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## THE NORWEGIAN SYSTEM OF SAMPLING LANDINGS FROM THE MIXED FISHERIES

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### INTRODUCTION

A brief description of the Norwegian mixed fisheries (Recommendation 2) and the sampling of commercial catches has previously been presented by Lahn-Johannessen, Olsen and Stålesen (1964). The increased annual landings from these fisheries during the past few years have, however, emphasized the need of developing a more comprehensive sampling system which would produce better estimates of the species composition. This paper deals with the sampling system in use at present.

### FISHERIES

Norwegian trawlers using small-meshed bottom trawl carry out fishing throughout the year in the northern North Sea and off the coast of Møre, between 62°N and 64°N. Landings from the North Sea amount on an average to approximately 90 per cent of the total Norwegian annual yield, and the most important fishing grounds are located along the western and southern slopes of the Norwegian Deeps. Catches from these grounds which mainly consist of Norway pout and blue whiting are landed at fish meal plants situated along the south-western coast of Norway. In 1972 about 290 trawlers participated in the North Sea fisheries and they landed approximately 181 000 tons for reduction purposes. The catches from the fishing grounds off Møre mainly consist of greater silver smelt, silvery pout and blue whiting. The total landings in 1972 amounted to approximately 16 000 tons.

### SAMPLING SYSTEM

The Institute of Marine Research initiated in 1960 a regular small-scale sampling programme of commercial Recommendation 2 landings in order

to analyse the species composition with particular reference to undersized Recommendation 4 species. In autumn 1964 the Directorate of Fisheries in collaboration with the Institute of Marine Research expanded the sampling programme to include collection of more basic biological material.

Through the experiences gradually achieved during the period ending in 1970 an improved sampling programme was introduced. Since 1971 authorized inspectors appointed by the Directorate of Fisheries have been working at the most important fish meal plants according to standard instructions regarding quality control and biological sampling of Recommendation 2 landings. Inspections are made at random on board the trawlers when their catches are unloaded. The quality control is based upon visual examination of the catch and is roughly divided into 3 categories varying from very good to bad. Biological sampling is made by picking 30 litres from the catch. This might in some circumstances be too small, but normally it gives a fairly good picture of the species composition. Eventual disadvantages are compensated for by increasing the number of samples. Each Recommendation 4 species is grouped in legal and undersized fish. The number and weight of either group are entered on a special form together with the total number and weight of each Recommendation 2 species, and the Non-Recommendation 2, Non-Recommendation 4 species. The form also contains data on when and where the sampling has been carried out, vessel specification, type of trawl and mesh size, main fishing ground or position, fishing depth range and number of fishing days. The quantity of Recommendation 4 species used for human consumption are also given. No systematic sampling of these parts of the catches have yet been carried out.

In addition to the 30 litres samples the inspectors collect, approximately once a week, data on length distribution of the Recommendation 4 species and the dominating Recommendation 2 species. These informations are further supported by samples of Norway pout, blue whiting, silver smelts and silvery pout for age/length keys.

#### SPECIES COMPOSITION

Sampling of Recommendation 2 landings from Division IVa has been carried out since September 1971 according to the improved sampling program.

During this year a total of 25 samples were taken, followed by 163 samples in 1972 (Hysten 1973). Up to the end of August 1973 the number of samples so far has reached 73. Analysis of the species composition of so-called "Norway pout catches" in 1972 revealed that the relative figures by weight of the different components were on an average as follows: Norway pout 41 per cent, blue whiting 35, silver smelts (mainly A.silus) 6, Recommendation 4 species 7, saithe 2 and other species 9 per cent. These figures have been used in order to give an estimated break down of the quantities of "Norway pout catches" as required by the Liaison Committee. Sufficient sampling did not take place in 1971. However, since the species composition of the landings in the last quarter of 1971 is similar to that of the same period in 1972, the 1972 figures for the whole year are used for 1971 and for 1970 as well. Fish landed for human consumption varied in 1972 from zero to 14 tons, on an average 1.4 tons per landing.

Some Recommendation 2 fishing is also carried out in Division IVb and IIIa, but as no regular sampling of commercial landings has taken place, no further break down of the total landings into species can be made.

The so-called "Norway pout landings" from Division IIa (southern part) consist mainly of greater silver smelt, silvery pout and blue whiting. Norway pout occur in the catches during winter, but the annual quantity is just a few per cent of the total. Recommendation 4 species, mainly haddock, contributed in 1972 on an average with 3 per cent by weight. This year 115 samples were analysed (Hysten 1973). Fish used for human consumption varied from a few hundred kgs to nearly 14 tons, on an average 5 tons per landing.

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