

ANNUAL MEETING - JUNE 1967

## AGE COMPOSITION OF IMMATURE HERRING PROCESSED

BY THE MAINE SARDINE INDUSTRY, 1960-1966

by  
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In the State of Maine, immature herring, Clupea harengus harengus, are caught chiefly for the sardine industry. Since 1960, the annual catch of sardines (including imports from Canada) has fluctuated between 27,000 and 60,000 metric tons, and has averaged 40,000. The processors of sardines prefer a herring of about 17 cm total natural length; these are "production fish" in age-group II, and they are augmented, as needed, by the larger herring of age-group III in early summer, and by the smaller herring of age-group I that enter the fishery early in the fall.

This report deals exclusively with samples from catches used in the 23 sardine canneries of Maine. Freezers are maintained at 7 areas for samples of the catches in 19 statistical divisions of Maine's coastline. Inspectors from the Maine Department of Agriculture collect, identify, and freeze each sample--a box of about 100 herring--from each boat unloaded at the cannery. The samples are brought to the Boothbay Harbor Laboratory for thawing and examination. The standard sub-sample for age determination was 50 fish from each catch until 1966, when the number was halved. Otoliths have been used to determine age.

The age compositions for the years 1960 through 1966 are listed in Table 1. The year 1960 was normal for that time: i.e., II-group herring were plentiful, 2 million cases of sardines were produced, and the existing market was satisfied. Herring were scarce in 1961 and the industry packed only 3/4-million cases despite heavy

reliance on groups I and III to augment the shortage of group II (1959 year class) herring. The fishery recovered strongly in 1962 with the very abundant 1960 year class which formed 96 percent of the catch. Two million cases of sardines were produced once again, but the market had shrunk by 25 percent after the shortage of 1961, a loss that has been only partly recovered. The surplus production of 1962 was brought forward into the 1963 inventories, reducing the incentive to pack, even though the strong 1960 year class was still available early in the summer. Age-group III formed one-third of the entire catch, and by August the anticipated market was well provided for.

In 1965 the II-group herring again dominated the catch at about 90 percent. During 1966 the 1963 year class was important in sustaining the industry: age-group III constituted half the catch.

In the seven-year span covered in this report, two abundant year classes have passed through the sardine fishery: the 1958 and the 1960. Both year classes were dominant in the catches as group II fish, and made sizeable contributions as group III before they exceeded the size desired by the sardine canners.

Table 1. Age composition and catch of sardines processed in the State of Maine, 1960-1966

Year	Catch in thousands of metric tons	Number of herring aged	Percentage composition by age groups				
			I	II	III	IV	IV+
1960	60	1,000	10	84	6	-	-
1961	25	2,000	22	54	23	1	-
1962	58	4,000	3	96	0.5	0.5	-
1963	41	13,000	12	50	36	2	-
1964	27	19,000	12	72	6	8	2
1965	34	13,000	4	89	6	1	-
1966	36	8,000	5	42	49	2	2