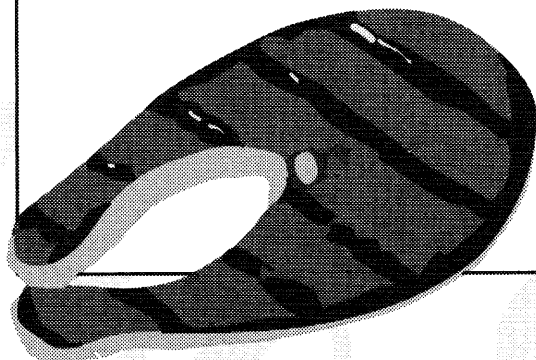


# Recoveries & Yields

from Pacific  
Fish and  
Shellfish



CIRCULATING COPY  
Sea Grant Depository

Chuck Crapo • Brian Paust • Jerry Babbitt



Alaska Sea Grant College Program  
Marine Advisory Bulletin No. 37  
1993

# Recoveries & Yields

from Pacific  
Fish and  
Shellfish



**CIRCULATING COPY**

## **Chuck Crapo**

---

University of Alaska  
Marine Advisory Program  
Fishery Industrial Technology Center  
Kodiak, Alaska

## **Brian Paust**

---

University of Alaska  
Marine Advisory Program  
Petersburg, Alaska

## **Jerry Babbitt**

---

National Marine Fisheries Service  
Kodiak, Alaska



## **Alaska Sea Grant College Program**

University of Alaska Fairbanks  
Fairbanks, Alaska 99775-5040  
907 474-6707  
Fax 907 474-6285

MAB-37  
Revised 1993  
Price \$5.00

## Elmer E. Rasmuson Library Cataloging-in-Publication Data

Crapo, Chuck.

Recoveries and yields from Pacific fish and shellfish / Chuck Crapo, Brian Paust, and Jerry Babbitt.

Rev. 1993

(Marine advisory bulletin ; no. 37 Rev.)

1. Fisheries—Pacific Ocean—Statistics. 2. Shellfish fisheries—Pacific Ocean—Statistics. I. Paust, Brian. II. Babbitt, Jerry. III. Alaska Sea Grant College Program. IV. Title. V. Series.

SH219.5.C72 1993

ISBN 1-56612-012-8

## **Acknowledgments**

---

This book was produced by the Alaska Sea Grant College Program which is cooperatively supported by the U.S. Department of Commerce, NOAA Office of Sea Grant and Extramural Programs, under grant numbers NA86AA-D-SG041 and NA90AA-D-SG066, project numbers A/75-01 and A/71-01; and by the University of Alaska with funds appropriated by the state. The University of Alaska Fairbanks is an affirmative action/equal opportunity employer and educational institution.

Sea Grant is a unique partnership with public and private sectors combining research, education, and technology transfer for public service. This national network of universities meets changing environmental and economic needs of people in our coastal, ocean, and Great Lakes regions.

Cover design is by Susan Burroughs. Layout and formatting is by Susan Burroughs and Lisa Valore.

---

# Table of Contents

---

<b>Introduction</b>	<b>1</b>	<b>Pollock, Walleye</b>	<b>9</b>
<b>Abalone, Pinto</b>	<b>2</b>	<b>Rat-Tails</b>	<b>9</b>
<b>Capelin</b>	<b>2</b>	<b>Rockfish</b>	<b>10</b>
<b>Clams</b>	<b>2</b>	Black	10
Softshell	2	Greenstriped	10
Macoma	2	Thornyhead	10
Cockles	2	Canary	10
Littlenecks	2	China	10
Geoducks	2	Dusky	10
Razors	2	Quillback	10
Butter	2	Redbanded	10
		Redstriped	10
		Rosethorn	10
<b>Cod, Pacific</b>	<b>3</b>	Rougheye	10
<b>Crab</b>	<b>4</b>	Shortraker	10
Dungeness	4	Silvergray	10
King (Red, Brown or Golden)	4	Tiger	10
King (Blue)	4	Widow	10
Tanner	5	Yelloweye	10
		Yellowtail	10
<b>Dogfish</b>	<b>5</b>		
<b>Eels</b>	<b>5</b>	<b>Sablefish</b>	<b>11</b>
<b>Fish Meal</b>	<b>5</b>	<b>Salmon</b>	<b>12</b>
<b>Flounders</b>	<b>6</b>	Pink	12
Arrowtooth	6	Chum	13
Starry	6	Sockeye	14
		Coho	15
<b>Hake, Pacific</b>	<b>6</b>	Other Salmon	16
<b>Halibut, Pacific</b>	<b>7</b>		
<b>Herring, Pacific</b>	<b>7</b>	<b>Salmon, Farmed</b>	<b>17</b>
<b>Lamprey, Pacific</b>	<b>7</b>	Norwegian	17
<b>Lingcod</b>	<b>8</b>	Chilean	17
<b>Mackerel, Atka</b>	<b>8</b>		
<b>Mussels</b>	<b>8</b>	<b>Salmon, Frozen and Thawed</b>	<b>17</b>
<b>Octopus</b>	<b>8</b>	Chum (Thawed)	17
<b>Oysters</b>	<b>8</b>	Pink (Thawed)	17
<b>Pacific Ocean Perch</b>	<b>9</b>	Sockeye (Thawed)	17
<b>Plaice, Alaska</b>	<b>9</b>	Silver (Thawed)	18

---

## Table of Contents (continued)

---

<b>Saury, Pacific</b>	<b>18</b>	<b>Tuna, Albacore</b>	<b>25</b>
<b>Scallops</b>	<b>18</b>	<b>Turbot, Greenland</b>	<b>25</b>
<b>Sculpin</b>	<b>18</b>	<b>Sources and References</b>	<b>26</b>
<b>Sea Cucumber</b>	<b>18</b>		
<b>Sea Urchin</b>	<b>19</b>		
<b>Shad, American</b>	<b>19</b>		
<b>Shark</b>	<b>19</b>		
Sharks, General	19		
Salmon	20		
Sevengill (Cow Shark)	20		
Soupfin	20		
Blue	20		
Thresher	21		
Blacktip	21		
<b>Shrimp</b>	<b>21</b>		
Pink	21		
Spot	21		
<b>Skates</b>	<b>22</b>		
<b>Smelt</b>	<b>22</b>		
<b>Snails</b>	<b>22</b>		
<b>Soles</b>	<b>22</b>		
Dabs	22		
Dover	22		
English	22		
Flathead	23		
Petrals	23		
Rex	23		
Rock	23		
Yellowfin	23		
<b>Squid</b>	<b>23</b>		
<b>Sturgeon</b>	<b>24</b>		
<b>Trout</b>	<b>24</b>		
<b>Trout, Farmed</b>	<b>24</b>		
Norwegian	24		

---

## Introduction

---

Yield and recovery data are important decision-making tools for many people in the seafood industry. The fisherman uses yield data to determine whether roe herring are ready to be fished. The line foreman tracks the efficiency of his filleting operation by documenting daily recovery. And the plant manager uses yield figures to estimate the profitability of a new fishery or processing line. Finding this information can be difficult since much of it is generated in scientific papers or under actual processing conditions, but without it making good decisions becomes more uncertain.

This publication is a compilation of recovery and yield data from scientific sources and industry experience.

### Note !!

---

*Recoveries are reported as averages and expected ranges.* The average yield represents high quality, properly handled fresh fish and shellfish in good physiological condition. If fish condition is abnormal, in a post-spawning or starving state, then the numbers will not be good estimates. The ranges, when available, represent the typical variations found within fish populations during the year.

Many other factors such as handling and processing conditions will also affect yields. Filleting skills, cooking times, and refrigeration systems can all have an effect on recoveries. The data presented here are based on typical processing and handling methods.

Smoked fish yields were calculated using an average 15% weight loss during salting/brining and 10% in the smoking process.

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Abalone, Pinto *Haliotis kamtschatkana*

Whole	Edible Muscle	42	40-45
	Meat	25	
	Trimming	16	
	Dried Muscle	10	

## Blackcod (see Sablefish)

## Capelin *Mallotus villosus*

Round	D/H-On	89	84-93
	D/H-Off	78	73-81

## Clams

### Softshell *Mya* sp.

Whole	Edible Meats	57	53-62
-------	--------------	----	-------

### Macoma *Macoma* sp.

Whole	Edible Meats	53	45-59
-------	--------------	----	-------

### Cockles *Clinocardium* sp.

Whole	Edible Meats	42	38-48
-------	--------------	----	-------

### Littlenecks *Protothaca* sp.

Whole	Edible Meats	37	31-46
-------	--------------	----	-------

### Geoducks *Panope* sp.

Whole	Edible Meats	33	32-35
	Steaks	22	20-25
	Necks	12	9-14

### Razors *Siliqua* sp.

Whole	Edible Meats	44	42-50
Raw Meat	Cooked Meat	60	

### Butter *Saxidomus* sp.

Whole	Edible Meats	45	38-46
-------	--------------	----	-------

D/H-On=Dressed/Head-On   D/H-Off=Dressed/Head-Off   S/B=Skinless/Boneless   sp.=species

From	To	Average (%)	Range (%)
<b>Cod, Pacific <i>Gadus macrocephalus</i></b>			
Round	D/H-On	81	72-90
	D/H-Off	63	56-75
	Skin-On Fillets (V-cut)	45	38-48
	Skinless Fillets (V-cut)	39	22-45
	S/B Fillets (V-cut)	33	18-39
	Skin-On Fillets	38	
	Skinless Fillets (J-cut)	32	
	S/B Fillets (J-cut)	26	
	Steaks	62	
	Salted D/H-Off	45	
	Smoked D/H-Off	58	50-65
	Belly Flaps	10	
	Liver	5	3-7
	Roe	4	1-7
D/H-On	D/H-Off	78	
	Skin-On Fillets	55	42-60
	Skinless Fillets	48	34-56
	S/B Fillets	41	20-48
D/H-Off	Skin-On Fillets	71	54-80
	Skinless Fillets	62	31-81
	S/B Fillets	52	25-70
Skin-On Fillets	Skinless Fillets	87	
	Trim	12	
	S/B Fillets	73	
Skinless Fillets	S/B Fillets	84	
	Trim	13	
Trim	Mince	90	80-95

D/H-On=Dressed/Head-On

D/H-Off=Dressed/Head-Off

S/B = Skinless/Boneless

sp.=species



From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Crab

### Dungeness *Cancer magister*

Raw Whole	Raw Sections	60	
	Cooked Whole	90	
	Cooked Sections	52	
	Cooked Meat	24	22-25
	(during molt)		13-14
Raw Sections	Cooked Sections	87	
Cooked Whole	Cooked Meat	27	
Cooked Sections	Cooked Meat	46	

### King (Red, Brown or Golden) *Paralithodes camtschatica*, *Lithodes aequispina*

Raw Whole	Raw Sections	69	67-74
	Cooked Whole	92	90-95
	Cooked Sections	60	52-67
	Cooked Meat	25	23-28
	(during molt)		16-19
Raw Sections	Cooked Sections	87	
Cooked Whole	Cooked Meat	27	
Cooked Sections	Cooked Meat	42	

### King (Blue) *Paralithodes platypus*

Raw Whole	Raw Sections	65	
	Cooked Whole	90	
	Cooked Sections	55	50-61
	Cooked Meat	20	16-23
	(during molt)		13-14
Raw Sections	Cooked Sections	84	
Cooked Whole	Cooked Meat	22	
Cooked Sections	Cooked Meat	37	

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Crab (continued)

### Tanner *Chionoecetes bairdi*, *C. opilio*

Raw Whole	Raw Sections	68	65-72
	Cooked Whole	92	90-95
	Cooked Sections	60	58-66
	Cooked Meat	17	15-21
	(during molt)		10-14
Raw Sections	Cooked Sections	88	
Cooked Whole	Cooked Meat	19	
Cooked Sections	Cooked Meat	28	

### Dogfish *Squalus acanthias*

Round	D/H-On	75	69-80
	D/H-Off	55	41-68
	Edible Portion	36	32-40
	Backs	30	
	Belly Flaps	5	
	Tails and Fins	4	4-6
	Liver	13	10-21
	Viscera	51	
D/H-On	D/H-Off	69	
	Backs	38	
	Belly Flaps	7	

### Eels Anguilliformes

Round	D/H-On	90	
	D/H-Off	72	70-75
	Skin-On Flesh	62	56-65
	Smoked D/H-Off	65	

### Fish Meal

Lean Fish	Meal	18	16-20
Fatty Fish	Meal	22	20-25

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Flounders

### Arrowtooth *Atheresthes stomias*

Round	D/H-On	90	84-94
	D/H-Off	74	70-80
	Skinless Fillet	34	25-39
	Surimi	11	
	Kurimi	48	
	S/B fillets	25	18-30

### Starry *Platichthys stellatus*

Round	D/H-On	84	79-86
	D/H-Off	67	63-69
	Skinless Fillet	33	25-40

### Hake, Pacific *Merluccius productus*

Round	D/H-On	80	70-85
	D/H-Off	60	56-71
	Skin-On Fillets	43	
	Skinless Fillets	32	
	S/B Fillets	27	
	Roe		2-8
D/H-On	D/H-Off	71	
	Skin-On Fillets	51	
	Skinless Fillets	38	
	S/B Fillets	32	
Skin-On Fillets	Skinless Fillets	75	
	Trim	12	
	S/B Fillets	63	
Trim	Mince	90	

From	To	Average (%)	Range (%)
------	----	-------------	-----------

### Halibut, Pacific *Hippoglossus stenolepis*

Round	D/H-On	88	85-92
	D/H-Off	72	68-80
	Steaks	62	60-75
	Skin-On Fillet	49	45-56
	Skinless Fillet (Fletch)	41	34-44
D/H-On	D/H-Off	83	73-94
	Steaks	76	71-88
	Skin-On Fillet	56	47-64
	Skinless Fillet (Fletch)	46	38-50
D/H-Off	Skin-On Fillet	68	64-73
	Skinless Fillet (Fletch)	56	45-60
	Steaks	79	70-94
	Roasts	84	

### Herring, Pacific *Clupea harengus pallasi*

Round	D/H-On	82	78-87
	D/H-Off	70	60-76
	Skin-On Fillets	53	45-60
	Skinless Fillets	49	41-58
	Salted Round	82	79-88
	Salted Gibbed	65	
	Salted Fillets	42	35-47
	Smoked D/H-Off	60	
	Roe	10	3-18
	Pickled D/H-On	74	
Skin-On Fillets	Salted Fillets	85	
	Pickled	90	

### Lamprey, Pacific *Lampetra tridentata*

Round	D/H-Off	77	74-85
-------	---------	----	-------

From	To	Average (%)	Range (%)
------	----	-------------	-----------

### Lingcod *Ophiodon elongatus*

Round	D/H-On	90	83-93
	D/H-Off	70	62-74
	Skinless Fillet	35	29-38
	Steaks	62	
D/H-On	D/H-Off	80	67-89
	Skinless Fillet	39	31-45
	Steaks	69	
D/H-Off	Skinless Fillets	49	
	Steaks	86	

### Mackerel, Atka *Pleurogrammus monopterygius*

Round	D/H-On	87	83-93
	D/H-Off	68	62-74
	Skinless Fillet	31	29-33
	Steaks	57	
	Salted D/H-Off	41	

### Mussels *Mytilus* sp.

Whole	Edible Meat (wild)	26	19-32
	Edible Meat (cultured)	20	11-27
	Steamed	14	10-18

### Octopus *Octopus dofleini*

Whole	Gutted/Skin-On	80	80-85
	Gutted/Skinned	65	
	Viscera	20	

### Oysters *Crassostrea* sp.

Raw Whole	Raw Meats		5-14
Raw Meats	Cooked Meats	61	

From	To	Average (%)	Range (%)
------	----	-------------	-----------

### Pacific Ocean Perch *Sebastes alutus*

Round	D/H-On	88	82-94
	D/H-Off	62	46-72
	Skinless Fillet	30	27-32
D/H-On	D/H-Off	71	
	Skinless Fillet	35	

### Plaice, Alaska *Pleuronectes quadrituberculatus*

Round	D/H-On	84	79-86
	D/H-Off	68	60-72
	Skinless Fillet	35	30-40

### Pollock, Walleye *Theragra chalcogramma*

Round	D/H-On	79	72-86
	D/H-Off	62	52-72
	Skin-On Fillets	40	35-55
	Skinless Fillets	34	29-43
	S/B Fillets	28	24-36
	Mince	50	30-60
	Surimi (shore plant)	20	15-22
	Surimi (factory trawler)	15	11-17
	Roe	6.5	3-20
Skin-On Fillets	Skinless Fillets	85	
	Trim	15	
	S/B Fillets	70	
Trim	Mince	90	

### Rat-Tails *Coryphaenoides* sp.

Round	Edible Meat	53	
-------	-------------	----	--

### Red Snappers (see Rockfish)

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Rockfish

**Black** *Sebastes melanops*

**Greenstriped** *Sebastes elongatus*

**Thornyhead** *Sebastes altivelis*

Round	D/H-On	88	85-91
	D/H-Off	57	48-62
	D/H-Off (Eastern)	50	
	Skin-On Fillet	32	30-36
	Skinless Fillet	27	25-33
Skin-On Fillet	Skinless Fillet	85	
D/H-On	D/H-Off	65	
	Skin-On Fillet	56	
	Skinless Fillet	48	

**Canary** *Sebastes pinniger*

**China** *Sebastes nebulosus*

**Dusky** *Sebastes ciliatus*

**Quillback** *Sebastes maliger*

**Redbanded** *Sebastes babcocki*

**Redstriped** *Sebastes prorigor*

**Rosethorn** *Sebastes helvomaculatus*

**Rougheye** *Sebastes aleutianus*

**Shortraker** *Sebastes borealis*

**Silvergray** *Sebastes brevispinis*

**Tiger** *Sebastes nigrocinctus*

**Widow** *Sebastes entomelas*

**Yelloweye** *Sebastes ruberrimus*

**Yellowtail** *Sebastes flavidus*

Round	D/H-On	88	85-91
	D/H-Off	57	48-62
	D/H-Off (Eastern)	50	
	Skin-On Fillet	28	25-35
	Skinless Fillet	23	21-30
Skin-On Fillet	Skinless Fillet	82	
D/H-On	D/H-Off	65	
	Skin-On Fillet	49	
	Skinless Fillet	40	

From	To	Average (%)	Range (%)
<b>Sablefish</b> <i>Anoplopoma fimbria</i>			
Round	D/H-On	89	86-94
	D/H-Off	68	67-71
	D/H-Off (Eastern)	62	60-67
	Skin-On Fillet	40	
	Skinless Fillet	35	
	Steaks	62	60-65
	Salted D/H-Off	45	
	Smoked Sides	31	27-35
D/H-Off	Skin-On Fillet	59	
	Skinless Fillet	28	
	Smoked Sides	45	40-49
D/H-Off (Eastern)	Skin-On Fillets	64	
	Skinless Fillet	56	
	Smoked Sides	50	45-52
Skin-On Fillets	Smoked Fillets	80	



From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Salmon

### Pink *Oncorhynchus gorbuscha*

Round	D/H-On	91	84-94
	D/H-Off	73	68-80
	Canned	65	58-67
	Skin-On Fillet	52	47-58
	Skinless Fillet	42	41-46
	S/B Fillet	33	30-36
	S/B Trim	14	12-16
	Steaks	58	53-65
	Dry-Salt Sides	36	
	Mild Cure Sides	30	
	Smoked Sides	30	
	Roe	6	3-10
D/H-On	D/H-Off	81	72-90
	Skin-On Fillet	57	50-69
	Skinless Fillet	46	43-55
	S/B Fillet	36	32-43
	S/B Trim	16	13-19
	Steaks	63	56-77
	Dry-Salt Sides	40	
	Mild Cure Sides	33	
	Smoked Sides	33	
D/H-Off	Skin-On Fillet	72	
	Skinless Fillet	58	
	S/B Fillet	45	
	S/B Trim	19	
	Steaks	80	
	Dry-Salt Sides	49	
	Mild Cure Sides	41	
	Smoked Sides	41	35-50

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Salmon (continued)

### Chum *Oncorhynchus keta*

Round	D/H-On	89	79-91
	D/H-Off	74	71-77
	Canned	67	60-70
	Skin-On Fillet	60	55-63
	Skinless Fillet	50	41-46
	S/B Fillet	38	30-36
	S/B Trim	15	12-16
	Steaks	58	55-65
	Dry-Salt Sides	43	
	Mild Cure Sides	35	
	Smoked Sides	35	
	Roe	8	4-10
D/H-On	D/H-Off	83	79-91
	Skin-On Fillet	67	61-74
	Skinless Fillet	56	49-62
	S/B Fillet	43	38-47
	S/B Trim	17	13-19
	Steaks	65	61-75
	Dry-Salt Sides	48	
	Mild Cure Sides	39	
D/H-Off	Smoked Sides	39	
	Skin-On Fillet	81	
	Skinless Fillet	67	
	S/B Fillet	51	
	S/B Trim	20	
	Steaks	78	
	Dry-Salt Sides	58	
	Salted D/H-Off	47	
	Smoked Sides	55	45-60

D/H-On=Dressed/Head-On

D/H-Off=Dressed/Head-Off

S/B = Skinless/Boneless

sp.=species

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Salmon (continued)

### Sockeye *Oncorhynchus nerka*

Round	D/H-On	92	85-94
	D/H-Off	74	66-82
	Canned	67	60-70
	Skin-On Fillet	53	50-59
	Skinless Fillet	46	41-49
	S/B Fillet	35	30-38
	S/B Trim	15	12-16
	Steaks	57	55-65
	Dry-Salt Sides	40	
	Mild Cure Sides	33	
	Smoked Sides	33	
	Roe	4	3-6
D/H-On	D/H-Off	80	70-94
	Skin-On Fillet	57	53-68
	Skinless Fillet	50	43-56
	S/B Fillet	38	32-41
	S/B Trim	16	13-28
	Steaks	62	59-75
	Dry-Salt Sides	44	
	Mild Cure Sides	36	
D/H-Off	Smoked Sides	36	
	Skin-On Fillet	72	
	Skinless Fillet	62	
	S/B Fillet	47	
	S/B Trim	20	
	Steaks	77	
	Dry-Salt Sides	54	
	Mild Cure Sides	45	
	Smoked Sides	45	35-60

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Salmon (continued)

### Coho *Oncorhynchus kisutch*

Round	D/H-On	92	87-94
	D/H-Off	75	70-83
	Canned	67	60-70
	Skin-On Fillet	57	52-60
	Skinless Fillet	51	46-56
	S/B Fillet	38	30-40
	S/B Trim	14	12-17
	Steaks	62	58-65
	Dry-Salt Sides	43	
	Mild Cure Sides	36	
	Smoked Sides	36	
	Roe	7	5-10
D/H-On	D/H-Off	82	76-92
	Skin-On Fillet	62	58-67
	Skinless Fillet	55	49-63
	S/B Fillet	41	32-45
	S/B Trim	15	13-18
	Steaks	66	63-73
	Dry-Salt Sides	47	
	Mild Cure Sides	39	
	Smoked Sides	39	
D/H-Off	Skin-On Fillet	76	
	Skinless Fillet	68	
	S/B Fillet	51	
	S/B Trim	19	
	Steaks	81	
	Dry-Salt Sides	57	
	Mild Cure Sides	48	
	Smoked Sides	48	40-60

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Salmon (continued)

### Other Salmon, including Chinook and Cherry

Round	D/H-On	88	82-94
	D/H-Off	72	68-74
	Skin-On Fillet	55	52-60
	Skinless Fillet	46	41-49
	S/B Fillet	36	30-40
	S/B Trim	14	12-16
	Steaks	58	54-65
	Dry-Salt Sides	40	
	Mild Cure Sides	34	
	Smoked Sides	34	
	Roe	6	3-10
D/H-On	D/H-Off	82	73-90
	Skin-On Fillet	63	55-73
	Skinless Fillet	52	44-59
	S/B Fillet	41	32-49
	S/B Trim	16	13-20
	Steaks	66	57-79
	Dry-Salt Sides	46	
	Mild Cure Sides	39	
	Smoked Sides	39	
D/H-Off	Skin-On Fillet	76	
	Skinless Fillet	64	
	S/B Fillet	50	
	S/B Trim	19	
	Steaks	81	
	Dry-Salt Sides	56	
	Mild Cure Sides	47	
	Smoked Sides	47	35-60
Raw Steak	Baked Steak	89	
	Broiled Steak	83	

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Salmon, Farmed

### Norwegian

D/H-On	D/H-Off	88	
	Skin-On fillet	76	
	Skinless Fillet	68	
	Roasts	85	

### Chilean

D/H-On	D/H-Off	86	
	Skin-On Fillet	72	
	Skinless Fillet	66	
	Roasts	83	

## Salmon, Frozen and Thawed

**Note:** Freezing conditions and length of storage will affect recoveries. Poor conditions and storage more than six months will reduce yields significantly.

### Chum (Thawed)

D/H-On	Skin-On Fillet	62	
	Skinless Fillet	52	
D/H Off	Skin-On Fillet	75	
	Skinless Fillet	63	

### Pink (Thawed)

D/H-On	Skin-On Fillet	54	
	Skinless Fillet	45	
D/H-Off	Skin-On Fillet	67	
	Skinless Fillet	56	

### Sockeye (Thawed)

D/H-On	Skin-On Fillet	52	
	Skinless Fillet	47	
D/H-Off	Skin-On Fillet	65	
	Skinless Fillet	59	

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Salmon, Frozen and Thawed (continued)

### Silver (Thawed)

D/H-On	Skin-On Fillet	58	
	Skinless Fillet	49	
D/H-Off	Skin-On Fillet	71	
	Skinless Fillet	60	

### Saury, Pacific *Cololabis saira*

Round	D/H-On	88	83-92
	D/H-Off	76	71-86
	Skinless Fillet	57	54-61

### Scallops *Chlamys* sp., *Hinnites* sp., *Pecten* sp.

Raw Whole	Adductor Muscle	10	8-12
	Viscera	22	20-26
Raw Meats	Cooked Meats	50	

### Sculpin *Enophrys* sp., *Hemilepidotus* sp., *Myoxocephalus* sp.

Round	D/H-On	80	75-87
	D/H-Off	39	25-51
	Skinless Fillet	24	20-41

### Sea Cucumber *Cucumaria* sp.

Whole	Eviscerated Meat	36	
	Edible Meat	25	
	Cooked Meat	13	
	Dried Meat	5	

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Sea Urchin *Strongylocentrotus* sp.

### Green

Round	Roe		5-30
-------	-----	--	------

### Red

Round	Roe		8-30
-------	-----	--	------

## Shad, American *Alosa sapidissima*

Round	D/H-On	88	85-92
	D/H-Off	74	69-77
	Skin-On Fillet	65	62-67
	Skinless Fillet	54	
	Roe		3-17

## Shark

### Sharks, General

Round	D/H-On	80	62-90
	D/H-Off	58	22-75
	Trunk	51	33-67
	Skin-On Fillet	42	21-60
	Skinless Fillet	32	17-56
	Fins	5	1-12
D/H-On	D/H-Off	73	
	Trunk	64	
	Skin-On Fillet	53	
	Skinless Fillet	40	
	Fins	6	
D/H-Off	Trunk	88	
	Skin-On Fillet	73	
	Skinless Fillet	55	
	Fins	9	



From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Shark (continued)

### Salmon *Lamna ditropis*

Round	D/H-On	80	
	D/H-Off	63	50-66
	Trunk	58	44-59
	Skin-On Fillet	53	39-57
	Skinless Fillet	44	32-48
	Fins	5	

### Sevengill (Cow Shark) *Notorynchus maculata*

Round	D/H-On	86	
	D/H-Off	55	
	Trunk	52	
	Skin-On Fillet	45	
	Skinless Fillet	35	
	Fins	5	

### Soupin *Galeorhinus zyopterus*

Round	D/H-On	65	
	D/H-Off	51	
	Trunk	45	
	Fins	4	

### Blue *Prionace glauca*

Round	D/H-On	88	
	D/H-Off	67	
	Trunk	54	
	Skin-On Fillet	51	
	Skinless Fillet	40	
	Fins	6	

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## **Shark (continued)**

### **Thresher** *Alopias vulpinus*

Round	D/H-On	85	
	D/H-Off	71	
	Trunk	57	
	Skin-On Fillet	49	
	Skinless Fillet	44	
	Fins	14	

### **Blacktip** *Carcharhinus limbatus*

Round	D/H-On	82	
	D/H-Off	62	
	Trunk	52	
	Skin-On Fillet	46	
	Skinless Fillet	36	
	Fins	10	

## **Shrimp** *Pandalus* sp.

### **Pink**

Raw Whole	Raw Headless	53	
	Cooked Whole	90	
	Raw Peeled	36	
	Cooked Peeled	25	
Raw Headless	Cooked Peeled	69	
Cooked Whole	Cooked Peeled	28	

### **Spot**

Raw Whole	Raw Headless	47	45-49
	Cooked Whole	90	
	Raw Peeled	34	30-38
	Cooked Peeled	26	
Raw Headless	Raw Peeled	72	
Cooked Whole	Cooked Peeled	29	

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Skates *Raja* sp.

Round	D/H-On	90	75-95
	D/H-Off	39	
	Wings	23	20-23

## Smelt *Hypomesus* sp., *Spirinchus* sp.

Round	D/H-On	85	82-90
	D/H-Off	71	67-78
	Skinless Fillet	38	
	Salted D/H-Off	45	
	Smoked D/H-Off	57	
	Cooked Fillet	35	

## Snails *Neptunea* sp.

Whole	Edible Meats	28	27-31
-------	--------------	----	-------

## Soles

### Dabs *Limanda proboscidea*

Round	D/H-On	85	75-90
	D/H-Off	64	55-75
	Skinless Fillet	23	17-26

### Dover *Microstomus pacificus*

Round	D/H-On	86	75-90
	D/H-Off	65	55-65
	Skinless Fillet	29	26-32

### English *Parophrys vetulus*

Round	D/H-On	85	79-94
	D/H-Off	65	55-75
	Skinless Fillet	27	25-28

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Soles (continued)

### Flathead *Hippoglossoides elassodon*

Round	D/H-On	86	80-94
	D/H-Off	67	60-79
	Skinless Fillet	27	25-32

### Petrale *Eopsetta jordani*

Round	D/H-On	86	75-90
	D/H-Off	66	55-75
	Skinless Fillet	29	28-32

### Rex *Glyptocephalus zachirus*

Round	D/H-On	85	75-90
	D/H-Off	65	55-75
	Skinless Fillet	33	27-37

### Rock *Lepidopsetta bilineata*

Round	D/H-On	87	82-92
	D/H-Off	67	62-78
	Skinless Fillet	28	22-30

### Yellowfin *Limanda aspera*

Round	D/H-On	86	76-94
	D/H-Off	69	60-83
	Skinless Fillet	25	16-30
	Surimi	11	
	Kurimi	48	

## Squid *Loligo* sp.

Whole	Edible Meats	71	64-73
	Mantle w/Fins	52	45-55
	Mantle w/o Fins	39	36-42
	Tentacles	17	13-20
	Fins	12	10-13

From	To	Average (%)	Range (%)
------	----	-------------	-----------

## Sturgeon *Acipenser* sp.

Round	D/H-On	85	82-87
	D/H-Off	75	72-78
	Skin-On Fillet	56	50-59
	Skinless Fillet	45	
	Steaks	62	
	Salted D/H-Off	46	
	Smoked D/H-Off	56	
	Roe		8-12
D/H-On	D/H-Off	88	
	Skin-On Fillet	66	
	Skinless Fillet	53	
	Steaks	73	

## Trout *Salmo* sp., *Salvelinus* sp.

Round	D/H-On	88	
	D/H-Off	69	
	Skin-On Fillet	61	60-65
	Skinless Fillet	55	
	Steaks	60	
	Smoked D/H-Off	54	
D/H-On	D/H-Off	78	
	Skin-On Fillet	69	
	Skinless Fillet	63	
	Steaks	68	
D/H-Off	Skin-On Fillet	88	
	Skinless Fillet	79	
	Steaks	86	

## Trout, Farmed

### Norwegian

D/H-On	D/H-Off	78	
	Skin-On Fillet	69	
	Skinless Fillet	63	

From	To	Average (%)	Range (%)
------	----	-------------	-----------

### Tuna, Albacore *Thunnus alalunga*

Round	D/H-On	90	
	D/H-Off	75	
	Skinless Fillet	35	
	Steaks	65	
D/H-On	D/H-Off	83	
	Skinless Fillet	39	
	Steaks	72	

### Turbot, Greenland *Reinhardtius hippoglossoides*

Round	D/H-On	90	
	D/H-Off	74	70-80
	Skinless Fillet	30	25-35

## A Final Note

---

Every effort has been made to assure that the data presented in this publication are as accurate as possible. Since recovery information is highly dependent on processing techniques and handling systems, frequently conflicting data are generated. If you have contradictory information on any species, please let us know. Send additions and corrections to:

Chuck Crapo  
Marine Advisory Program  
Fishery Industrial Technology Center  
900 Trident Way  
Kodiak, Alaska 99615

Brian Paust  
Marine Advisory Program  
P.O. Box 1329  
Petersburg, Alaska 99833

## Sources and References

---

- Alaska Department of Fish and Game. 1969. Minutes of the Second Alaskan Shellfish Conference. Information Leaflet No. 135. Alaska Department of Fish and Game, Juneau, AK.
- Alaska Department of Fish and Game. 1985. Alaska 1984 catch and production. Commercial Fisheries Statistics. Statistical Leaflet No. 37. Alaska Department of Fish and Game, Juneau, AK.
- Alaska Department of Fish and Game. 1986. Alaska 1985 catch and production. Commercial Fisheries Statistics. Statistical Leaflet No. 38. Alaska Department of Fish and Game, Juneau, AK.
- Alaska Sea Grant College Program. 1977. The Bering Sea tanner crab resource: U.S. production capacity and marketing. Sea Grant Report No. 77-5. Univ. Alaska, Fairbanks, AK.
- Allread, K. 1987. Western Alaska Fisheries, Inc., Kodiak, AK. Pers. communication.
- Anon. 1977. The specification on squid processing plant. Available from the author, FITC, Kodiak, AK. 99615.
- Anon. 1981. Portland fish-drying company exporting to Asia. *Australian Fisheries* 43(5):18.
- Anon. 1986. Cod. *Seafood Leader* 6(1):18.
- Anon. 1986. Rockfish. *Seafood Leader* 6(1):127.
-

- Anon. 1987. Sablefish (*Anoplopoma fimbria*). Seafood Leader 7(1):111.
  - Baker, W.L. 1979. Report on Exploratory Diving by the Northern Diver. City of Ketchikan, Ketchikan, AK.
  - Barr, L. 1970. Alaska's fisheries resources—The shrimps. Fishery Leaflet No. 631. Bureau of Commercial Fisheries, Auke Bay, AK.
  - Berger, J.D. and S.R. Hare. 1988. Product Recovery Rates Obtained Aboard Foreign Fishing Vessels Operating in the Northeast Pacific Ocean and Eastern Bering Sea, 1983-85. U.S. Department of Commerce, NOAA Technical Memorandum NMFS F/NWC-129., Washington, D.C.
  - Berk, Z. 1974. Processing squid for food. Sea Grant Report No. 13. Massachusetts Institute of Technology, Cambridge, MA.
  - Berntsen, S. 1988. Oregon State University, Newport, OR. Pers. communication.
  - Bethers, M. 1985. Learn to identify S.E. salmon, trout and char. Alaska Department of Fish and Game, Juneau, AK.
  - Blankenbeckler, D. and R. Larson. 1983. Pacific herring (*Clupea harengus pallasii*) harvest statistics, hydroacoustical surveys, age, weight, and length analysis, and spawning ground surveys for S.E. Alaska, 1980-1983. Data Report No. 202. Alaska Department of Fish and Game, Juneau, AK.
  - Brooks, L.A. and R.P. Singh. 1979. Properties of squid useful in designing of cleaning and handling systems. Transactions of the American Society of Agricultural Engineers 22(3):658.
  - Brown, D.E. 1979. A machine to eviscerate and skin squid. ASAE Paper No. 79-6525. American Society of Agricultural Engineers, St. Joseph, MI.
  - Bykov, V.P. 1985. Marine fishes: Chemical composition and processing properties. A.A. Balkema Publishing, Rotterdam, Netherlands.
  - Cheney, D.P. and T.E. Mumford. 1986. Shellfish and seaweed harvests of Puget Sound. Univ. Washington Press, Seattle, WA.
  - Collins, J. and R. Jones. 1966. Spot shrimp: Yield and quality studies. Technical Report No. 77. Bureau of Commercial Fisheries, Ketchikan, AK.
  - Dart, D. 1987. Commercial Fisherman, Petersburg, AK. Pers. communication.
  - Dassow, J.A. 1967. Characteristics of frozen shellfish: Factors affecting quality changes during freezing and storage. Part I —Crabs and lobsters. In: Freezing preservation of foods, Volume 2 (Fourth edn.). AVI Publishing Company, Westport, CT.
  - Dassow, J.A. 1979. Product yields from various Alaska fish species. National Marine Fisheries Service, Seattle, WA.
-



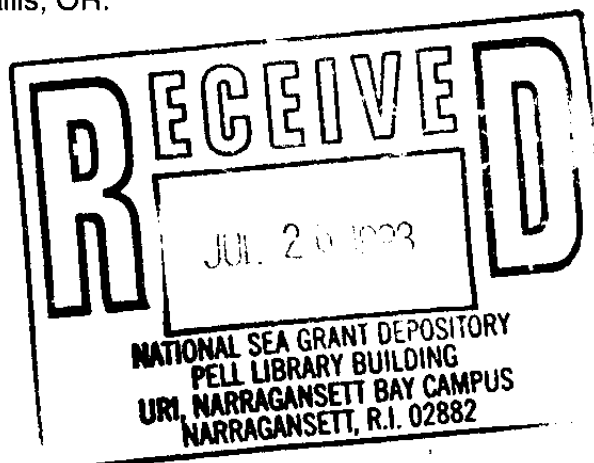
- Edwards, E. and J. Early. 1972. Catching, handling and processing crabs. Advisory Note No. 26. Torry Research Station, Aberdeen, Scotland, U.K.
  - Elwell, T. 1977. Dogfish—An underutilized Oregon resource. Oregon State Univ., Corvallis, OR.
  - Enge, J. 1986. Petersburg Fisheries, Inc., Petersburg, AK. Pers. communication.
  - Evans, W.E. 1987. Conversion factors for fishery products. National Marine Fisheries Service, Washington, D.C.
  - Feder, H.M. and A.J. Paul. 1973. Abundance estimations and growth rate comparisons for the clam *Protothaca staminea* from three beaches in Prince William Sound, Alaska, with additional comments on size-weight relationships, harvesting and marketing. Sea Grant Report No. 73-2. Univ. Alaska, Fairbanks, AK.
  - Fitzgerald, R. 1981. Mussels. Ocean Leader 1(3):2.
  - Freeman, K. 1984. Geoduck. Pacific Fishing 5(13):21.
  - Freeman, K. 1984. Thresher Shark. Pacific Fishing 5(11):51.
  - Freeman, K. 1987. Bering Sea snails: A fishery that still goes begging. National Fisherman 67(11):8.
  - Freeman, K. 1987. Diving for urchins: A prickly business. National Fisherman 68(4):12.
  - Gisslen, W. 1983. Professional cooking. Wiley & Sons, New York.
  - Goodwin, C.L. 1973. Subtidal geoducks of Puget Sound, Washington. Technical Report No. 13. Washington Department of Fisheries, Olympia, WA.
  - Gordievskaya, V.S. 1971. Shark flesh in the food industry. Pacific Scientific Research Institute of Marine Fisheries and Oceanography (TINRO). Translated from Russian by the Israel Program for Scientific Translations. National Marine Fisheries Service and National Science Foundation, Washington, D.C.
  - Graham, J. 1984. Planning and engineering data: 3. Fish freezing. Fisheries Circular No. 771. Food and Agriculture Organization of the United Nations, Rome, Italy.
  - Hammerstrom, L. and M. Merritt. 1985. A survey of Pacific weathervane scallops (*Pecten caurinus*) in Kamishak Bay, Alaska. Information Leaflet No. 252. Alaska Department of Fish and Game, Juneau, AK.
  - Haynes, E.B. and B.C. Powell. 1968. A preliminary report on the sea scallop fishery exploration, biology, and commercial processing. Information Leaflet No. 125. Alaska Department of Fish and Game, Juneau, AK.
-

- Heggelund, P. 1979. Teaching manual for extension courses in white fish processing technology. Marine Advisory Bulletin No. 8. Univ. Alaska, Fairbanks, AK.
  - Hoag, S.H., C.C. Schmitt, and W.H. Hardman. 1979. Size, age and frequency of male and female halibut: Setline research catches, 1925-1977. Technical Report No. 17. International Pacific Halibut Commission, Seattle, WA.
  - Hoopes, D.T. 1973. Alaska's fisheries resources—The dungeness crab. Fisheries Facts No. 6. National Marine Fisheries Service, Seattle, WA.
  - Hughes, S. 1977. Northwest and Alaska Fisheries Center processed report, Results of an industry-government joint venture on Bering Sea clams, September 1976. National Marine Fisheries Service, Seattle, WA.
  - International Pacific Halibut Commission. 1986. Annual Report 1985. International Pacific Halibut Commission, Seattle, WA.
  - Iverson, J.L. 1957. Pacific Ocean perch: Proximate composition and commercial utilization. Technical Report No.12. Bureau of Commercial Fisheries, Ketchikan, AK.
  - Jensen, C. 1988. Eastpoint Seafoods, Inc., Kodiak, AK. Pers. Communication.
  - Kaersgaard, K. 1979. Unit operations in white fish processing. In: P. Heggelund (ed.). Teaching manual for extension courses in white fish processing technology. Marine Advisory Bulletin No. 8. Univ. Alaska, Fairbanks, AK.
  - Ke, P.J., E. Lervantes, B. Smith-Lall and R.W. Hirtle. 1983. Freshness preservation of Canadian Atlantic crab, scallop, squid and sea cucumber (*Cucumaria frondosa*). Industry Report No. 138. Fisheries and Oceans Canada, Halifax, Nova Scotia.
  - Kizevetter, I.V. 1973. Chemistry and technology of Pacific fish. Pacific Scientific Research Institute of Marine Fisheries and Oceanography (TINRO). Translated from Russian by the Israel Program for Scientific Translations. National Marine Fisheries Service and National Science Foundation, Washington, D.C.
  - Klein, S.J. 1985. Selectivity of trawl, trap, longline and set-net gears to sablefish, *Anoplopoma fimbria*. Master's Thesis. Univ. Washington, Seattle, WA.
  - Koeneman, T. 1986. Alaska Department of Fish and Game, Petersburg, AK. Pers. Communication.
  - Kramer, D.E. and D.M.A. Nordin. 1978. Physical data from a study of size, weight and gonad quality for the green sea urchin (*Strongylocentrotus droebachiensis*) over a one-year period. Manuscript Report No. 1476. Fisheries and Oceans Canada, Vancouver, British Columbia.
  - Kyte, M. 1986. Andrea Enterprises, Lynnwood, WA. Pers. Communication.
-

- Low, L.L., J.E. Smoker, L.J. Watson, J.D. Berger and M.W. Ecklund. 1989. A Review of Product Recovery Rates for Alaska Groundfish. U.S. Department of Commerce, NOAA Technical Memorandum NMFS F/NWC-175., Washington, D.C.
  - MacIntosh, R. and A.J. Paul. 1977. The relation of shell length to total weight, tissue weight, edible-meat weight and reproductive organ weight of the gastropods *Neptunea heros*, *N. lyrata*, *N. pribiloffensis*, and *N. ventricosa* of the eastern Bering Sea. Proceedings of the National Shellfisheries Association, Volume 67.
  - Marshall, R.P. and T.J. Quinn. 1988. Estimation of average weight and biomass of pink, chum, sockeye and coho salmon in southeast Alaska commercial harvests. Fishery Research Bulletin 88-07. Alaska Department of Fish and Game, Juneau, AK.
  - Matthews, R.H. and Y.J. Garrison. 1975. Food yields summarized by different stages of preparation. Agriculture Handbook No. 102. United States Department of Agriculture, Washington, D.C.
  - Monical, J.B. 1980. Comparative studies on growth of the purple hinge rock scallop (*Hinnites multirugosus* [Gale]) in the marine waters of southern California. Proceedings of the National Shellfisheries Association, Volume 70.
  - Mottet, M.G. 1976. The fishery biology and market preparation of sea cucumbers. Technical Report No. 22. Washington Department of Fisheries, Olympia, WA.
  - Mottet, M.G. 1978. A review of the fishery biology of abalones. Technical Report No. 37. Washington Department of Fisheries, Olympia, WA.
  - Natural Resource Consultants. 1981. Pacific pollock (*Theragra chalcogramma*): Resources, fisheries, products, and markets. National Marine Fisheries Service, Seattle, WA.
  - Nettleton, J. 1985. Seafood nutrition: Facts, issues, and marketing of nutrition in fish and shellfish. Osprey Books, Huntington, NY.
  - Norris, J.G., J. Rowley, and S.B. Mathews. 1987. Analysis of four factors affecting the sablefish soft fish problem. National Marine Fisheries Service, Seattle, WA.
  - Northwest and Alaska Fisheries Center. 1986. Monthly Report. National Marine Fisheries Service, Seattle, WA.
  - Orth, F., C. Smelcer, H. Feder, and J. Williams. 1975. The Alaska clam fishery: A survey and analysis of economic potential. Sea Grant Report No. 75-5. Univ. Alaska, Fairbanks, AK.
-

- Otwell, W.S. and T.C. Lanier. 1978. Utilization of North Carolina skates and rays. Special Scientific Report No. 31. North Carolina Department of Natural Resources and Community Development Division of Marine Fisheries, Morehead City, NC.
- Parker, J.W. 1973. The abalone in Alaska. Wildlife Notebook Series. Alaska Department of Fish and Game, Juneau, AK.
- Paul, J.M., and A.J. Paul. 1984. Reproductive cycle and gonad yield of green sea urchins in lower Cook Inlet, Alaska. Sea Grant Report No. 84-2. Univ. Alaska, Fairbanks, AK.
- Paust, B.C. 1988. Fishing for octopus: A guide for commercial fishermen. Sea Grant Report No. 88-3. Univ. Alaska, Fairbanks, AK.
- Paust, B. and R. Smith. 1986. Salmon shark manual: The development of a commercial salmon shark, *Lamna ditropis*, fishery in the north Pacific. Sea Grant Report No. 86-1. Univ. Alaska, Fairbanks, AK.
- Peters, J.A. 1978. Scallops and their utilization. Marine Fisheries Review 40(11):1.
- Powell, G.C. and R.B. Nickerson. 1965. Meat content of king crabs (*Paralithodes camtschatica*, Tilesius) from Kodiak Island, Alaska. Informational Leaflet No. 46. Alaska Department of Fish and Game, Juneau, AK.
- Price, R. 1988. University of California, Davis, CA. Pers. communication.
- Quayle, D.B. 1962. Abalones in British Columbia. Progress Report No. 114. Fisheries Research Board of Canada, Ottawa, Ontario.
- Randall, R.C. 1982. Herring spawn on kelp in pounds fishery, Prince William Sound, 1979-82. Area Data Report No. 83-6. Alaska Department of Fish and Game, Cordova, AK.
- Rathjen, W.F. and J.B. Rivers. 1964. Gulf of Alaska scallop explorations. Commercial Fisheries Review 26(3):1.
- Sakuda, H.M. 1957. Meat content of Pavlof Bay king crabs. Commercial Fisheries Review 19(11):4.
- Seagram, H.L. 1958. Contribution to the chemistry of the king crab (*Paralithodes camtschatica*). Commercial Fisheries Review 20(11):15.
- Slaby, B. 1982. Storage and processing of mussels. Department of Food Science, Univ. Maine, Orono, ME.
- Slatergood, L.W. 1961. The sea urchin fishery. Fishery Leaflet 511. U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Washington, D.C.
-

- Stanley, R.D. and A.C.C. Otterdyks. 1987. Round weight conversion factors for Pacific Ocean perch (*Sebastes alutus*) processed by B.C. freezer trawlers. Manuscript Report No. 1925. Department of Fisheries and Oceans, Nanaimo, British Columbia.
- Stokes, R.L. 1986. The Washington geoduck fishery: Commercial prospects. Sea Grant Report No. WSG-AS-86-2. Univ. Washington, Seattle, WA.
- Stroud, G.D. 1972. The Herring. Advisory Note No. 57. Torry Research Station, Aberdeen, Scotland, U.K.
- Stroud, G.D. 1978. Squid. Advisory Note No. 77. Torry Research Station, Aberdeen, Scotland, U.K.
- Stroud, G.D. 1981. Handling and processing oysters. Advisory Note No. 84. Torry Research Station, Aberdeen, Scotland, U.K.
- Talley, K. 1982. Petrale sole: The fish of the month. Pacific Fishing 3(4):42.
- Thompson, H. 1989. Sitka Sound Seafoods, Sitka, AK. Pers. communication.
- Tomlinson, N., S.E. Geiger, G.A. Gibbard, and S.J. Westrheim. 1972. Utilization of Pacific rockfish. I. Comparison of *Sebastes alutus*, *S. reedi* and *S. prorigor* with respect to their quality during chilled and frozen storage. Technical Report No. 425. Fisheries Research Board of Canada, Vancouver, British Columbia.
- Washburn, J. 1985. The economic viability of harvesting the red urchin. National Marine Fisheries Service, Seattle, WA.
- Waterman, J.J. 1968. The cod. Advisory Note No. 33. Torry Research Station, Aberdeen, Scotland, U.K.
- Waterman, J.J. 1979. Measures, stowage rates, and yields of fishery products. Advisory Note No. 17. Torry Research Station, Aberdeen, Scotland, U.K.
- Youde, J.G. and J.R. Wix. 1967. Economics of the dungeness crab industry. Information Circular No. 627. Agricultural Experiment Station, Oregon State Univ., Corvallis, OR.



---

**National Sea Grant Depository**  
Pell Library Building - GSO  
University of Rhode Island  
Narragansett, RI 02882-1197USA

## Seafood Handling Publications

---

For a free brochure on seafood handling publications from Alaska Sea Grant,  
contact:

Alaska Sea Grant College Program  
University of Alaska  
304 Eielson Bldg. RY  
Fairbanks, AK 99775-5040

Phone (907) 474-6707  
Fax (907) 474-6285

ISBN 1-56612-012-8



9 781566 120128

50500>



---

UNIVERSITY OF ALASKA FAIRBANKS  
SCHOOL OF FISHERIES AND OCEAN SCIENCES

---