Problems In Marketing Canned Fishery Products

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ABSTRACT

The biggest marketing problem facing the canned fish industry is the one basic to the entire fishing industry—difficulties in effecting an increase in the per capita consumption of fish in the United States because of the competition of other protein foods. In addition to this basic challenge, fish canners are beset with three additional major marketing problems: fluctuations of raw fish supply, competition from increasing numbers of domestically produced "convenience fish products" in both fresh and frozen forms, and increased competition from imports greatly favored by relatively low production costs.

Florida's Fish Marketing Problems Can Be Solved

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ABSTRACT

The Florida fin fisheries have suffered a market decline during the past few years. After 1953, the market price of mullet, the leading food fish, decreased rapidly.

Research has centered around the following points: (1) the past and present markets for Florida mullet, (2) the forces competitive with the markets for Florida mullet, (3) the possible expansion of present markets, (4) the present methods of handling, preserving, packaging, shipping and selling fish. The major portion of the decrease can be attributed to three factors: first, increased competition from other seafood and meat products; secondly, accelerated growth of the supermarket and conversion of these supermarkets to self-service; and thirdly, the inability of the Florida seafood industry to take advantage of the marketing and technological innovations that occurred during the past few years.

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Production and Distribution Costs in Florida Fisheries

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Introduction

IN 1953 the Bureau of Economic and Business Research at the University of Flordia made a field survey to obtain information on the production and distribution activities of the Florida producers (initial wholesalers) of edible fish and shellfish. Part of the information from this survey was incorporated into a statistical report which was presented at a meeting of the Southeastern Fisheries Association in June, 1953.

After the 1953 field survey the Bureau continued its study of the Florida fisheries, utilizing information from a number of sources, and has published a report on its investigations entitled "Florida's Commercial Fisheries—Markets, Operations, Outlook." In the present paper a report will be made on some aspects of production and distribution costs in certain Florida fisheries.

In obtaining production and distribution data in the 1953 survey, questionnaires were sent to all known producers in the state and interviews were carried out with a large sample of them. Although many responded to the questionnaire and interview, adequate and usable production and distribution cost information was received from a comparatively small proportion of these respondents. The average costs reported here are based on only the reports that were usable and thus represent no more than the average costs of those reporting the information. Complete reports on production costs were received on 21 boats engaged in gill net operations, and fishing principally for mullet or Spanish mackerel, on nine boats employing lines, and fishing principally for snappers and grouper, and twenty-two shrimp boats using otter trawls. Although we cannot say that the costs of these operations reflect the averages for these various segments of the industry, it is believed that they are indicative of the cost conditions in the industry because of the similarity of the fishing operations within the segments.

In summarizing and analyzing the distribution costs of the producers, the same approach was followed as that used for production costs. Distribution costs cannot be broken down in the same manner as production operations; however, distributors were classified into three groups on the basis of the principal species of fish handled: those whose most important species were (1) mullet and Spanish mackerel; (2) snapper and grouper; and (3) shrimp. Again the distribution costs of the producers represent no more than the average costs of those reporting.

One of the first problems encountered by the Bureau in its attempt to secure cost data was the lack of complete and accurate firm records on fishing operations—a factor which led to the decision to obtain data on only the producers' major cost elements in production and distribution. A further justification for this approach was the belief that sufficient information would be revealed on the existing cost structure, and about per unit costs of production and distribution, to indicate some of the cost problems in certain major segments of the Florida fisheries.

In examining the information on overall average costs for certain types of fishing operations, various, more detailed aspects of costs were noted that should be subjects for future study. For example, there is a need to examine the influence of geographic location on the cost of mullet fishing. The northern part of Florida's west coast as opposed to the southern part presents different production situations. The type of ocean bottom limits the type of gear that may be used in the northern area and the average sizes of fish are different from those landed in the southern area. There are also the important questions as to the use of other types of gear as a means of increasing productivity over that now being achieved by gill-net fishing. There is need to know more about the efficiency of specific types of boats and gear operations within all of the major fisheries. These matters cannot be dealt with here but study specifically oriented to them should be initiated.

Production Costs in the Mullet and Spanish Mackerel Fisheries

Producers' records reveal that the gross return to small boats may vary from

considerably less than a thousand dollars to over ten thousand dollars per year, depending on the time spent fishing, the skill and success of the fishermen, and the types of boats and gear employed. Given these conditions, which made it difficult to obtain representative data, even if the records were available, it appeared more feasible to examine the cost data on boats reported to be actively engaged in fishing operations throughout the fishing season. The twenty-one boats on which the cost figures for gill-net operations are based ranged in size from 20 to 37 feet. One boat had total annual landings of slightly less than 26,000 pounds, whereas another had landings of approximately 100,000 pounds. Within these limits the majority landed from 40 to 60 thousand pounds during the year. The average number of pounds landed per boat for the year was 53,180. The value of the production per operating unit was $5,763 and the value per fisherman was $2,575. There were an average of 2.24 men per boat, so that on the basis of the average labor cost of $3,166 per boat, the fisherman's average wage was $1,413. The costs as a percentage of the sales value were labor 55.0%, gear 12.0%, gas 19.4%, oil 0.8%, maintenance (repairs) 8.9%, depreciation 7.1%, ice 0.9%. These costs were 104.1% of the sales value of the fish. These figures readily suggest the reason why producers would prefer the fisherman both to own and operate his boat. There is little profit to be obtained from boat operations if costs conditions such as these prevail, and the difference between profitable and nonprofitable boat operations will be closely linked to the costs of maintenance and repairs and the speed with which the replacement of capital items will occur.

Although precise average profit or loss from boat operations cannot be ascertained because of incomplete cost data, the figures on average cost of mullet and Spanish mackerel boat operations show that even though the average wage to the fisherman is low, the average labor cost per pound of fish landed is high. Also, the fuel cost is equal to about 20 per cent of the value of the product landed, which is much greater relative to value of product than was found for the other fisheries. Given this cost situation at the production level, the existing transportation rates, and the customary margins at the various levels of distribution, fresh mullet and Spanish mackerel moving to the New York wholesale market will require an average retail price of from 29 to 36 cents per pound. This is the price for the fish in the round, not drawn or dressed. If mullet and Spanish mackerel are drawn or dressed, the required price will be from 39 to 48 cents. If the two varieties are filleted by the retailer, the required price per pound would be from $1.00 to $1.20. If mullet and Spanish mackerel are sorted, packaged, and frozen before distribution, it is estimated on the basis of an average price of 10.8 cents per pound paid to the fisherman, that the required minimum retail price would be 94 cents. The term "required price" as used here indicates the price which results when the customary margins and transportation costs are added to the average price paid to the fishermen, plus any processing costs that may have been incurred before distribution.

Production Costs of Snapper and Grouper Fishing Operations

The operation of the snapper and grouper boats was characterized by a high degree of seasonality. One boat reported as much as eight months of fishing activity, whereas the remainder reported less time, and several only about two months. The boat operating over the longest period of time reported landings of 180,000 pounds, while the boats operating only two months reported about 20,000 pounds. The value of the production per operating unit was $7,747 and the value per fisherman was $3,874. The costs as a percentage of sales

values were, labor 55.5%, groceries 12.2%, gear 4.8% bait 2.3%, fuel 5.9%, ice 3.2%, maintenance (repairs) 8.2% and depreciation 7.5%. These costs were 99.6% of the sales value of fish. The very manner in which certain costs such as labor, groceries, bait, and fuel were incurred caused them to be high or low per pound of landings depending on the average value of landings per trip rather than on the number of trips. Maintenance and depreciation per pound, on the other hand, will be high or low depending on the total number of pounds landed during the accounting period.

On the basis of the average price of 16.6 cents per pound to the fishermen, the retail price of grouper, in the round, moving into the New York wholesale market, would be approximately 35 cents per pound; if drawn, the required price would be around 47 cents; if in steaks, around 70 cents; and if filleted, around $1.00 per pound. These figures are based on the customary margins and the average weight loss experienced in the various indicated types of processing.

Costs of Production for Shrimp Boat Operations

These boats ranged in length from 49 to 72 feet, with the majority 60 feet or longer. The average gross receipts per boat were $26,900—an average of 48 cents per pound of headless shrimp. The cost as a percentage of sales were, labor and groceries 38.1%, gear 7.7%, fuel 12.2%, ice 7.3%, maintenance (repairs) 13.7%, insurance 3.6% and depreciation 11.2%. These costs were 93.8% of the sales value. Despite the favorable percentages, the per-pound costs of these operations are high in comparison to the costs in the other two types of fishing operations examined. Although shrimp has occupied a very favorable market position, there is need to develop more cost information on the different methods of shrimp fishing. Based on the average costs and margins found for shrimp-boat operations and the corresponding margins for fishhouse operations, headless shrimp moving to the New York wholesale market would require a retail price of approximately 97 cents per pound.

Distribution Costs of Mullet and Spanish Mackerel Producers

The thirteen producers on whose operations the mullet and Spanish mackerel cost data are based handled an average volume per producer of 448,893 pounds of fish, having a net sales value per producer of $70,310. The cost of the principal items as a per cent of sales were as follows: cost of fish sold, 74.2%; wages and salaries 7.9%; wooden boxes and barrels 5.0%; ice 2.0%; telephone and telegraph 1.2%; depreciation 0.9%; heat, light and power 1.5%; taxes 1.9%; insurance 0.6%; office expense 0.2%. These averages reveal the relative importance of the major distribution costs, but perhaps of more importance were the significant variations in the amounts producers were paying for services and materials purchased for operations. In view of the fact that, on the average, these mullet and Spanish mackerel producers were operating on a margin of four cents per pound of fish handled, a slight reduction in a number of these cost items could have a significant effect on the profit position of individual producers.

Distribution Costs of Snapper and Grouper Producer Operations

The four snapper and grouper producers on whose operations the cost data are based handled an average of 1,546,750 pounds of fish per producer, having a net sales value of $449,692. The average costs as a per cent of net sales were as follows: cost of fish sold, 68.5%; wages and salaries 19.2%; wooden boxes

and barrels 2.4%; ice 0.8%; telephone and telegraph 0.5%; depreciation 0.3%; heat, light and power 1.5%; taxes 1.4%; insurance 0.6%; office expense 0.2%.

The gross margin for these producers was 9.17 cents per pound of fish handled. The labor cost of 5.59 cents per pound was by far their largest single item of distribution cost. On a cents-per-pound basis this figure exceeds the gross margin on which the mullet and Spanish mackerel producers operate.

Distribution Costs of Shrimp Producers

The shrimp producers' distribution costs as a per cent of net sales were as follows: cost of shrimp sold, 81.9%; wages and salaries 2.4%; wooden boxes and barrels 1.4%; ice 0.6%; telephone and telegraph 0.4%; depreciation 0.1%; heat, light and power 1.5%; taxes 1.4%; insurance 0.6%; and office expense 0.2%. On a cents-per-pound basis the distribution costs of the shrimp producers were lower than those of the snapper and grouper producers, and yet higher than those of the mullet and Spanish mackerel producers. The wages and salaries, amounting to 1.4 cents per pound, is very little above the comparable figure shown for the mullet and Spanish mackerel producers. This low cost reflects in part the small amount of processing done by the shrimp producers. It was frequently the practice for shrimp to be unloaded from the boat and packed in hundred pound boxes and carried away almost immediately by waiting trucks. This type of operation depended heavily upon a favorable market, and the producer assumed little responsibility for the marketing of the product.

Costs of Services and Supplies

The percentage relationships of the producers' distribution costs give a summary view of the relative importance of the cost components in production and distribution operations. Some idea of the extent to which these influence the total cost picture may be gleaned from these data. A large proportion of the producers reported information on the prices paid for goods and services purchased for production and distribution needs. These cannot be fully examined here, but an analysis of individual items reveals important differences in the prices paid for them. These differences are attributable to many factors, such as the size of the firm's operations, its location, the products handled, and the character of its associated activities. Nevertheless it is important to note that such differences suggest that a number of firms may be able to improve their cost position by securing lower prices than those now being paid for certain commodities and services.

Conclusions

More cost studies are needed to afford the information necessary to appraise some of the specific problems of the industry and the available alternative courses of action that may be pursued. However, the costs examined in the present review indicate a number of problems confronting the three segments of the industry examined. The lack of profit from mullet and Spanish mackerel boat operations suggests why producers are glad for fishermen to be boat owners. Certainly what profit there may be from these operations is closely linked to the costs of maintenance and repairs and to the speed with which capital replacements must be made. The high cost of labor relative to the value of landings does not result in a high wage to the fisherman. This is a clear reflection of the average low productivity per fisherman.

A comparison of like items of cost incurred by the three types of fishing

operations examined reveals wide variations in their relative importance. This is to be expected from the nature of the differences in fishing operations, but at the same time it directs attention to the differences in the cost problems involved. For example, fuel costs are of greater relative importance in mullet and Spanish mackerel fishing.

In production operations such as exist in the Florida fisheries, in which the biggest single item of cost is directly tied to the value of the product, and where wage improvements can occur only as a result of an increased productivity or an increased market value for the product, possible improvements in both production and marketing should be carefully studied.

Wide difference in the prices paid by producers for goods and services used in production and distribution operations indicates that each producer should carefully examine the prices he is paying his suppliers.

Problems in Marketing Menhaden Products

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THE PRINCIPAL PRODUCTS manufactured from menhaden are fish meal, fish scrap, fish oil and fish solubles. Fish meal is clean, dried, ground tissues of undecomposed, whole menhaden fish, with most of the oil removed. Fish scrap is the same material before grinding. Fish oil is the product recovered from the fish press water either by centrifuging or by a settling method. Condensed solubles is the product obtained by concentrating the press water resulting from the hydraulic extraction of oil from fish. It is approximately 50% moisture, with a tendency to thicken when cold, and has a pronounced fish odor.

Problems in marketing menhaden products arise because:

1. Seasonal production hampers year-round distribution.
2. Variable raw materials and processing conditions prevent complete quality control.
3. "Unknown growth factors," protein quality and other values cannot be measured by rapid laboratory methods.
4. Insufficient products make use of characteristics which are unique in menhaden.

One of the big problems in the marketing of menhaden fish meal today is its seasonal supply. During the summer when most of the fishing occurs, the price is usually the lowest, and during the winter when very little material is produced, the price is usually at its peak. Even warehousing cannot always solve this problem, inasmuch as the small manufacturer cannot always finance large stores of material in his warehouse. Many do not have the space available. Consequently, if a buyer wants a year around supply of menhaden fish meal, he usually has to warehouse it himself.

The menhaden industry increasingly recognizes the importance of working out effective quality control, quality standards and methods of evaluating its products. A prime example is fish meal which interests the feed industry because:

1. It is a good source of the "unknown growth factors" which are believed

to be necessary for optimum growth and performance in animals.

2. It supplies a high quality protein, when properly processed, that contains a liberal quantity of amino acids.
3. It is a good source of the B-complex vitamins.
4. It also adds liberal quantities of calcium, phosphorus and trace minerals.

In spite of these known values in fish meal, there is often considerable concern over the variations occurring in the product. The buyer is beginning to insist upon closer tolerances in moisture, protein and fat content. Limits on moisture can be controlled by careful drying procedures. Properly operated dryers help assure high protein quality while careful supervision of pressing is at least a partial answer to excessive fat contents. On the other hand, there is an impressive list of variables which presently constitute a serious problem in attempting to produce uniformly high quality fish meal and other menhaden products. This can be illustrated by the following examples:

1. Effect of species: Here the menhaden fishery has some advantage over competitors in the relative uniformity of the commercial catch. There are only a few commercially important species of menhaden caught in the Atlantic and in the Gulf of Mexico. Just what bearing those variations have upon the products produced is virtually unknown. It is established that variations do exist between fish meal and scrap, solubles, and particularly fish oils, produced from different kinds of fish. Even greater differences result when cannery and filleting by-products are used as a source of raw materials. In the latter instances, it seems equally true, that excellent products are produced, each with its own set of advantages.
2. Effect of size, condition and food supply of the fish: It is well known that composition varies with the size of the fish, thereby influencing the properties of the final products. Changes that occur in fish from the time caught until they are landed and processed also bear upon the make-up of the products produced. The food supply of the fish influences the end result, as evidenced by recent work on herring, indicating that rapid softening sometimes results from a diet rich in certain forms of copepods. It is suspected that at times this also occurs with menhaden. Also, it is known that composition of fish varies with seasons, locality, and as a result of climatic conditions. These and many other factors are beyond the control of the fisheries. Such natural and unavoidable variations that bear on the quality will have to be measured and taken into consideration in promulgating quality standards.
3. Processing variables: These are numerous, but fall under such general categories as:
   a. Unloading of boats, involving variations in unloading gear, kind of water used in flooding holds, extent to which pump liquors are recirculated.
   b. Raw box conditions, involving such factors as extent of bacterial contamination.
   c. Cooker conditions, involving variations in amount of condensate, product temperatures, mechanical treatment received by raw material, extent to which cooker liquors are drained.
   d. Press conditions, involving press speeds, product temperatures, pressure obtained.
   e. Dryer conditions, including throat and stack temperatures, product temperatures, moisture differentials entering and leaving dryers.

f. Scrap shed, grinding and bagging techniques, including methods of turning scrap piles, heating of scrap piles, oxidative changes, fineness of grind, moisture differentials.

g. Oil house procedures, including all of the processing variables that occur during centrifuge or settling tank operation, tanking of oil.

h. Solubles plant procedures, including methods of preserving stick water, product temperatures during storage, acidification during storage.

Consideration of these factors indicates the difficulties of laying down quality standards. Requirements for any product must rest on a proper regard for manufacturing variations.

Every industry approaches the subject of quality standards with trepidation since at first glance it appears to be a leveling process classifying the best manufacturer with the most mediocre one capable of barely meeting requirements. The fallacy of the argument is best demonstrated by examining the hundreds of industries which presently produce raw materials and products described under some form of quality standard. In almost every instance the result has been to improve the status of the industry, to establish better trading rules and to eliminate shoddy products offering unfair competition. There is little evidence to support the contention that standards tend to destroy individual initiative, or to rule out added profits resulting from the introduction of quality factors beyond those described in the specification.

As the result of a code suggested by the California Hay, Grain, and Feed Dealers Association and by the California fishing industry, some sardine plants are producing meals of greater uniformity. Prior to development of the code, variation in the protein content between bags in a single lot might be as much as ten per cent. This code might well be a starting point for the menhaden producers and buyers. The proposed code, with some minor changes, is as follows:

a. Uniform grind, light color, and protein content per lot: Differences between lots, in grind and color, are not desirable. The protein content of individual bags within a certain lot should not vary over a range greater than 5 pounds of protein per 100 pounds of meal.

b. Maximum particle size: All particles should pass a No. 7 Tyler standard screen or a U.S. No. 7 standard screen, and 98 per cent of the particles should pass a No. 9 Tyler standard screen or U.S. No. 10 standard screen.

c. Moisture: An average moisture content of eight per cent, with a deviation not greater than plus or minus two per cent, is satisfactory.

d. Fat: The content should not exceed ten per cent, and preferably not more than eight per cent. A high fat content increases the hazard during storage.

e. Labelling: Statements appearing on the tag are the manufacturer's responsibility. The tag should have on it the name of the manufacturer, brand name and analysis required in the state into which it is being shipped. In this regard there is an urgent need for standardization of analysis requirements among the various states.

f. Weight: The sack should contain not less than 100 pounds on the standard moisture basis.

g. Bag size: To facilitate piling the bags, use one size of bag in any given shipment.

h. Sterilizing: Used bags should be cleaned and sterilized in order to prevent the spread of communicable animal diseases.

i. Preventing damage: Use "temporary car doors" to protect the bags against damage when car doors are opened.

It is freely admitted that these quality standards are not the ultimate from either buyer's or seller's standpoint. However, they are the best we have available at this time and, more important, they are in actual day to day use in the industry. As further research develops more refined standards, the California standards can serve as a foundation to which the refinements can be added.

Turning to the problem of fish oil, we note that in former years the soap industry consumed almost the entire production of menhaden fish oil. This is not true today since synthetics and detergents have made great inroads in the soap market. Unlike other commodities, the price of menhaden fish oil is not governed by the law of supply and demand. It is governed more by the price of its competition, vegetable oils and oils from other sources. In the past few years European markets for menhaden oil have played an important part in supporting the price, in that it has taken great quantities of available menhaden oil off the domestic market. The European market for fish oil is based almost wholly on the use of fish oil for human consumption. The Germans and Dutch seem to be quite clever, as are the Norwegians, in deodorizing and processing fish oil into oleomargarine. One factor which might affect the sale of fish oil to processing plants in Holland and West Germany is the political situation. If political considerations dictate a restriction on dollar spending or exchange, then this market would probably quickly switch to the Sterling area and buy African fish oil. With an expanding European population, all getting hungry every day, it would seem reasonable to expect this market to continue consumption of our fish oil.

The pressing problem in the marketing of menhaden fish oil is to find a greater domestic usage, particularly making use of such unique properties as its high percentage of long chain fatty acids and its high degree of unsaturation. These properties, particularly in a low cost raw material, are of tremendous interest to research chemists. At present, their ability to use fish oils is reduced by insufficient knowledge of its chemical structure, methods of deodorization and lack of uniformity of the product. New chemical compounds and extended use in the applied fields will arrive when our fund of knowledge increases. Fortunately, it is possible to say that extensive research is now under way that will enable us to know more about this product and what to do with it. In addition to these newer approaches to the utilization of fish oil there can undoubtedly be an expansion of some of the older and better known uses. The ability of fish oils to "wet" rust and thus to penetrate to sound metal, and to form flexible films which expand and contract with heat, will continue to be interesting properties to the protective coatings industry.

Fish oil continues to have potential value as an energy ration in poultry feeds in that it decreases dustiness in feeds, thereby reducing wastage, it improves palatability and it improves texture and appearance. Research is now being conducted to determine the limits that can be used in poultry feeding and this work is also expected to bring forth some improved formulating techniques.

Leaving fish meal and oil, we turn our attention to condensed fish solubles. The most important marketing problem in solubles has been an increase in production without a corresponding increase in demand. There are too few

feed companies that have facilities for using this material as a liquid. Dried solubles, or mixtures thereof, undoubtedly help widen the market. Concentrates made from large amounts of fish solubles are one way of getting the product to a larger number of feed manufacturers. Return of a part or all of the solubles to the press cake or meal is another way, and certainly an excellent means, of improving the nutritive value of fish meal, as well as an excellent outlet for sale of fish solubles. Here again would enter the problem of seasonal production of fish meal. Many buyers who prefer whole meal want this product all year around.

Although there is little problem in storing condensed fish solubles, and not too much difficulty preventing separation if adequate mixing facilities are maintained, it is still a variable product. Its nutritional value is said to vary considerably. Also, the need for careful plant control is brought out by the records of a large feed manufacturer which showed samples taken from various cars to vary in fat content from a low of 0.95% to 19.9% and in moisture content from a low of 39.3% to 53.0%.

There are many problems to be solved in the menhaden industry, but extensive work is under way, not only within the industry but under the direction of the U. S. Fish and Wildlife Service. The Government program has included the establishment of two sizeable research programs dealing with "Quality Index for Fish Meal" and an even larger one on fish oil. The "Quality Index for Fish Meal" research program is intended to untangle many of the complexities involved in producing and in measuring the quality of fish meal. It involves collection of fish meal samples produced under controlled and well defined conditions. These samples are checked for performance in feeding tests to determine their relative quality and are then subjected to extensive chemical investigations. The feeding work is being done at the University of Delaware, the University of Wisconsin and the University of California, while the other phases of the work are being done in Service laboratories located at College Park, Maryland and in Seattle, Washington. Well known universities are participating in the chemical studies dealing with proteins, liquids and growth factors. Extensive work on oxidative changes in fish fats is being done at the University of California. Basic research on the structure of fish oils and the chemistry of odor is under way at Hormel Institute, University of Minnesota, while some of the nutritional characteristics are being investigated at University of Connecticut and University of Oregon. This does not describe the entire program, but only such phases that apply to improvement of quality. Other phases of the fish oil research program deal specifically with applied research. The finding of new uses for fish oils in as short a time as possible is the objective of this portion of the work. Florida Southern College is engaged in an investigation concerning agricultural uses of fish oils in insecticides and fungicides. The University of Cincinnati is handling a project concerned with uses of fish oils in the leather trades while resin uses of fish oils is being investigated at Arthur D. Little, Inc. These and other studies which result in more varied uses for our products are capable of solving marketing problems resulting from insufficient outlets.

Industrial fishery products will continue to improve. However, the attitude of the menhaden products buyer of today is definite; they want quality menhaden products, all year-round. Consequently, the emphasis of the menhaden processor must be on the quality of his product and the ability to keep the customer supplied. If these factors are maintained, there is no doubt that menhaden products will find a ready market.