TECHNOLOGICAL PUBLICATIONS, FISCAL YEAR 1951-52

COMMERCIAL FISHERIES REVIEW Articles and Separates

The following technological articles appeared in Commercial Fisheries Review and were also issued as separates. Both the issue in which each article appeared and the number of the separate which was issued after the article was published in the Review are given below.

Effect of Ascorbic Acid on Keeping Quality of Frozen Oysters, by S. R. Pottinger, vol. 13, no. 7, July 1951, pp. 5-8 (Sep. 287).

Results of Some Tests with Frozen Oysters, by S. R. Pottinger, vol. 13, no. 10, October 1951, pp. 1-5 (Sep. 290).

A Study of pH of Strictly Fresh Commercially-Shucked Eastern Oysters, by S. R. Pottinger, vol. 13, no. 11a, November 1951, pp. 8-10 (Sep. 295).

Chemistry of Menhaden, by C. F. Lee, vol. 13, no. 11a, November 1951, pp. 11-19 (Sep. 296).

Cytological Studies on Lactobacillus leichmannii in the Assay of Vitamin B_{12}, by Sigurdur H. Petursson, vol. 13, no. 11a, November 1951, pp. 20-25 (Sep. 297).

Utilization of Alaska Salmon Cannery Waste as a Source of Feed for Hatchery Fish, by R. G. Landgraf, Jr., D. T. Miyauchi, and M. E. Stansby, vol. 13, no. 11a, November 1951, pp. 26-33 (Sep. 298).

Suggested Code for Fish Meal, Technical Note No. 12, by F. Bruce Sanford, vol. 13, no. 11a, November 1951, pp. 34-35 (Sep. 299).

Acceptability and Keeping Quality of Pacific Ocean Perch Fillets, Technical Note No. 13, by M. E. Stansby, vol. 13, no. 11a, November 1951 (Sep. 300).

A Brief Study of the Alkali Process for Recovery of Oil from Pink Salmon Cannery Waste, Technical Note No. 14, by R. N. Ten Eyck, H. W. Magnusson, and J. E. Bjork, vol. 13, no. 11a, November 1951, pp. 39-43 (Sep. 301).

Conducting Organoleptic Tests in the Laboratory, Technical Note No. 15, by M. E. Stansby, vol. 13, no. 11a, November 1951, pp. 44-46 (Sep. 302).

A Simple Penetrometer for the Measurement of Texture Changes in Canned Salmon, Technical Note No. 16, by H. J. Craven and John A. Dassow, vol. 14, no. 1, January 1952, pp. 18-21 (Sep. 305).

Freezing Fish at Sea--New England, vol. 14, no. 2, February 1952 (Sep. 306):
Part I - Preliminary Experiments, by Jean C. Hartshorne and Joseph F. Puncochar, pp. 1-7.
Part II - Experimental Procedures and Equipment, by H. W. Magnusson, S. R. Pottinger, and J. C. Hartshorne, pp. 8-15.
Part III - The Experimental Trawler Delaware and Shore Facilities, by C. Butler, J. F. Puncochar, and B. O. Knake, pp. 16-25.
Part IV - Commercial Processing of Brine-Frozen Fish, by C. Butler and H. W. Magnusson, pp. 26-29.

Refractive Index of Free Oil in Canned Salmon, Technical Note No. 17, by M. E. Stansby, vol. 14, no. 2, February 1952, pp. 31-33 (Sep. 307).

Proximate Composition of the Classified Trimmings from Pink Salmon, Technical Note No. 18, by H. W. Magnusson and R. K. Whitaker, vol. 14, no. 3, March 1952, pp. 23-26, (Sep. 310).

The Alaska Sheefish: Description and Proximate Composition, Technical Note No. 19, by Donna M. Galerman and Howard J. Craven, vol. 14, no. 4, April 1952, pp. 22-23 (Sep. 312).

Federal Specifications for Fishery Products, Technical Note No. 20, vol. 14, no. 5, May 1952, pp. 14-16 (Sep. 314).

REPORT OF THE FISHERIES EXPERIMENTAL COMMISSION OF ALASKA

Technological Studies on the Alaska Butter Clam, Review of Problem of Occurrence of a Toxin, by H. W. Magnusson and C. J. Carlson, Technical Report No. 2, Fisheries Experimental Commission of Alaska, Fishery Products Laboratory, Ketchikan, Alaska, issued September 1951.

ARTICLES BY FISH AND WILDLIFE SERVICE TECHNOLOGISTS IN TRADE AND SCIENTIFIC PERIODICALS

The Amazing Fish Meal Industry, by F. B. Sanford, Feedstuffs, vol. 23, no. 23, June 9, 1952, pp. 18-24.

Byproducts of the Fisheries, by F. Bruce Sanford, Fishing Gazette "Annual Review Number," vol. 67, no. 13, July 1951, p. 210.

Chapter on "Fish, Shellfish and Crustaces," by M. E. Stansby, Jacobs' Chemistry and Technology of Food and Food Products, vol. 2, 1951, pp. 560-570. Interscience Publishers, Inc. New York, N. Y.

Frozen Atlantic Oyster Investigations, by S. R. Pottinger, Food Technology, vol. 6, no. 1, January 1952, pp. 28-30.

The Menhaden Industry - Past and Present, by C. F. Lee, Fish, Meal, and Oil Industry (International Edition), vol. 4, no. 4, March 1952, p. 12.

Canning "Little Tuna," by N. D. Jarvis, Food Technology, vol. 6, no. 3, March 1952, pp. 113-117.

A Technologist Goes Non-Technical, by J. M. Lemon, 1952 Fisheries Yearbook, pp. 51-52, National Fisheries Institute, Washington, D. C., 1952.

Freezing Fish at Sea, by Joseph F. Puncochar, 1952 Fisheries Yearbook, pp. 53-54, National Fisheries Institute, Washington, D. C., 1952.

By-products Research, by M. E. Stansby, 1952 Fisheries Yearbook, pp. 103-104, National Fisheries Institute, Washington, D. C., 1952.

King Menhaden, by C. F. Lee, 1952 Fisheries Yearbook, p. 107, National Fisheries Institute, Washington, D. C., 1952.

MILD CURING, PICKLING, DRY SALTING, AND SMOKING SALMON

Mild-cured salmon is a lightly salted product which is largely dependent on refrigeration for preservation. This method of curing was first introduced on the Pacific Coast in 1889 when a shipment was prepared for the German market, but the experiment was unsuccessful. Salmon was not mild-cured in large quantities until 1898, when two small plants were established on the Columbia River. Packing of mild-cured salmon began on Puget Sound in 1901. While a few tierces were occasionally packed in Alaska prior to 1906, it was not until then that mild-curing was established on a commercial basis. A substantial part of the king salmon taken in southeastern Alaska is now mild-cured.

Mild-cured salmon must be handled more carefully than any other salmon product. In few food products is handling so important in determining the quality of the manufactured product. Red king salmon is used almost exclusively, and dressed fish weighing 18 to 20 pounds are the smallest sizes suitable for mild-curing. There is some variation in this minimum, as at Astoria, Oregon, fish of less than 30 pounds in weight are rejected by mild-curers, while in Vancouver, Canada, the minimum size is 18 pounds (dressed weight).

The following illustrations show the steps in the preparation of salmon for mild-curing:

FIG. 1 - REMOVING THE HEAD FROM KING SALMON PRIOR TO SPLITTING THE FISH.

FIG. 2 - SPLITTING KING SALMON

FIG. 3 - CLEANING AND TRIMMING KING SALMON SIDES.

FIG. 4 - SALTING KING SALMON SIDES.

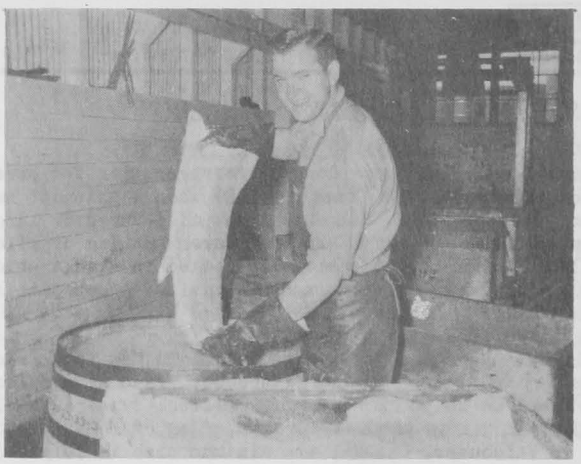

FIG. 5 - PLACING SALTED SIDES OF KING SALMON INTO TIERCE FOR CURING.

FIG. 6 - FILLING TIERCE WITH KING SALMON SIDES FOR MILD CURING.

By Norman D. Jarvis --Fishery Leaflet 60

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ODOR CONTROL IN FISH-PROCESSING PLANTS

CONDITIONS EXISTING AROUND MODERN FISH INDUSTRIES IN THE UNITED STATES: As in other industries, the conditions existing around fish-processing plants in the United States depend on both management and the type of operation. In plants which handle or prepare fresh or frozen fish for market there is little odor if proper sanitary procedures are observed. The objectionable odor which is normally associated with handling fresh fish is usually the result of decomposition. If decomposition is prevented, all strong odors will be eliminated.

The conditions in fish-curing plants are very similar to those in plants which handle fresh fish. In these plants there should be no intense objectionable odor if proper handling procedures are used.

In fish-meal plants there are sources of odors other than from decomposition which may be objectionable. These odors may have their origin in the steam from the cooking process, in the moist gases from the dryer, in the dust from the dried fish meal, or from scorching the meal during the drying process. Although these odors are quite pronounced, they are not too objectionable if strictly fresh material is used in the plant and the plant is kept clean. The use of decomposed fish in the production of fish meal will greatly intensify the objectionable processing odors.

LOCATION OF FISH-PROCESSING PLANTS: In the United States there is no fixed pattern for plant location. In most cases fish-meal plants are located at least several miles from residential areas. The distance of the plants from residential areas depends on local atmospheric conditions, such as general wind direction, temperature, and humidity. In many instances fish-meal plants are operated in cities close to the residential districts, but usually considerable effort and equipment is required to control odors from these plants.

ODOR-CONTROL METHODS: Operators of modern fish-processing plants in the United States have recognized that one method of controlling odors is to have sufficient plant capacity to handle the fish immediately on landing rather than to accumulate the fish for later processing. This method eliminates the possibility of decomposition after the fish are delivered to the plant.

The odor which is usually associated with the handling of fish may be eliminated to a great degree by good housekeeping procedures, such as thorough washing of equipment, floors, etc., and the use of detergents and chlorine solutions. A concentration of chlorine up to 50 parts per million is used for sanitizing. Specific information on sanitizing methods, detergents, and cleaning equipment may be obtained from the various chemical companies.

A number of methods for controlling odor in fish-meal plants have been proposed and tested. Reports regarding the success of these methods differ. However, it is safe to say that the odor of fish-meal plants may be reduced or at least partially controlled by one of the following methods:

1. Use of low-temperature drying methods.
2. Use of chemical deodorants in scrubbing towers.
3. Burning of odor gases.

Recently, plants in California are reported to have been successful in reducing fish-meal processing odors by lowering the temperature in flame or steam dryers. The principal reason for lowering the temperature is to eliminate the possibility of scorching the meal during drying. Other processors have used low-temperature air-drying equipment and have reported considerable success in odor control.

Chemical deodorizing systems are claimed to be the most effective. In most cases, the chemical is brought into contact with the obnoxious gases by use of conventional scrubbing towers. Chlorine has been used for a number of years in the water of the scrubbing towers in an attempt to control odors but reports differ regarding its effectiveness. Chlorine dioxide is reported to be very effective. A rather complete description of a scrubbing tower deodorizing system using chlorine dioxide is given in an article entitled "Air-Contaminating Odors Banished by New Treatment," by E. R. Woodward and E. G. Fenrich. The article appeared in the April 1952 (vol. 24, no. 4) issue of the magazine Food Engineering.

The collection and burning of gases from plants is said to be effective in controlling odors, but references to the use of this type of equipment in fish-processing plants are not available.

The following references contain additional information on plant processes and odor control in fish-meal plants.

Drying in Fish Meal Reduction Plants, Pitt, Norman, Fish Meal and Oil Industry, vol. 3, no. 12 (November 1951), pp. 6-7, 10-11.

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Converting Problems to Profits, Anonymous, Fishing Gazette, vol. 66, no. 1 (January 1949), pp. 50, 68.

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