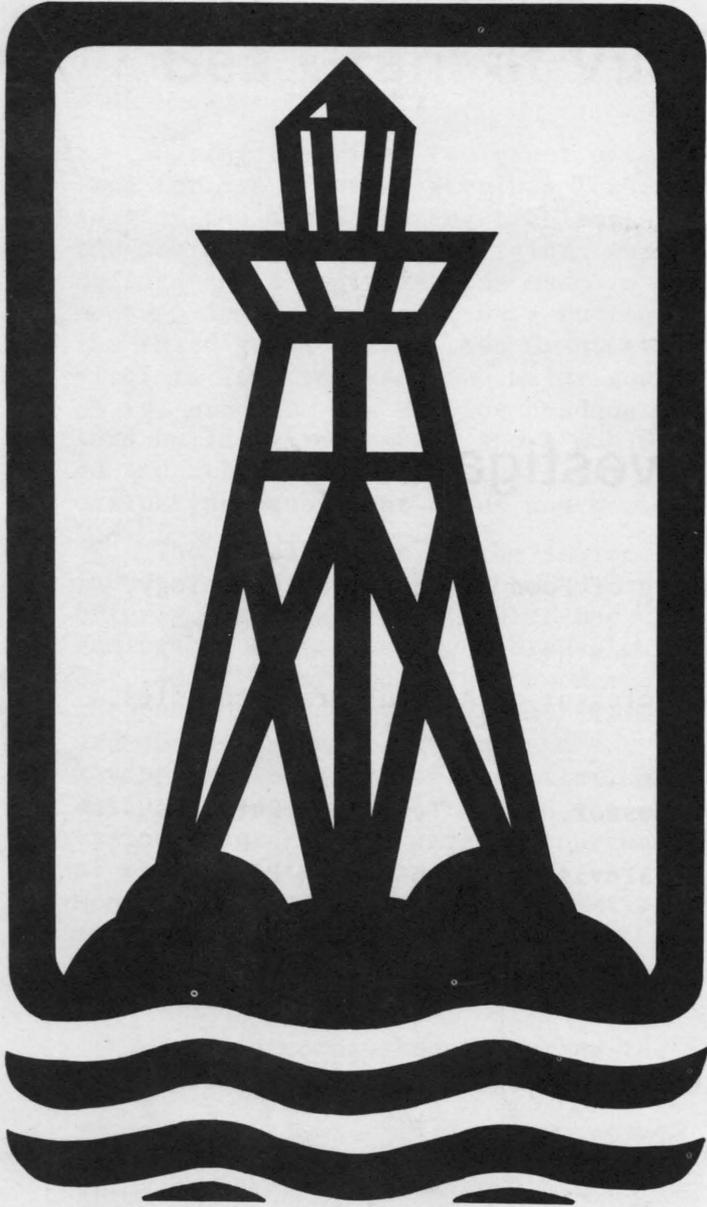


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Sea Grant at Virginia Tech

Third Annual Report • February 16, 1975 to February 15, 1976

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SEA GRANT AT VIRGINIA TECH
COOPERATIVE EXTENSION SERVICE, EXTENSION DIVISION
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Sea Grant at Virginia Tech — 1975

During the first two grant periods for Sea Grant at Virginia Tech, some of the more pressing problems of the seafood industry in Virginia were defined and a beginning was made in meeting some of these needs. During the third grant period, Sea Grant at Virginia Tech realized two major goals of its program — a service headquarters building in Hampton and a published and utilized audit system for evaluating management needs and goals.

The problems facing the seafood industry in Virginia have been defined, briefly, as: deterioration of the ecological system in the Chesapeake Bay, James River, and other estuaries; international competition; inefficiency and obsolescence; cash flow and marketing problems; lack of organizational unity; and competition between the various users of the water resources of the state including sports fishermen, industrial interests, recreational users and vacationers, military users, and the commercial fishermen and seafood processors.

Other accomplishments during the third grant period include the



stationing of a seafood Extension agent in the Hampton area, the publication of a computerized directory of seafood processors in Virginia, the provision of engineering and laboratory aid and advice to solve specific processing problems, the discovery of new food uses for underutilized species, and the provision of marketing and management advice to processors.

COOPERATIVE EXTENSION SERVICE, NOAA AGREEMENT

With the signing of the agreement between the Cooperative Extension Service of the U. S. Department of Agriculture and the National Oceanic and Atmospheric Association of the U. S. Department of Commerce, late in the second grant period, a number of advantages have accrued to the Sea Grant at Virginia Tech program, namely:

1. all the resources of the well-established Cooperative Extension Service were made available to the seafood industry in Virginia;
2. additional agents with marine-oriented responsibilities could be assigned to Extension offices;
3. additional administrative staff was not necessary because these new agents and services could be incorporated into the already-operational Extension Service;
4. a wider range of community problems could be addressed, and a wider range of resources called upon for solutions;
5. all of the state's Sea Grant Advisory programs could have their effectiveness and efficiency enhanced, including the program at the Virginia Institute of Marine Science.

SPREU — The Seafood Processing



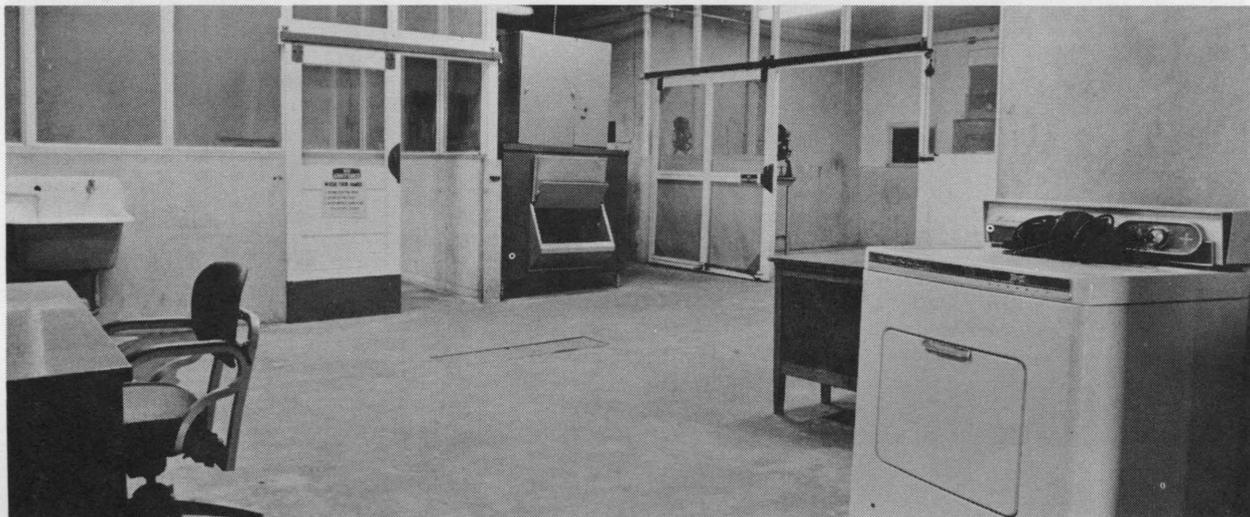
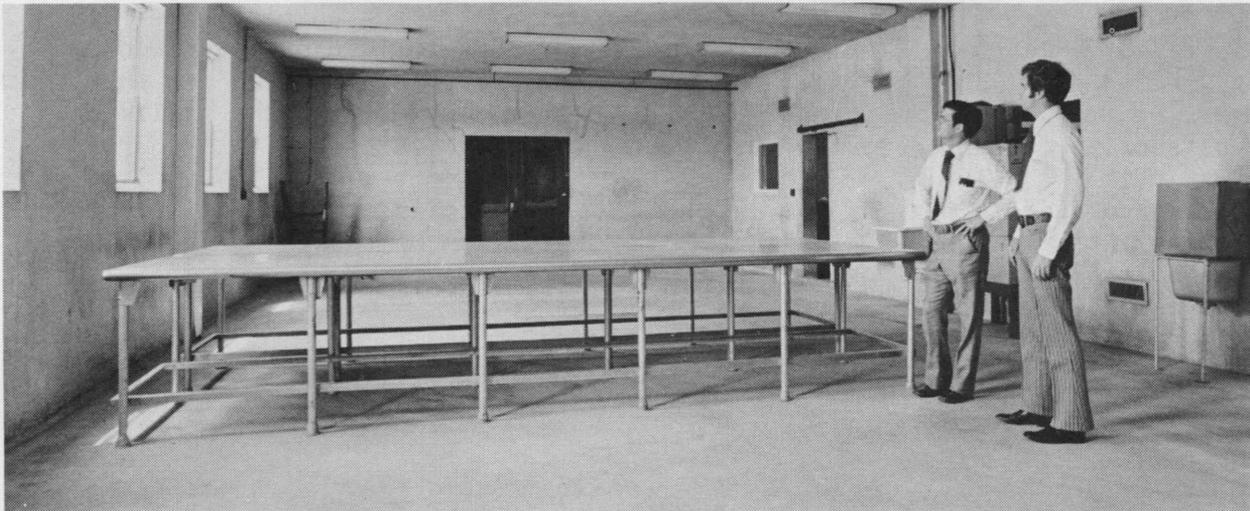
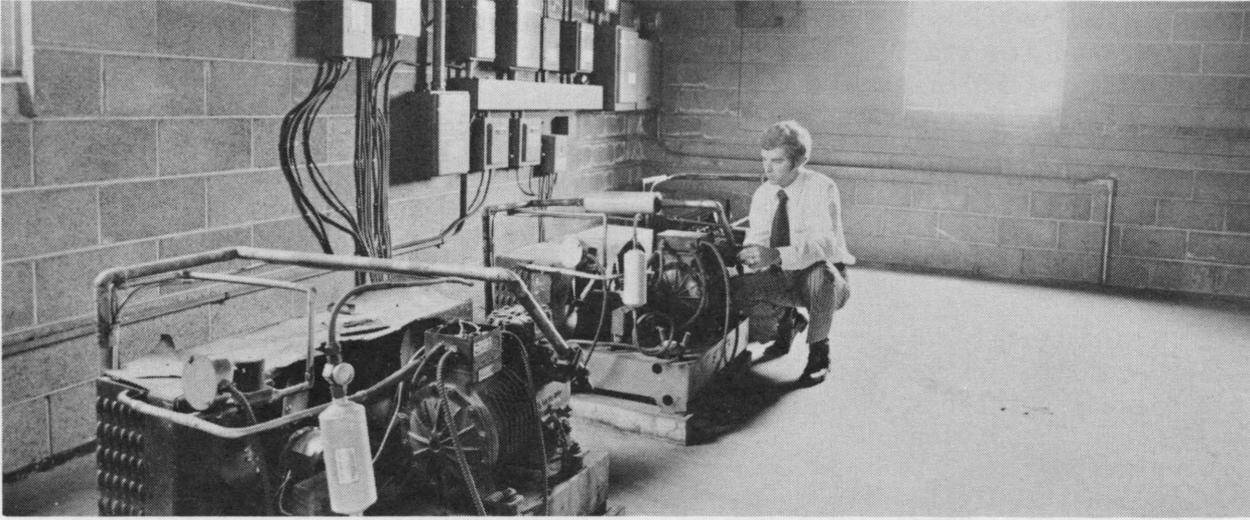
Another major step toward resource and service coordination was taken during this grant period, when Sea Grant at Virginia Tech acquired a service building in Hampton to serve as headquarters for advisory (extension) and research programs. The former G. T. Elliott packing plant at 102 South King Street formally opened on July 1, 1975, as the Seafood Processing Research and Extension Unit (SPREU) of the Department of Food Science and Technology of Virginia Polytechnic Institute and State University, under the direction of Donn R. Ward.

The potential of the SPREU facility is a result of many contributing factors, among which are size, location, internal and external design and construction, and existing facilities. The 7,000 square-foot, two-story structure, built in 1957, is situated next to viable seafood processing plants, is located on the water, and has approximately 150 feet of dock

space. This proximity to the seafood industry's producers and processors allows for strong ties and rapid communication with the users of the advisory service information.

The design and construction of the building, which at one time was a seafood processing plant, are such that the building will lend itself readily to modifications. Facilities present at the time of acquisition, vital for the development of the seafood technology program, include two walk-in freezers, one walk-in refrigerator, one walk-in cooler, two commercial-size retorts, and several large stainless steel worktables. Long-range plans for the SPREU facility include the construction of a laboratory with bacteriological and analytical capabilities for testing of seafoods; a pilot plant for study of new methods for processing, pasteurizing, or canning seafoods; a classroom for short courses, conferences, and workshops which will be available to the whole seafood

Research and Extension Unit — Hampton



industry; and offices and storage areas. SPREU will be, in essence, an experiment station for service to the seafood industry. However, the building and its staff will also serve as an information-dissemination facility and a link between the seafood processors and producers on the coast and the university in the mountains.

FIRST SPREU COURSE

Approximately 70 Extension Homemaker Club leaders participated in the two one-day workshops on purchasing and processing of seafoods, sponsored by the Newport News Unit Extension Office and the Virginia Tech Sea Grant Project, at the new Research and Extension Unit in Hampton during October.

George J. Flick discussed "How and What to Purchase": quality characteristics, market forms, grades, and costs of seafoods and seafood products.

According to many of the participants interviewed, the highlight of the course was the demonstration of processing of various seafoods in the

home. Mr. John Bradshaw, of Amory's Seafood Market in Hampton, demonstrated how to clean and fillet finfish. Extension staff members demonstrated shucking oysters and picking crabs.

The last part of the three-hour course was a discussion by Donn Ward on "How to Preserve and Store Seafood." He talked about packaging, canning, freezing, and proper storage of seafoods in the home.

The fish and other seafoods used in the demonstration were made available at no cost to the participants in the course, who paid only a \$2.00 registration fee.

A teaching manual that parallels the lectures was prepared and a copy mailed to each participant. It is intended for use by the Extension Homemaker Leaders, who can then teach their club members the skills and knowledge gained in this course.

A similar course was offered to Extension Homemakers of Hampton, in December.



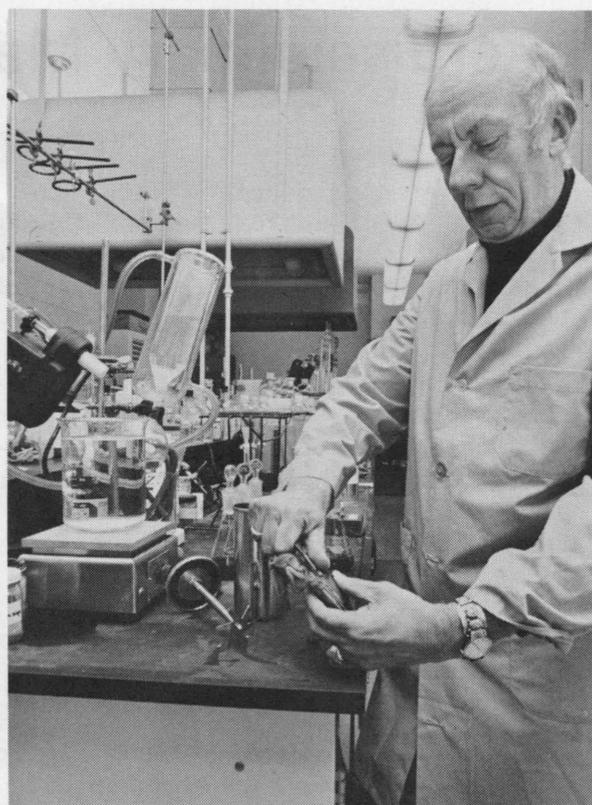
Kepone

Unfortunately, late in 1975 a problem of major proportions hit the seafood industry of Virginia, when the state and federal officials concerned began to document the effects of Kepone poisoning on human beings and the extent of the Kepone pollution in the James River. Sea Grant at Virginia Tech was one of the state agencies represented on the Governor's Kepone Task Force, and served particularly to analyze seafood samples for their Kepone levels, using the methods and laboratory facilities, including the mass spectrometer, of Dr. Roderick W. Young's in the Department of Biochemistry at Virginia Tech.

A number of projects planned by Sea Grant at Virginia Tech had to be postponed, so that time and money could be diverted to analyze and then try to find some way of alleviating the effects of the Kepone disaster on the seafood industry.

The closing of the James River to all commercial and sports fishing for a time, and the detrimental effect of the adverse publicity on the acceptance of Virginia seafoods both locally and nationally, have been major disasters for many persons who made their living by harvesting or processing seafoods from the James and/or the Chesapeake. "No Virginia Seafoods" and similar signs have been appearing in areas which used to be major markets for Virginia seafood processors. It should be made clear that fishermen and others involved in seafood and other maritime pursuits had nothing whatsoever to do with the use, manufacture, or discharge of Kepone into the James River.

Sea Grant at Virginia Tech personnel will continue to cooperate with the Governor's Kepone Task Force



as requested by that agency, and will work to aid the industry by trying to find new markets, species unaffected by Kepone, and ways to eliminate or detoxify Kepone in the affected species.

Near the end of this third grant period, the Environmental Protection Agency finally had acquired enough data to establish an action level for Kepone in various species of seafoods (0.1 ppm for finfish, 0.3 ppm for oysters, and 0.4 ppm for crabs). Establishment of the action levels allowed seafoods from areas where samples tested below that level to be marketed, and some order began to reappear in the markets and plants offering seafoods for sale. And a Sea Grant at Virginia Tech study indicates that oysters may depurate Kepone, once they are placed in Kepone-free water, in as little as four summer months.

Interdisciplinary Management Workshop

For Professionals Working

The major achievement of the Agricultural Economics members of the Sea Grant at Virginia Tech program, during the third grant period, was the development of a workshop course for professionals who work with the seafood industry. The course was based on a management team audit of a specific firm, with detailed information on finances, inventory, procedures for handling fish and other seafoods, relationship with fishermen, equipment, legal problems, staff, both wholesale and retail marketing, storage, movement of raw to finished product through the plant, etc.

Held in Treasure Island, Florida, in February 1976, the workshop had about 40 participants, from all over the country, with leaders from various parts of the U.S. and from several fields of expertise. Each brought his special interests and talents to bear on the general problems facing firms marketing seafood, in an effort to find team-work solutions and to communicate these solutions to companies and individuals engaged in the processing and marketing of seafoods.

The workshop is part of a program designed to develop a comprehensive, interdisciplinary, scientific approach to the management of seafood marketing firms. The objective is for the specialist — engineer, food technologist, educator, or economist — to "sit in the seat" of the seafood firm's manager, in order to grasp an understanding of his problems, so that a team approach may be developed for solving the problems contributing to inefficiencies in the seafood marketing industry.

The method of the workshop began with a detailed study of a real firm

which is actively engaged in marketing of seafoods, with attention to the many different functions involved — transportation, processing, retailing and wholesaling. Its real marketing and management problems were analyzed by the workshop leaders in order to assist the professionals attending the workshop in making recommendations at the individual firm level in the areas of supply and demand, financial management, long range planning, productivity, etc.

Workshop leaders worked together as a Management Study Team in preparing the case study report which served as the "textbook" for the workshop.

During the first session Lewis F. Norwood (Extension Service, USDA) divided the participants into "advisory panels" or teams, each team consisting of 4 to 5 persons with differing specialties — food technology, marine science, economics, marketing, etc.

Norwood began by asking "Why are we here — what are we doing?" After some discussion among the workshop participants, he drew the conclusion: "We're here to learn how to help firms make more money." Norwood outlined seven steps necessary to develop an effective organization and pointed out that no one expert could advise in all areas. The seven steps include statements of need, purpose, objectives, policies, action plans, procedures, communications, and evaluation.

During the following days, the workshop participants studied these seven categories in depth, using the case study firm as an example.

With the Seafood Industry

At the second workshop session, Norwood posed the question, "Would you buy this firm? How much would you give?" Each team was first directed to determine what they considered to be the strengths of the case-study firm. The value of the team approach was evidenced as the various teams reported their recommendations and evaluations, which showed substantial differences — some teams recommending actions nearly opposite to the recommendations of other teams. Other items considered, one at a time, by the workshop teams were the firm's weakness, problems the manager should begin working on, and potential opportunities the firm should plan to cash in on.

J. Perry Lane (National Marine Fisheries Service, Gloucester, Massachusetts) discussed the productivity of the firm: how fish are caught, how they are handled at the dock; and how they are marketed. This presentation included color slides and floor plans of the firm's fishing ships, dock area, and buildings. The workshop teams then analyzed these procedures of the firm, determining what they considered the strengths and weaknesses of each operation and what recommendations they would make to the management. George J. Flick (VPI&SU) aided Lane in the correlation of recommendations by the teams. Don L. Long (VPI &SU) discussed ways to use the materials provided in the workshop, in a one-on-one approach to a firm.

The Organization of People — the human resources available to the firm — was discussed by Coale, who pointed out that any reorganizational plan must take into consideration the personalities and abilities of the persons available, and must provide for succession and promotion.

The workshop teams were assigned as "homework" the development of goals for the firm to meet by 1980 and a procedural program to enable the firm to meet the goals.

Norwood specified that the workshop teams needed to set sales objectives for the firm; he assigned each workshop team to write five major objectives for the case-study firm.

After the management team has agreed on its sales objectives, it can then set action plans for carrying out and meeting these goals. Norwood emphasized that these plans should have specific time limits.

One of the workshop leaders, Bud Hodgdon (Farm Credit Banks, Springfield, Massachusetts) had prepared over 50 pages of financial statements and reports for the case-study firm. Hodgdon recommended that the manager receive a financial and inventory report each day, so that he can keep up with how the business is doing, where weak spots are, and actually manage.

Other financial questions posed by Hodgdon were "how do we establish standards — how to determine what sales should be compared with what they are, or what labor costs should be?"

Jimmy Goodwin (LSU) summarized, after the two-day workshop experience, the value and operation of the management audit technique developed during the workshop. He pointed out that it is a "tool" for improving business" but also has "benefits for educators."

Preston Smith (Department of Commerce), moderator for the last session, stated that the management team audit assists both the industry and the consumer, and is, therefore the "real role that the federal

government should be involved in." Ken Roberts (Clemson University) pointed out that it is "dangerous to use information on a scanty basis" and that the audit team should work with "public sector groups" who are in the firm's area on nearly a daily basis.

Ranzell Nichelson (Texas A & M University) stated that individuals attending the workshop have been "doing the same thing in little units, like a sanitation audit, a financial audit" — but the management team audit is "the whole thing." He suggested the need for evidence of results, one to two years later, and that a team work with other members of the firm besides the top management.

One of the highlights of the workshop was the discussion by Richard N. Larsen (Chatham Seafood Cooperative, Massachusetts), an actual manager of a seafood processing firm with some of the same problems as the case-study firm. After experiencing the workshop, he stated that he felt such audits would be of value anywhere in the country, and particularly for firms in his area.

Don L. Long (VPI&SU) summarized the workshop's purpose by stressing the necessity of interdisciplinary work — for example, an engineer may suggest something, a financier must say if the question is financially feasible, etc. Long stressed that before any recommendations are made, the firm's strengths, weaknesses, and objectives must be clearly formulated.

SEMINAR FOR SEAFOOD MARKETING MANAGERS

Three workshops, based on the publication *A Seafood Marketing Firm; Feasibility, Management by Objectives, A Productive Economic Model, and Profitability Based on Predetermined Goals*, were offered to industry members in Wachapreague, Chincoteague, and Hampton, Virginia, during March. The workshops instructed participants on the techniques and procedures necessary for conducting an economic analysis of their seafood marketing firms.

CITIZEN'S PROGRAM FOR THE CHESAPEAKE BAY

During April, VPI&SU, University of Maryland, and industry spokesmen presented an eight-hour workshop to Extension agents in Fredericksburg on the uses, problems, needs, and conflicts in the Chesapeake Bay area.

In cooperation with the Citizen's Program for Chesapeake Bay, Agricultural Economists from Virginia Tech provided advisory and consulting services to the Executive Committee, published their newsletter, and provided aid, expertise, and facilities for publishing several booklets (see Publications section).

Assistance to Individual Firms — 1975

Both the Extension Specialist assigned to the Hampton SPREU building, and representatives of the three areas of expertise represented by Sea Grant at Virginia Tech staff — Agricultural Economics, Technical Services, Food Science and Technology — made periodic and by-request visits to seafood processors, to provide assistance in solving specific local problems and to maintain awareness among the processors of the services available to them through the program.

Such visits provided the following services, among others:

1. a study on the heat stability of enzymes during retort operations and pasteurization in blue crab meat.
2. assistance in developing a frozen crabmeat casserole product which could be marketed competitively, would possess adequate shelflife, and would meet both state and federal food laws; the product has been successfully test-marketed.
3. assistance to determine the cause of heavy and periodic losses of refrigerated pasteurized crabmeat, within a few weeks of processing. We determined that these losses were caused by inadequate cooling of the cans prior to refrigeration, and by use of storage boxes which inhibited air circulation around the cans in the refrigerator.
4. a feasibility and market study of the market potential for rock crabs (*Cancer irroratus*), a presently underutilized species, in Florida as a substitute for stone crabs which are in limited supply. We estimated that total sales the first year should range from five to ten thousand dollars.
5. an economic and processing study of the technology of using fish scrap as crab bait for local watermen. Such scrap is usually ground, bagged, and frozen for sale to mink growers as mink food, but this market may be sporadic since it depends on the state of the U.S. economy. The alternative use, as crab bait, was determined to be prohibitively expensive at this time, because of the expenses of using a binder to hold the scraps together during manufacture of the bait.
6. evaluation of a cooking process for crabs which is traditional in the deep South. The usual processing procedure is to steam crabmeat at 15 pounds pressure at 250°F for 10 to 12 minutes. This process successfully cooks the crabmeat but results in significant moisture loss, which translates into pounds of saleable product lost to the processor. The evaluated procedure involved boiling (cooking at 212°F), which also cooks the crabmeat but retains moisture and thus results in higher yield. We determined that heat penetration was sufficient for microbiological acceptability of the product, and the processor is proceeding with design and development of a system for boiling large volumes of crabs.
7. an in-service training program for workers at Smith Crab Company, Reedville, designed to improve the efficiency of meat recovery by changing their processing techniques. We estimated the plant was losing up to \$30,000 per year because workers didn't remove meat from the tops of crab cores.

8. a study on heat stability of enzymes during retort operations and pasteurization of blue crab meat. We determined that enzyme activity was reduced by heating but regenerated during 14 days cold storage. Studies are continuing on this problem.

Assistance to Consumers

In addition to work with seafood processors, Sea Grant at Virginia Tech personnel have answered numerous telephone inquiries from consumers of seafood products. Such contacts are regarded as an important component of the SPREU program. Expanded consumer awareness of seafood products as well as an understanding of the proper methods of processing and packaging of seafood products assists the seafood industry in expanding its markets. Also, consumer programs generate understanding relative to the seafood industry's problems of intensive manual labor processing, low yields, and troublesome but often unavoidable defects such as small pieces of shell and grit.

Besides offering courses to consumers, extension homemakers, and others at the SPREU facility, we organized a tour of Virginia's seafood industry for patrons of the Peninsula Nature and Science Museum. We have participated in six local television interview programs, discussing timely topics related to seafoods.

Continuing Research

Research is continuing on a number of projects, including:

1. identification of the chemical or microbiological mechanism by which nodules form in stored herring,
2. development of a technology for retarding nodule formation on herring,
3. development of a computer program for calculation of thermal processes,
4. study of enzyme formation in pasteurized blue crab meat.



Engineering — 1975

Energy conservation in cold storage rooms was the major concern of the engineering consultants during the third grant period. Individual processors were advised on techniques appropriate to their plants, including summer shading, air doors, and proper insulation.

The development of a machine to sort and count clams was suspended for a number of reasons by the private firm which had under-

taken the project. The Office of Sea Grant was consulted and a method developed whereby assistance could be continued, so that this much needed machine could be perfected.

A new sound absorbent panel which has proved effective to poultry processing plants was tested for use in other food processing plants, where noise is a problem. The panel is easily cleaned and has been approved by the USDA.



Other Projects — 1975

SEA GRANT AT VIRGINIA TECH personnel participated as leaders, planners, and consultants for a number of training workshops during the third grant period, including:

Four "Town Hall" meetings of the Eastland Fisheries Survey as commissioned by the 93rd Congress	4 evenings, January
Effect of Processing on Nutrient Composition of Foods In-service Training for Extension Agents	4 hours, May
Wise County Food Service Workshop In-service Training for food workers	2 days, May
Fifth Annual School Food Service Conference	3 days, June
Food Preservation Workshop In-service Training for Extension Agents	3 days, June
Russell, Dickenson, Buchanan Counties Food Service Workshop In-service Training for food workers	8 hours, August
In-service Training for Extension Agents, Hampton	8 hours, November

Advisory and Information Services — 1975

Taping began for a series of programs to be released under the pseudonym "Damon Dolphin" to radio stations for public service broadcasting time. The one-to-two minute spots will focus on one seafood-related item at a time, and will feature the voice of Joe Brush, radio specialist with the Information Services Radio/TV unit. Connie Blackwood and Jim Jenkins of the same unit are collecting the information and writing the scripts.

"Picking the Blue Crab" — an eight-minute color movie illustrating how to pick and eat a blue crab — was completed and offered for sale or loan. Filming was done on location at two seafood processing plants in eastern Virginia, and production was handled by Gerald Scheeler of the Motion Picture Unit at Virginia Tech.

The film describes and demonstrates the correct procedures for both left and right-handed people, and shows how to remove flake, lump, back-fin, and claw meat. It is intended for general audiences and assumes no previous knowledge or experience on the part of the audience.

M. C. Holliman who replaced Ellen Savage, the original editor of the *Virginia Marine Times*, continued the successful features and subjects of the newsletter, including new patents for seafood products, research projects in the state, and news about the seafood industry in Virginia. The new editor, after a period of becoming acquainted with the processing industry and with seafoods, intends to expand the publications and other written communications of the Sea Grant at Virginia Tech program.

News releases to daily and weekly newspapers, informational mailings of items of interest to processors, interviews on television and other media — these were some of the other direct ways in which Sea Grant at Virginia Tech personnel maintained contact with the general public and with the seafood industry.

Both the Tri-State Seafood Committee and the Industry Advisory Committee continued to meet regularly, and to offer advice both to processors and to Sea Grant personnel concerning the best ways to enhance the seafood industry in the state.

Budget* — 1975

Salaries and Wages	\$46,025.00
Expendable Supplies and Equipment	750.00
Travel	5,000.00
Publication and Documentation	2,560.00
Educational Materials	155.00
Workshops	140.00
Indirect Costs	13,808.00
TOTAL EXPENDITURES *	\$68,438.00

*Includes both federal funds and university cost sharing funds.

Publications — 1975

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