Guide to the
BUREAU OF COMMERCIAL FISHERIES TECHNOLOGICAL LABORATORY
SEATTLE, WASH.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES

Cover Photo.--The Bureau of Commercial Fisheries Research Center is on the shore of Portage Bay and is across the Lake Washington Ship Canal from the University of Washington.

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By

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ABSTRACT

Goals of the technology program, accomplishments, current programs, organization and staff, physical facilities, and answering of inquiries are discussed. Some laboratory publications, by subject, are listed.

The Bureau of Commercial Fisheries Technological Laboratory, along with the Food Science Pioneer Research Laboratory, occupies the fourth floor of the easternmost building of the Bureau's Fisheries Research Center at 2725 Montlake Boulevard East, Seattle. Other units of the Bureau in the center are the Biological Laboratory, the Exploratory Fishing and Gear Research Base, and offices of the Branch of Marketing and the Division of Publications. The oldest building of the center was built in 1931. The large new laboratory building and a library and auditorium linking the old building with the new were constructed in 1964-65 and occupied in January 1965.

PROGRAM OF THE BCF TECHNOLOGICAL LABORATORY AT SEATTLE

The technology program is built around five goals that are important to the Bureau's key objective of increasing the net contribution of aquatic living resources to the nation's economy. In the following are listed these five goals. Included under each listing are what the Laboratory has already done toward accomplishing the given goal and what the Laboratory's current program is toward accomplishing it further.

Goal 1. Increase domestic landings in the Pacific Northwest and expand the Pacific trawl fisheries.

a. Accomplishments.--Methods for utilization of Pacific hake were developed.

b. Current program.--New products from Pacific groundfish are being developed.

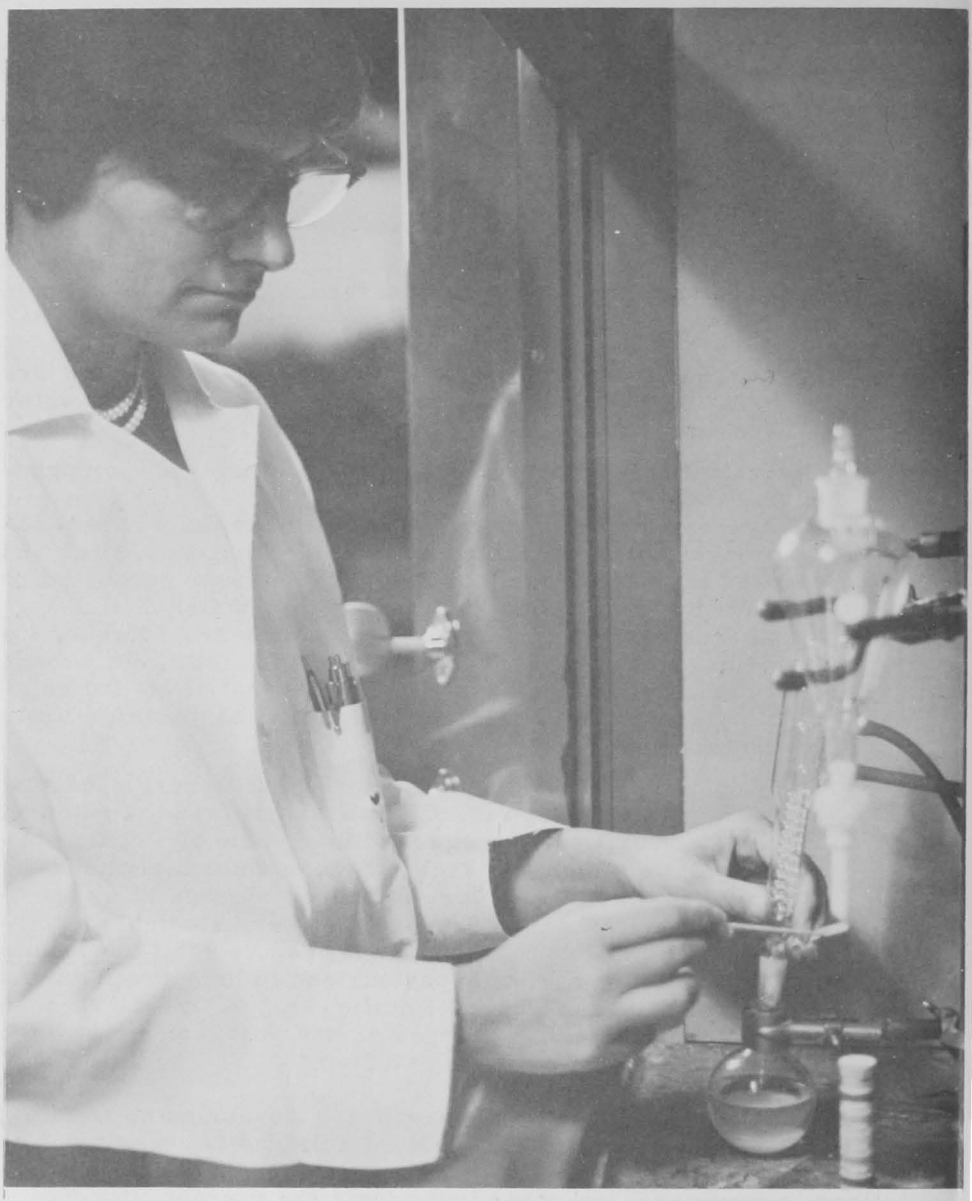

Figure 2.--A chemist is preparing a standard for analysis of fishery products for pesticide residues.

engineers, and microbiologists, and 8 scientific aids and office personnel. In addition, the Laboratory employs student scientific aids. Limited facilities are available for visiting scientists who wish to conduct research of mutual interest.

PHYSICAL FACILITIES

The Technological Laboratory occupies space jointly with the Food Science Pioneer Research Laboratory on the fourth floor of the new Fisheries Research Center building completed in early 1965. The Laboratory floor plan is based on a module of 204 square feet, with services and utilities available from hall risers. Of the total floor area of 16,400 square feet, 30 percent is service area and 70 percent is utilized for 56 modules divided into research and office facilities. The floor plan is simple, flexible, and unusually efficient in terms of usable space per unit of gross floor area. The Technological Laboratory has 48 percent of the fourth-floor research and office areas; the Food Science Pioneer Research Laboratory, 12 percent; and 40 percent is shared.

The Technological Laboratory also has a separate pilot plant building of 2,600 square feet. This building, constructed in 1937, houses a processing laboratory and pilot plant, freezing and cold storage facilities, fishery inspection service, and an isolation microbiological laboratory for research on pathogenic microorganisms.

Specialized equipment and instrumentation available at the Laboratory include gas chromatographs for lipid research, recording visual and infrared spectrophotometers, refrigerated centrifuges, a preparative ultracentrifuge, electron magnetic resonance equipment, a refrigerated environmental laboratory, freeze-dryer, plate freezer, a large molecular still, and specialized facilities for research involving hazardous solvents. A research cobalt-60 Mark II irradiator supplied by the Atomic Energy Commission is located nearby at the College of Fisheries, University of Washington, and is used jointly for studies on application of irradiation to fishery products. The Laboratory operates no vessels but does conduct specific studies at sea aboard the Bureau exploratory fishing vessel, John N. Cobb, and commercial fishing vessels under cooperative arrangements. Limited facilities for trawl-fish preservation studies at sea are available on the new 215-foot BCF biology-oceanography vessel, Miller Freeman.

INQUIRIES

Inquiries by correspondence, telephone (583-7746, area code 206), or in person concerning any aspect of the Laboratory's program are welcome. Transient scientific personnel may wish to visit the Laboratory to discuss research of mutual interest. The research library facilities at the complex are open from 7:30 a.m. to 4:00 p.m. weekdays for reference purposes only and may be used by anyone interested. Arrangements for scheduled visits can be made on short notice. Inquiries are invited from scientists interested in working at the Laboratory on a temporary basis or as part of a scientific personnel exchange program.

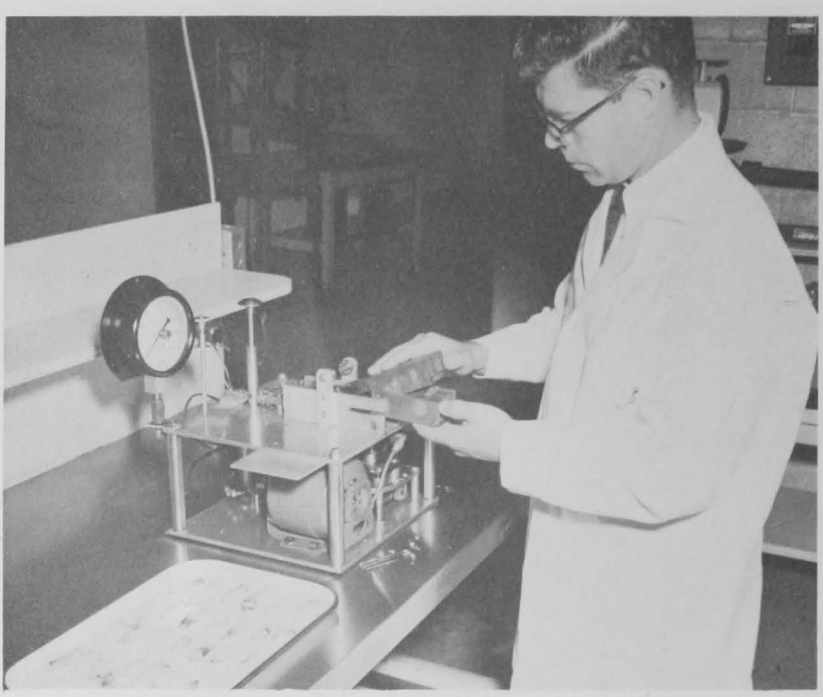

Figure 5.--Relative tenderness of Dungeness crab meat samples is being determined with a laboratory-built device for shear measurement.

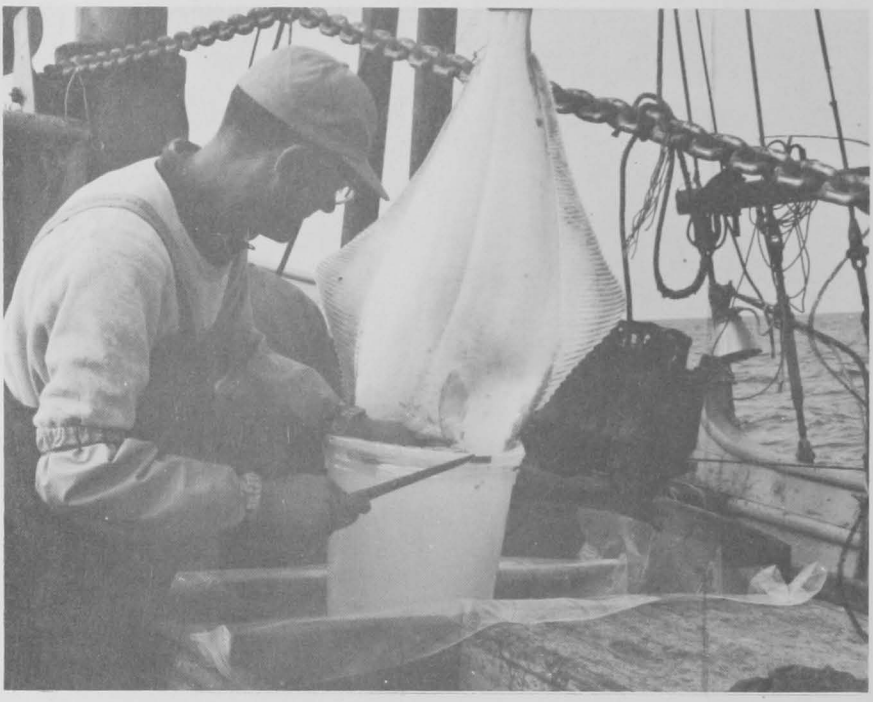

Figure 6.--Technological investigations are not confined to research within the laboratory. Here a chemist studies the problems of quality variation in north Pacific halibut.

Figure 7.--A chemist and technician help to bring in a small scallop dredge aboard a chartered fishing vessel. Scallops are being obtained from Puget Sound for processing studies.

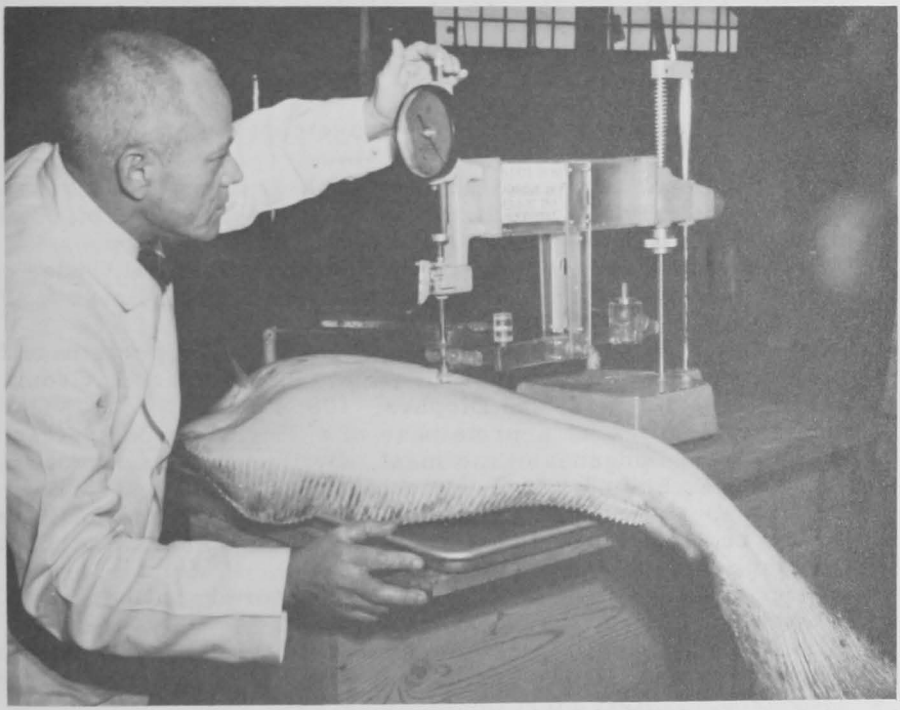

Figure 8.--Elasticity of halibut flesh is being measured to determine quality change during iced storage.

PUBLICATIONS

The work and interests of a laboratory are best typified by its publications. Some publications of the Laboratory in the past few years are listed below. These may be obtained on request to the Laboratory. A complete list of available publications and reprints of the Laboratory is also available on request.

Fish Oils - Product and Process Development

1. The preparation of polyunsaturated aliphatic aldehydes via the acyloin condensation. By Erich J. Gauglitz, Jr., and Donald C. Malins. J. Amer. Oil Chem. Soc. 37: 425-427. 1960.
2. Fatty acid composition of oils from 21 species of marine fish, freshwater fish, and shellfish. By E. H. Gruger, Jr., R. W. Nelson, and M. E. Stansby. J. Amer. Oil Chem. Soc. 41: 662-667. 1964.
3. Reaction of acetyl nitrate with alcohol derivates of fatty acids: a synthesis of nitrate esters. By D. C. Malins, J. C. Wekell, and C. R. Houle. J. Amer. Oil Chem. Soc. 41: 44-46. 1964.
4. Synthesis of triglycerides from fish oil fatty acids. By L. W. Lehman and E. J. Gauglitz, Jr. J. Amer. Oil Chem. Soc. 41: 533-535. 1964.
5. Adsorptive bleaching and molecular distillation of menhaden oil. By E. J. Gauglitz, Jr., and E. H. Gruger, Jr. J. Amer. Oil Chem. Soc. 42: 561-563. 1965.
6. Nitrated fatty acid esters. By Clifford R. Houle and Donald C. Malins. U.S. Pat. 3,305,567. 1967.
7. Properties and applications of fish oils. By Erich J. Gauglitz, Jr. Activ. Rep. 19: 104-108. 1967.

Biochemical Systems and Quality Management

8. Measurement of hypoxanthine in fish as a method of assessing freshness. By J. Spinelli, M. Eklund, and D. Miyauchi. J. Food Sci. 29: 710-714. 1964.
9. Observations of the "blueing" of king crab, Paralithodes camtschatica. By Herman S. Groninger and John A. Dassow. Fish. Ind. Res. 2(3): 47-52. 1964.
10. Partial purification and some properties of a proteinase from albacore (Germo alalunga) muscle. By Herman S. Groninger, Jr. Arch. Biochem. and Biophys. 108: 175-182. 1964.
11. Characteristics of a proteinase of a Trichosporon species isolated from Dungeness crab meat. By Herman S. Groninger, Jr., and M. W. Eklund. Appl. Microbiol. 14: 110-114. 1966.
12. Rapid measurement of inosine monophosphate and total adenosine nucleotides in fish tissue. By John Spinelli and Barbara Kemp. J. Agr. Food Chem. 14: 176-178. 1966.
13. Degradation of nucleotides in ice-stored halibut. By John Spinelli. J. Food Sci. 32: 38-41. 1967.
14. EDTA inhibition of inosine monophosphate dephosphorylation in refrigerated fishery products. By H. S. Groninger and J. Spinelli. J. Agr. Food Chem. 16: 97-99. 1968.

Total Resource Utilization and Process Engineering

15. Development of an instrument for evaluating texture of fishery products. By John A. Dassow, Lynne G. McKee, and Richard W. Nelson. Food Technol. 16(3): 108-110. 1962.
16. Bacteriological survey of filleting processes in the Pacific Northwest:
    - I. Comparison of methods of sampling fish for bacterial counts. By Wayne I. Tretsven. J. Milk Food Technol. 26: 302-306. 1963.
    - II. Swab technique for bacteriological sampling. By Wayne I. Tretsven. J. Milk Food Technol. 26: 383-388. 1963.
    - III. Bacterial and physical effects of pughing fish incorrectly. By Wayne I. Tretsven. J. Milk Food Technol. 27: 13-17. 1964.
    - IV. Bacterial counts of fish fillets and equipment. By Wayne I. Tretsven. J. Milk Food Technol. 28: 287-291. 1965.
17. Storage life of individually frozen Pacific oyster meats glazed with plain water or with solutions of ascorbic acid or corn syrup solids. By Richard W. Nelson. Commer. Fish. Rev. 25(4): 1-4. 1963.
18. Determining fish quality with a new electronic fish tester. By Richard W. Nelson and Harold J. Barnett. Pac. Fish. 62(12): 20-21. 1964.
19. Observations on the milky condition in some Pacific Coast fishes. By Max Patashnik and Herman S. Groninger, Jr. J. Fish. Res. Bd. Can. 21: 335-346. 1964.
20. Proximate composition, sodium, and potassium of Dungeness crab. By Richard W. Nelson and Claude E. Thurston. J. Amer. Diet. Ass. 45(1): 41-43. 1964.
21. New approaches to quality changes in fresh chilled halibut. By Max Patashnik. Commer. Fish. Rev. 28(1): 1-7. 1966.
22. Pacific hake (Merluccius productus) as raw material for a fish reduction industry. By John A. Dyer, Richard W. Nelson, and Harold J. Barnett. Commer. Fish. Rev. 28(5): 12-17. 1966.
23. Shrinkage during hot smoking of fish controlled with polyphosphate treatment. By H. J. Barnett, R. W. Nelson, and John A. Dassow. Fish. Ind. Res. (in press). 1968.
24. Using the Cotlove titrator for measuring chloride in marine products. By Harold Barnett and R. W. Nelson. Food Technol. 22: 139-141. 1968.

Radiation of Fish

25. Irradiation preservation of Pacific Coast fish and shellfish. III. Storage life of petrale sole fillets at 33° and 42° F. By J. Spinelli, M. Eklund, N. Stoll, and D. Miyauchi. Food Technol. 19: 126-130. 1965.
26. Changes in the microflora of vacuum-packaged, irradiated petrale sole (Eopsetta jordani) fillets stored at 0.5° C. By Gretchen A. Pelroy and Melvin W. Eklund. Appl. Microbiol. 14: 921-927. 1966.
27. Irradiation preservation of Pacific Coast fish and shellfish. IV. Storage life of Dungeness crab meat at 33° F. (0.5° C.) and 42° F. (5.5° C.). By D. Miyauchi, J. Spinelli, N. Stoll, G. Pelroy, and M. Eklund. Int. J. Appl. Radiat. and Isotop. 17: 137-1-4. 1966.

28. Radiation preservation of Pacific Coast fisheries products. By D. Miyauchi, J. Spinelli, G. Pelroy, and M. A. Steinberg. Isotop. and Radiat. Technol. 5: 136-141. 1967-1968.
29. Improved multipoint inoculating device for replica plating. By John P. Seman, Jr. Appl. Microbiol. 15: 1514-1516. 1967.
30. Irradiation of Pacific Coast fish and shellfish. 6. Pretreatment with sodium tripolyphosphate. By J. Spinelli, G. Pelroy, and D. Miyauchi. Fish. Ind. Res. 4: 37-44. 1967.

Pathogens in Radiation-Pasteurized Fishery Products

31. Characteristics of yeasts isolated from Pacific crab meat. By M. W. Eklund, J. Spinelli, D. Miyauchi, and H. Groninger. Appl. Microbiol. 13: 985-990. 1965.
32. Clostridium botulinum type F from marine sediments. By M. W. Eklund and F. Poysky. Science (New York) 149: 306. 1965.
33. Incidence of Cl. botulinum type E from the Pacific Coast of the United States. By M. W. Eklund and F. Poysky. Proc. Symp. Botulism, Int. Microbiol. Congr., 1966, 49-55. 1967.
34. Characteristics of Clostridium botulinum type F isolated from the Pacific Coast of the United States. By M. W. Eklund, F. T. Poysky, and D. I. Wieler. Appl. Microbiol. 15: 1316-1323. 1967.
35. Outgrowth and toxin production of nonproteolytic type B Clostridium botulinum at 3.3 to 5.6 C. By M. W. Eklund, D. I. Wieler, and F. T. Poysky. J. Bacteriol. 93: 1451-1462. 1967.

TECHNOLOGICAL LABORATORY'S POSITION IN THE BUREAU OF COMMERCIAL FISHERIES

The Technological Laboratory at Seattle is one of seven such laboratories in the Division of Food Science of the Bureau of Commercial Fisheries and is supervised by the Bureau's Regional Office in Seattle.

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