United States Department of the Interior, J. A. Krug, Secretary
Fish and Wildlife Service, Albert M. Day, Director

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WRAPPING MATERIALS FOR FROZEN FISH

By Martin Heerdt, Jr.*

Many wrapping materials that are completely satisfactory in preventing desiccation of frozen fish products during storage do not furnish acceptable resistance to the penetration of air from the outside.

Atmospheric oxygen causes the loss of fresh flavor, the development of rancidity, the bleaching or fading of natural color, and the development of colors foreign to the fish. To minimize these deleterious effects, contact with oxygen must be avoided; for even the amount of air often inadvertently included at the time of packaging contains enough oxygen to start these oxidative changes on their way.

Experiments in progress at the Seattle Laboratory of the Fish and Wildlife Service strikingly demonstrate the inadequacy of ordinary moisture-vapor proof films in keeping air away from frozen fish fillets and steaks that have been wrapped according to present practice. Two methods were employed in packaging duplicate lots of fish. The first, or conventional method, consisted of wrapping the fillets or steaks in moisture-vapor resistant film. The second consisted of vacuum packing the fillets in hermetically sealed tin cans. After being rapidly frozen and subsequently placed in cold-storage for several months, the fish that had been vacuumized and hermetically sealed in tin were in the same condition as at the time of packing, while the samples that had been wrapped in moisture-vapor proof paper were lacking in flavor, faded, discolored, and partially rancid.

With many species a tremendous decrease in quality occurred in the wrapped samples, in some cases rendering them completely inedible, in contrast to the fresh, unchanged condition of the duplicate samples packed in evacuated tins.

These results should not be interpreted as a recommendation for the use of evacuated tin containers in the storage of frozen fish. Although such a packaging method would undoubtedly keep fish in an excellent condition over a long period of time, there is danger that if frozen fish were packed in ordinary tin cans, consumers or dealers might store the cans at room temperatures regardless of any printed cautions. Under such conditions, frozen foods would defrost and spoil rapidly; and when hermetically sealed, defrosted canned foods possess all of the requirements for the growth of Clostridium botulinum with consequent toxin production. The findings should serve to emphasize the importance of the selection or development of packages, films, or wraps that are not only moisture and vapor proof but that also resist the entrance of atmospheric oxygen.

*Chemist, Fishery Technological Laboratory, Seattle, Washington.

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14453