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# **Putting Technological Knowledge To Work in the Gulf Fishing Industry**

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## **Abstract**

A large volume of technological knowledge is available to develop the potential of the Gulf fishing industry. Data are also available to increase profits by

control of "drip loss," proper use of approved chemical additives, by better control of enzymatic and bacterial degradation of seafoods, and many other methods. A large loss of quality often occurs at the retail level, and retail merchants should be educated to better handling of this perishable product. The Bureau of Commercial Fisheries has available publications and consultants to aid the fishing industry and requests suggestions for future research, as well as a means for putting the results into effect.

THE ANNUAL MEETING of the Gulf and Caribbean Fisheries Institute is an excellent opportunity for technologists to present applied-science data to the industry. Region 2 of the Bureau of Commercial Fisheries welcomes this opportunity to point out the wealth of technological information that is available for solving problems of the Gulf fishing industry. Although many problems are new, pressing, and require additional study, publications that contain solutions to numerous existing problems are already available in our Bureau and in other agencies. Several of these problems will be listed below to illustrate the type of information available, and possible application of this information will be suggested. The problems mentioned are by no means the only ones, nor are they necessarily the outstanding ones. They merely serve as ready examples for this discussion.

#### ***Drip Loss In Frozen Seafoods***

Technological studies on loss of profits from "drip loss" in poorly handled seafoods are many and varied. Most of the Bureau's technological laboratories have publications showing the effects of improper freezing and holding of seafoods. Producers of frozen seafood can avail themselves of this knowledge and apply it to their manufacturing procedures to increase quality and profits.

#### ***Quality Retention In Frozen Seafoods***

In addition to the above studies on "drip loss" in seafoods are studies on the retention of quality at various temperatures. Briefly, these studies indicate significant loss of quality when seafoods are stored at the higher temperatures observed in commercial practice. From these studies, the inescapable fact arises that seafood must be stored at temperatures below 0 F if quality is to be retained.

The weakest link in the distribution channel to the consumer is the freezer cabinet in the retail store. Industry would benefit by taking concerted action to educate the retail store manager in the proper manner of storing and handling frozen seafoods and thus carry plant quality through to the consumer. These studies on the retention of quality in frozen foods have been published, and the publications are available free.

#### ***Chemical Additives***

Chemical additives have become suspect as the result of the unfavorable publicity recently focussed on them. Several useful additives, however, have been approved by the U. S. Food and Drug Administration for specific uses in controlled amounts. (Additives are never approved merely because they will do a certain job. An actual need must be shown for the additive.) Listed below are a few instances to illustrate proper and needed use.

**ANTIOXIDANTS AND MOLD INHIBITORS:** Smoked fish is well accepted by consumers wherever it is offered. To fit into an economical distribution pattern in our modern merchandising system, smoked fish must have a shelf life of 10 or 12 weeks.

Unfortunately in ordinary handling practices, the product comes into contact with mold spores and becomes moldy after 2 or 3 weeks at 35 F. When the technologists at the Pascagoula Technological Laboratory were made aware of this problem by industry, they solved the mold problem with sorbic acid, an additive already approved by the U. S. Food and Drug Administration for a similar problem in sliced cheese. However, during the extended shelf-life made possible with sorbic acid, rancidity developed. This new problem was solved by the use of butylated hydroxy toluene, an antioxidant approved for use in margarine and shortening. Thus, technological knowledge already available was utilized to solve production problems of mold inhibition and rancidity. Today, firms in the smoked fish business could safely embark on a widespread distribution of the product to a ready consumer market.

**BUFFERS OR pH CONTROLS:** As you may know, certain species of shrimp, such as the "sea-bob," contain an enzyme that rapidly breaks down the nitrogenous compounds of the shrimp while they are being held in ice and thereby raise their pH. Several firms are using various types of buffers, such as phosphates and citric acid, to control the pH and prevent corrosion of the cans and blackening of the product, which are the usual results of canning shrimp of high pH. Recent work at the Pascagoula Laboratory using citrus juice to treat these shrimp is promising.

Chemists have assigned a corrosion-prevention power to citrus juice concentrate far above its mere buffering power. Some workers have theorized that the pulp and peel included in the concentrate may partly cause this action. Whatever the reason for the efficacy of citrus juices, manufacturers of products containing it can list citrus juice as an ingredient rather than having to declare a chemical additive on the label. The point here, however, is not to stress the use of any one additive, but instead, to point out that information is available that makes possible the utilization of a species that is difficult to can.

#### ***Protein Utilization Data***

The Branch of Technology of the Bureau of Commercial Fisheries has published extensive information on the utilization of protein from industrial fish. My discussion on this aspect will be limited to species other than menhaden.

Our files contain data on production, handling, and nutritive value of these fish. Also, the Gulf Exploratory and Gear Research Unit has published data showing that large stocks of the industrial fish are available in nearby waters.

The demand for meals of high quality is good. We know of one firm producing meal of such quality that they have a standing order for all of their output. Information on how to produce a high-quality meal is available, and our technologists can supply additional help if necessary.

#### ***Bacteriological Controls for Sanitation and Quality***

The most carefully planned program of plant sanitation may contain oversights that result in a finished product with a high count of undesirable bacteria. To combat this, the modern plant manager finds that a very useful tool is bacteriological control. Bacteriological analysis of production-line samples and of surface swabs will demonstrate the efficiency or failure of the program. Careful bacteriological studies can actually pinpoint the items of equipment that contribute the high counts. Several Bureau laboratories and many State and Federal agencies have made studies on this problem.

Bacteriological analyses by regulatory agencies are being used increasingly

to support plant inspections. The present-day plant manager should know before any outside inspection just how his firm stands in so far as bacterial counts are concerned. In short, each producer of seafood should establish some form of bacteriological control. This control is particularly helpful with the recent trend toward establishment of standards for frozen foods. Private consultants have provided this service satisfactorily for many plants.

The importance of bacteriological control is indicated by the fact that it has been the subject of many talks by other Bureau technologists. It should be a topic of interest to all who are concerned with the processing, handling, or storage of seafoods.

#### ***Much Technological Information Available***

The Bureau publishes *Commercial Fisheries Abstracts*, which covers material pertaining to fisheries from all over the world, including its own scientific publications. These abstracts are on file in each Bureau office to assist us in answering your questions. Interested persons may have CFA mailed to them free of charge upon request by writing to the Director. In addition, other sources of information, such as the monthly journal *Commercial Fisheries Review* is published, which contains original articles of interest to commercial fisheries.

Many people familiar with the problem of getting scientific information into the hands of ultimate users have suggested an approach similar to that used by the Department of Agriculture in their County Agent program. Perhaps it will be possible some day to have the funds, facilities, and personnel available to carry the information directly to the plants where the seafoods are produced.

At Pascagoula, a step has been taken in that direction by the holding of a Canned Shrimp Seminar. Round-table discussion between members of the industry and the laboratory personnel resulted in the dissemination of information on problems from both the commercial processors and the research workers. Additional seminars covering other products are planned.

We invite all interested persons in Region 2 to send their requests for information on fishery technology to the Pascagoula Technological Laboratory.

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## **Report on the New Albatross IV**

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A NEW ERA in fisheries-oceanographic research will soon begin with the commissioning of the ALBATROSS IV. The new vessel has been built to serve the research needs of the Bureau of Commercial Fisheries Biological Laboratory at Woods Hole. It is one of several new vessels to be built by the Bureau to assist in meeting the pressing demands for a better understanding of oceanic resources.

The ALBATROSS IV perpetuates an illustrious name in the annals of marine research that started with the steamer ALBATROSS, launched in 1882. It was the first vessel built especially for marine research by any government, and like