ALASKA LEGISLATURE COMMITTEE FILES 1981-1982 8672

1935 SRES SB 843 - SB 872

1925

TABLE 3, continued

Region	Missouri 5	Oklahoma 5	Montana 8	Wyoming 8
Results				
Acres mined per month	25.72	34.29	11.23	8.12
Dragline size (cubic yards)	76	78	33	50
Coal loader size (cubic yards)	12	1	26(2)	26(2)
Bulldozer size (horsepower)	410	410	410	520
Bulldozers used in reclamation	4	5	2	1
Scraper size (cubic yard)	44	44	44	31
Scrapers used in reclamation	4	6	2	2
Minimum acceptable selling price ($)	18.73	19.97	5.22	5.64
Topsoiling cost ($)				
per ton of coal	1.049	1.318	.101	.078
per acre disturbed	3,399	3,202	3,751	4,018
Grading cost ($)				
per ton of coal	.818	1.044	.079	.055
per acre disturbed	2,652	2,538	2,916	2,812
Revegetation cost ($)				
per ton of coal	.203	.307	.024	.021
per acre disturbed	659	746	902	1,067
Total reclamation cost ($)				
per ton of coal	2.071	2.669	0.204	.154
per acre disturbed	6,710	6,487	7,569	7,897
percent of minimum price	11.06	13.37	3.91	2.73

Region	Colorado 9	Arizona 10	New Mexico 10	Washington 11
Assumptions				
Annual production (million tons)	2	4	3	3
Overburden depth (feet)	47	50	65	41
Coal-Seam thickness (feet)	6.7	16.2	11.7	11.4
Coal density (tons per acre foot)	1,800	1,770	1,770	1,770
Results				
Acres mined per month	15.36	12.92	13.41	13.77
Dragline size (cubic yards)	47	43	58	40
Coal loader size (cubic yards)	21	42	32	32
Bulldozer size (horsepower)	620	410	410	410
Bulldozers used in reclamation	2	2	2	2
Scraper size (cubic yard)	44	31	31	31
Scrapers used in reclamation	3	3	3	3
Minimum acceptable selling price ($)	8.60	5.73	7.40	6.22
Topsoiling cost ($)				
per ton of coal	.371	.149	.201	.202
per acre disturbed	4,021	3,847	3,742	3,667

TABLE 3, continued

Region	Colorado 9	Arizona 10	New Mexico 10	Washington 11
Grading cost ($)				
per ton of coal	.269	.102	.138	.139
per acre disturbed	2,923	2,642	2,576	2,531
Revegetation cost ($)				
per ton of coal	.072	.052	.071	.045
per acre disturbed	786	1,334	1,320	821
Total reclamation cost ($)				
per ton of coal	.712	.303	.410	.387
per acre disturbed	7,730	7,822	7,638	7,019
percent of minimum price	8.28	5.29	5.54	6.22

loader sizes were calculated through the production equations of the model. Bulldozer size was restricted to two options; 410 and 620 horsepower, and likewise, scraper size was restricted to two options, 31 or 44 cubic yards, which are popular conventional sizes for land reclamation equipment. Total reclamation cost reported in Table 3 is the sum of topsoiling, grading (including recontouring), and revegetation costs. Bonding and other legal costs are included in calculating the minimum acceptable selling price but are not included as part of reclamation cost as defined for our purposes.

On a per-acre basis, simulated land reclamation costs are relatively uniform across regions, ranging from about $6,500 to $8,000. On a per-ton basis and as a percentage of selling price, reclamation costs are much lower in the West than in the East or Midwest due to significant differences in coal-seam thickness. Costs per acre estimated for Arizona and New Mexico are among the highest reported due to the high revegetation costs for region 10. If the depth of topsoil segregated is reduced to six inches for these states, however, estimated costs per acre fall to about $6,000. This would lower reclamation costs by about 7¢ per ton in Arizona and 10¢ per ton in New Mexico, giving mine operators in these states an even greater cost advantage over their eastern counterparts.

Land reclamation costs estimated by the model are somewhat sensitive to the number of acres disturbed per month. This appears due in large part to equipment and labor indivisibilities, which are likely to have a proportionately more significant effect on cost when the number of pieces of equipment in use is small. Although we found no mention of this effect in any of the studies cited in this paper, we presume that this same phenomenon occurs in most analyses of this type, which implies that estimates of land reclamation costs found in the literature may be sensitive to the sizes of mines analyzed.

To investigate the significance of this effect, we derived conditions for a typical western mine (10.46′ coal-seam, 45′ overburden) at which 200,000 ton increments in required annual output are associated with one-acre increments in land area disturbed per month. As with the simulation analysis reported on Table 3, we restricted the choice of bulldozers and scrapers used in reclamation to two

options and examined the pattern of land reclamation costs for each reclamation task with each type of equipment. This procedure was followed for mining operations ranging from 5 to 35 acres disturbed per month (i.e., 1 million to 7 million tons of coal produced per year). Sensitivity of topsoiling and grading costs to variations in the number of acres reclaimed per month are illustrated in Figure 2 and Figure 3, respectively. The discontinuities of the average cost curves in both figures occur with successive ... tions to the fleet of land reclamation equipment. The second 44-cubic-yard scraper, for example, which is needed when the number of acres reclaimed per month increases from 7 to 8, may only be required for a few hours per week. Although fuel and maintenance costs are functions of hours of operation, there are significant fixed costs associated with acquisition and operation of the second scraper, including the cost of the driver

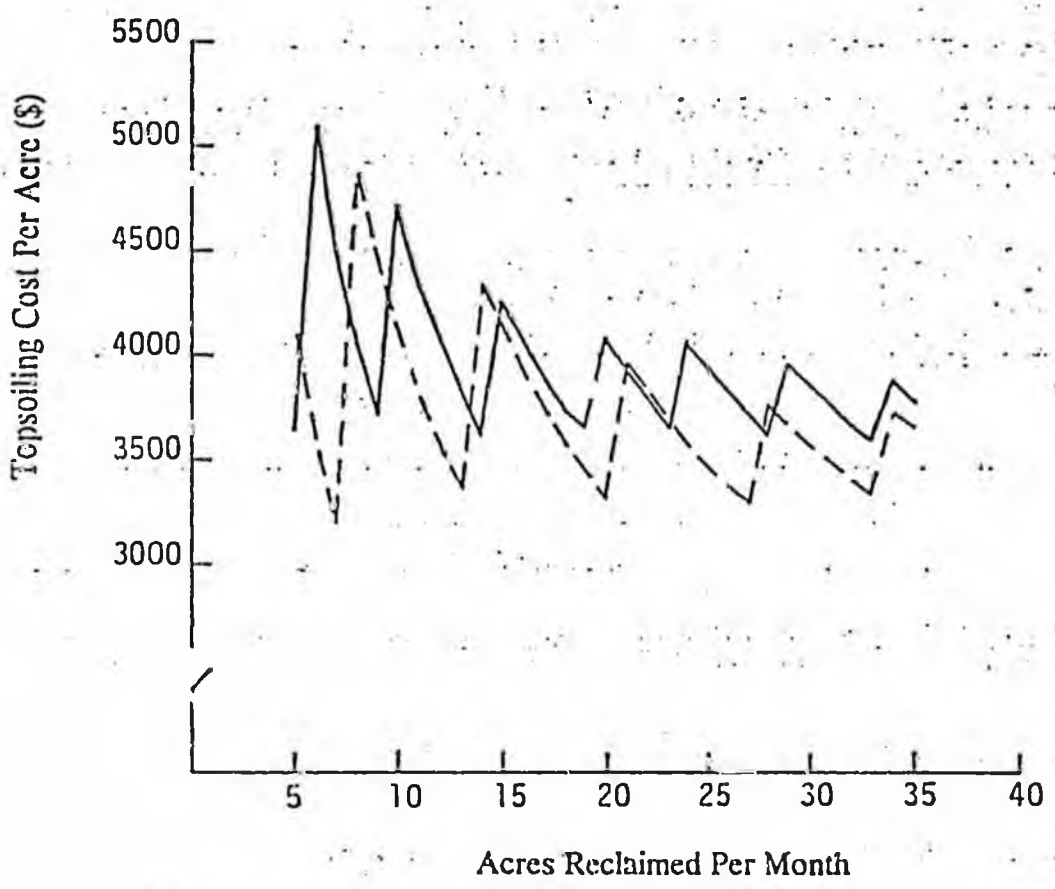

FIGURE 2
VARIATION OF T... SOILING COST WITH SCALE OF OPERATION

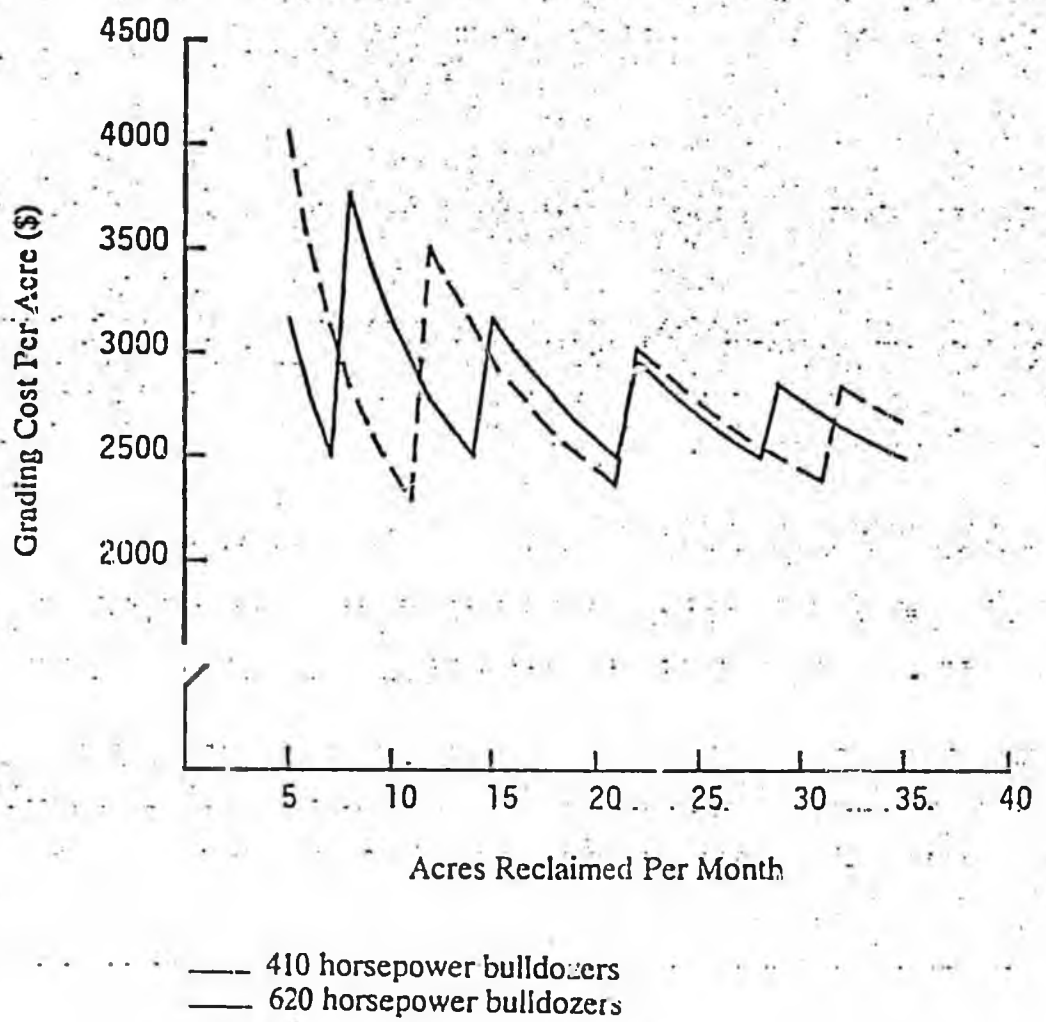

FIGURE 3
VARIATION OF GRADING COST WITH SCALE OF OPERATION

who must be paid a full-week's wage. Variations in average cost associated with this phenomenon are, as anticipated, relatively greater when the number of pieces of equipment over which the effect is spread is small. Minimum average cost points attained prior to addition of each piece of equipment do not appear to show any significant trend with respect to output levels. We conclude from this exercise that topsoiling costs of approximately $3,500 per acre and grading and recontouring costs of approximately $2,500 per acre may be achievable at various output levels depending on the points at which discontinuities exist under different mining conditions.

Revegetation costs reported in Table 3 display a more pronounced relationship to total acres reclaimed than do grading and topsoiling costs. Again this effect is due to indivisibilities in equipment. Average costs per acre at the Wyoming

mine are considerably greater than in Alabama because precisely the same equipment is used at both locations. Equal fixed costs are thus spread over fewer acres per month in the Wyoming case. With subcontracting of this task at smaller mines, it may be possible at most locations, except for the desert Southwest, to achieve revegetation costs in the neighborhood of $650 per acre.

Land reclamation costs per ton of coal and minimum acceptable selling prices, which are reported in Table 4, were calculated on the assumption that with modest variations in output levels these standardized topsoiling, grading, and revegetation costs ($3,500, $2,500, and $650, respectively) could be achieved in each state, except for those of region 10 for which we assume a revegetation cost of $1,300 per acre (approximately the same as that reported for these states in Table 3). Land reclamation costs and minimum acceptable selling prices so calculated do not differ substantially from those reported in Table 3 for most states. The largest difference occurred for Ohio where minimum costs were approximately 15% below those reported in Table 3.

From both tables 3 and 4 it can readily be seen that simulated land reclamation costs on a per-ton of coal basis, are considerably higher in the East than in the West. The average reclamation cost per ton of coal reported in Table 4 is $1.263 for regions 1–4, $2.430 for region 5, and $.332 for regions 8–11. As a percent of minimum acceptable selling price, the averages are 7.9%, 12.5%, and 4.9% respectively. Because of high coal extraction costs in region 5, little new mining activity is occurring there. This leaves the major cost comparison to be made between the eastern states of regions 1–4 and the western states of regions 8–11.

Surface-mine coal production data reported in Table 5 indicate that substantial change in mining patterns occurred between 1977 and 1979, with some western states showing very large increases in production while output declined in most eastern states. Differences in sulfur and ash contents have undoubtedly contributed to these shifts, and scale factors may have contributed as well. The importance of differences in land reclamation costs may be quite significant however. Costs of land reclamation appear responsible for nearly a $1 per-ton difference between the cost of mining eastern and western coals, with much of this difference associated with the controversial topsoiling requirement.

SUMMARY AND CONCLUSIONS

This study has estimated land reclamation costs in the neighborhood of $6,500 to $8,000 per acre (in 1980 dollars) for large-scale, area mines in the United States. This estimate is higher than those found in most previous studies, a difference which we attribute primarily to differences in the definition of the cost of reclamation. Our estimates include opportunity costs and indirect effects of taxes, secondary equipment requirements, and royalties in calculating the effect of land reclamation activities on the minimum acceptable selling price of surface mined coal. We maintain that other studies that fail to consider such nondirect costs tend to underestimate costs of land reclamation.

We have also found that reclamation costs may be influenced by equipment selection and size. Labor and equipment indivisibilities may result in excess capacity under certain circumstances, affecting estimates of the cost of land reclamation. We found that topsoiling and grading costs totaling approximately

TABLE 4

LAND RECLAMATION COSTS WHEN STANDARDIZED COSTS PER ACRE ARE ASSUMED

Region	Ohio 1	Pennsylvania 1	Alabama 3	Illinois 4	Indiana 4	Missouri 5	Oklahoma 5	Montana 8	Wyoming 8	Colorado 9	Arizona 10	New Mexico 10	Washington 11
Topsoiling Cost ($) per ton of coal	.635	.695	.966	.473	.600	1.111	1.481	.097	.070	.332	.140	.193	.193
Grading cost ($) per ton of coal	.441	.482	.671	.328	.417	.772	1.029	.067	.049	.230	.097	.134	.138
Revegetation cost ($) per ton of coal	.115	.125	.174	.085	.108	.201	.267	.018	.013	.060	.050*	.070*	.036
Total reclamation cost ($) per ton of coal	1.191	1.302	1.812	.886	1.126	2.083	2.777	.182	.132	.622	.287	.397	.372
Minimum acceptable selling price ($)	16.43	15.19	18.11	13.43	16.15	18.74	20.08	5.20	5.62	8.51	5.71	7.39	6.21
Total reclamation cost ($) percent of minimum price	7.25	8.57	10.00	6.60	6.97	11.11	13.83	3.50	2.35	7.30	5.03	5.37	5.99

* Revegetation cost assumed to be $1,300 per acre, compared to $650 per acre in other regions.

TABLE 5
SURFACE MINE PRODUCTION BITUMINOUS COAL AND LIGNITE PRODUCTION
(thousand short tons)

	1979	1977	% Change
Alabama	15,682	14,949	4.9
Arizona	11,389	11,059	3.0
Colorado	12,259	7,704	59.1
Illinois	26,844	24,082	11.5
Indiana	26,669	27,294	− 2.3
Kentucky	73,108	84,590	−13.6
Missouri	6,487	6,366	1.9
Montana	32,451	27,226	19.2
New Mexico	14,203	10,343	37.3
North Dakota	14,963	12,028	24.4
Ohio	29,825	33,742	−11.6
Oklahoma	4,781	5,978	−20.0
Pennsylvania	45,816	46,266	− 0.1
Texas	26,634	15,865	67.9
Virginia	8,495	14,567	−41.7
Washington	5,050	5,057	− 0.1
West Virginia	21,141	21,924	− 3.6
Wyoming	71,093	45,378	56.7
Total U.S.	455,978	425,394	7.2

Source: U.S. Department of Energy, Energy Information Administration

$6,000 per acre were achievable under a wide range of mining conditions, and we suggest that this estimate may be more realistic than those obtained for individual mining scenarios.

Our regional reclamation cost analysis indicates that the minimum acceptable selling price of coal is more greatly affected by federal land reclamation requirements in the East and Midwest than in the Far West, due to significant differences in coal-seam thickness. This cost impact may be a factor contributing to current shifts in regional mining patterns. Our study also reveals the significant share of total reclamation cost that is associated with topsoiling operations. Costs of removing and replacing topsoil appear to constitute approximately 50% of total reclamation cost when one foot of topsoil is segregated. Given the significance of this effect, it is not surprising that many mine operators have resisted compliance with the topsoiling provisions of the federal regulations. In a future study we plan to focus on the topsoiling question in particular, analyzing whether it may be possible to attain the same or greater environmental benefits at lower cost through a reduction in the amount of topsoil segregated coupled with an increase in erosion control, land management, or revegetation measures.

As a final comment, we would like to emphasize that our estimates are based on current surface mining techniques which utilize standard construction industry machinery for land reclamation operations. Given the strong market incentives to minimize the cost of compliance with land reclamation regulations, entirely new surface mining practices or forms of equipment may emerge. Our experience is, however, that mine operators seem to regard current land reclamation equipment and practices as proven, reliable, and relatively cost effective and do not anticipate radical changes in technique in the near future.

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328 Pages

Surface Coal Mining in Alaska

An Investigation of the Surface Mining Control and Reclamation Act of 1977 in Relation to Alaskan Conditions

A Report Prepared by the
Committee on Alaskan Coal Mining and Reclamation
Board on Mineral and Energy Resources
Commission on Natural Resources
National Research Council
National Academy of Sciences

NATIONAL ACADEMY PRESS
Washington, D.C. 1980

NOTE REGARDING THE FOLLOWING FRAME ON MICROFILM:

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337 pages

3/6/81

CONTENTS LIST

Register , NATURAL RESOURCES

TITLE 11. NATURAL RESOURCES

Chapter
90. Surface Coal Mining and Reclamation Operations (11 AAC 90.001 -- 11 AAC 90.901)

CHAPTER 90. COAL MINING AND RECLAMATION OPERATIONS

Article

SB

872

COMMITTEE REPORT

SENATE

3/23/82

FURTHER: None

Date: 4/5/82

Mr. President:

The Committee on RESOURCES has had SB 872

sanitation, sanitary practices, and quality assurance in the seafood processing industry

under consideration and (a majority of the committee) (the committee) reports it back with the following recommendations:

[X] do pass [ ] do not pass

[ ] do pass with attached amendments(s)

[X] replace with CS for [ ] same title [X] new title

and recommends

[X] AND attaches a "Letter of Intent" [X] New Fiscal Note

[ ] reports it back without recommendation

[ ] referred to the Committee

MEMBERS SIGNING
DO PASS

MEMBERS HAVING
OTHER RECOMMENDATIONS:

CHAIRMAN

S 60 (Rev. 12/78)

JAY S. HAMMOND
GOVERNOR

STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

March 11, 1982

The Honorable Bettye Fahrenkamp
Senator
Alaska State Legislature
Pouch V
Juneau, AK 99811

Dear Senator Fahrenkamp:

The recent embargoes and recalls of Alaska canned salmon in both foreign and domestic markets are expected to cause substantial economic loss to many Alaskan seafood processors. The high cost of the recall and an anticipated lowering in consumer demand and retail price, coupled with this summer's predicted record salmon runs, leave some seafood processors facing economic disaster. This will ripple through our fishermen, cannery workers, small businessmen, and Alaska communities, which are all dependent upon a healthy seafood processing industry for their survival.

Several weeks ago, I appointed a working group of representatives of my Cabinet, the seafood processing industry, fishermen and cannery workers, and the Alaska Seafood Marketing Institute. I am pleased to provide a copy of the working group's report and recommendations for action to offset any adverse effect of this incident. Of particular importance are actions which can be taken immediately by the Alaska Legislature:

Improved standards for operation and inspection of seafood processors to help preclude recurrence of an incident of this type. The Department of Environmental Conservation is developing proposals for improvements in its seafood sanitation provisions. This will require new legislation.

A substantial new marketing effort is needed to reverse the loss of consumer confidence in Alaska canned salmon. The Alaska Seafood Marketing Institute is developing a

proposal for an international effort to convince markets and consumers that Alaska canned salmon is a healthful, safe source of high quality protein. The Institute will have a detailed proposal to present to me next week.

Research is needed to determine potential points and sources of contamination of canned salmon, to determine means of detecting can integrity failure, and plan processing changes that may be needed to help prevent can damage. Funding for the Department of Environmental Conservation to conduct this research would be appropriate. A detailed proposal will be forthcoming.

Amendments to the existing fishpack loan programs are needed so that the financial requirements of this summer's harvest are met, and the costs of the recalls and embargoes can be borne by Alaskan processors. Many of these changes were in the original Senate Bill 140 introduced last year, which was substantially modified by the Legislature before it was finally passed. I also propose to convert this program from a direct loan to a loan guarantee program, to allow leveraging of additional funds from the private financial market. In addition, the repayment term needs to be extended from the existing one-year limitation. The Department of Law is working on these amendments, and they will be available shortly.

The working group is available to meet with the appropriate legislative committees to discuss these proposals in detail. I urge the Legislature to take rapid action to avert serious problems with the upcoming salmon season.

Sincerely,

Jay S. Hammond
Governor

cc: The Honorable Jalmar M. Kerttula
The Honorable Joe H. Hayes
The Honorable Richard W. Halford

Enclosure

MEMORANDUM State of Alaska

TO: The Honorable Jay S. Hammond
Governor

DATE: March 10, 1982

FILE NO:

TELEPHONE NO:

FROM: Ernst W. Mueller
Commissioner
Department of Environmental Conservation

SUBJECT: Report of Working Group on the Canned Salmon Botulism Incident

Attached is a report of findings and recommendations of the canned salmon botulism incident working group you formed several weeks ago. The report discusses most of the options the State could reasonably consider in its efforts to help the seafood product industry in general, and the canned salmon industry in particular, through a period of substantial economic loss.

At this point in time, the extent of that loss cannot be predicted with any degree of certainty. However, based on the experience of similar botulism contamination of canned seafood in the past, we can expect a precipitous drop in retail sales, a lack of confidence in the product by both consumer and retail marketer, and a concomitant reduction in retail price. If this is coupled by substantial costs of product recall and inspection work, the economic impact on a processing firm may be disastrous.

Because of the nature of the working group, the statements and recommendations in this report are not to be understood as representing the position of any one member, or, necessarily, even a consensus. They are my general synthesis of the discussion points the group felt would be most valuable in assisting the Alaska Seafood Products Industry recover from the economic consequences of this incident. I would certainly expect that many of the members of the group would have additional suggestions of their own, or the organizations they represent.

The most important and immediate action that can happen now would be for the Legislature to take up measures to provide additional funds to the Alaska Seafood Marketing Institute, and to provide new funding flexibility for the fishpack loan program. There are currently pending several bills that could be used to handle both these issues. Other matters probably require introduction of new bills, or new funding. In particular, new legislation would be needed to expand the State's participation in plant operation control, to relax requirements for raw fish tax, to provide new avenues of financial assistance to the industry to help pay the costs of the recall, or to help finance corrective measures.

Of course, the group's primary mission was to address the short-term ramifications of this issue. The State should, however, also look at its long-range fishery management policies to determine

if changes can be made that would preclude recurrence of this type of incident. A great many Alaskans are dependent upon the seafood products industry for their life-style and livelihood. Any substantial adverse impact on the economics of the fish processing industry may cause loss of income to more than 50,000 Alaskans. It is certainly in the State's overall best interests that further incidents of disease caused by contaminated fish products be prevented from both the public health and economic standpoints.

Members of the working group and I would be pleased to discuss this report with you at your convenience.

Enclosure

RECOMMENDATIONS ON MEASURES THE STATE MIGHT ADOPT TO MITIGATE IMPACTS OF THE ALASKA CANNED SALMON EMERGENCY

Prepared By
Governor's Working Group
on the Canned Salmon Emergency
March 8, 1982

The Alaska fishing industry faces substantial costs and loss of revenues as a result of the recent death in Belgium of a man who contracted botulism upon consuming salmon from a 7-3/4 oz can processed in the Ketchikan NEFCo-Fidalgo plant in July 1980. Because the can was found to have apparently been contaminated by introduction of botulina spores through a hole which was caused by the processing equipment in Ketchikan, that plant's entire 1980 and 1981 7-3/4 oz packs were recalled in the United States and many other countries. Additionally, all Alaska canned salmon in several European countries was embargoed. At present, the industry is temporarily withdrawing all 7-3/4 oz cans which were processed through the same type of canning equipment and which were not also examined for defects by electronic means. These cans will be subsequently tested and those without defects returned to the market. Depending upon the results of this testing, there may be further recalls of individual processing plants production.

Regardless of the eventual outcome of the present situation, the Alaska salmon canning industry will suffer significant financial loss from two sources--(a) the direct cost of compliance with the recall, the temporary withdrawal and examination of cans and bringing their production runs into compliance, and (b) lost revenues from the likely lowering of consumer demand for canned salmon and a subsequent retail price drop. Traditionally, this time of year is one in which the industry has the positive cash flow needed to finance the summer's pack. This flow is now reversed for many processors because they must pay for the return of the suspect cans, their examination, and ultimate return to the market place.

Governor Hammond established an informal working group to address potential impacts of this situation on the Alaska seafood industry and the State in general, and also to formulate and examine strategies to assist the industry in overcoming the potential loss. The working group members are:

Commissioner Ernie Mueller, Chairman

Commissioner Ron Skoog

Commissioner Charles Webber

Roger Painter, Executive Director, United Fishermen of Alaska

Eric Eckholm, Executive Director, Alaska Seafood Marketing Institute

Rick Lauber, Representative, Pacific Seafood Processors Association

Mike Whitehead, Special Assistant to Governor Hammond

Larry Cotter, Business Manager, International Longshoreman's & Warehousemen's Union

It must be understood that at this point in time, the exact consequences of this incident cannot be predicted. The number of actual recalls, the number of cans involved, and the cost to the industry will not be known for several months. To some extent, there will be a cause and effect relationship between these factors. The intent of the industry in preparing for the 1982 salmon harvest will not be able to be determined with any degree of accuracy until early May at the earliest. An individual firm's reaction will be dependent upon its own management decisions, economic situation, and how directly it is affected. However, as a practical matter, we can assume that the loss to the industry will be great, and that the loss will be translated into a loss to fishermen, cannery workers, communities, small businesses and the many, many others whose life-style and livelihood depend, at least in part, on Alaska's seafood industry. Thus, any strategy which is developed by the State must attack the situation in a direct and expeditious manner, and also provide means, over the long term, to prevent recurrence of this incident.

After review of the material available to it, the working group has made the following observations and recommendations:

MARKETING

I. The State is conducting a comprehensive analysis of the 1982 Alaska seafood market. This project will be able to estimate the market impacts of the canned salmon incident, and the contractor for this ongoing project has been requested to redirect the study where necessary:

- Lead agency: Commerce and Economic Development
- Additional funds needed: None
- Preliminary report: April 1
- Final report: May 15
- Further work needed: None

II. Detailed analysis of the market implications will be needed, and detailed market demand statistics and price information will be essential for at least the next two years. The Alaska Seafood Marketing Institute is negotiating a contract to provide these services:

° Lead agency: ASMI

° Additional funds needed: $100,000 (estimate)

° Contract negotiated: March 30

° Reports prepared: To be determined

° Further work needed: Secure appropriation

III. A substantial effort in advertising and marketing will be required to reverse any erosion in sales of canned salmon and other fisheries products that will result from reduced consumer confidence. ASMI is developing a detailed proposal based on the work of the Tuna Institute after a tuna-related botulism incident occurred in the early 1960s. No funding exists for such a project, however, HB 453, now in the House Rules Committee would, if amended, be able to provide funding to the Alaska Seafood Marketing Institute for this special project.

° Lead agency: ASMI

° Additional funds needed: To be determined

° Proposal available: March 15

° Further work needed: Legislature needs to amend and pass House Bill 453

IV. Opportunity exists for possible large volume institutional purchase of canned salmon by the U. S. Government for use in Defense Department, Bureau of Prisons, and other institutional feeding programs. The State may be able to encourage these purchases through the Alaska Congressional Delegation.

° Lead agency: ASMI

° Status: Ongoing

V. The European nation embargo on Alaska canned salmon and action by other nations must be removed before the industry can become viable. Now that the U. S. Food and Drug Administration has made its final position known, foreign nations should be encouraged to adopt it, rather than a more harsh alternative. The Alaska Congressional Delegation, the U. S. Department of Commerce, and the State Department all need to be contacted by the State.

° Lead agency: Governor's Office

° Further work to be done: Contact Congressional Delegation and U. S. Government agencies

° Time: As soon as possible

FINANCING

I. The State's current fish pack loan program could help assist the industry in meeting its financial needs for the 1982 harvest. Additionally, the program does hold a substantial amount in notes from the 1981 pack to processors who will suffer economic loss as a result of this incident. Funds in the fish pack loan fund will lapse at the end of June 1982, and no funds will be available for the 1982 pack unless the Legislature takes action. In addition, eligibility requirements for these loans must be amended by the Legislature so that loans can be extended to all those in need. Extending payment period of these loans beyond the current one year statutory limit is extremely important to improving the ability of this program to offer real help to the industry. More funds would be available if the current appropriation were restructured into a loan guarantee program which would leverage additional funds through the private financial market. HB 669, currently in the House Finance Committee, could be amended and passed to meet these needs. Specific statutory language will be available from the Pacific Seafood Processors Association late in the week of March 8.

- Lead agency: Commerce and Economic Development and PSPA
- Industry position available: March 10
- Further work needed: Amend and pass HB 669.

II. Present mechanisms exist to provide funds through State-sponsored programs to assist the industry in meeting this crisis. The Alaska Renewable Resources Corporation, the Commercial Fisheries and Agriculture Bank and the Alaska Industrial Development Authority need to be contacted to determine programs and resources available. The Department of Commerce and Economic Development has scheduled a meeting for Tuesday, March 9, among these programs.

- Lead agency: Commerce and Economic Development
- Date of Meeting: March 9
- Availability of recommendations: March 10

III. The Legislature may want to consider special forms of tax relief for those suffering loss as a result of this incident. The most appropriate tax vehicle may well be the Raw Fish Tax. Consideration could be made of foregiveness or deferral of part or all of the 1981 Raw Fish Tax payments of those who suffer loss, as well as suspension or deferral of the 1982 tax payments. Industry representatives will likely make such a proposal to the Legislature.

- Lead agency: Pacific Seafood Processors Association
- Proposal prepared: March 10
- Further action: Legislation submitted by appropriate committee

QUALITY ASSURANCE AND PRODUCT SAFETY

I. Research needs to be performed to determine the extent of microbial contamination of cannery environs, possible points of contamination of canned salmon, improved means of preventing contamination, and means of rapidly and effectively detecting can integrity failure. The Pacific Seafood Processors Association is developing a detailed proposal in this area. If this program is supported, funds should be appropriated to the Department of Environmental Conservation, who would then contract with a qualified scientific research establishment.

- Lead agency: ADEC with PSDA
- Additional funds needed: $500,000 (estimate)
- Proposal available: March 8
- Additional work needed: Seek legislative appropriation

II. The Alaska Seafood Marketing Institute has developed a draft model Seafood Quality Assurance Program as part of its mandated effort to improve quality control in the Seafood Processing Industry. This voluntary program will be undergoing wide review in the next few months, and will be in place on a test basis in the 1982 season. The plan would then be updated and made final for the 1982 season. This program would eventually cover all major Alaska seafood, not just canned salmon. ASMI is also looking into means to encourage or enforce voluntary compliance with these guidelines.

- Lead agency: ASMI
- Draft available: Now
- Preliminary implementation: 1982 season
- Final implementation: 1983 season

II. The State needs to expand its current program of surveillance over seafood processing in order to help ensure that incidents such as this one do not occur in the future, and to help assure the consumer that we have taken positive steps to increase the safety of the product. As far as the canned salmon industry goes, the currently developed Canned Salmon Control Plan system could be used as a vehicle for strengthening State requirements. If the State required that such a plan be prepared and approved before each processor begins his annual operations, the State could enforce use of the plan through its current inspection and enforcement program.

- Lead agency: ADEC
- Funds required: To be determined
- Further work to be done: Draft and introduce new legislation

1982 SEASON

I. The impact of the canned salmon/botulism incident will likely be felt the greatest in the 1982 fishing season. At this point, it is not possible to predict the impact on raw fish prices, cannery operating schedules, product marketing and pricing, and many other factors. It is important to analyze, on an ongoing basis, the capacity for processing fresh, frozen and canned salmon, the intent of the processing industry in using this capacity, actual plant utilization, and any shift from canned salmon to other forms. The Department of Fish and Game conducted an analysis of plant capacity in December 1981, this is not expected to change significantly.

Because of the competitive nature of some of this information, it is not likely that the State will be able to ascertain precisely what the processing industry will do during the 1982 season. Information available will probably be largely limited to monitoring ongoing operations and noting any changes from past practices. The ability of the State to respond to under-utilized fish processing capacity is limited. However, it may be possible to encourage use of foreign fish processing vessels, or air freighting raw fish to other processing areas. The most effective way to keep abreast of this evolving aspect is to rely on periodic reports of the Department of Fish and Game as the season progresses.

° Lead agency: ADF&G

° Progress reports: As needed

II. In the event that there is significant under-utilization of canning capacity, some fish processors may want to fly fish to freezer plants, or fly them fresh to market. Currently, there is no legal obstruction to air freighting fish directly from the point of catch to a plant or market outside of Alaska. Transporting fish by air intra-state does, however, fall under the jurisdiction of the Alaska Transportation Commission. In the past, the seafood industry has alleged that insufficient certificated carriers were available to transport the quantities of fish required, and the ATC was too inflexible to allow non-certificated carriers or to issue emergency certification that would assure transport of fish to available processors. At this point, it appears that the ATC has sufficient authority to provide sufficient carriers, and merely needs to be convinced of the need. This should be the responsibility of the processing industry in concert with appropriate air carriers. However, the working group should keep informed of developments so that it can take action necessary to assure that harvested fish are not delayed in transporting to available processing facilities.

° Lead agency: ATC

° Status: Ongoing

III. In the event that active capacity is not sufficient to process the 1982 harvest, it may be appropriate for foreign-owned processing vessels to provide the additional capacity needed. However, there are legal problems associated with the State controlling foreign processing vessel use in Alaska's waters. There is legislation pending before Congress that would allow a governor of the affected state to control foreign processor entry. It is sugested that the State take action necessary to encourage the passage of this legislation.

° Lead agency: Office of the Governor and
Department of Fish and Game

° Status: Ongoing

botulism file Salmon Leg -

UNITED FISHERMEN OF ALASKA

MAR 2 1982

MAILING ADDRESS & OFFICE
197 SOUTH FRANKLIN ST
JUNEAU, ALASKA 99801
907 586-2820

Rodger Painter
Executive Director

March 2, 1982

TO: Governor Jay Hammond
Commissioner Ernst Mueller
Senate President Jay Kerttula
Represenative Rick Halford

FROM: Rodger Painter Rodger Painter

RE: Potential reaction by State of Alaska to botulism incident in canned salmon.

(1) Approve multimillion dollar emergency appropriation to the Alaska Seafood Marketing Institute based upon development of special marketing and public relations campaign. The plan should include at least the following programs:
   (a) Public relations effort designed to restore the confidence of distributors and retailers in Alaska canned salmon products;
   (b) Promotion designed to move the estimated 3 million cases of salmon now sitting in warehouses and stimulate demand for 1982 pack; and
   (c) Special promotions for opening up new sales outlets for frozen and fresh salmon in the United States and overseas.

(2) Restructure salmon marketing study underway in Alaska Department of Commerce and Economic Development to focus on impacts of botulism incident, embargo and recalls on foreign and domestic markets for canned salmon. The potential to redirect 1982 salmon production into fresh and frozen markets should be explored in depth.

(3) Create a mandatory, state-approved inspection program designed to prevent defective cans of Alaska salmon from reaching the consumer. Safety assessments of all salmon canning equipment in Alaska should be undertaken.

(4) Alaska Department of Environmental Conservation and the Alaska Seafood Marketing Institute should explore the advisability of a state-approved and monitored quality inspection program by inplant quality assurance personnel.

(5) Alaska Department of Fish and Game should update its assesment of the projected processing capacity of domestic seafood companies for canned and frozen salmon in 1982.

( ) The Office of International Fisheries and External Affairs should focus on ensuring Alaska's 1982 salmon resources can be fully utilized. The goal should be to fill shortfalls in the domestic processing industry's ability to handle the anticipated salmon runs. Care should be taken to ensure that the use of foreign bottomed vessels as supplemental processing capacity does not pose significant threat to the established world markets for Alaska salmon.

(7) Congressional delegation should be asked to actively pursue potential purchases of surplus canned salmon by the federal government for use by Armed Forces and other institutions.

(8) The State of Alaska should consider a special tax relief program giving canning companies credits on Alaska's raw fish and corporate income taxes for the 1982 and 1983 tax years. The companies could be given credits for

capital improvements to come into compliance with new canned salmon safety inspection programs and the costs involved in recalls of salmon packs.

(9) The State of Alaska should reappropriate the $20 million remaining in the 1981 pack loan guarantee fund to the revolving pack loan program. Additional funds should be diverted into the non-subsidized revolving pack loan program. Amendments should be made to the revolving loan fund to allow companies to carry over 1981 pack loans at a subsidized interest rate.

(10) The State of Alaska should consider appropriations to fund special research programs to study prevention of future incidents involving botulism in canned salmon, including development of new designs for cans and canning equipment.

(11) The Alaska Seafood Marketing Institute should continue with its effort to fashion voluntary quality assurance programs. ASMI should be directed to study the concept of a quality assurance seal to which all ASMI promotional efforts would be tied and other options designed to ensure industry compliance with voluntary quality programs.

PLEASE NOTE

THE ORGINAL FILE CONTAINS AN OVERSIZED DOCUMENT THAT IS UNSUITABLE FOR FILMING. PLEASE REFER TO THE ALASKA STATE ARCHIVES TO VIEW THE ORIGINAL.

NEWSPAPER
"THE NETWORK
(ALASKA SEAFOOD MARKETING INSTITUTE)
NO. 3 (NO DATE)

Alaska State Legislature

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JUNEAU, ALASKA 99811
(907) 465-3834
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Senate

Committee on Resources

TO: Bettye Fahrenkamp
Chairman

DATE: 9/28/82

FROM: Resa King
A. A.

RE: Seafood Quality
Assurance Coordinating
Meeting

I attended the Alaska Seafood Marketing Institute (ASMI) quality assurance coordinating meeting on Friday September 24th. A report of activities was presented by the following:

ASMI Reported that their television, radio and print material is completed for the national and international marketing efforts. They believe they will have a good measure of the success of the program by March 1983. ASMI has developed quality guidelines for fishing, tendering and processing operations. ASMI is in the very draft stages of working on the premium seal. And they are working on an educational and training program which they are coordinating with other agencies.

Department of Environmental Conservation Commissioner Mueller reported that they are starting some cross training of inspection personnel in Dutch Harbor inorder for them to be able to inspect for sanitation, waste disposal and water purity.

Dr. Honsinger and George Hart, Division of Seafood and Animal Industires, reported that they have eleven full time employees for the seafood component. The 1984 budget, to be submitted, will have additional personnel and funds for more people in the field, laboratory and clerical. The quality assurance program has been assigned to Dick Phiefer to coordinate. Dick has just returned from California where he was briefed on that state's program. The Division is developing a manual, standards and identifying priority research needs.

National Marine Fisheries Service They are working on imporved handeling, enriched atmosphere transportation, storage and changes in fish due to various holding processes. Their voluntary inspection service is conducted through a cooperative agreement with the Department of Environmental Conservation which implements the program. A task group has been formed to develop a national quality improvement plan. This group is looking at ways to improve U. S. seafood products from the sea to the consumer. The group should have a draft work plan by the spring of 1983.

National Food Processors Association NFPA is a technical and scientific support group to the industry. Their Seattle lab has approximately 30 employees and 95-98% of their lab work is conducted on salmon. They audit cans sent to them from the canneries and off grocery store shelves. Their member canneries pre-inspect the tin flats for defects; visually inspect process every 20 minutes; are now using double dud dectors (top and bottom); cans that are rejected have to be logged and the reasons cited, and; send weekly summaries to NFPA. NFPA and the FDA are also checking on can integrity.

Commerce and Economic Development, Office of Commercial Fisheries Development reported on projects dealing with: use of ionized ice for holding fish; marketing trial of boneless and skinless canned salmon; conducted a study that showed that the resistence in the United Kingdom to purchasing Alaskan salmon was not so much with the individual consumer but with the wholesalers and distributors.

University of Alaska John Doyle reported that they had received $170,000 for salmon quality education but due to a typical inside the University budget problem, nothing has happened with the program to date. Due to the high turnover of personnel in the canneries, Pacific Pearl has done a 25 minute cassett TV film to train plant workers, the basic theme is: keep it cold, keep it clean and keep it moving.

Dr. Lee of the Fisheries Industry Technical Center (which has been moved from the cooperative extension service) reported that they have scheduled 58 workshops on 14 topics ranging from technical, scientific, electronics to net mending. They do need a research facility but that will not be a bond issue until 1985. They are working on a salmon handlers handbook which should be completed soon.

Alaska Fisheries Development Foundation Reported that most of their work has been on white fish and under-utilized species. Their quality concerns are due to the very fragile nature of these species. They are working on handeling guidelines for sable fish and a manual for the production of salt cod.

Alaska Seafood Marketing Institute

SEAFOOD QUALITY ASSURANCE PROGRAM COORDINATION MEETING

Friday, September 24, 1982
Gastineau Suite, Baranof Hotel
Juneau, Alaska

PROPOSED AGENDA

10:00 INTRODUCTORY COMMENTS

10:15 ALASKA SEAFOOD MARKETING INSTITUTE

- Organizational Structure
- Legislative Mandate
- Summary of FY 82 Q.A. Program Activities
- Plans for FY 83
- Discussion

10:45 ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION Ernie Dr.

- Organization
- Authority -- S.B. 872
- Summary of FY 82 Activities
- Plans for FY 83
- Discussion

C. int. staff

11:15 NATIONAL MARINE FISHERIES SERVICE Carl

PSPA

11:45 NATIONAL FOOD PROCESSORS ASSOCIATION Hartley Krueger

12:15 Buffet Luncheon, Gastineau Suite

1:15 ALASKA DEPARTMENT OF COMMERCE AND ECONOMIC DEVELOPMENT
Dick Reynolds & Kay

1:45 UNIVERSITY OF ALASKA
John Doyle + Dr. Lee

2:15 ALASKA FISHERIES DEVELOPMENT FOUNDATION
Sharon

2:45 OPEN DISCUSSION

MEMORANDUM

TO: Conference Participants

DATE: September 13, 1982

FROM: Janet Fries, Q.A. Coordinator
Alaska Seafood Marketing Institute

RE: Quality Assurance Program
Coordination Meeting

This is to remind you that the Alaska Seafood Marketing Institute is holding a Quality Assurance Program Coordination Meeting on Friday, September 24, 1982, in the Gastineau Suite of the Baranof Hotel, in Juneau. The meeting will begin at 10 a.m., will include a luncheon, and will continue until approximately 3 p.m.

The purpose of this meeting is to facilitate coordination among the many quality assurance research, education, and regulatory programs currently being developed and conducted by state, federal and industry groups, which affect the Alaska seafood industry.

Representatives from each of following organizations have been invited to attend: Alaska Dept. of Commerce and Economic Development, Alaska Dept. of Environmental Conservation, Alaska Fisheries Development Foundation, National Food Processors Association, National Marine Fisheries Service, Pacific Seafood Processors Association and the University of Alaska.

Each representative has been requested to prepare a brief presentation and short written memorandum describing the current structure and the past, current, and anticipated future q.a. programs and activities of his/her organization. After each presentation, there will be time for questions and discussion. When all presentations have been completed, there will be time to discuss new ideas and plan for coordination of FY 83 programs and activities.

I look forward to seeing you there.

Alaska Seafood Marketing Institute
526 Main Street
Juneau, Alaska 99801
(907) 586-2902

ALASKA SEAFOOD MARKETING INSTITUTE

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A.S.M.I. 8/12/82

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Jolly Steel

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Ken Wong

A.S.M.I. 8/12/82

Preliminary Draft

Recommended Salmon Quality Guidelines for Fishing, Tendering and Processing Operations

June 1982
Alaska Seafood Marketing Institute
Department of Commerce &
Economic Development
526 Main Street
Juneau, Alaska 99801
(907) 586-2902

Alaska
Seafood
Marketing
Institute

26 Main Street Juneau, Alaska 99801 (907) 586-2902

"Promoting Alaska's Finest Resource"

June 1, 1982

MEMORANDUM

TO: SALMON FISHERMEN, TENDER OPERATORS AND PROCESSORS

FROM: Eric Eckholm, Executive Director
Alaska Seafood Marketing Institute

RE: RECOMMENDED STATEWIDE QUALITY ASSURANCE GUIDELINES FOR PACIFIC SALMON

The draft recommended salmon quality guidelines in this booklet were developed by the ASMI Quality Committee and distributed to fishermen and processors throughout the state for public comment this spring. Several comments were received and many are included in the Appendix. However, in an effort to obtain a broader response, the public comment period has been extended to September 1, 1982.

ASMI urges all salmon fishermen, tender operators and processors to use these guidelines, to the extent possible, during the 1982 salmon season, write any comments on the guidelines directly in this booklet, and send any comments to the ASMI office in Juneau at the end of the season.

Voluntary compliance with these recommended guidelines would go a long way toward achieving one of the major goals of the ASMI quality program, which is to ensure a consistent, high quality image for all Alaska seafood products in world markets. However, a voluntary quality assurance program will only be successful with full industry cooperation.

This booklet has been widely distributed and additional copies are available upon request.

PRELIMINARY DRAFT

Alaska Seafood Marketing Institute

RECOMMENDED STATEWIDE QUALITY ASSURANCE GUIDELINES AND SPECIFICATIONS FOR PACIFIC SALMON

Phase 1: Fishing and tendering vessels and operations, processing facilities and operations, quality evaluation criteria and general product specifications.

Preface

These draft guidelines for Pacific salmon represent the foundation upon which the Alaska Seafood Marketing Institute (ASMI) intends to build a comprehensive quality assurance program for all Alaska seafood products.

Consumer surveys show that the approximately one billion pounds of Alaska seafoods produced and distributed annually have a high quality reputation. ASMI believes that it is important to continue its efforts to maintain and improve the quality of Alaska seafood products whereby all members of the seafood industry will benefit from the economic advantage of a consistent, high quality product image in the world marketplace.

Because of the complexities of harvesting, processing, transporting and distributing seafoods from remote points along Alaska's 34,000 miles of coastline and extensive inland river system, there is a need for industry education to assure the quality of seafoods produced in all areas of the state. These guidelines are an important part of that educational effort.

The ASMI quality assurance program is designed to unite the efforts of the seafood industry and government agencies into an effective partnership. ASMI believes that this cooperative effort, involving fishermen, processors, brokers, transporters, and state and federal officials, will be helpful in assuring the consistent high quality of all Alaska seafood products sold in national and international markets.

Notice to Users

These recommended guidelines and specifications for Pacific salmon were developed by the Alaska Seafood Marketing Institute (ASMI) to assist in producing high quality salmon products. They are intended to be used by fishermen, tender operators and processors as general guidelines. They are not intended to replace the advice of trained and experienced technologists regarding the construction, operation and maintenance of unique vessels, facilities and equipment or regarding operating procedures in unique geographic areas. These guidelines and specifications are also designed to facilitate complete understandings in commercial transactions and may be used for reference by public service agencies. They should not in any way be construed as replacing existing state or federal regulations.

ASMI recommends that these draft guidelines be implemented by all members of the industry beginning with the 1982 season.

It is recognized 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 temperature, intrinsic quality of the fish, or other factors. In such cases, alternative guidelines will be adopted in order to assure high quality salmon production throughout the industry, statewide.

Nothing contained in these guidelines and specifications is intended to be or shall be construed to create or form the basis for any liability on the part of ASMI, or 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 and specifications to comply with its provisions, or by reason or in consequence of any act or omission in connection with the implementation or enforcement of these guidelines and specifications on the part of ASMI by its officers, employees or agents.

RECOMMENDED STATEWIDE QUALITY ASSURANCE GUIDELINES AND SPECIFICATIONS FOR PACIFIC SALMON

Contents

RECOMMENDED STATEWIDE QUALITY ASSURANCE GUIDELINES AND SPECIFICATIONS FOR PACIFIC SALMON

Section 1. SCOPE

1.1 These guidelines and specifications 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 any number of 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

1.2 These guidelines and specifications do not apply to minced salmon by-products, such as eggs, oil, fish meal and minced flesh, at this time. Guidelines will be developed for these products in the future.

Section II. DEFINITIONS

Belly burn is a condition of deterioriation of the lining of the belly cavity evidenced by discoloration and/or exposure of the rib bones.

Chilled sea water (CSW) is a type of refrigeration system, sometimes called a "slush ice" system, 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 is kept cold by the use of ice or mechanical refrigeration. A cool room is any facility where fish is held at a temperature of 40°F or below. A cold storage room is any facility where fish is held at a temperature of 0°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 combing is the raised portion on the deck of a vessel which surrounds the 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.

Minimum specification is a description of a design, material or product which is currently attainable and within which all seafood vessels and facilities should be in compliance.

Natural water is fresh water or salt water from a natural source which may meet State of Alaska drinking water requirement , but has not been approved for such use.

Nonpotable water is water from any source which does not meet State of Alaska drinking water standards.

Potable water is water which meets all State of Alaska drinking water regulations.

Preferred specification is a description of a design, material or product which is not necessarily attainable at the present time for all existing vessels and facilities, but should be met or exceeded in the design of all new, or alterations to existing, vessels and facilities.

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 defined as 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 refrigeration system which uses sea water 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 in such poor quality that they are unfit for human consumption, as defined by U.S. Food and Drug Administration regulations.

Section III. GENERAL INFORMATION ABOUT FISH QUALITY

Although there are many aspects that must be considered when defining what is meant by "high quality" fish products, there are two major ones that fishermen, tender operators and processors should be concerned with as producers:

(a) the "intrinsic" quality of the fish before it is harvested, and
(b) the "extrinsic" quality of the fish as it is delivered to the tender, processor and, finally, the consumer.

The first aspect, the "intrinsic" quality of the fish, is determined by the physical condition of the fish at the time it is harvested, including species, size, sex, stage of maturity and other physiological characteristics. These characteristics are inherent to a particular fish, and the method of handling that fish will not significantly alter these characteristics.

The second aspect, the "extrinsic" quality of the fish, is determined entirely by the methods employed in the harvesting, handling, processing and storing of that fish. Proper handling procedures will result in fish of high extrinsic quality; improper handling methods will result in loss of extrinsic quality. Fish which are handled so poorly that they become "unwholesome" are unfit for human consumption.

These guidelines outline proper procedures for harvesting, tendering, processing and storing Pacific salmon which, if followed carefully, will result in products of consistently high extrinsic quality which are more desirable to consumers. The product specifications address both intrinsic and extrinsic quality characteristics, however, they are in no way intended to rate the intrinsic quality characteristics of the fish as more or less desirable to consumers.

4. Section IV. FISHING VESSELS AND OPERATIONS

4.1 A. VESSEL SPECIFICATIONS

4.1.1 General Information

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

4.1.1.2 All vessel operators should have valid gear and vessel and crew licenses issued by the State of Alaska.

4.1.2 Minimum Specifications

4.1.2.1 All vessels should have a suitable fish hold for storing the catch, whether it be below deck or on-deck. Plastic totes with drainage capability are acceptable for use as fish holds.

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

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

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

4.1.2.5 Fish holds should be adequately insulated to control heat transfer from engine, crew's quarters or heated pipes to fish.

4.1.2.6 Fuel and hydraulic lines running through fish holds should be enclosed to protect the fish in case of line failure.

4.1.2.7 Vessels should have hatch-combings of sufficient height to prevent the flow of contaminants from the deck to the fish holds.*

4.1.2.8 Vessels should be equipped with sufficient hatch covers or suitable covering material to eliminate the exposure of fish to sunlight or airborne contaminants.

4.1.2.9 All lights in fish handling areas should be shatterproof or have protective covering such that if they are broken, product contamination will not occur.

*This is a preferred specification for existing vessels 32 ft. and under, but should be included in any new vessel design.

4.1.3 Preferred Specifications

4.1.3.1 Vessels should meet all minimum specifications stated in Section 4.1.2, and in addition:

4.1.3.2 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 sheeted hold, caulked with nontoxic seam compound and coated with a suitable paint or covering is acceptable. A fully approved hold would be completely insulated, and would 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.

4.1.3.3 Vessels should have watertight hatch covers or covering designed to protect fish from salt or fresh water intrusion.

4.1.3.4 On vessels with refrigeration systems, the systems should be in good operational condition and capable of chilling a full load of fish to a range of 30° to 35°F (-1° to 2°C) within a reasonable amount of time.

4.1.3.5 RSW vessels should limit their loads to a maximum of 45 lbs. of fish per cubic foot of hold space.

4.1.3.6 On vessels with freezing systems, the systems should be in good operational condition and capable of reducing the core temperatures of a full load of fish to 0°F (-18°C), or lower, within a reasonable amount of time.

4.1.3.7 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-metel thermometers which accurately measure the internal temperature of the fish.

4.1.3.8 Vessels with below-deck holds should be equipped with chutes or other techniques or devices to convey fish into holds, after removal from net, with a minimum of damage to the fish.

4.2 B. RECOMMENDED OPERATING PROCEDURES FOR FISHERMEN*

4.2.1 General Guidelines for all Gear Types

4.2.1.1 Fish should be handled carefully at all times. This includes, but is not limited to:
- Remove fish gently from gear.
- Do not handle fish or remove from nets by the tail.
- Do not throw, kick or step on fish.
- Protect fish from damage in shaft alley or any other part of the vessel.

4.2.1.2 No pughs, forks, picks, hooks or pumps which damage the edible part of the fish should be used.

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

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

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

4.2.1.6 Fish held in bulk on vessels without tanked holds should be shelved at 90 cm (35 in.) intervals.

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

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

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

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

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

*Fishermen should also refer to recommended Fish Quality Evaluation Procedures aboard tenders on page 18.

**This is not feasible for seining operations.

4.2.1.12 Fish should be delivered to tenders or processing facilities as rapidly as possible. All fish should be chilled within twelve (12) hours from the time of capture.

4.2.1.13 Pumps and brailers used for unloading fish should be operated in a manner that minimizes physical damage to fish. The recommended maximum load per brailer is 200 fish or 800 lbs.

4.2.1.14 The holds, bin boards and decks should be thoroughly cleaned and sanitized in accordance with the Fishing Vessel Sanitation Procedures described in Section 4.5 of these Guidelines. The vessel should be cleaned after every delivery.

4.2.2 Additional Guidelines for Drift Gill Net Operations

4.2.2.1 Drift gill net sets should not be longer than two (2) hours.

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

4.2.3 Additional Guidelines for Set Gill Net Operations

4.2.3.1 Set gill net sets should not be longer than six (6) hours.

4.2.3.2 Set gill nets should not be dragged on the beach until all fish have been picked from net.

4.2.3.3 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.

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

4.2.3.5 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.

4.3 C. CHILLING AND CHILL STORAGE DURING FISHING OPERATIONS

4.3.1 General Guidelines for Round Fish

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

4.3.1.2 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 to a range of 32° to 35°F (0° to 2°C).

4.3.1.3 If a chilled (CSW) or refrigerated (RSW) sea water system is used, the fish should be maintained at 30° to 35°F (-1° to 2°C). All tanks should be prechilled to 30° to 32°F (-1° to 0°C) before loading fish.

4.3.1.4 All ice used for chilling fish should be made with clean water from an approved source and should not be contaminated during manufacturing, transportation or storage.

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

4.3.1.6 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 (6) 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 approximately one minute.

4.3.2 Additional Guidelines for Dressed (Eviscerated) Fish

4.3.2.1 Dressed fish should be iced in plastic tubs with drainage capability, boxes or small removable bins as soon as possible after evisceration.

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

4.4 D. FREEZING AND FROZEN STORAGE ABOARD FISHING VESSELS

4.4.1 The core temperatures of several average size fish should be measured with a thermocouple at regular intervals during a trial run of a full load of fish, to determine the actual capacity of the freezers during operation at sea.

4.4.2 Fish should not be removed from freezers until the core temperature has been reduced:
(a) preferably, to 0°F (-18°C), or
(b) at least, to 5°F (-15°C) or lower.

4.4.3 The core temperatures of fish in storage should remain at 0°F (-18°C) or lower.

4.4.4 Fish should be frozen and held at a constant temperature with a minimum of fluctuation.

4.4.5 The temperature of freezers and storage areas should be monitored at regular intervals, preferably every six (6) hours.

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

4.5 E. FISHING VESSEL SANITATION

4.5.1 General Informatio.

4.5.1.1 Fish stored in an insanitary fishing vessel 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.

4.5.1.2 All RSW systems should be designed with a cleaning loop to permit proper cleaning and sanitizing of the sea water piping and the heat exchangers.

4.5.2 Cleaning and Sanitation Procedures

4.5.2.1 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, using a solution of detergent in warm water.
(c) Rinse with cold fresh water or sea water.
(d) Sanitize with a solution containing chlorine or iodine.
(e) After 5 to 10 minutes, rinse off the sanitizing solution.

4.5.2.2 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.

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

4.5.3 Detergents and Sanitizers

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

4.5.3.2 A sanitizing agent containing either chlorine or iodine should be used to kill bacteria left after the vessels have been cleaned. Ordinary liquid chlorine bleach (5% hypochlorite) is suitable. It is very important that it be diluted in the ratio of one-half cup to 5 gallons of water. 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.

5. Section V. TENDERING VESSELS AND OPERATIONS

5.1 A. VESSEL SPECIFICATIONS

5.1.1 General Information

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

5.1.1.2 All tender operators should have valid vessel and crew licenses issued by the State of Alaska.

5.1.2 Minimum Specifications

5.1.2.1 All vessels should have a suitable fish hold for storing the catch, whether it be below deck or on-deck. Plastic totes with drainage capability are acceptable for use as fish holds.

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

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

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

5.1.2.5 Fish holds should be adequately insulated to control heat transfer to fish from engine, crew's quarters or heated pipes.

5.1.2.6 Fuel and hydraulic lines running through fish holds should be enclosed to protect the fish in case of line failure.

5.1.2.7 Vessels should have hatch-combings of sufficient height to prevent the flow of contaminants from the deck to the fish holds.

5.1.2.8 Vessels should be equipped with sufficient hatch covers or suitable covering material to eliminate the exposure of fish to sunlight or airborne contaminants.

5.1.2.9 All lights in fish handling areas should be shatterproof or have protective covering such that if they are broken, product contamination will not occur.

5.1.3 Preferred Specifications

5.1.3.1 Vessels should meet all minimum specifications stated in Section 5.1.2, and in addition:

5.1.3.2 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 sheeted hold, caulked with nontoxic seam compound and coated with a suitable paint or covering is acceptable. A fully approved hold would be completely insulated and would 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.

5.1.3.3 Vessels should have watertight hatch covers or covering designed to protect fish from salt water or fresh water intrusion.

5.1.3.4 On vessels with refrigeration systems, the systems should be in good operational condition and capable of chilling full loads of fish to a range of 30° to 35°F (-1° to 2°C) within a reasonable amount of time. Circulation systems should be adequate to ensure even temperatures throughout the hold.

5.1.3.5 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.

5.1.3.6 Vessels with below-deck holds should be equipped with chutes or other techniques or devices designed to convey fish into holds, after removal from net, with a minimum of damage to the fish.

5.2 B. RECOMMENDED OPERATING PROCEDURES ABOARD TENDERS

5.2.1 General Guidelines

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

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

5.2.1.2 No pughs, forks, picks, hooks or pumps which damage the fish should be used.

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

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

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

5.2.1.6 Fish held in bulk on vessels without tanked holds should be shelved at 90 cm (35 in.) intervals.

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

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

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

5.2.1.10 Fish should be delivered to processing facilities as rapidly as possible. All fish should be chilled within twelve (12) hours from the time of capture.

5.2.1.11 Pumps and brailers used for unloading fish should be operated in a manner that minimizes physical damage to fish. The recommended maximum load per brailer is 200 fish or 800 lbs.

5.2.1.12 The holds, bin boards and decks should be thoroughly cleaned and sanitized in accordance with the Tendering Vessel Sanitation Procedures described in Section 5.5 of these Guidelines. The vessel should be cleaned after every delivery.

5.2.2 Fish Quality Evaluation Procedures

5.2.2.1 Both the intrinsic and extrinsic quality of all fish should be evaluated "as received," whenever fish is transferred

(a) from a fishing vessel or set net site to a tender or other vehicle used for transporting fish, or

(b) from a tender to another tender or motor vehicle used for transporting fish.

5.2.2.2 A written evaluation of fish quality should be made, and the record of the evaluation should be delivered to appropriate personnel at the processing facility. The written evaluation should include, but need not be limited to

(a) correct species identification,

(b) external appearance of eyes, gills, scales, skin and general condition of the entire load,

(c) odor,

(d) internal fish temperature, and

(e) sexual maturity.

If fish quality appears questionable, evaluation should include internal appearance of viscera, kidney and belly walls.

5.2.2.3 Any known 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 included in the written evaluation.

5.2.2.4 The date and time of the catch on each vessel should be determined by examining fish, logs and checking date and time of last delivery, before fish are transferred to the tender and fish tickets are issued. The catch date and time should be noted on the written evaluation.

5.2.2.5 Fish suspected of being unwholesome or contaminated should be segregated from all other fish on the tender and should be identified in the written evaluation. High quality fish should not be mixed with fish of questionable quality.

5.2.2.6 Fish found during evaluation to be unwholesome or contaminated by bilge water, fuel, lubricants, phenols or other contaminants should not be accepted by tenders or processing facilities.

5.2.2.7 Fish exhibiting visible signs of wounds, seal bites, bruising, belly burn or other signs of intrinsic or extrinsic loss of quality should be segregated.

5.3 C. CHILLING AND CHILL STORAGE ABOARD TENDERS

5.3.1 General Guidelines for Round Fish

5.3.1.1 All tender operators should use ice or some other method of chilling the fish. Whatever method is used, fish should be chilled as soon as possible after loading on the tender.

5.3.1.2 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 to a range of 32° to 35°F (0° to 2°C) within a reasonable amount of time.

5.3.1.3 If a chilled (CSW) or refrigerated (RSW) sea water system is used, the fish should be maintained at 30° to 35°F (-1° to 2°C). All tanks should be prechilled to 30° to 32°F (-1° to 0°C) before receiving fish.

5.3.1.4 All ice used for chilling fish should be made from clean water from an approved source and should not be contaminated during manufacturing, transportation or storage.

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

5.3.1.6 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 (6) 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 approximately one minute.

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

5.3.2 Additional Guidelines for Dressed (Eviscerated) Fish

5.3.2.1 Dressed fish should be stored in ice in impermeable tubs with drainage capability, boxes or small removable bins on the tender.

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

5.5 D. TENDERING VESSEL SANITATION

5.5.1 General Information

5.5.1.1 Fish stored in an insanitary tendering vessel 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.

5.5.1.2 All RSW systems should be designed with a cleaning loop to permit proper cleaning and sanitizing of the sea water piping and the heat exchangers.

5.5.2 Cleaning and Sanitation Procedures

5.5.2.1 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, using a solution of detergent in warm water.
(c) Rinse with cold fresh water or sea water.
(d) Sanitize with a solution containing chlorine or iodine.
(e) After 5 to 10 minutes, rinse off the sanitizing solution.

5.5.2.2 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.

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

5.5.3 Detergents and Sanitizers

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

5.5.3.2 A sanitizing agent containing either chlorine or iodine should be used to kill bacteria left after the vessel has been cleaned. Ordinary liquid chlorine bleach (5% hypochlorite) is suitable. It is very important that it be diluted in the ratio of one-half cup to 5 gallons of water. 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.

Section VI. SHORE-BASED AND FLOATING PROCESSING FACILITIES AND OPERATIONS

6.1 A. FACILITY AND EQUIPMENT SPECIFICATIONS

6.1.1 General Information

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

6.1.1.2 No fish processing facility may operate in Alaska without a valid annual certificate and permit as required by the State of Alaska.

6.1.1.3 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 specifications 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.

6.1.1.4 All aspects of salmon canning in Alaksa must 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.

6.1.2 General Specifications

6.1.2.1 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.

6.1.2.2 Each room should have sufficient natural or artificial lighting for the purpose for which it is to be used. Lighting should be adequate in all areas to permit visibility for cleaning and sanitary inspection operations.

6.1.2.3 All lights should be shatterproof or have protective covering such that if they are broken, product contamination will not occur.

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

*See citation in the Recommended References section of these Guidelines.

6.1.2.5 Toilets 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 city and state codes.

6.1.2.6 Adequate handwashing facilities should be provided with soap, running water of suitable temperature and drying facilities. Directions should be posted which instruct employees to wash hands thoroughly before re-entering the processing area. Where practicable, portable hand dips containing a sanitizing solution should be used.

6.1.2.7 Equipment which comes in contact with butchered fish should be constructed of smooth, nontoxic, corrosion-resistant metal or other nonabsorbent material or should be covered by another material which is equally sanitary and does not contaminate the fish.

6.1.2.8 Where applicable, any 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. This may include but is 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.

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

6.1.2.10 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 and other animals or contamination by dust and dirt.

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

6.1.3 Water Supply Specifications

6.1.3.1 The natural water supply intake should be located with the intent of avoiding pollution from shore facilities, marine vessels or processing residuals.

6.1.3.2 There should be no cross-connections between potable and nonpotable water.

Example 1: 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.

Example 2: A cross-connection occurs when a potable water service pipe is directly connected to prime a nonpotable water pump.

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

6.1.3.4 Natural water may be used for unloading, fluming or refrigerated holding of round fish (a) if it has been effectively sanitized, (b) if it has been approved by a federal, state or local agency, or (c) if the fish are rinsed with effectively sanitized water before they enter the facility.

6.1.3.5 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.

6.2 B. RECOMMENDED OPERATING PROCEDURES FOR ALL SHORE-BASED AND FLOATING PROCESSORS

6.2.1 Employee Education

6.2.1.1 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) handle fish gently,
(b) do not handle by the tail,
(c) do not throw, step on or in any way abuse the fish, and
(d) do not handle fish carelessly.

6.2.2 Unloading the Fish

6.2.2.1 All pumps, including the suction end, tubing and discharge end, should be designed and operated so as to avoid physical damage to the fish. All pumps should be cleaned and sanitized daily.

6.2.2.2 The recommended maximum load per brailer or tote is 200 fish or 800 lbs.

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

6.2.2.4 Discharge after transport by flumes and conveyor belts or handling on sorting tables should not result in fish being dropped more than 18 inches. This equipment should be cleaned and sanitized at least once a day.

6.2.2.5 Wagons, totes and bins should be designed and operated to facilitate drainage, and should be cleaned and sanitized at least once per day.

6.2.3 Fish Quality Evaluation Procedures - As Received at Processing Facility

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

6.2.3.2 Fish should be evaluated by experienced personnel who are familiar with regulatory agency requirements and company grade specifications.

6.2.3.3 Fish should be evaluated according to each company's individual grade standards using the general criteria stated in Paragraph 6.4.1.

6.2.3.4 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) should be discarded.

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

6.2.4 General Guidelines for All Processing Operations

6.2.4.1 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 to a range of 32° to 35°F (0° to 2°C). If a chilled (CSW) or refrigerated (RSW) sea water system is used, the fish should be maintained at 30° to 35°F (-1° to 2°C). All tanks should be prechilled to 30° to 32°F (-1° to 0°C) before loading fish.

6.2.4.2 Raw salmon should be stored no higher than 35 inches (90 cm) deep in clean, well-maintained containers before and during processing operations.

6.2.4.3 Any salmon that accidentally fall on the floor should be picked up immediately by the head and nape and rinsed with potable water before further processing.

6.2.4.4 Only authorized persons should be allowed in processing areas.

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

6.2.4.6 Cutting boards used at butchering or sliming tables which are made of wood or other porous material should be sanitized daily and replaced or reconditioned annually (or more often if necessary) to remove gouged, splintered or otherwise worn surfaces.

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

6.2.4.8 Fresh fish should be washed, preferably with a low pressure water spray containing 1 ppm chlorine, externally, prior to evisceration, and internally, after evisceration.

6.2.4.9 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 Section 6.5 for a complete description of processing facility sanitation procedures.

6.2.5 Fish Quality Evaluation Procedures - During Processing Operations

6.2.5.1 Both the intrinsic and extrinsic quality of the fish should be evaluated on a routine basis during processing operations.

6.2.5.2 Fish should be evaluated by experienced personnel who are familiar with regulatory agency requirements and company grade specifications.

6.2.5.3 Fish should be evaluated according to each company's individual grade standards, using the criteria stated in Paragraph 6.4.2.1.

6.2.5.4 Any fish which are unwholesome (i.e., do not meet minimum standards for human consumption) should be discarded.

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

6.2.5.6 Any unwholesome portions or defects should be removed at the time of the evaluation.

6.3 C. RECOMMENDED OPERATING PROCEDURES FOR FREEZING PLANTS

6.3.1 Freezing Operations

6.3.1.1 Fish should be clean, correctly identified, gently laid straight on clean freezer trays or racks, and promptly sharp frozen.

6.3.1.2 Fish should not be removed from freezers until the core temperature has been reduced to 5°F (-15°C) or lower.

6.3.1.3 Fish should be gently removed from freezer trays or racks and immediately glazed or shrink-wrapped and/or packaged to prevent dehydration and oxidation.

6.3.2 Glazing Operations

6.3.2.1 Glaze water should be pre-chilled.

6.3.2.2 The fish should be completely submerged in glaze water.

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

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

6.3.3 Cold Storage Operations

6.3.3.1 Frozen fish should be stored at 0°F or lower, with minimal temperature fluctuations.

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

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

6.4 D. FISH QUALITY EVALUATION CRITERIA

6.4.1 Quality Evaluation Criteria for Fresh Fish

6.4.1.1 All fresh fish should exhibit the following characteristics prior to and during processing operations:

(a) Eyes should be bright, clear and 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.
(d) Skin color should be characteristic of fresh fish that is typical of the species, stage of sexual maturity, district from which it was taken, and time of the year it was caught.
(e) Viscera and eggs should be bright and firm and should smell sea-fresh (practically odorless).
(f) Belly cavity should have no breaks due to tissue breakdown by enzymatic action.
(g) Flesh should be resilient when subjected to finger pressure.
(h) Flesh color should be characteristic of a fresh fish that is typical of the species, district from which it was taken and time of year it was caught.
(i) Physical shape should be characteristic of the species at its stage of sexual maturity.
(j) Scale adherence should be reasonably uniform and nearly complete.*
(k) Odor should be characteristic of fresh fish. There should be no odor indicating decomposition or contamination.

6.4.2 Quality Evaluation Criteria for Frozen Fish

(To be developed in 1983)

*Fish with substantial scale loss should be carefully examined, as this may be an indication of poor handling practices.

6.5 E. PROCESSING FACILITY SANITATION

6.5.1 General Information

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

6.5.2 Detergents and Sanitizers*

6.5.2.1 A standard approved detergent should be used to clean fish contact surfaces.

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

6.5.2.3 Either gaseous chlorine or a hypochlorite compound can be used as a sanitizing agent (see Reference No. 9 for more details on the use of these forms of chlorine).

6.5.2.4 Under no circumstances should sanitizers containing phenols (such as lysol and pinesol) be used in a fish hold or on fish handling surfaces.

*All processors should use USDA approved detergents and sanitizers as listed in USDA Food Safety and Quality Service Miscellaneous Publication #1373, List of Chemical Compounds Authorized For Use Under USDA Inspection and Grading Programs.

Section VII. GENERAL PRODUCT SPECIFICATIONS

7.1 General Information

7.1.1 Any of the five species of Pacific salmon (Oncorhynchus sp.) harvested in Alaska may be offered for sale in any number of 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

7.1.2 Variations in method of processing, style of product and physiology or physical characteristics of the fish are all acceptable if identified and agreed upon by the Seller and the Buyer.

7.2 Nomenclature

(To be developed in 1983)

7.3 Product Specifications

(To be developed in 1983)

7.4 Defects Tables

(To be developed in 1983)

RECOMMENDED STATEWIDE QUALITY ASSURANCE GUIDELINES AND SPECIFICATIONS FOR PACIFIC SALMON

Recommended References

State and Federal Regulations

1. Title 21 - Food and Drugs, Part 110, Current Good Manufacturing Practice (Sanitation) In the Manufacturing, Processing, Packing or Holding Human Food. U.S. Food and Drug Administration, effective May 26, 1969, recodified March 15, 1977.

2. Alaska Fish Inspection Regulations, State of Alaska, Department of Natural Resources, Division of Agriculture (1979).

General References

1. Net Caught Salmon - Handle with Care (John P. Doyle), Alaska Seas and Coasts, Volume 6, Number 3 (June 1978).

2. Chilled and Refrigerated Sea Water - Easier and Faster Cooling of Fish (Donald E. Kramer), Alaska Seas and Coasts, Volume 8, Number 4 (October-November 1980).

3. Onboard Freezing Systems: Some Options for the Small Vessel (Edward Kolbe), Oregon State University, Extension Marine Advisory Program, Publication SG 67 (July 1969).

4. Draft Code of Practice for Frozen Fish, 11R7, International Institute for Refrigeration (1969).

5. Operating Instructions for RSW Systems on B.C. Salmon Packers (S.W. Roach), Fisheries Research Board of Canada, Vancouver Laboratory (1973).

6. Recommended International Code of Practice for Fresh Fish, FAO/WHO Codex Alimentarius Commission (1976).

7. Code of Practice for Frozen Fish, CX/FFP 77/15 (FAO Fish. Circ. C145, Rev. 1).

8. Recommended International Standard for Canned Pacific Salmon. FAO/WHO Codex Alimentarius Commission (1969).

9. Fishplant Sanitation and Cleaning Procedures (John P. Doyle), University of Alaska, Marine Advisory Bulletin No. 1 (1970).

10. Cleaning and Sanitizing Agents for Seafood Processing Plants (Jong S. Lee), Oregon State University, Extension Marine Advisory Program, Publication SG 21 (1973).

APPENDIX

COMMENTS RECEIVED TO DATE ON THE DRAFT RECOMMENDED SALMON QUALITY GUIDELINES

GENERAL COMMENTS

Industry comments received on the guidelines to date have been, in general, very supportive of ASMI's efforts to establish a statewide industry-lead quality assurance program for salmon. Individual responses have varied from those who feel the guidelines have established too high a standard that would be difficult for the industry to meet, to those who feel that the guidelines are not strict enough and that a mandatory program, perhaps with variable time allowances for certain regions and/or gear types to meet the guidelines, is the only way to accomplish the goals of the program. In addition to the specific comments that follow, many suggestions were made regarding the broader scope of implementing a statewide quality assurance program. While these comments are too numerous to list in this booklet, they have been recorded and are being considered by ASMI in future program development. More comments of a general nature are welcome in the extended comment period, which is open until September 1, 1982.

SPECIFIC COMMENTS

Notice to Users

Paragraph one - Delete the word "unique" in line 6 and line 7.

Section I. SCOPE

1.1 Should include smoked salmon.

Section II. DEFINITIONS

Belly burn - "lining of the belly cavity" should be changed to "belly wall."

Cold storage facility - (a) Insert "(-18°C)" after 0°F. (b) Note: Canadian definition is -15°F.

"Intrinsic" quality - Should read "is a term which refers to the inherent physical characteristics of a fish before and after is it harvested."

Natural water - Should read "is fresh water or salt water from a natural source which may meet State of Alaska bacteriological requirements for drinking water."

Unwholesome - Should read "as defined by U.S. Food and Drug Administration and Alaska Department of Environmental Conservation regulations."

Section III. GENERAL INFORMATION ABOUT FISH QUALITY

Paragraph two - This paragraph may be misleading in that it implies that handling and processing techniques need not be altered to take into consideration the intrinsic quality of the particular fish being processed. On the contrary, the intrinsic quality should be a major factor in determining how a fish is handled.

Paragraph three - Should read "the 'intrinsic' quality of fish of a given species," to avoid the potential confusion as stated for paragraph two, above.

4. Section IV. FISHING VESSELS AND OPERATIONS

4.1.1.1 Should read "should be constructed, operated and maintained as to minimize physical damage or deterioration and eliminate contamination of fish."

4.1.1.2 Should be deleted as it is irrelevant to quality assurance guidelines.

4.1.2.1 (a) Should read "Plastic totes with drainage capability where practical are acceptable".
(b) Might be difficult for skiff fisheries.

4.1.2.2 (a) Specific identification of contaminants should be deleted as unnecessary. At a minimum, "bilge water" should not be specified as a contaminant without further definition.
(b) Should read "Fish holds should have watertight bulkheads designed to eliminate contamination of the fish from bilge water, fuel, lubricants or other contaminants."

4.1.3.2 Sentence three should read "A wooden hold, caulked with nontoxic seam compound and coated with a suitable covering is acceptable" and should be moved to the Minimum Specifications section.

4.1.3.3 (a) Hatch covers are not feasible on many vessels 32' and under.
(b) Should be stated more clearly.

4.1.3.4 (a) Should read "to a range of 30° to 32°F (-1.1° to 0°C)," as storage of fish in the 32° to 35°F range will cause spoilage and excessive salt uptake.
(b) Should give an example of a "reasonable amount of time".

4.1.3.7 (a) The recommendation that vessels be able to "record" hold temperatures is unnecessary so long as it can be accurately measured. The recommendation that dry gillnet and purse seine vessels be equipped with a thermometer to measure fish temperatures is unnecessary.
(b) Type and cost of thermometer should be specified.

4.1.3.8 This guideline is too broadly stated and ignores the necessity of brailing fish into the hold of seine boats.

4.2.1.1 It is very difficult not to handle fish by the tail in high volume operations.

4.2.1.2 Delete "the edible part of".

4.2.1.4 (a) Should read "Fish must be protected", as this is an FDA regulation.
(b) Bilge water should not be classified as a contaminant.

4.2.1.5 See comment on 4.1.3.8.

4.2.1.6 This guideline ignores the existence of the Alaska purse seine fishery and is completely impractical and unnecessary.

4.2.1.9 (a) Not feasible for many high volume gillnet operations.
(b) Should apply to kings in all types of operations.

4.2.1.10 Not practical in many net fisheries.

4.2.1.12 (a) Should be restated to clarify.
(b) Not practical in most net fisheries in Alaska.
(c) Difficult for dry seiners in southeastern Alaska due to 15 hour openings.
(d) Difficult with existing vessels, facilities and ice making capacity.
(e) Twelve hours is too long a period for fish to be left unchilled. This should be reduced to two or four hours and made a mandatory requirement.

4.2.1.13 (a) Should read "200 fish or 800 lbs., whichever is less".
(b) Should not be recommended due to different brailer designs.

4.2.1.14 Would be difficult to comply at some remote buying stations.

4.2.2.2 Language should be clarified.

4.2.3.1 Should be amended to allow for bad weather in skiff fisheries, which would make picking nets dangerous.

4.2.3.3 (a) Burlap should be washed and sanitized.
(b) Should be deleted due to existing FDA regulations.

4.2.3.4 Should read "Fish must be protected" or deleted, as this is mandated by federal regulation.

4.2.3.5 Should not apply to fish picked while tide is in.

4.3.1.1 (a) Not practical in some fisheries at this time due to vessel design, lack of sufficient ice making capacity and distance of fishing grounds from ice supply.
(b) Not necessary with delivery times under six hours.

4.3.1.3 See comment on 4.1.3.4 (a).

4.3.1.4 Should read "All ice used for chilling fish must be made with potable water from an approved source".

4.3.1.5 Impractical; one could infer a guideline that each vessel carry testing equipment.

4.3.1.6 There is no reason to monitor and log the internal temperature of iced fish, and while water temperature in CSW and RSW systems should be monitored, logging should not be recommended. The type of thermometer should not be specified.

4.3.2.2 Should read "RWS systems should not be used for holding eviscerated fish. CSW systems are okay, provided fresh water or diluted sea water is used".

4.4.1 The manner of measuring core temperatures should not be specified.

4.5.3.2 Should include the statement "sanitizing agents should be used consistent with package labeling directions."

5. Section V. TENDERING VESSELS AND OPERATIONS

5.1.1.1 See comment on 4.1.1.1.

5.1.1.2 See comment on 4.1.1.2.

5.1.2.2 See comments on 4.1.2.2.

5.1.3.2 (a) See comments on 4.1.3.2.
(b) The term "fully equipped" should be deleted as it is unnecessary language and implies the existence of a body to issue approval. Full insulation may not always be necessary.

5.1.3.4 See comments on 4.1.3.4.

5.1.3.5 Unnecessary to record hold temperatures on tenders. Not useful to require "bi-metal" thermometer on dry tenders.

5.1.3.6 Too broadly stated and recommends unnecessary practices for handling fish in bulk from net fisheries.

5.2.1.4 See comments on 4.2.1.4.

5.2.1.5 See comments on 4.1.3.8.

5.2.1.6 (a) See comment on 4.2.1.6.
(b) Would be difficult for existing Bristol Bay tender fleet.

5.2.1.10 (a) Should read "Fish should be delivered to processing facilities as rapidly as possible. All fish should be chilled immediately after accepting fish onto the tender."
(b) The question of waiting lines at the tenders should be addressed here.

5.2.2 Entire section should be rewritten to take into account the practical aspect of handling fish in bulk in Alaska's net fisheries.

5.2.2.1 (a) A short checklist would be valuable if of a size that would fit in a card file.
(b) What should be done if a tender has six different grades?

5.2.2.2 (a) Checklists should be developed.
(b) A system should be developed for uniform implementation which specifies the number of fish to be checked in each lot and the method of evaluation.

5.2.2.4 Fairly accurate time estimates can be made and serve as a good indicator of quality.

5.3 (a) Entire section should be rewritten to take into account the extensive use of dry tenders in Alaska's net fisheries.
(b) The use of dry tenders should be eliminated in Alaska salmon fisheries, as adequate CSW and RSW vessels are available for such use during salmon season.

5.3.1.2 Give an example of "reasonable amount of time."

5.3.1.3 See comment on 4.1.3.4.

5.3.1.4 See comment on 4.3.1.4.

5.3.2.2 See comment on 4.3.2.2.

6. Section VI. SHORE-BASED AND FLOATING PROCESSING FACILITIES AND OPERATIONS

6.1.1.1 See comment on 4.1.1.1.

6.1.1.2 See comment on 4.1.1.2.

6.1.2 Several items in this section are already mandated by federal and/or state regulations and should be distinguished from the voluntary guidelines by specific language (e.g., "must" should be used instead of "should").

6.1.2.11 Should be clarified.

6.2.2.2 See comments on 4.2.1.13.

6.2.3.4 Should read "must" be discarded.

6.2.3.5 Labeling of fish of different quality is impractical when handling fish in bulk.

6.2.4 (a) This section should be rewritten to take into account the handling of fish in bulk.
(b) This section should specify a maximum time for processing operations.

6.2.4.1 See comment on 4.1.3.4 (a).

6.2.4.6 Should specify nonporous surfaces only.

6.2.5 This section should be rewritten to take into account the handling of fish in bulk.

6.2.5.4 Should read "must be discarded in a sanitary manner."

6.3.3.1 Should be expanded to include cold storage transportation operations.

6.4.1.1 Subparagraph (f) should read "Belly wall".

7. Section VII. GENERAL PRODUCT SPECIFICATIONS

7.1.1 Should include smoked salmon.

Recommended References

Should include the Canned Salmon Control Plan.

DRAFT WORKPLAN FOR THE DEVELOPMENT OF AN ADEC SEAFOOD INDUSTRY QUALITY ASSURANCE PROGRAM

August 20, 1982 DRAFT

A. BACKGROUND

Senate Bill 872 (chapter 57 SLA 1982) is part of the State of Alaska response to the botulism problem and recalls experienced by the canned salmon industry.

A. Program Effects of SB 872:

1. Expands seafood inspection responsibilities of the Department of Environmental Conservation, Division of Seafood and Animal Industries.
2. Provides research funds for seafood product surveillance.
3. Provides for "inspectional" and "premium quality" seals on Alaskan seafood products.
4. Requires the Commissioner of Environmental Conservation to provide to the legislature by January 30, 1983 a proposal for implementing and financing an inspection program to ensure the use of the "premium quality seal" on Alaskan produced seafoods.

B. Legal Authority:

The legal authority under which the seafood inspection program operates is found in Alaska Statutes (AS) 03.05.010 - 03.05.090.

Within these statutes, SB 872 amended AS 03.05.010(c), added section 03.05.025, 03.05.026 and 03.05.045 and amended 03.05.090.

This present workplan sets out a 4 month program for developing the quality assurance program proposal to be submitted to the Legislature by January 30, 1983.

B. OBJECTIVES

1. Development of a document outlining a quality assurance program for the Alaska seafood processing industry. This document will be presented to the Legislature by January 30, 1983 in fulfillment of Senate Bill 872 (chapter 57 SLA 1982).

2. Development of the necessary technical criteria and guidance for implementation of a quality assurance program. To include:

   (a) Draft Quality Control Manual — FOR INDUSTRY
   (b) Draft Facility and Operation Inspection Guidelines and Procedures — FOR DEC INSPECTORS
   (c) Draft Product Standards and Specifications — FOR "SEALS"
   (d) Identification of Priority Research Needs — FOR DEC

Canada Meeting

3. Identification of programmatic needs to fully implement a quality assurance program, to include:

   (a) Funding and management requirements
   (b) Logistical requirements
   (c) Annual work programs
   (d) Recommendations for changes to regulations and statutes

C. TASKS AND PRODUCTS

1. Evaluate Existing Quality Assurance Regulatory Programs and Alternatives

   Purpose: The Alaska quality assurance program will benefit in its development from the previous experience of other states, agencies and industries.

   Meetings will be scheduled with other states, agencies and industries to review existing regulatory and quality control programs. The attributes of each program and possible areas of mutual cooperation and assistance with an Alaska quality assurance program will be considered. Appropriate agencies in the State of Washington, Oregon, and California, as well as the Province of British Columbia will be contacted. The National Marine Fisheries Service and the U. S. Food and Drug Administration will also provide information on their quality assurance efforts.

   Products: A brief report describing existing quality assurance programs and identifying possible links with an Alaskan quality assurance program.

   Responsibility: Division of Seafood and Animal Industries (Honsinger, Hart, Peifer)

   Completion Date: September 30, 1982

2. Develop Recommendations for Major Elements of a DEC Quality Assurance Regulatory Program

   Purpose: (a) Assure consideration of Alaskan specific conditions in the development of the Alaska quality assurance program in (3) below.

   (b) Obtain preliminary departmental approval of major policy recommendations for input to draft program document

   Review available current reports on the quality of Alaskan seafood. Recent publications by National Food Processors Association, Alaska Seafood Marketing Institute, and the Office of Commercial Fisheries Development (Norgaard, Inc.) are examples of reports which are available. Using this information, and the findings of task (1) above, propose the major points of an Alaskan regulatory quality

assurance program. Obtain preliminary approval of these recommendations from the Commissioner and the Director of Seafood and Animal Industries.

Products: A brief summary of major elements recommended for inclusion in the Alaska quality assurance program. Aspects such as facility inspection, product quality, and premium quality designation will be considered.

Responsibility: Division of Seafood and Animal Industries (Hart, Peifer)

Completion Date: Draft recommendations to Director - October 8, 1983
Director and Commissioner preliminary approval or response - October 15, 1983

3. Prepare Draft Quality Assurance Program Document

Purpose: (a) Provide for a unified Alaskan quality assurance program for approval by the legislature as mandated by S. B. 872 (chapter 57 SLA 1982).

(b) Provide the department with a plan for implementing the quality assurance program.

This task represents the major effort of the work plan program. The products of tasks (1) and (2) above and staff knowledge of existing Division of Seafood and Animal Industries programs will be utilized to:

(a) Develop a DEC quality assurance Program
and
(b) Identify the Necessary Programmatic Developments for Implementation of the Quality Assurance Program.

The elements to be considered under each of these subtasks are identified in Appendix A, Tentative Outline the for Final Draft Program Document, Sections IV and V.

Products: Draft of Program Document. The Draft will include sections I, II, III, IV, and V identified in Appendix A.

Responsibility: (3a) Division of Seafood and Animal Industries (Hart, Peifer)
(3b) Division of Seafood and Animal Industries (Honsinger, Hart, Peifer)

Completion Date: For both tasks - November 10, 1983

4. Develop Draft Technical Documents Required For Implementation Of Quality Assurance Program

Purpose: Provide industry and agency personnel with distinct technical criteria and guidance to be utilized in the implementation of a quality assurance program.

he following subtasks provide the draft technical documents and recommendations to be included in Section VI of the Final Draft (see Appendix A). Review within and approval by the department for each subtask draft product is to be completed by the completion date indicated for each product. Technical documents will be finalized sometime during 1983, according to a schedule to be developed in the annual work program developed in task (3b) above.

(a) Develop Draft Quality Control Manual

The manual will present model quality control plans, technical criteria for critical point evaluations, and quality control inspection procedures for use by industry. Available guidelines and procedures, as well as those identified through task (1) above, will be considered in completion of this subtask.

(b) Develop Draft Facility and Operations Inspection Guidelines and Procedures

Guidelines will specify procedures and acceptable levels for regulatory inspection and evaluation of industry quality control programs. Available guidelines and procedures, as well as those identified through task (1) above, will be considered in completion of this subtask.

(c) Develop Draft Product Standards and Specifications

For key Alaskan species, canning, smoking, vaccum packaging, freezing, and fresh product standards and specifications will be proposed. Existing information and guidline efforts of the Alaska Seafood Marketing Institute, the National Marine Fisheries Service, and other sources will be used for updated reference. Appropriate agencies and organizations will be consulted in the development of these standards.

(d) Identify Priority Research Needs

This subtask will result in the allocation of contractural monies in accordance with AS 03.05.045.

Products: (a) Draft Quality Control Manual
(b) Draft Facility and Operations Inspection Guidelines and Procedures
(c) Draft Product Standards and Specifications
(d) Summary of Priority Research Needs

Responsibility: for subtasks (a), (b), (c) - Division of Seafood and Animal Industries (Peifer)

for subtask (d) - Division of Seafood and Animal Industries (Hart)

Completion Date: (4a) November 1, 1982
(4b) November 15, 1982
(4c) November 30, 1982
(4d) October 10, 1982

5. Review of Draft Quality Assurance Program Document

Purpose: Obtain comments on the draft program document prior to presentation to the legislature.

The Draft program document (Sections I, II, III, IV, and V) as identified in Appendix A will be provided to appropriate agencies and organizations for scheduled review and comment, and the final draft will be prepared.

Products: Final Draft Quality Assurance Program Document

Responsibility: Division of Seafood and Animal Industries (Hart, Peifer)

Completion Date: Review of Draft begins - November 10, 1982
Review completed - December 10, 1982
Final Draft Complete - December 31, 1982

D. SCHEDULE

(See attached time line)

E. BUDGET

Funds and staff time necessary for completion of this short-term project will be borrowed from programs which are currently underway. The majority of the work will be coordinated and conducted by Dr. Honsinger, George Hart, and Dick Peifer of the Division of Seafood and Animal Industries. Staff of the DEC Seafood Inspection Program will be utilized as their schedules allow. The Division of Environmental Quality Management will provide review and comment on products as appropriate.

Completion Date: Review of Draft begins - November 10, 1982
Review completed - December 10, 1982
Final Draft Complete - December 31, 1982

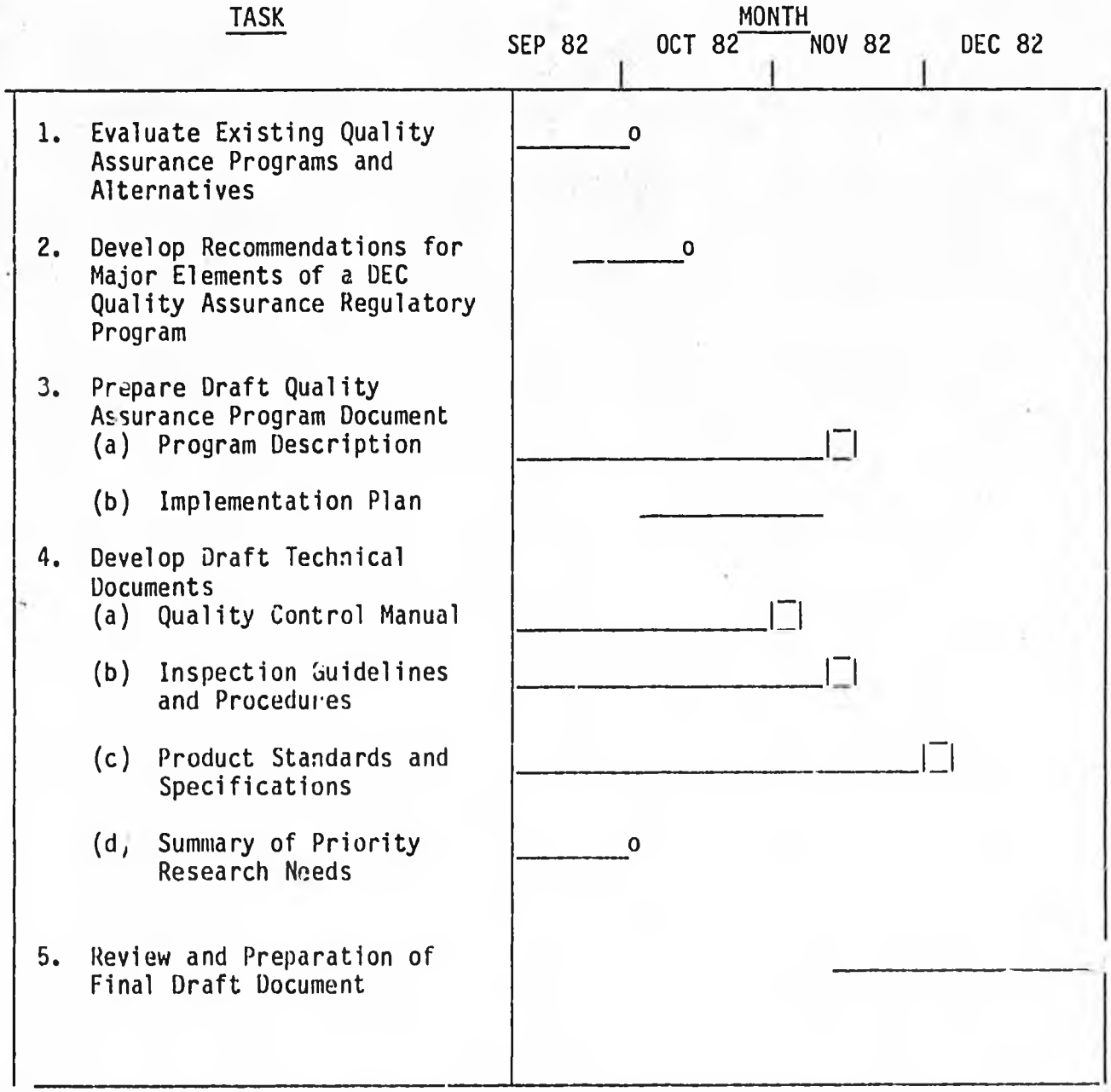
D. SCHEDULE

(See attached time line)

E. BUDGET

Funds and staff time necessary for completion of this short-term project will be borrowed from programs which are currently underway. The majority of the work will be coordinated and conducted by Dr. Honsinger, George Hart, and Dick Peifer of the Division of Seafood and Animal Industries. Staff of the DEC Seafood Inspection Program will be utilized as their schedules allow. The Division of Environmental Quality Management will provide review and comment on products as appropriate.

WORKPLAN TIMELINE



Products

o Report

|_| Draft Document

|X| Final Draft Document

APPENDIX A
TENTATIVE OUTLINE FOR ADEC SEAFOOD INDUSTRY QUALITY ASSURANCE PROGRAM FINAL DRAFT PROGRAM DOCUMENT

I. Executive Summary

II. Introduction

III. Summary of Quality Assurance Programs which exist in other states and agencies and recommendations for an Alaska Quality Assurance Program. (Section III is developed through completion of work-plan tasks (1) and (2).

IV. Quality Assurance Program Description

Program Level 1 - Proposed Alterations to Existing DEC Facility Inspection Program

Program Level 2 - Bilateral Quality Assurance Program

(a) Operator Quality Control Plan and requirements.

(b) DEC Quality Assurance Verification

- in-plant inspection
- product inspection
- statistical analysis

Program Level 3 - Premium Quality Program Requirements
(Section IV is developed through completion of workplan task 3a)

V. Program Implementation

- Management Structure and Staffing Requirements
- Personnel Training
- Logistical Requirements (office space, travel, laboratory, and data management support)
- Proposed Budget (FY 84 increment)
- Program Implementation Schedule
- Annual Work Program
- Provisions for Program Evaluation
- Recommendations for Changes in Regulations and Statutes
(Section V is developed through completion of workplan task 3b)

VI. Program Technical Components

- Draft Quality Control Manual
- Draft Facility and Operation Inspection Guidelines and Procedures
- Draft Product Standards and Specifications
- Summary of Priority Research Needs for Product Surveillance

(Section VI is developed through completion of workplan task 4, depending on length, these components may be included as appendices to the Final Draft)

VII. Bibliography

alaska environment

Volume 6, No. 2 ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION March/April 1982

Fish Preservation and the Final Product

"The main object of fish canning is to yield a product that may be stored for a considerable time, at the end of which it will still be interesting and safe to eat."[1] This is the objective of one form of fish preservation. Over the centuries other methods used have varied greatly. Drying over open fires is one of the oldest methods of preservation; salting of fish, while limited to coastal areas where salt was available, took place as far back as in Bronze Age civilizations.[2] In some cases, the preservation of fish caused other environmental problems. In 1558, Master Anthony Jenkinson wrote concerning his trip to Astrakhan (now a city in the U.S.S.R.): "they hang up their fish in their streets and houses to dry for their provision, which causeth such abundance of flies to increase there, as the like was never seene in any land, to their great plague."[1] Nowadays, perhaps to avoid the above situation, much preservation is done by canning.

Fish canning is not a mysterious process; it consists of several steps. The larger fish are first gutted and cleaned, then washed and descaled. Blood must be removed along with surface slime. Some types of fish are then placed in a brine. In salmon canning processing in Alaska, salt tablets are placed in the cans with the filleted fish, and the brine forms as water or oil is added and the process continues. Following packing in cans, a process called "exhausting" takes place. The object, according to G.H.O. Burgess, *Fish Handling*, is to produce a partial vacuum or headspace at the top of the can. This space remains after the can is heat processed. During the heat processing, the pressure increases inside the can, water evaporates to steam, and solid and liquid contents expand. The partial vacuum accomplishes two ends: first, it helps reduce the positive pressure which built during the heating process; second, the vacuum causes the ends of the can to collapse inward, making it easier to detect cans which are damaged. The ends of such damaged cans will be swollen — called "swellers" in the processing industry.

The next process step is the heating phase. Cans are bulk-loaded into retorts — machines which are similar to autoclaves used to sterilize surgical instruments. Retorts are large industrial pressure cookers, and cans generally are maintained at 240°F for 60 minutes. Cans are usually pressure cooled

(continued on page 3)

1. *This photo represents an aerial view of a canning plant. It shows the holding tank for fish, the cutting tables, the packing operation, and the retorts (pressure cookers) at the far end.*

2. *This photo is a detailed shot of the packing operation. The people on the line are packing fish into cans.*

3. *In this photo, the packed cans are being loaded into the retorts at the right.*

4. *After being removed from the retorts, the cans are cooled. They are then packed together and loaded into the overhead machine. From here, they are bundle-covered with a heavy sheet of plastic which is heat sealed. They are then shipped South for storage and sale.*

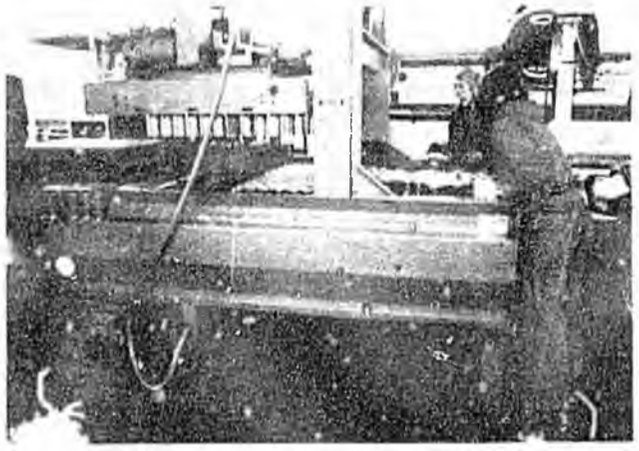


Photo credits — Carl Ohls, United Fishermen of Alaska

Seasonal Drilling Restrictions on the Beaufort Sea

In 1979, drilling leases were issued for the area within three miles of the shore on the Beaufort Sea. Basically, the leases stipulate that drilling activity take place only between November 1 and March 31 each year. The winter drilling season was specified in order to allow drilling during solid ice conditions only. This restriction allowed time for study of such environmental concerns as the bowhead whale's migratory patterns, effects of drilling on marine and bird habitats and the special problems of oil spill cleanup in broken ice conditions. Many of these leases are now expiring and the seasonal restriction dates are being re-evaluated.

Early this year, the Department of Natural Resources hosted several public meetings and workshops to give concerned groups an opportunity to present their views. Oil industry officials request a lengthened season. The National Marine Fisheries Service and the North Slope Borough are concerned about disturbances to sensitive habitat areas during biologically active seasons. DEC is concerned that oil spills are difficult to clean up during the season of deteriorating and broken ice.

The 1980 legislature made DEC responsible for the review and approval of oil spill contingency plans for many operations, including oil and gas drilling. To date, contingency plans have been approved only for the solid ice conditions.

In a report to the Commissioner of DNR, DEC examined the current technology available for oil spill response in broken ice. The report points out that several serious problems make cleanup more difficult. Unstable ice does not allow heavy clean-up equipment to be taken to the site, and moving water and ice flows tend to spread spilled oil and damage containment barriers. The report concludes that oil cleanup on broken ice is difficult, expensive and labor intensive.

Several solutions to the drilling season issue have been proposed, ranging from no restrictions at all to maintenance of the current season. Some compromise solutions contain provisions for addition of time as conditions permit or allowing certain drilling activities for which the probability of a spill is very small.

In a memo to the Commissioner of DNR, DEC Commissioner Ernie Mueller suggests adopting a lengthened drilling season of November 1 through May 14. Mueller also suggests lessees be allowed to spud and set surface casing throughout the year, and to continue drilling to a depth below surface casing but only to a predetermined threshold depth above deep oil bearing formations. This safety zone limit could be estimated based on drilling records of existing rigs. Winter drilling in frontier areas would supply the information for new rigs in the same geologic formation. This compromise would allow for increased activity with the least chance of environmental damage due to oil spills or blowouts.

Litter and Recycling

Second Annual Report

The litter and recycling program's second annual report to the Legislature has been completed and distributed. It boasts of several substantial accomplishments. More materials were cleaned up and recycled, and public awareness measurably increased.

DEC estimates that about 25 communities held cleanups in 1980, collecting about 275 tons of refuse. In 1981, 60 communities cleaned up over 722 tons. Distribution of large yellow garbage bags also increased from 57,800 in 1980 to over 101,000 in 1981.

Recycling efforts show similar growth. More than 50 recycling efforts were identified in Alaska in 1981, a substantial increase over the 28 counted in 1980. In Fairbanks, newspaper recycling jumped 51% over 1980 figures. Juneau's aluminum rate increased by 18%. Statewide, DEC estimates that over 30,000 tons of recyclables were recovered in 1981.

The litter and recycling program expanded its visibility in 1981, both in print and broadcast media.

In early spring, a lively radio jingle with an anti-litter message was distributed, followed in the fall with animated television public service announcements. These broadcasts totaled, DEC estimates that on behalf of the litter and recycling program, over 300 media contacts were made in 1981, reaching nearly one-third of the state's population.

The program's second annual report also contains a plan for youth litter patrols and recycling corps, a report on litter law enforcement, and the program goals for 1983. Copies of the report are available from DEC.

Are You Interested?

Public HEARINGS, MEETINGS, and WORKSHOPS are held periodically by DEC to hear any concerns and answer any questions you may have about department programs and decisions.

HEARINGS are legally required meetings and usually occur shortly before the deadline for public comment on a proposed action or decision. Public MEETINGS and WORKSHOPS are either informational in nature or are held in the early stages of a decision-making process.

If you have been grumbling, praising, or are just plain in the dark about what is going on in DEC, here is your chance! Come and talk.

Everyone Hates Paperwork —

New Master Permit Applications

There is nothing more contrary to the image of the independent Alaska gold miner than to see one digging through reams of paper work and driving all over town to regulatory agencies for necessary permits. A typical mining operation in Alaska may require up to six permits from state agencies and three from the federal government. As a result of this burden, many mining operations have operated without all the necessary authorizations and some measures for environmental conservation may have been ignored. To correct this situation, DEC has worked with other state agencies to develop "master permits" such as the Annual Placer Mining Application. This single form revised for the 1982 mining season, is being used by six state agencies — the Alaska Departments of Environmental Conservation, Fish and Game, Revenue, and the Department of Natural Resource's Division of Minerals and Energy Management (DMEM) and Division of Parks — and three federal agencies — the Environmental Protection Agency, Bureau of Land Management, and the U.S. Forest Service — and replaces the nine separate permits formerly necessary. All nine agencies can review this master application simultaneously. In most cases, decisions will be finalized within 90 days.

Master applications for other types of operations are also in the works. One is for developments on or near shorelands and wetlands. Since nearly all industry in Alaska falls into this category, most will be affected. Currently, wetlands development requires a consistency determination from Alaska Coastal Management, a tidelands permit and lease from DNR, a habitat protection permit from Fish and Game and a water quality certification from DEC. All of these permits are being reviewed and may be consolidated this year.

In addition another mining master application — for hard rock mining — is currently in the works. DEC is working with DMEM to gather technical data needs. The form is expected to be ready for the 1983 season.

Development of master applications is an area where regulatory agencies can apply management and administrative expertise to contribute to the state's regulatory reform program. The resulting efficiencies improve an agency's performance in meeting its obligation to protect the public health and the environment.

Alaska Water Resources Board
Spring Meeting, April 14-16, 1982
Courtroom A
Court Building, Juneau
The Wetlands Task Force will meet the last week of April, 1982. For details call your local DEC office.

208 Projects Update

DEC staff members working on 208 projects have produced some interesting items over the past few months. The contractor working with DEC on the sledge disposal study has submitted the next task associated with the project. Stearns, Conrad and Schmidt Consulting Engineers, Inc. identified seven study areas and gave them a priority ranking of 1 to 7 based on estimated annual sludge generation, population, and current assessment of potential problems. As the next step of the study, they will take these seven priority areas, develop a matrix format, and then perform an analysis which will yield two best sludge disposal alternatives for communities which have a primary or secondary wastewater treatment system. For communities without a system, one preferred wastewater treatment method will be selected. The contractors will also investigate the economics of the systems.

The first Forest Practices training seminar has been scheduled. It will be held in Klawock April 25th through the 30th. For further information, contact the Public Information Office at DEC in Juneau.

R and M Consultants have completed the draft report on the placer mining demonstration pond project. This report may be requested from the Public Information Office.

The next meeting of note is that of the Water Resources Board. It is scheduled April 14, 15, and 16th in Juneau. Meetings will be held in Courtroom A of the State Court Building across from the Capitol Building.

Fish Preservation (continued)

in the retorts, then air cooled for several weeks prior to labelling. This cooling period allows the liquid in the cans to permeate the flesh and the contents to mature. Cans are then packed, shipped, and ultimately sold.

The photo story accompanying this article shows the operation of one plant only, and it is not necessarily representative of processes used in other plants in Alaska. The plant shown is owned by Bumblebee Seafoods and is located in South Naknak. The photographs show the cannery portion of the plant.

[7] G.H.O. Burgess, et al, Editors, *Fish Handling & Processing* (Edinburgh, 1965), p. 195.

[8] Charles L. Cutting, *Fish Savings*, (New York, 1956), p. 17.

[9] Cutting, pp. 48-9.

Botulism Is...Botulism Causes...Botulinum Grows...

"The marketing task will be formidable, partly because news of the poisoning scare has circulated internationally, and also because botulism — a virus produced by botulinus bacteria — is so deadly." "A puncture lets in air that can allow botulism organisms to grow." Both these quotes came from newspapers published in Alaska; both contain misinformation.

First, a virus is a virus, and bacteria are bacteria. Virus are submicroscopic agents that are regarded as either the simplest microorganisms, or extremely complex molecules. Bacteria are microscopic single-celled plants. Virus are not produced by bacteria. Second, botulism organisms grow only in the *absence* of oxygen, a gas, found in air.

Unfortunately, botulism is a word which has been seen frequently in papers across the state over the past few weeks. There have been misconceptions communicated along with valid information. For those with a technical background in biological sciences, words such as "anaerobic, gram positive, protein neurotoxin, macromolecules, heat-labile, and *Clostridium botulinum*" combine to tell a story, for the rest of us, by far the majority, the words used above can be confusing, misleading, and even dangerous as we try to understand an incident or process which may affect us.

It is critically important that men and women engaged in canning understand bacterial spoilage processes and how to avoid such contamination. There are two main types of bacterial action which may affect food canned at home or in food-processing plants. The first is caused by bacteria which reproduce only in oxygen-free surroundings (anaerobic). This type of bacteria produces gasses such as hydrogen or carbon dioxide and a toxin that is one of the most potent poisons known. The second type of bacterial contamination, while still hazardous, is more easily discovered because a foul smell is associated with it. A third type of spoilage, mold, is easily seen.

Of the three processes listed above, botulism is most dangerous because it is least readily detected. While there may be a smell of decaying meat, there is not always an odor, and there is no distinguishing taste.

Botulinum bacteria are very prevalent in soil, and two of at least four types are important. Type A is less of a problem because it is found in virgin soil or newly reclaimed forest areas. Type B is found in cultivated soils, and is most commonly the problem.

Botulinum will grow only in an anaerobic environment meaning that the immediate surroundings must contain no oxygen. There are two stages of development, a vegetative and a spore stage. The growth occurs as the spores grow and change into the vegetative cells to produce the toxin. The bacteria feeds upon sugar or protein material and is most commonly found in preserved string beans, corn, spinach, olives, beets, asparagus, seafood, pork products, and beef.[1]

According to the *Merck Manual*, the first signs of botulinum poisoning are visual disturbances such as blurred vision. The next symptom may be difficulty in swallowing and speaking. Muscles of the arms and legs become weak. Cause of death generally is respiratory failure. One problem of diagnosing botulism is that symptoms don't appear immediately and often imitate those of stroke or heart attack. The amount of poison ingested has a lot to do with recovery rates.

In home canning, there are two ways to avoid botulinum poisoning. The first is to be sure foods are sterilized adequately in the canning process. In a wet heat process, such as that used in a pressure cooker, pint jars must be maintained at 240°F, 10 pounds pressure, for 110 minutes to kill the spores. If using tin cans, they must be exhausted first by putting the lids on loosely and steaming in the pressure cooker for 10 minutes at 212°F and 0 pounds pressure. They should then be removed, sealed and cooked at 240°F, 10 pounds pressure for 90 minutes for ½ pound cans.

The second way to avoid botulinum poisoning is to boil home-canned products for 10 to 15 minutes before eating. This neutralizes the toxin. If contamination of purchased products is suspected return the material to the store. Another important rule to remember is: never taste low acid canned or frozen foods suspected of being spoiled.[2] With proper care and preventive measures, there should be no reason to fear botulism.

[1] Norman W. Desrosier, *The Technology of Food Preservation* (Connecticut, 1959), p. 194.

[2] David N. Holvey, M.D., Editor, *The Merck Manual* (New Jersey, 1972), p. 711.

[3] Desrosier, p. 196.

May is Cleanup Month in Alaska

Ice and snow are melting all over the state. Is there ugly garbage hiding underneath? Plan your neighborhood cleanup now. Call the litter and recycling **HOTLINE** number nearest you to order large plastic garbage bags, small car or boat litter bags, or vinyl stickers to identify trash receptacles or bins for "aluminum only." These materials, available free of charge, advice about organizing and implementation of cleanup and recycling activities can be obtained from DEC regional offices.

In 1981
60 Communities Held Cleanups
Over 722 Tons Collected

In 1980
25 Communities Held Cleanups
over 275 Tons Collected

REGIONAL OFFICES

Northern Regional Office
P.O. Box 1601
Fairbanks, Alaska 99707
(907) 452-1714

Southeast Regional Office
P.O. Box 2420
Juneau, Alaska 99803
(907) 789-3151

Southcentral Regional Office
437 E Street
Anchorage, Alaska 99501
(907) 274-2533

REPORT ALL OIL and HAZARDOUS SUBSTANCE SPILLS: Call toll-free Zenith-9300 (call long distance operator)

PERMIT INFORMATION CENTER: Call 465-2615 (Juneau)
279-0254 (Anchorage)
452-2340 (Fairbanks)

Call collect any time for information on state, federal, and local permits.
Calls after working hours will be recorded and returned when working hours are resumed.

RECYCLING and LITTER HOTLINE: 789-3151 (Juneau)
274-2533 (Anchorage)
452-1714 (Fairbanks)

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The truth about botulism

Food handling is biggest cause — especially in Alaska

By Chris McClain

In 1975, two women from New Stuyahok, a village on the Nushagak River near Bristol Bay, died from eating contaminated beaver. Botulism, a deadly disease produced by botulinus bacteria, had grown on a chunk of beaver tails sealed in a plastic bag and kept behind a stove for several weeks.

Few persons are aware that more illness, including botulism, is caused by improper food handling than by errors in commerical processing or packaging.

Alaska has the highest rate of botulism poisoning in the world documented among Natives, according to a state expert on epidemic diseases. However, no known cases have occurred in the state from either commercially or home canned foods.

No deaths from botulism have occurred in Alaska since 1977, thanks to better education, prevention and treatment efforts, says the expert — state epidemiologist Dr. John Middaugh.

Foodborne poisoning is a sneaky attacker and botulism is a "chilling" word to the food industry.

The American food industry has had for many years a good record of keeping botulism out of its products, due at least in part to federal laws and inspections established in recent decades.

From 1899 through the early 1970s there were nearly 1,800 cases of botulism in the United States in about 700 separate outbreaks, with nearly 1,000 deaths. Roughly 50-60 outbreaks, involving more than 200 victims, were related to commercial products. The contaminated commercial foods included ripe olives, sardines, spinach, ham, potted meat and beets.

Food poisoning may result from a variety of inciting agents but the tendency persists to identify every type of such illness under the guise of "ptomaine" poisoning. The term has been consistently used since its introduction a century ago, even though it is unscientific and meaningless.

There is no specific entity or groups of substances that properly might be called "ptomaine." The word is derived from *ptoma*, which means carcass or dead flesh.

Today, the majority of meat carries the U.S. Department of Agriculture's stamp of aproval. But during the Depression when I was a kid in eastern Washington I ate a lot of beef, veal and pork without a stamp of aproval.

I also recall that my father took care of his deer with very little effort. He'd hang it up to bleed for three days. And the coldest place for storage was the root cellar.

Had I known about food poisoning, botulism and bacteria, I probably would have been a vegetarian.

Bacteria is the known cause of food poisoning and botulism spores are found throughout the environment, in the soil and water. We probably swallow many of these in raw fruits and vegetables. The botulism spores themselves are harmless. But in warm airless invironments — that is, where no oxygen is present — they go to work to produce their deadly toxins.

There are six known strains of botulism, identified as Types A, B, C, D, E and F, and other rare strains that have not been identified. Poisoning most commonly occurs from Types A, B and E botulinus germs. Botulism is probably the deadliest form of food poisoning known — a toxin so lethal that a millionth of a gram will kill a human being and a glassful, evenly distributed, could destroy the human race.

So, it is only natural that botulism causes great general concern, and when it does, it can ruin a thriving industry.

Back in August of 1978, Alaska's salmon industry was in jeopardy due to the death of an elderly person in Birmingham, England.

It was established that four elderly persons ate a salmon salad. The salmon was traced to a Seattle firm and had been canned in Alaska.

The British government acted quickly to warn paeople not to eat salmon canned in Alaska.

Health officials were in a quandary, as canned salmon botulism poisoning had never happened before in the industry.

Meanwhile, the Food and Drug Administration sent investigators to Unimak Island, on the Aleutian chain, where the salmon was canned in July 1977.

The case was closed when FDA inspectors stated that the salmon was cooked 10 minutes longer than required.

If the FDA could have continued with the investigation, it might have been learned what else was in the salmon salad. It could have been prepared early, then left standing without refrigeration — when foods are not properly refrigerated, bacteria multiply at an unbelieveable speed.

And while cooking probably will kill botulism if it has begun to grow in food, it is not failsafe — temperature, pressure, cooking time and packaging all are critical factors in both commercial processing and home canning.

The recent death of a Belgian man was also traced to Alaska salmon, and subsequent embargoes against the product in some European countries have added to the burdens of bad publicity and the recall of millions of cans of the product. This time, however, botulism was found in at least 20 cans. Precisely why and how the botulism developed is still a matter of speculation.

Of course, the risk of botulism is just as great with home-canned and home-prepared foods. Food poisoning was especially common when homemakers followed the recommended cold-pack method. This method often failed to get the food contents of the jar hot enough to kill the tough spores of *Clostridium botulinum*.

As I recall, my mother would fill the jars with raw or blanched food, then place them in a boiler atop the wood stove.

She was very cautious, examining each jar before using the contents. She knew when bacteria was at work inside a jar by its tiny bubbles. But she didn't know there was a difference between the acidity of beans and tomatoes that determined the cooking time. The use of pressure cookers for home canning decreased food poisoning.

A major botulism scare arose in 1963 with 17 cases and five deaths resulting from vacuum-packed smoked whitefish. The fish had been packaged in a plastic film from which all air had been pumped before sealing. This method was supposed to prolong shelf-life under refrigeration, but the removal of oxygen, called an "anaerobic" environment, coupled with lack of refrigeration merely encouraged the formation of botulin toxins.

On Oct. 25, 1963, the FDA recommended that all smoked fish then on the market which had been caught or processed in the Great Lakes area be destroyed. Five days later, the FDA and the National Fisheries Institute issued a joint release announcing that Great Lakes smoked fish should henceforth be frozen and kept frozen in shipment.

Also in 1963, in Detroit, a mother, daughter and a neighbor ate tuna fish sandwiches. The mother survived.

The tuna industry faltered and sales remained low for many months.

In fact, five separate outbreaks of botulism occurred from commercial products in 1963.

However in the years between 1899 and 1977, 72 percent of all botulism outbreaks was traced to home canning, while a mere 9 percent was attributable to commercial processing. (Causes for the remaining outbreaks were unknown.)

In the late 1970s, a major outbreak of botulism in Mich-

Photo by Fran Durner

Members of whaling crews in Barrow divide fresh whale meat — some for immediate cooking and consumption but the majority for storage and future meals. The Native practice of eating raw, aged and fermented meats causes all of Alaska's known cases of botulism.

igan — 58 cases, no deaths — was caused by home canned chili peppers used at a Mexican restaurant, and another — with 34 cases and two deaths — was traced to a country club luncheon in New Mexico (no specific source was ever found).

Today, botulism need not be fatal if treated by the best medical care and if symptoms are recognized immediately.

Usually symptoms occur 12 to 49 hours after eating the contaminated food. There's blurred or double vision and sometimes sensitivity to light, difficulty in swallowing and breathing, abdominal pain, diarrhea, severe nausea and vomiting, changes in speech, difficulty with coordination in walking and general weakness.

Each year, until recently, botulism claimed at least one or two lives among the Native population. These deaths generally did not make international news nor would the FDA become involved in investigations or "bans," because the botulism comes strictly from Native delicacies such as whitefish, fishhead soup, fish eggs, salted salmon, fermented seal and raw and aged meats.

[illegible] be more aged [illegible]le in 1969, [illegible] washe[illegible]

Tununak to treat those not ill enough to be evacuated. Health officials later estimated the whale had been dead about three months before it washed ashore.

From my observation, there's no preparation when containers are made of seal organs, intestine and stomach. And sanitation is difficult without running water.

In the early 1950s, I was in Kotzebue when I witnessed three Beluga whales butchered on the shore. The whale meat was tossed into a tub, some landed on the ground, it was picked up and heaved into the waterless tub.

The state maintains a botulism registry, begun in 1947 with a study of all information available to date, and maintained carefully since then. The registry shows the following for the past seven years:

1975 — 3 cases, 2 deaths.
1976 — 14 cases, 1 death.
1977 — 8 cases, 2 deaths.
1978 — none.
1979 — 5 cases, 0 deaths.
1980 — 3 cases, 0 deaths.
1981 — 9 cases, 0 deaths.

"All botulism in Alaska has occurred from Native prepared foods," says Dr. Middaugh. "This is well known among public health workers around the state, and any time there's a suspected case, a medical epidemiologist hits the plane right away. We have literally snatched food 1899 and 1949, the case fatality rate for botulism nationwide was more than 60 percent. By the early 1970s, the rate was 23 percent. The number of cases that are reported each year, however, remains more or less steady, even today.

off the table from people getting ready to eat it.

"A lot of Natives have stopped eating Native foods, and though we recognize that these are an integral part of the culture . . . they are beginning to stop letting meat thaw in plastic bags or ferment, beginning to cook more. If Native people use Native foods, but cook them, they don't get sick."

In the fifty years between

What has improved, says Middaugh, is medical diagnosis. "That's the art of medicine," he says. "If someone has nausea and vomited, and has any problem with vision and swallowing, dry mouth and throat, then we consider it botulism until we prove it isn't."

Chris McClain is an Anchorage free-lance writer.

REPORT OF THE ALASKA SENATE COMMITTEE ON QUALITY
ASSURANCE IN THE SALMON FISHING INDUSTRY
BY THE SUBCOMMITTEE ON EDUCATION

Background and Need

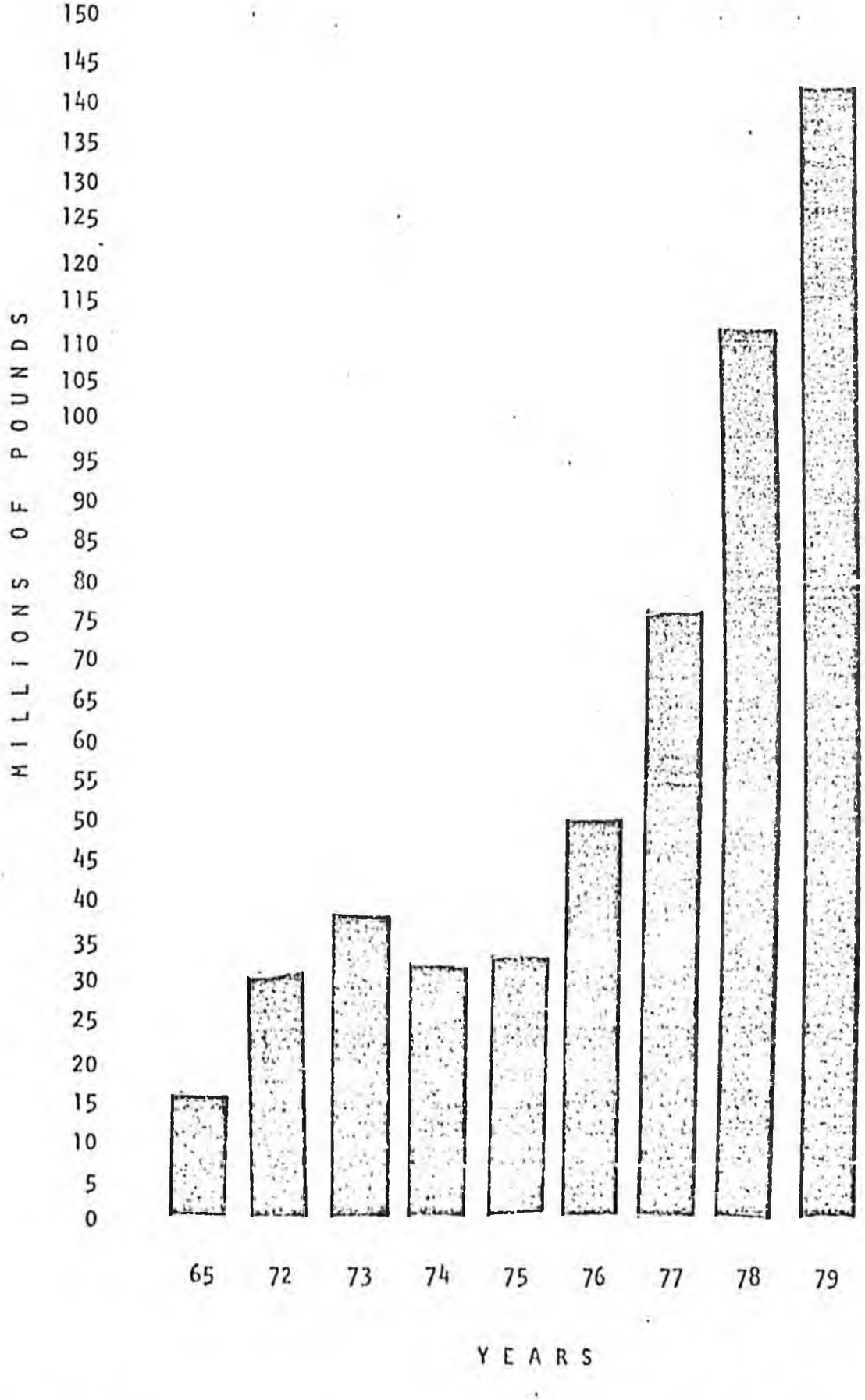
The Alaska salmon industry has undergone a major change in the last ten years. This change consisted of a shift from a primary emphasis on canned salmon to a heavy emphasis on fresh and frozen salmon processing (Fig. 1). This shift is as dramatic as, and is economically more significant than the development of the tanner crab fishery.

Traditionally, the fresh and frozen salmon markets were supplied by troll-caught salmon from Southeast Alaska and the Pacific Northwest. These were high-quality silver and king salmon, bled and dressed immediately after capture and iced within a short period of time. The supply was supplemented by gillnet-caught salmon, again principally silvers and kings.

As the market for fresh and frozen salmon expanded, it had to be filled with net-caught salmon. This move was accompanied by an increase in cold storage capacity in the Gulf of Alaska and air shipments from Bristol Bay and the AYK district.

During the last four years the growth has been dramatic (Fig. 1). In 1979 over 100 million pounds of salmon, including sockeye, chums and pinks that would previously have gone into the can, went to the frozen market. This is accomplished

ALASKA FROZEN SALMON PRODUCTION



by "high grading" at the plant, which has resulted in an overall lowering of quality in both the canned and frozen product.

Many of the fishermen and processors who are now producing for the fresh and frozen market formerly canned all of their product. Therefore, they are not familiar with the proper methods of handling fish to attain a high quality frozen product.

In Japan and Europe the devaluation of the U.S. dollar has put salmon within the buying range of more people. The Japanese market is for high quality dressed salmon with the head on, which are sold whole on the retail market. In Europe, the demand is for frozen salmon which are thawed and split for mild curing and smoking. Both markets demand a quality fish with no external or internal blemishes or visible flaws. North America, too, is experiencing a shift toward fresh and frozen salmon for use as steaks and fillets and, to a lesser extent, the mild cure and smoking market.

European and Asian markets are looking to our competition for a high quality product. This includes Canada and Norway, both of whom have high quality standards set by government regulation.

Processors in Europe complain about bruises, soft flesh, belly burn, rancidity and poor butchering of the product they receive from the U.S., including Alaska. These are all caused by improper handling and processing.

Problem

The Alaska fish are as good as any when they come from the water, but several million pounds of frozen salmon were condemned by state and federal inspectors after the 1979 season. Quality loss occurs in the hands of humans.

The problem of salmon quality is statewide, but is more critical in areas where the production of frozen salmon is a relatively new form of processing.

Goals and Objectives

The goal of this project is to "Raise the quality of Alaska frozen salmon to a level that will meet or exceed that of any other country's product competing on a world market."

Our immediate objective is to improve the overall quality of Alaska salmon. Clearly, efforts need to be made in assisting the industry to improve the quality of salmon submitted to the world markets. Education is needed in proper techniques for handling salmon.

A committee has been appointed to determine these educational needs and the kinds of educational efforts the state should support. A broad-based educational program, directed at fishermen, tendermen and fish processors, is recommended by the committee.

Approach

A broad-based education program will be developed. This program must be delivered to the largest number of industry members possible. The project will reach fishermen, tendermen, processors and shippers of salmon; i.e., all segments of the industry. In order to reach most of the industry, a number of different audio and visual educational techniques will be employed. These will include, but not be limited to:

1. Seminars, workshops and conferences
2. Consultation services
3. Public service radio spots
4. "How-to" fact sheets
5. Slide series on handling salmon
6. 16-mm educational film on salmon handling and processing methods
7. Salmon handler's manual

In order to provide these educational services it will be necessary to employ a full-time specialist in the care, handling and processing of frozen salmon. This will need to be a long-term project. Current practices are ingrained and will take a number of years to change.

Outline of Education Activities

1. Seminars, workshops and conferences. Seminars and workshops will be conducted in fishing ports throughout the

state. These will be directed at fishermen and processing personnel. This mechanism is helpful in making industry members aware of the problem and will offer solutions to specific problems of each fishery and region. This has been demonstrated to be one of the best methods for provoking a desirable change.

A conference will be held to bring together the leaders of the fishermen's organizations with the objective of informing them of the problems poor quality has caused in the marketplace; to obtain their ideas for a long-range solution; and to enlist their support. A second conference will be held with the quality assurance personnel in the processing plants to inform them of the problems that occur in plants and to provide them with information and materials for training their in-plant workers.

2. Consultation services. In order to improve the quality of fish landed it will be necessary to do conversion work on many of the salmon vessels presently in use. This will include the installation of slush ice, refrigeration systems, or other types of cooling systems on the vessel. In some areas of the state the older or smaller vessels are not lined. Fish lay in the bilge or against hot engineroom bulkheads. In some cases boxing may be justified. The specialist would be available to provide technical information on these and other specific problems. In many cases, the

fishermen or processors could make the necessary changes themselves with technical assistance made available through this program.

3. Public service radio announcements (PSA's). All radio stations make time available for public service announcements. Several stations have been contacted and have expressed a willingness to air educational spots relating to good handling practices for salmon. A series of PSA's will be produced and distributed to all radio stations in coastal communities. The PSA's will contain "how-to" tips as well as what not to do. They will each contain an educational message; however, their prime function will be to raise the general awareness of the necessity for good handling practices. Through personal contact with participating radio stations it is expected that the PSA's will be aired at a time most fishermen listen to the broadcast band--at the time of the marine weather forecast.

4. "How-to" fact sheets. A series of "how-to" fact sheets will be written. They will be developed for each fishery by region. It is necessary to develop them by fishery and region because of the differences in the harvesting methods employed and the different conditions existing in each region. Fact sheets will also be developed for in-plant handling. Subjects to be covered will include, but

not be limited to, effects of temperature; sanitation; use of ice; refrigeration; etc. These fact sheets will be given broad distribution to fishermen and processors and be used in workshops and seminars.

5. Slide series on salmon handling and processing. A series of slides is presently being assembled that shows the effect of poor handling and butchering practices. This series will be expanded to show proper methods. The series will be duplicated for use in workshops and seminars and will be available for fish processors to use in their own in-plant training sessions. These slides must be considered as a tool rather than standing on their own as an educational program.

6. 16-mm movie film/television tape on salmon handling and processing methods. A 16-mm educational movie film will be developed showing proper handling and icing and the processing of frozen salmon in the plant. Television tape copies of this film will be made available for circulation to schools and educational TV, and will be used in workshops, seminars, etc. A film will not be a complete educational program but will augment the other educational efforts.

7. Salmon handler's manual. The fact sheets will be completed and supplemented with additional materials to produce a salmon handler's manual. This manual will in-

clude the why as well as the how to. The major use of this manual will be for in-plant training by company personnel. It will also be used to train new quality control people in the plants.

Interactions

It is necessary that this project interact with present education efforts in salmon quality enhancement in both the private and public sectors. This would include the University of Alaska, the National Food Processors Association, fishermen's associations, and the state legislature.

It is recommended that a permanant advisory committee be appointed to monitor the program. This committee should meet on a quarterly basis to review progress and to identify problem areas.

Salmon Quality Education

BUDGET

SALARIES		
Instructor 12 mo @ $3000 mo	$ 36,000	
Clerical assistance 1/2 time 12 mo	8,000	
	44,000	
Staff benefits @ 20.5%	9,020	
TOTAL		$ 53,020
EQUIPMENT		
Office equipment	1,500	
Audio Visual	950	
TOTAL		2,450
EXPENDABLE SUPPLIES		
Recording tape	480	
35-mm film	120	
Office supplies	200	
TOTAL		800
TRAVEL		7,800
CONTRACTUAL SERVICES		
16-mm movie	40,000	
Printing (fact sheets, manual)	13,200	
Postage	1,100	
Communications	3,000	
Xerox and drafting	2,000	
Video tapes	400	
Reproduction of slide sets	500	
Subcommittee travel and per diem	10,000	
TOTAL		70,200
TOTAL DIRECT		134,270
TOTAL INDIRECT @ 50.8% of S & W		22,352
GRAND TOTAL		$156,622