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MFV *Sunbeam* LK335

Joint venture with Shetland Islands Council

N05

REPORT

4-28 July 1990

Personnel

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Objectives

To compare, using a twin trawl:

- a) the catches in a standard 90 mm diamond mesh cod-end having 120 meshes round its circumference and
 - (i) a cod-end with a 6 m long, 80 mm square mesh window in the top panel;
 - (ii) a cod-end with a 6 m long, 90 mm square mesh window in the top panel and
- b) the catches in a cod-end with an 80 mm mesh window in the top panel and a 110 mm diamond mesh cod-end with 100 meshes round its circumference.

Narrative

Scientific staff joined the vessel in Scalloway on 4 July when the fishing gear was rigged and thoroughly checked. After calibration of the cod-end weighing system and repairs to ship's equipment, the vessel sailed on the afternoon of 5 July for fishing grounds around Fair Isle and Foula.

Three hauls were made with 70 mm mesh cod-ends on both nets of the twin trawl to check equality of the catches in the two sides. Thirty-one hauls were then made to compare haddock, whiting and cod catches in a standard 90 mm diamond mesh cod-end and a similar cod-end with an 80 mm square mesh window in the upper panel. The cod-ends were changed from port to starboard on three occasions. The cod-end with the 80 mm square mesh window was then fished for six hauls alongside a 110 mm diamond mesh cod-end having 100 meshes on its circumference. A further four hauls were completed using the standard cod-end and a cod-end with a 90 mm square mesh window before the ship docked in Lerwick at the end of the trip.

Grounds east of Orkney and in the area of Fair Isle and Foula were fished. The vessel came into port at weekends to change staff and land fish.

Results

The 90 mm diamond mesh netting was made from knotted green polyethylene double braided twine of 3.5 mm diameter. The 80 mm square mesh window was made of knotless black polyethylene single twisted twine. The 90 mm square mesh window was made of knotless black polyethylene single braided twine of 5 mm diameter.

The top panel of the square mesh window cod-ends comprised two windows divided by a short 90 mm diamond mesh section under the lifting becket with a short 90 mm diamond mesh section at the aft end. However, during the cruise the aft window of 80 mm square mesh was replaced with 90 mm diamond mesh. This was done to stop distortion of the cod-end below the lifting becket when lifting the full cod-end aboard. The 110 mm diamond mesh cod-end had 93 meshes round its circumference and was constructed from 3.5 mm diameter braided green "Olivene" twine.

For haddock, the 80 mm and 90 mm window cod-ends clearly reduced the discards of small fish compared to the standard cod-end. The 80 mm mesh window maintained the same catch of haddock above 33 cm as the standard cod-end, while the cod-end with the larger window caught the same amount of fish above 36 cm. In the restricted range of fish sizes between these lengths and the minimum landing size, there were losses of 20% and 38% respectively. Compared to the 80 mm square mesh window cod-end, the 110 mm diamond mesh cod-end caught 68% fewer discards but suffered a 47% catch reduction of haddock between 30 and 36 cm.

There were also large reductions in the retention of small whiting but this was not consistent for all hauls. In a few cases substantial quantities of small whiting were caught. Generally there was a larger reduction in marketable whiting than haddock because of the lower minimum landing size of whiting. As with haddock, the 80 mm square mesh window cod-end maintained the catch above 33 cm and the other cod-ends above about 37 cm.

The changes in the catches of cod were not very clear for the two square mesh window cod-ends, except that a reduction in numbers of discards of 30% was obtained with the 90 mm window. The 110 mm diamond mesh cod-end, on the other hand, reduced discards by 60%, relative to the 80 mm square mesh window cod-end. There was also a 20% loss of marketable cod between 35 cm and 42 cm.

The table shows the results for haddock. The reduction of discards is shown when the less selective cod-end is changed to a more selective one, as indicated on the left hand side. The fish length above which the two cod-ends catch similar quantities has also been identified where possible. The percentage loss of marketable fish in the size range from this length down to the minimum landing size is tabulated below:

Table. *Percentage reduction in discards below minimum landing size (mls) and percentage loss of marketable fish up to the length at which catches are equal (leq) for haddock.*

	% Discard reduction	% Loss of marketable fish (between mls and leq)
80 square window compared to 90 diamond	31	20 (between 30 and 33 cm inclusive)
90 square window compared to 90 diamond	61	38 (between 30 and 36 cm inclusive)
110 diamond compared to 80 square window	68	47 (between 30 and 36 cm inclusive)

The introduction of square mesh windows can improve the selectivity of haddock and whiting significantly. The result is not so clear for cod. Some loss of marketable fish in the size range immediately above the minimum landing size will occur. If rigged to fish with meshes open, a 110 mm diamond mesh cod-end will be more selective than either an 80 mm or 90 mm square mesh window cod-end but will also lose more marketable fish.

R S T Ferro

1 November 1990