

The following is a list of projects carried out by the Technological Section of the Service's Branch of Commercial Fisheries during the fiscal year 1951, beginning July 1, 1950, and ending June 30, 1951. Included is a very brief summary of the progress made on each project. More complete details^{1/} already have been published on certain projects and reports are being or will be prepared on the remaining.

NUTRITION:

1. Effect of low and high temperatures on chemical properties of proteins--Relationship between water and fish proteins: The effect of grinding fish has been investigated as regards its relationship to the water-binding property of fish proteins. It has been shown that the water-binding property is at a minimum for meat of fish which has been coarsely ground, and as the particle size decreases the water-binding property increases. A start has been made on investigation of the effect of temperature of fish on its water-binding property.

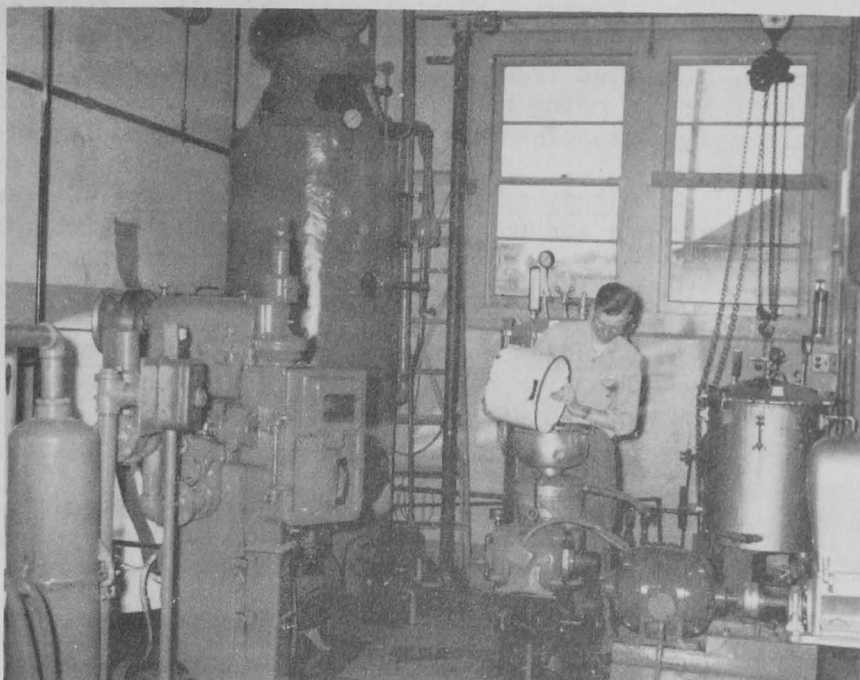
2. Utilization of salmon cannery waste for hatchery food:

- (a) A chemical method for preservation of fish eggs for hatchery food was developed by a Service laboratory. A commercial-scale test (involving 10,000 pounds of salmon eggs) of the method will be made during the coming fishing season in August.
- (b) Methods for collection and shipping frozen salmon viscera from Alaska to fish hatcheries in the U. S. will be tested on a commercial scale in August.
- (c) Analyses have been completed for niacin, biotin, riboflavin, vitamin B₁₂, and proximate composition on the experimental diets used by Federal and State fish hatcheries, and preliminary reports prepared. A rough-draft report on the analytical procedures developed for vitamin assays was completed.

^{1/}MORE DETAILED INFORMATION ON ANY OF THESE PROJECTS MAY BE OBTAINED BY THE FISHERY AND ALLIED INDUSTRIES BY WRITING DIRECTLY TO THE BRANCH OF COMMERCIAL FISHERIES, U. S. FISH AND WILD-LIFE SERVICE, WASHINGTON 25, D. C.; TO THE SERVICE'S LABORATORIES; OR BY CONSULTING WITH MEMBERS OF THE TECHNOLOGICAL SECTION.

3. Clam processing methods and clam toxicity survey: Additional packs of whole and minced canned butter clams were prepared. A small number

of samples remain for extracting for toxicity tests. As soon as additional test animals are obtained the toxicity tests will be completed and the data tabulated. A second report on the seasonal variations in toxicity of butter clams from selected Alaskan beaches was prepared covering the period from September 1949 to August 1950.



PORTION OF PILOT PLANT OF THE SERVICE'S TECHNOLOGICAL LABORATORY AT KETCHIKAN, ALASKA, SHOWING CAN SEALER, BOILER, CENTRIFUGE, AND STEAM-PROCESSING EQUIPMENT.

Results also indicate that transplanted highly toxic clams to a

beach of low toxicity do not lose toxin at an appreciable rate during a year's period despite the fact that indigenous clams remained at low toxicity throughout the period. Clams transplanted from a low toxic area to a highly toxic area showed a slight but significant increase in toxicity during the year.

4. Study to determine the hemopoietic (blood-producing) value of fish: (Cooperative project with University of Maryland.) Human feeding tests have been completed. The data are now being summarized.

5. Feeding studies with gum extracted from Irish moss: Long duration feeding tests on Irish moss extractives were initiated using rats and mice to determine the wholesomeness of these products.

6. Investigation of the toughening of frozen blue-crab meat: (Project sponsored by The Refrigeration Research Foundation in cooperation with the U. S. Fish and Wildlife Service and University of Maryland.) Data indicate that there is considerable variation in pH of freshly cooked crab meat and that there seems to be a trend toward a more alkaline pH during frozen storage. The cooked meat maintains an average low level of respiration during frozen storage of approximately one quarter as great as the fresh uncooked meat. Attempts are being made to enhance the respiration of freshly cooked crab meat in order to identify the enzyme which may be responsible for changes in texture.

7. Determination of food value of fishery products as prepared for serving: The report was completed and submitted for consideration for publication. It contains data on the proximate composition and caloric value of a number of prepared fish dishes.

REFRIGERATION:

1. Freezing fish at sea, defrosting, filleting, and refreezing the fillets: To test the proposed method of freezing fish at sea on a commercial scale, a surplus trawler was obtained by transfer from another Federal agency, and it is now being reconditioned and equipped with fish-handling and refrigeration equipment. The first commercial trial is planned for June 1951.

2. Study of fresh and frozen oysters: Darkening of oysters during frozen storage was not prevented or appreciably retarded by treating with ascorbic acid. Commercially-packed frozen oysters showed insignificant pH changes during storage. A report was submitted for publication.

3. Studies on methods of handling frozen salmon for canning: Use of frozen salmon for canning produces a slightly inferior canned product, even if the frozen fish were handled and stored under the present best conditions. A preliminary report was published.

4. Freezing pink salmon: Storage life of frozen pink salmon may be extended to 10 months or more by use of improved packaging methods, lower storage temperatures, or suitable antioxidant dips.

5. Freezing and storing Alaska shrimp and Dungeness crab: Preliminary tests indicate the quality of frozen Alaska shrimp is affected greatly by the methods of precooking and packaging. Frozen cooked crab meat in the shell stored at 0° F. was unmarketable after 60 to 90 days.

6. Palatability and cold storage life of various species of Pacific Coast rockfishes: Sebastes alutus (long-jawed rockfish) is far superior in cold storage life and slightly superior in initial palatability to other common species of rockfish. S. alutus is slightly superior to Sebastes marinus (Atlantic Coast ocean perch or rosefish) in cold storage life but very slightly inferior in initial palatability.

7. Preparation of a manual on the refrigeration of fish: The outline was prepared and literature references are being reviewed and assembled.

PROCESSING AND PRESERVATION:

1. Canning of "little tuna": Test packs indicate it is possible to prepare a canned product of commercial quality. A report on the project will be presented at the annual convention of the Institute of Food Technologists, June 1951.

2. Evaluation of the antibiotic "subtilin" as a preservative for fishery products: Application of subtilin to preservation of fresh cooked crab meat showed little promise. This fact coupled with adverse criticisms regarding use of antibiotics in foods by other Federal agencies and certain trade associations prompted discontinuance of this project.

3. Comparison of canned gill net-caught albacore tuna with the troll-caught fish: The tuna were canned in a custom cannery where certain differences existed between the procedure used and that ordinarily employed commercially. As a result the product was not well packed and considerable scorch was present. Therefore, no definite conclusion could be drawn from the test.

SANITATION AND BACTERIOLOGY:

1. Bacteriological survey of the preparation of crab meat: Limitation of personnel and funds precluded initiation of this study.
2. Growth of pink yeast (isolated from oysters) at below freezing temperatures: Limitation of personnel and funds precluded additional studies on cultural characteristics and the physiology of the pink-yeast organisms.

ANALYSIS AND COMPOSITION:

1. Chemical composition of fish, (A) Menhaden: The literature survey has been substantially completed.
2. Cooperative work with the Association of Official Agriculture Chemists on the determination of oil in fish meal: Report presented at the meeting of the Association and will be published in the Journal of the Association of Official Agriculture Chemists. Data are presented of preliminary tests using a refluxing method for the determination of fat in fish meal in an attempt to develop a method resulting in more rapid and complete extraction of fat.
3. Correlation of biological and spectrophotometric methods for the determination of vitamin A potencies: Recheck of spectrophotometric assay and bioassay was completed and data are being summarized.

BYPRODUCTS:

1. Vitamin content, particularly vitamin B₁₂ of fishery byproducts: Analytical and bioassay methods for vitamin B₁₂ were studied. An exhaustive series of more than 200 samples of fish meal and other byproducts was collected and work is in progress on the assay for vitamin B₁₂.
2. Utilization of salmon cannery waste for animal food: (Cooperative tests with the Petersburg, Alaska, experimental fur farm.) Tests indicate that frozen salmon cannery waste can be used as the main component in an inexpensive efficient diet for fur farm animals.
3. Preparation of a manual on the fish meal and oil industry: Work on this project was postponed and personnel assigned to another more pressing project.

