

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1. John P. Doyle, "Net-Caught Salmon — Handle with Care," *Alaska Seas and Coasts*, Volume 6, Number 3 (June, 1978).
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3. Edward Kolbe, *Onboard Freezing Systems: Some Options for the Small Vessel*, (Oregon State University Extension Marine Advisory Program, Publication SG 67, July, 1969).
4. S.W. Roach, *Operating Instructions for RSW Systems on B.C. Salmon Packers*, (Fisheries Research Board of Canada, Vancouver Laboratory, 1973).
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The Key to Quality

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## I. Introduction

Salmon that are bruised in handling are a major economic drain on the fishing industry. They create an unfavorable market image, have higher weight loss, and are of lower grade and quality than salmon that are handled carefully. Bruised products have long plagued many segments of the food industry. For example, bruising of even the hardy potato is a serious economic problem in the industry it supports (Kline-Schmidt 1989). To compete effectively for the consumer's food dollar, all segments of the food industry must continually improve the quality of their products.

Quality is especially important in today's highly competitive salmon market. Unlike rice, potatoes, or pasta, salmon is not daily fare; it is a speciality food in North America, Asia, and Europe. Consumers must be attracted to salmon, and if they are to be repeat customers, the product must meet their expectations. To meet consumer expectations, the quality of net caught salmon must improve. The old ways of handling and taking care of fish are no longer acceptable.

Over the past 15 years, the following major changes in the salmon market have affected all aspects of the industry: (1) in the mid-1970s, the amount of salmon going to the frozen market increased at the expense of the canned volume, and (2) in the late 1980s, the production of farmed salmon expanded rapidly.

The industry did not react quickly to meet market needs for a better product as consumer demand shifted from canned to frozen salmon. The quantity of frozen salmon increased, but in general its quality still does not meet market expectations. Historically, most Pacific salmon destined for the frozen and mild cure markets were taken by trollers and gillnetters in Southeast Alaska, British Columbia, and the Pacific Northwest. These fishermen traditionally fished for the high value markets and took very good care of their catch, meeting the demand for kings, silvers, and bright Southeast Alaska chum salmon. In the mid-1970s, the demand for fresh and frozen fish, including frozen salmon, increased rapidly in the U.S. market. Later increases in demand were spurred by a devaluation of the dollar against European and Japanese currency. To meet the increased demand, salmon freezing expanded in Southcentral Alaska

(Continued from page 2)

some form of chilling. Some in the gillnet fleet (even in remote areas) use ice or chilled sea water to cool their fish.

The problem facing the Alaskan salmon industry is that its competitors have advanced so rapidly in marketing a high-quality product. For example, handling of farm reared salmon is designed to produce the freshest, most defect-free product possible. Farm reared salmon, regardless of their source of origin, are usually in transit to market within four hours after they are slaughtered.

### B. The opportunity

The world supply of salmon increased rapidly during the 1980s, and by 1990 farmed salmon amounted to 28 percent of the world production (Alaska Seafood Marketing Institute [ASMI] 1991). This indicates that the growth in farmed fish has increased the consumption of salmon. Currently, most farmed fish are marketed fresh, which reduces inventory costs. More importantly, freshness appeals to consumers. The 1991 ASMI report shows that quality, freshness, and consistency of supply are the *most important* factors in attracting users to farmed salmon. Until ocean ranching of chinook, sockeye, and coho becomes a major element in overall "wild" salmon production, Alaskan fish producers can control only quality, one attribute of which is freshness. Producers of farmed salmon can control supply as well as biological factors such as weight, flesh color, flesh firmness, and oil content.

### C. The characteristics of quality

Each species of salmon has its own distinctive quality attributes. Quality is what buyers consider desirable in a product, a set of characteristics that makes eating the product an enjoyable experience. For salmon, these characteristics include appearance, flavor, odor, texture, and freshness. (As the word *freshness* is used here, it is a function of time and temperature and does not differentiate between frozen and unfrozen fish.) Freshness is given primary emphasis by marketers of farmed salmon. For the most part, harvesters and processors of wild salmon do not pay enough heed to freshness. Neither the U.S. Food and Drug Administration nor the Alaska

and Western Alaska. However, fishermen operating in these areas had little experience in producing fish for the frozen market, so the product quality did not meet market needs.

A second major source of pressure on Alaska's salmon markets is the recent rapid expansion in production of farmed salmon. From 1985 through 1990 the world supply of farmed salmon increased from 102 million pounds to 621 million pounds. In contrast, between 1982 and 1990 Alaska's production of fresh and frozen salmon has averaged 323 million pounds annually. (See figure 1 on page 3). Most farmed salmon are sold fresh, and limited amounts are frozen, so it is obvious that Alaska no longer controls the salmon market; instead, the market controls the Alaska salmon industry.

A very recent trend in salmon farming will put even greater pressure on wild salmon markets. In 1990 and 1991 Norway froze large amounts of salmon to ease the glut of fresh salmon on the world market. Salmon farmers in Chile freeze about half of their total production. In 1990 Chilean exports of frozen farmed salmon to Japan accounted for 7% of Japan's salmon imports, according to a forthcoming paper by J. L. Anderson and Y. Kusakabe.

## A. The problem

Bad attitudes that persist among some members of the fishing sector are a major cause of poor product quality. Such attitudes stem from short seasons, fierce competition for fish, and limited vessel capacity for fish and machinery. These conditions produce a general feeling that the first and foremost job is to maximize the harvest and that care of the product is secondary. This feeling leads to rough handling; poor or no chilling; and in some cases, dirty, unsanitary holding conditions. These practices must change if the Alaska salmon industry is to regain control of the salmon market.

Despite bad attitudes among some in the fishing sector, during the past 25 years all segments of the Alaska salmon industry have made good progress in improving product quality. For example, fish pugs are no longer commonly used, dry scow tendering is almost a thing of the past, and a large percentage of the purse seine fleet uses

(Continued on page 4)

Department of Environmental Conservation inspects for freshness. Both agencies ensure only that minimum standards are met. Their main concerns are that the product is wholesome (free from decomposition, adulteration, and contamination) and was not handled and processed under conditions wherein it may have become contaminated or adulterated.

A voluntary seafood inspection program has been administered for many years by the National Marine Fisheries Service for the U.S. Department of Commerce (USDC). The USDC inspection certifies only that salmon is processed under sanitary conditions and meets a company's own definition of standards as stated on its packages. In the North American scientific community, most seafood technology research has been devoted to understanding bacterial spoilage, chemical measurements of spoilage, and methods of extending the shelf life of fish. No wonder we pay so little attention to the overall quality and freshness of our seafood. In contrast, much research in Japan and Europe is devoted to methods for measuring freshness, and both physical and chemical methods have been developed. In Japan the chemical score for freshness often is displayed on a product at the retail level. This chemical score is a measure of chemical changes in fish flesh which occur before significant bacterial growth takes place. These methods are little used in North America. Our lack of concern for freshness is an attitude which must change if Pacific wild salmon from North America are to compete successfully with farm reared fish.

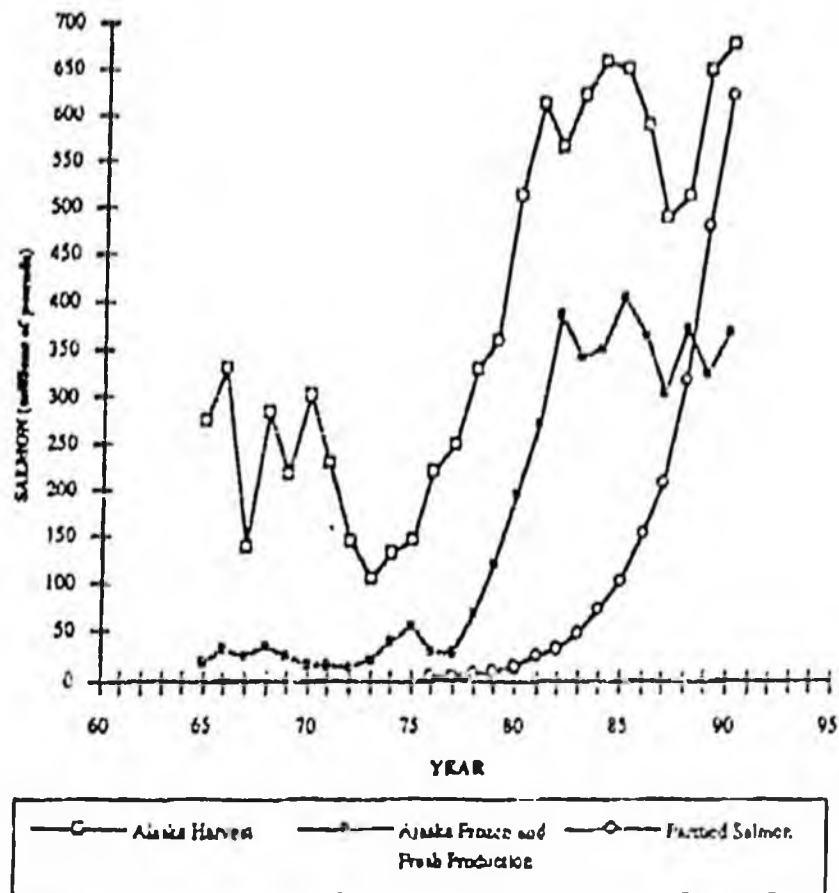


Figure 1. Comparison of total Alaska salmon harvest, world production of farmed salmon, and Alaska's fresh and frozen salmon production. Alaska's canned salmon production is the difference between the total Alaska salmon harvest and the total Alaska production of fresh and frozen salmon. All figures are in round weight. Sources: Alaska Department of Fish and Game statistical leaflets, Alaska Seafood Marketing Institute, National Food Processors Association, and Alaska Fisheries Entry Commission.

### VIII. General Recommendations

The following recommendations apply to all vessels harvesting and/or transporting fresh salmon.

#### A. Holds

1. All vessels must have watertight holds that prevent any contamination from the engine room, bilges, and shaft alley.
2. Holds must be lined with a nonporous material such as glass-reinforced plastic (fiberglass); aluminum; or coated steel.
3. Holds must be adequately insulated to reduce incoming heat. The engine room bulkhead should have an "R" factor of 50, and other surfaces, including the shaft alley, should have an "R" factor of 33.
4. All angles and corners must be faired because the hold cannot have sharp obstructions.
5. There must be a sump and a sump pump at the lowest part of the hold.
6. Fuel lines and hydraulic lines that pass through the hold must be shielded to prevent heat loss and contamination from spillage.
7. Hatch combings and covers must be adequate to prevent leakage of water and contaminants from the deck into the hold.
8. Sernet and other skiff fisheries must hold and transport fish in light-colored totes.

**B. Chilling**

1. All fishing vessels must chill their fish at the time of catch, using ice, chilled sea water, refrigerated sea water, or its equivalent.
2. Salmon must be chilled to a core temperature of at least 35°F (1.67°C) within 24 hours of harvest.

#### IV. Conclusions

The Alaska fishing industry faces a difficult struggle to regain lost markets. Neither its competitors nor the marketplace will be swayed by advertising or promotion. Consumers must see a significant improvement in the quality of wild salmon from Alaska and, to a lesser extent, from Canada and the Pacific Northwest before they will return to the use of wild salmon for top of the market items.

The most important change needed is a *change in attitude* in the industry; firstly, a recognition of the need for improved quality, and secondly, a willingness to move away from the concept that the most important job is to maximize production and to accept the idea that the job is to produce a high-quality food. If these changes take place, the industry will be well on its way to better serving the consumer.

With proper care and handling, up to 90% of net caught sockeye and coho salmon should provide sides of the quality shown in photograph 16.<sup>5</sup>

The State of Alaska has a responsibility for and a vested interest in promoting salmon quality, in a broad sense to protect the State's economy, and in a narrower sense to maximize income to the state treasury.

Salmon products from Alaska often will be judged by the product of lowest quality—that is, by the lowest common denominator. Therefore, the State should implement as regulations either the general recommendations given above or similar requirements. The hold recommendations that appear above should be enforced no later than the 1993 fishing season, and the chilling recommendations should be enforced no later than the 1995 season.

**Remember, salmon is a fine food:**

**Handle with care.**

**Keep it cold,**

**keep it clean,**

**keep it moving to the consumer.**

<sup>1</sup> Because there are so many genetically separate populations within a species of salmon, the intrinsic quality of fish of the same species varies greatly. All major buyers of Alaska salmon are well aware of that fact. For example, Yukon king salmon are renowned for their high oil content, bright flesh color, and thick belly walls. In 1991 Yukon fishermen received an average of \$4.10 per pound for gillnet caught fish. Cook Inlet kings are large but do not enjoy a good reputation because they have low oil content, relatively poor skin color, and thin belly walls. The average price for Cook Inlet king salmon in 1991 was \$1.15 per pound. Fish buyers also recognize the differences in handling practices and other extrinsic quality factors in salmon produced in different regions.

<sup>2</sup> This is generally true between 32°F (0°C) and 68°F (20°C); however, each enzyme has a specific temperature at which it is most active. Most enzymes which break down protein are denatured at high temperatures.

<sup>3</sup> Because laboratory experiments usually are conducted under ideal handling conditions in which the fish receive little abuse, published shelf life times usually are longer than those listed here. Laboratory experiments usually do not reflect the "real world" in which a large quantity of product must be handled in a short time.

<sup>4</sup> Some fishermen don't want to use chlorine, because they believe it will cause corrosion. However, it has been demonstrated in food plants that the regular use of chlorine on equipment will reduce corrosion by killing bacteria that produce acid to break down protein.

<sup>5</sup> Prince William Sound fishermen instituted a voluntary quality and education program in 1980 and 1981. As a result, the quantity of exported number one sockeye salmon suitable for the manufacture of lox increased from a previous level of 70% to between 80% and 90% (interviews with the president and staff of Sanyo Food Co., Hokkaido, Japan, 1984 and 1986).