

give lectures on fisheries and on the distribution of fishery products. Also a mobile demonstration unit was set up, which makes it possible to distribute information to every part of the country.

Labor productivity in the Netherlands is, generally speaking, at a very high level. A shortage of labor has led to a more vertical investment (more capital per worker) as opposed to the earlier horizontal investment (capital to provide employment for an additional number of workers). It remains to be seen, however, to what extent the vertical investment can be applied to the fishing industry. The fact is that fishing is not a mechanized operation, and the fishing waters situated around the Netherlands offer only limited possibilities to the fishermen.

It is possible to determine fairly accurately how much fish is needed for home consumption, taking into account an increased per capita consumption, but the quantity to be exported remains more or less uncertain. The Marketing Board of Fishery Products—an agency of the Ministry of Agriculture, Fisheries and Food—has, despite this difficulty, set up a work schedule for the current year, listing the quantities of fish which they expect from the Dutch fishing fleet and the manner in which the fish will be used.

PRODUCTION	CONSUMPTION			
	Preserved fish	Fish meal	Domestic market	Exports
120 million lbs. of seafish	7%	3%	73%	17%
8½ Million lbs. shrimp	—	—	40%	60%
187 million lbs. pickled herring and ungutted herring	—	7%	33%	60%
120 million lbs. fresh herring	30%	7%	27%	36%

These figures show that the fishing industry is greatly dependent on exports. These exports need not be reduced if the domestic consumption should increase, because there are still many fishing grounds which can be reached by at least part of the existing Dutch fishing fleet to increase the production. The aim is to strive for greater expansion and for an increase in consumption both in the domestic and the export markets.

In the present competitive American market the Dutch interests have to make use of all available devices to promote its fishery products. Although the cost of promotion in foreign countries is higher than in the Netherlands, the results in these countries are more rewarding. In several countries the Netherlands fishing industry has built a reservoir of goodwill, resulting in satisfactory trade relations.

In a country like the Netherlands where industrial expansion is further ahead than ever before in history, the modernizing of the promotion of fishery products is receiving special attention and shows great possibilities.

## **Can Natural Sponges Meet Competition from Synthetic Sponges?**

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FOR THOUSANDS OF YEARS natural sponges have been an item of commerce in the Mediterranean world. Aristotle wrote of soldiers padding their helmets

with a "very fine, very dense, very strong" kind of sponge called "Achileion" and Pliny has written that the Romans used sponges for paint brushes and also used them with wooden handles for mops.

The use of sponges dates back to antiquity. Naked divers used heavy stones to reach desired depths and carried small baskets which they filled with sponges. According to legend, hundreds of divers were sacrificed in getting sponges for the baths of Livia, Messalina, and other Roman empresses, who were satisfied with only the finest specimens obtainable at the greatest depths. The sponge industry was spread by hardy Greek divers who went to all parts of the Mediterranean to harvest the crops growing in profusion on the bottom. Naked diving was the major method for taking sponges until very recently when diving equipment and the techniques of hooking were developed. Deep sea diving was first introduced into the Aegean in the 1860's and soon came into general use among the spongers.

These methods are standard practice for harvesting sponges both in the Old World and along the Gulf Coast of Florida. The development of the domestic sponge industry began in 1849 when the first shipment of sponges was made from Key West, Florida, to New York. These sponges sold at 10c per pound. They were considered by most buyers as of little value, since they were familiar only with the European varieties. However, out of this shipment developed the organized industry which thrived at Tarpon Springs and Key West up to recent years.

While the number of sponge species of commercial importance is limited, there are numerous varieties from different localities which are easily recognized in the trade and have special and sometimes valuable characteristics. There are only about thirteen species of importance.

Most of the 3,000 other species have characteristics which make them unsuitable for use by man, although there have been numerous attempts to find some use for these so-called worthless varieties. It is entirely possible that some may be utilized in the future.

There was no substitute for the natural sponge until the middle 1930's when the DuPont Corporation developed a synthetic material from cellulose. Since it was porous and had certain water holding properties they named the product a "Cellulose" sponge. Since that time there have been numerous products developed by the chemist which are made from a variety of materials. Since they are also porous and have some of the properties of the natural sponge they have also been called "synthetic sponges."

All of these products could be manufactured on a mass basis in an industrial plant. They were soon produced in large quantities and sold at low prices. However, they really did not establish themselves in the market until World War II. During the war most of the natural sponges were purchased by the Government and industrial plants as part of the war effort. There were insufficient domestic stocks to supply both this demand and that of the household consumers. Furthermore, the supply of Mediterranean sponges was reduced to a mere trickle. This left the consumer market open to the synthetic sponge producers and they were alert to exploit it. More and more housewives used these synthetic products and less and less natural sponges were seen in the hardware and drug stores of the United States. (Table 1).

Since the war natural sponge producers, distributors, and retailers have been plagued with another problem. During the period when sponges were doing war work, there were high hopes that they would be able to recapture their

place in the market as soon as the war was ended. But, as the result of intensive fishing, coupled with a blight which attacked the Gulf sponges on the beds in the late 1940's, the supply of domestic sponges declined. Synthetic producers had the field almost to themselves since the price of natural sponges became higher and higher as a result of the scarcity. Increasing prices of genuine sponges gave synthetics an even greater advantage.

The natural sponge business would be almost extinct today in the United States except for substantial imports from Cuba, and from Greece and other European countries. Table 2 shows that the imports of sponges rose sharply after the war and have continued at a relatively high level. Production from Florida on the other hand has been low since shortly after the end of the war. Fortunately for the natural sponge industry of the United States, there were enterprising dealers both in Tarpon Springs and some of the major cities of the United States who refused to concede that the industry must stop when the local stocks were not available, and they have sought elsewhere for supplies. Imports from Greece alone over the past five years have averaged over \$1,000,000. While there have been considerable fluctuations in this source of sponges, brought about by all sorts of internal difficulties in Greece, the flow of sponges has continued and the supply of natural sponges today in the United States is still predominately from stocks originated in Greece and Cuba.

In 1950, in an address before this group, Dr. Richard A. Kahn of the U. S. Fish and Wildlife Service, laid down several criteria for the natural sponge industry to enable them to meet the challenge of the synthetic sponges. One of these was that a production of at least 300,000 pounds was needed, coupled with a decrease in price as production rose. Today domestic production is still only a small fraction of that figure, and the price is still proportionately high.

However, in the past nine months the reports from producers at Tarpon Springs have been more optimistic. Divers report considerable quantities of small sponges over the beds and the amount being landed has increased. The producers themselves are attempting to bring in about 100 experienced divers from Greece to replace the local divers who have become either too old or have drifted away from the business. They hope to increase the yield in this manner. It becomes increasingly important to push biological studies under these circumstances to avoid overfishing and a quick decline in a fishery which might be in the process of recovering.

Obviously then the production goal is far from being reached and, while the natural sponge is in a somewhat stronger position now than in 1950, the basic need for higher production is still the same.

Thus far, no one has been able to give a formula for bringing about this necessary increased production. We are looking to research to supply the knowledge which is essential to bring about recovery and then maintain production at a consistently high level. It has been heartening to have the Fish and Wildlife Service grant a contract to the Marine Laboratory of the University of Miami for biological studies of the sponge. Our only regret is that the amount is so limited that it may be impossible to learn enough to bring about the desired results.

As has been pointed out previously, the supply of synthetic sponges is almost unlimited. As their production has increased, the price has declined further, and this places the natural sponge in an even more difficult competitive position. This makes our problem a race against time so that our sponges can be

placed on the market before the synthetic domination is complete, and possibly it is already too late.

Dr. Kahn also pointed out the necessity of improved packing and grading, and proposed an extensive program of advertising. The industry over the intervening years has adopted these suggestions, with some success. First an attempt has been made to package natural sponges in attractively printed polyethylene bags and to get them out from under the hardware store counter into view of the prospective customer. Synthetics were already being wet-packed and packaged in attractive covers in 1950. In the last two years, the natural sponge distributors, through the Sponge and Chamois Institute, have instituted a uniform package and have devised a method of wet packing sponges which prevents the growth of fungi and molds, keeps the sponge soft and pliable so that it is not hard and harsh to touch, and practically eliminates any odor from the sponge.

Even though there is still a large spread between the price of natural and synthetic sponges, this simple procedure by the major distributors of sponges has met with considerable success. There has been an increase in the demand for the natural sponges, although an improper chemical formula for wet packing, which failed in some respects to meet the conditions listed above, slowed down this development. This aspect of the problem has been overcome by research at our Institute through the development of a new improved formula.

Some attempts have been made to advertise and promote sponges in the last five years, on an industry wide cooperative basis. In 1953 all distributors supplied identical "fliers" and point of sale material to their retail outlets. This first attempt was not highly successful because of limited funds, but it has led to more elaborate plans which are now being developed.

Grading of sponges is another problem of importance. For each species there are about four different grades for each size. With four sizes commonly sold, there are sixteen different grades for each kind of sponge. In the past, grading has been done by individual selection on the part of the foreman in charge of the packing shed. Sometimes when orders have been presented for a grade that is in short supply, lower grades have been substituted. This practice in itself has made for confusion and further difficulties in establishing standards, even though the Bureau of Standards has long maintained standard sponges for the various grades. Funds to study the grading of sponges have been granted to the University of Florida from the Fish and Wildlife Service. The industry hopes that out of this study will come a logical set of recommendations for grades and standards.

Until very recently the trend in sales of natural sponges has been downward, while that of synthetic sponges has continued to rise. For the first time in four years, there has been a slight rise in the sales of natural sponges, in 1955, even though there appears to have been no corresponding drop in the sales of synthetics. This upward change has been attributed to the industry-wide packaging program, although there may be some other factor which is operating. In any case, since 1951 the industry has tried to analyze its problem and take positive steps to meet its needs. Forward steps have been taken in packing and advertising and even greater efforts are planned.

Even though there are numerous pitfalls awaiting the natural sponges industry, the natural sponge can and is meeting the competition from synthetics. As time goes on and production increases, there is every reason to believe that more sponges can be sold on the United States market with resulting benefits to

the entire industry, from the diver who goes down in the depths to harvest the crop to the retailer in Butte, Montana, who sells sponges to local garages to wash cars.

Our industry has tried to analyze its problems. We have been making serious efforts to tackle the obvious defects in the business. Our efforts are beginning to show results although the key problem of increased production has not been solved. We may have to wait several years for further biological information.

TABLE 1.  
COMPARISON OF PERSONAL INCOME  
WITH SALES OF NATURAL SPONGES IN THE UNITED STATES  
DURING THE PAST TEN YEARS

YEAR	INCOME* (billions)	SPONGE SALES** (per cent)
1946	178.0	100.00
1947	190.5	70.2
1948	208.7	63.1
1949	206.8	54.4
1950	227.1	56.1
1951	255.3	52.6
1952	271.2	44.0
1953	286.1	42.1
1954	286.5	37.0
1955	292.3	38.6

\*From Economic Indicators, April 1955—84th Congress, 1st Session, prepared for the Joint Committee on the Economic Report by the Council of Economic Advisors, Washington, 1955.

\*\*From statistics compiled by SCI—confidential data converted to percentages to show trends. Highest year is 100%.

TABLE 2.  
COMPARISON OF  
DOMESTIC PRODUCTION WITH TOTAL IMPORTS OF NATURAL SPONGES  
FOR THE LAST TEN YEARS

YEAR	TOTAL IMPORTS		DOMESTIC PRODUCTION	
	Pounds	Value	Pounds	Value
1945	95,596	791,979	266,600	3,003,897
1946	328,307	3,087,963	222,438*	2,945,962*
1947	214,198	1,768,130	126,091*	1,246,244*
1948	355,026	2,587,336	85,545*	465,938*
1949	268,055	1,936,974	68,700*	470,703*
1950	369,775	2,329,108	22,000	130,500
1951	281,645	2,166,123	15,800	110,755
1952	191,776	1,295,935	25,000	142,100
1953	284,362	1,628,192	17,327	128,003
1954	191,107	1,124,113	15,185	120,738

(1) From Report No. FT 110, U.S. Imports of Merchandise for Consumption Bureau of the Census.

(2) From Fishery Statistics of the U.S., Fish & Wildlife Service except \*which are statistics on Tarpon Springs Sponge Exchange and thus slightly lower than total U.S. production.

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## APPENDIX

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- "Information Concerning the Importance of Conservation of Stocks by Fish and Sea Mammals in Arctic Waters" by Paul Hansen.
- "Productivity and Intensity of Exploitation of the Adriatic" by Sime Zupanovic.

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## DISCUSSION

### Marketing Session

Discussion Leader: L. W. STRASBURGER

Discussion Panel: CHARLIE BEVIS, SPENSER A. LARSEN, JAMES BARR,  
E. A. FIEGER

### The Government's Place in Market Promotion of Fishery Products

DONALD Y. ASKA

- Q. H. Taylor: Mr. Aska described the rather elaborate efforts of the Fish and Wildlife Service to promote the sale of surpluses of haddock in New England and the somewhat less elaborate efforts to promote the sale of tuna. Another paper described federal government sponsored activities to help the sale of mullet. So the government is obviously intervening in the interests of a particular fishery and a particular group of fishermen, instead of allowing the law of supply and demand to solve these problems in due time. Is it the philosophy of the federal government to attempt to market each of these products when the inventories get to be troublesome? This is a broad question of philosophy which I believe to