

A sequestering agent, EDTA (ethylenediamine tetrasodium calciumacetate) in combination with aluminum sulphate, has been tested and proven to be a preventative of iron, iron sulphide, and copper discoloration of canned shrimp. Struvite formation can be completely controlled by its use. The commercial use of EDTA, however, has not yet been approved by the U. S. Food and Drug Administration.

In the crabmeat plants, a mechanical picking machine has just made its appearance. This machine increases yields and successfully lowers costs. Phosphate buffers used in conjunction with the citric acid method for preventing blueing in canned crabmeat, have improved taste and color in the product.

In the oyster canneries, the noise of shells hitting steel pipes in a rotating drum or reel, denotes a technological advance. In January, 1956, the first mechanical oyster shucker in the Gulf area was placed in commercial use. It has completely supplanted hand shucking of steam opened oysters in a number of plants, and is used as an adjunct to hand shucking in others.

Automatic breadening machinery and cooking equipment has been quick to materialize in the breaded shrimp and fishstick industries.

New containers, new types of packaging and packaging materials have all had their impact on the industry.

Technology has given rise to a number of newly prepared products: frozen, raw, peeled and deveined shrimp, breaded shrimp, shrimp sticks, shrimp-burgers, precooked packaged cocktails, pasteurized shrimp, wazerized shrimp, pasteurized crabmeat, oyster stews and soups, fishsticks, cat food, to name a few. Technologists have also worked out delicious new ways of preparing and serving the crop from the sea.

All in all, I feel that we may take pride in the progress of fisheries technology in the Gulf and Caribbean area in the period 1948-1957.

Progress in Fishery Economics in the Gulf and Caribbean Area, 1948-1957

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THE GULF AND CARIBBEAN Fisheries Institute was founded to give members of the fishery trade and scientists the opportunity to discuss problems affecting their specific area. In the first four years of its existence the Institute included the consideration of cost of production and labor problems. Later, emphasis was given to international trade, the specific problems of the spiny lobster and shrimp industries, and questions of general stabilization of the industry, including insurance and loan problems. With the cessation of effective union representation in the Gulf and Caribbean area, discussion of labor problems ceased. Many of the discussions held during the Institute, especially those on loans and insurance, gave impetus to either legislative solutions or to further research.

Let us see in more detail what has happened to the commercial fishery industry in our area during the last ten years. In the period 1948 to 1955 (1955

is the latest year for which we have available complete records) the number of fishermen in the South Atlantic and Gulf States increased from about 33,900 to about 38,700, or 14 per cent, and the number of vessels from 2,500 to 4,145, or about 66 per cent. The South Atlantic and Gulf States did better in this respect than the United States as a whole, where the number of fishermen declined by 8.6 per cent and the number of vessels increased only by 22.5 per cent.

We know from a specific study of the shrimp fleet that not only did the number of vessels increase, but the tonnage also increased. This was caused by the discovery of new shrimp grounds, for example, those near Tortugas, and by the necessity of making longer trips from United States shores to areas as far distant as the Campeche banks. It is mainly due to this development that catches in the South Atlantic and Gulf States increased to high levels. The total catch of all fish and shellfish increased from 1948 to 1955 by 41.4 per cent, as compared with a total increase in the United States of five per cent. Mainly due to higher shrimp prices, the total value of the catch in the South Atlantic and Gulf areas increased by 51.3 per cent, as compared with a decrease of three per cent in the United States catch.

While the gross income from the catch per fisherman in the South Atlantic and Gulf areas was \$1,800 in 1948, it was \$2,400 in 1955. The gross income per vessel in 1948 was \$25,000 while in 1955 it was about \$22,000. This decline was caused by the tremendous increase of the fleet. Although the profits of the individual fishing enterprise, taken on a per vessel basis, decreased, the profits per fisherman increased. The catch per fisherman in the South Atlantic and Gulf States was about 24,000 pounds in 1948 and about 30,000 pounds in 1955. In the United States as a whole, fishermen caught an average of 29,000 pounds in 1948 and in 1955, about 33,000 pounds. These figures are highly influenced by the catches of "industrial fishes," mainly menhaden, which give a somewhat biased picture for the person who is interested principally in food fishes. The increase in the catch of industrial fishes in 1955 compared with 1948 was 58 per cent in the South Atlantic and Gulf States, while the increase in food fishes was 21.8 per cent. However, the increase in the value of food fishes was 52.6 per cent, while the increase in value of industrial fishes was only 41.7 per cent.

Landings in the countries of the Gulf and Caribbean area outside the United States from 1948 to 1955 increased about 13 per cent. While this overall increase in the catch did not keep pace with the population increases, which averaged 24 per cent, some specific increases of the catch were phenomenal. For example, in Surinam catches increased 400 per cent from 1947 to 1955, while the population increased only about seven per cent. The Republic of Honduras had a 2500 per cent increase in catch compared with a population increase of 30 per cent in the same period. In Puerto Rico the population increase was 4.7 per cent from 1947 to 1951 while the increase of the fish catch was 66.7 per cent, a surplus of food gains on a per capita basis.

The increase of the population in Barbados was 16 per cent, in Jamaica 18 per cent, in Trinidad 27 per cent and in the Windward Islands 21 per cent. Despite higher population figures, the per capita income in most of the countries in the area increased and this factor had a great effect on the fishery trade. The per capita income in the United States, based on current prices, increased from \$1,173 in 1947 to \$1,664 in 1956, (42 per cent) or in terms of constant prices, from \$1,173 to \$1,419. The per capita income on current prices in many states

of the Gulf and Caribbean area increased even more. This increase in Puerto Rico was 55.5 per cent from 1947 to 1955; in Honduras, 55.1 per cent from 1947 to 1956. In Colombia the increase from 1947 to 1954 was 132.8 per cent, and deducting a 30 per cent devaluation of the Colombia peso, it still was an increase of about 95 per cent. Mexico showed an increase of the per capita income of 128 per cent from 1947 to 1955, which adjusted for devaluation of the Mexican peso is an increase of 56 per cent.

In all countries of the Gulf and Caribbean area international trade increased. The value of the United States imports increased 155.5 per cent from 1947 to 1956, while the imports of edible fishery products increased 179 per cent in value, and inedible fishery products, 80 per cent. The value of exports decreased 25.2 per cent (edible products, 53.5 per cent). The decrease of 25.2 per cent was caused by a tremendous increase of exports of industrial products.

Spiny lobsters imports increased from 7,757,000 pounds in 1948 to 25,258,000 pounds in 1956. About eight million pounds came from the Gulf and Caribbean area, about seven million pounds from South Africa, and about five million pounds from Australia. Shrimp imports increased from 13,275,000 pounds in 1947 to 21,563,000 in 1948 and 68,619,000 pounds in 1956. These shrimp imports came mainly from Mexico.

The volume of international trade in the Caribbean area outside the United States increased by an estimated 63 per cent during the period 1947 to 1955, compared to 82 per cent for the United States for the same period. Exports increased about 84 per cent. Panama had the greatest percentage increase — from 293,000 pounds in 1947 to 4,228,000 pounds in 1955, or 1,343 per cent — while Mexico and Cuba also exhibited large increases. With incomplete data on hand, increases of exports can also be reported for the Bahamas, British Honduras, Honduras, the British Virgin Islands and Surinam. The only country with a decrease of exports was Costa Rica.

Imports of fishery products also were generally higher, due partly to the higher standards of living. Imports averaged about 50 per cent greater in 1955 compared with 1947. Trinidad, the Dominican Republic and Haiti played a major part in this percentage increase; smaller increases are observed in Panama and Jamaica. Generally speaking, the import increases were greater than the population increases, being about in the same percentage range as per capita income increases. Only Venezuela is an exception, and here there was no increase in imports, despite a population increase of 30 per cent.

In most countries of the Gulf and Caribbean area outside the United States dried salted fish was the most important import item among fishery products, with canned fish ranking second.

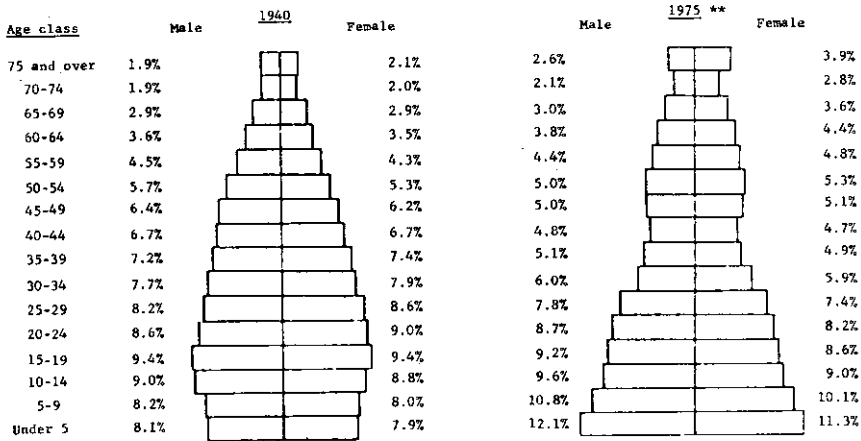
What can be predicted for the next ten years, and what should be the goal of our activities during this period?

We should first consider the increase in population, which will be about one-sixth more in 1967. This means that there will be about 23 million more people in the United States and about 15 million more in the Gulf and Caribbean area outside this country. The rate of increase is about the same in the United States and in Caribbean and Gulf areas outside the United States, but there are differences in the ability of various countries to absorb the additional population. The United States will absorb all its new people, but there will be a greater increase in the population in the South than in the North. The fish production in the South Atlantic and in the Gulf areas will be utilized more in the Southern area of the United States and will be less available for general

consumption and export.* Studies should be made on how the shift of the population will affect the fishery industry.

Not only has the fact of increased population to be considered, but also the changing of population composition by age groups. This may change the demands for certain particular types of fish and the fishery trade will have to become more selective. Our studies should extend to the economics of diversification in production and manufacturing. The composition of the United States population by age classes in 1940, and projected to 1975, may be seen from the following graph.

COMPOSITION OF UNITED STATES POPULATION BY AGE CLASSES, 1940 and 1975
Projection AA



Percentage in each five-year age class

Source: United States Bureau of the Census.

Percentage in each five-year age class

** Series AA estimate assumes that 1954-55 birth rates will continue to 1975.

Source: Projection by Meyer Zitter, United States Bureau of Census.

The increased population will need more food. This will not necessarily mean fish food, but the population will eat nourishing and relatively cheap food. Food prices in the United States are expected to increase generally because much land formerly used for agricultural production is abandoned, because there will be greater income opportunities in industrial manufacturing and because Europe will need more and better food and will be better able to pay for it. Whether fish food consumption increases greatly depends on the interrelations between prices of fish and prices of agricultural products. The Caribbean population, for many years to come, will need dried salted fish, and imports of this product and canned fishery products will increase in common with all imports.

North America depends for its fish to a large extent on imports. If European countries increase their prices and demand for fish, these products may become short in supply. For example, France and Italy pay higher prices for tuna than

*LCL express shipments of fishery products from New Orleans to South Atlantic States have been three per cent in 1954, five per cent in 1955, seven per cent in 1956, and ten per cent in July, 1957.

the United States does and fish exports from Europe to the United States may be seriously reduced. The fishery resources of the United States may not be rich enough to replace diminishing imports from Europe. Our studies must extend to research on resource development and its economic basis.

It may be that fresh water pond fish production can supplement fish production from the sea. There are already more than a million fish ponds in the United States and pond fish production has made good progress in some Caribbean countries, for example, Haiti. While the production from these ponds is not great at present, it may increase and eventually become a great source of food. Studies should, then, consider the economic importance of pond fish production.

Forecasts for the United States indicate that there will be a reduction of the working hours per week to about 38 by 1967, which leaves more time for leisure. There may, as a consequence, be more fish caught by sport fishermen with a resulting decrease in demand for commercially produced fish. We should keep a watchful eye on the fish production by anglers and sportsmen, and evaluate its economic importance.

I do not share the view of some economists that this country will continue to increase its production level at a high rate. Some economists believe that each individual in the United States will spend \$1,970 on consumer expenditures in 1965 as compared with \$1,530 in 1955. I consider this possible only under conditions of a continued inflation of about three per cent per year. If the Federal Reserve Board continues its present policy of stemming inflation, neither a 30 per cent inflation nor a 28 per cent increase in consumer expenditures will occur during the next ten years. Inflation increases the prices fishermen have to pay for their goods more than it does the price of fish landed. The value of food fishes increased only 6.9 per cent in the last ten years on a volume basis. With continued inflation the commercial fisherman will be the loser. Our Institute must continuously study the monetary values, consumer spending, fish prices and their interrelations.

Assuming a stable economy all over the world for the next ten years, population increases and the changing demand will be of a great challenge to fish producers, processors and dealers in the Gulf and Caribbean area. The greatest challenges will be in how to produce more fish and how to provide diversification of fishery products as required by the changing composition of the population. It is to be hoped that the tremendous development in the shrimp industry in the Gulf and Caribbean area will continue and that other fish industries, for example, the tuna industry in the Gulf, will experience similar growth. The Gulf and Caribbean Fisheries Institute, by its discussions of the economic problems, will hope to contribute even further to the improvement of the fishery industry in the future than it has in the past.

Progress in Fisheries Education in the Gulf and Caribbean Area, 1948 - 1957

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EVERYONE having any connection with fisheries, whether from the industrial or professional point of view, has been made repeatedly conscious of the severe