FISH OILS IN SPRAYS FOR CITRUS TREES

The quaternary ammonium salts of unsaturated fatty acids from menhaden oil have been prepared by chemists of the U. S. Fish and Wildlife Service's Fishery Technological Laboratory. Preliminary tests by Dr. Boris Sokoloff who is carrying out contract research (with funds provided by the Saltonstall-Kennedy Act) for the U. S. Fish and Wildlife Service at Florida Southern College, Lakeland, Fla., have indicated that this substance shows promise as a fungicide for spraying citrus trees.

Quaternary ammonium salts have been used extensively in industry to make use of their surface active and bactericidal properties. Fish oils have been shown in previous experimental work by Dr. Sokoloff to possess desirable properties for application as a spray in the citrus industry. By preparation of the quaternary ammonium salts of the unsaturated fish oil fatty acids, it is hoped to combine the beneficial effects of both in a single compound. Extensive laboratory and orchard tests still remain to be carried out before the full value and methods of application for fish oil products of this type can be established.

The quaternary ammonium salt was made by first preparing the unsaturated fatty acid alcohols from menhaden oil by sodium reduction. The unsaturated alcohols were then separated by fractional crystallization, and the alkyl iodides prepared. These were then reacted with triethyl amine to form the quaternary ammonium salt, $R\overset{+}{N}(CH_3)_3\,\bar{I}$ where R is the mixed unsaturated menhaden oil fatty acids.

Note: See Commercial Fisheries Review, March 1956, p. 9.

ALASKA SHRIMP WASTE HAS POSSIBILITIES AS HATCHERY FOOD

Preliminary experimental work has indicated that meals prepared from the waste of Alaska's shrimp industry may be a valuable feed for trout. Feeding tests were conducted recently at the Oregon State College Seafoods Laboratory, Astoria, Ore., with sample shrimp-waste meals prepared at the Fishery Products Laboratory, Ketchikan, Alaska. The tests indicated that the shrimp meal, because of some unknown factors, promoted an outstanding growth rate when fed to rainbow trout. The color characteristics imparted to the trout were superior also.

Further work on marketing and production problems must be carried out, however, before utilization of the approximately one million pounds of waste dumped annually by the Alaska shrimp industry becomes a reality.

TECHNICAL NOTE NO. 33 - REDUCTION OF DEHYDRATION IN FROZEN FISH-FILLET BLOCKS

Dehydration or the loss of moisture in fishery products during storage has been a major consideration in the fishery industry since the inception of freezing and cold-storage processes. A loss in moisture of as little as 2 percent of the weight of the stored product has been found to affect adversely the flavor and texture of the product (Adams, Klein, and Simerl, 1953). Elaborate packaging procedures have been developed to minimize such losses in the finished marketed products. However, only the most primitive methods of minimizing dehydration of the product have been applied in the frozen fish-fillet block industry.

The great majority of blocks have been prepared, frozen, and stored in cold-water-waxed, kraft-fiber cartons. For shipment and subsequent storage, most blocks are then packed in corrugated cardboard master cartons. Neither of these types of packaging materials are considered to be effective barriers to the passage of water-vapor.

A consequence of such packaging has been the serious dehydration problem found in representative lots of blocks subjected to grading according to the proposed standards for frozen fish-fillet blocks. In groups of five blocks of the same history, the degree of dehydration found varied from negligible to excessive amounts.

Fillets of the type used in the manufacture of fish blocks.

Fiber-cartoned blocks in storage have shown marked dehydration in a period of time as short as three months. The spongy, dead-white appearance of the exposed surfaces became progressively more pronounced as storage continued. After 5 months of storage, the dehydration extended from $\frac{1}{8}$ to $\frac{1}{4}$-inch into the product. The dry and woolly, spongy material could be scraped from the surface of the block, exposing the solidly frozen meat in the interior of the block. The flavor and texture of such blocks, when heated, was unsatisfactory, being dry, tough, and flavorless. This was also true of products prepared from such blocks.

Even a slight degree of added protection afforded a considerable lengthening of storage life without undue dehydration. A sheet of moisture-vaporproof cellophane, placed on the surface of the block of unfrozen fillets and extending over the sides of the container to be locked into place by the cover, effectively reduced moisture transfer during subsequent storage. Frozen blocks wrapped in heavy-duty aluminum foil have been held in frozen storage for periods of over a year without noticeable dehydration.

During 1955, a total of 48 million pounds of frozen fish-fillet blocks, valued at over $9 million, were produced. If the production of frozen fish-fillet blocks is to retain its importance in the fishing industry, greater attention must be paid to the

maintenance of quality in the product. Not the least of these problems is the use of proper packaging materials to reduce dehydration during storage.

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LITERATURE CITED

Adams, E.; Klein, M.; and Simerl, L. E.
1953. Packaging Tests of Glazed and Unglazed Shrimp. Quick Frozen Foods, vol. 15, no. 6, pp. 55-57 (January).

INTERIM FEDERAL SPECIFICATIONS FOR CANNED SARDINES

The Interim Federal Specification for canned sardines (PP-S-0051c) was issued March 5, 1956, by the U. S. General Services Administration (GSA). It was developed by the U. S. Fish and Wildlife Service and the Quartermaster Corps Food and Container Institute for the Armed Forces. It is authorized as a valid waiver to Federal Specification PP-S-51b for use by all Federal agencies for the purchase of the product. It will be converted to a Federal specification after further coordination.

The new specifications are now in force for procurement but are subject to change after a six-month trial period.

The specifications were first established in 1933 and revised in 1938 and now have been brought up to date to cover many changes and improvements in the packing procedures. Among the changes has been the development of a 12-ounce institutional pack now eligible for Federal procurement.

Putting cans of sardines into cartons in a Maine canning plant.

GROWING ALGAE

The best method of growing and harvesting algae is said to be by circulating them rapidly through thin plastic tubes which expose the cells to light for only a fraction of a second at a time, permitting them to utilize the sunlight most efficiently. The bright green paste which is gathered by settling is said to taste something like raw lima beans. A harvest of 17.5 metric tons of dry algae per acre per year is foreseen. The one-celled algae when dried contain about 50 percent protein.

--Food Field Reporter, August 24, 1953.