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Nets and Meshes used by the Spanish Cod Fishing Vessels in the ICNAF Area

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The Spanish fisheries in the Northwest Atlantic are carried out in two ways which differ in certain characteristics, although both of them are bottom fisheries with trawls.

The gears have the same form and are based on the same principles. However designs and dimensions vary considerably according to the vessels using the nets, the bottom on which the fishery is carried out, and the experience and knowledge of the captains, etc.

These trawls can be divided in two groups, the trawlers' and the pair trawlers'.

1. The Nets of the Trawlers

These nets are of the Vigneron-Dahl type with some modifications which the experience gained during the fishery around Newfoundland has caused. The trawl is worked from one boat which uses two gallows, one in the fore and one in the hind part of the vessel and on both sides, although generally only the ones on the starboard side are used.

The trawl is composed of various parts made of nets of different sizes. These parts are: (a) mouth; (b) wings; (c) ceiling; (d) bottom; (e) tunnel; (f) codend. The mouth of the trawl is the space between the ends of the wings and the head and foot ropes. The head line is kept floating by floaters of aluminium, which now are used almost always instead of the older ones of glass. The floaters are fixed in nets of twine and in groups ("maestras") of 5-10. The floating capacity of a floater of aluminium is five times greater than that of one of glass.

The foot rope is furnished with cylindrical rollers of iron or wood. The foot rope passes through the rollers, and these are rolling along the bottom during fishing. The ground rope during working forms a more or less open arch. The rings of the rollers show striations due to sliding over the bottom. The angles of the stripes to the direction of the trawls increase with distance from the centre.

Thanks to the aluminium floaters and the rollers, the ground rope and the doors, these weighing around 720 kg., keep the mouth of the trawl open. The mouth opening varies somewhat, between 30 and 40m.

After the wings follow the ceiling, the square and the belly. The wings and the ceiling have a larger mesh and are made of thinner twine. Actually the diameter of the new mesh measured is 150mm. The nets of the square and of the bottom have a smaller mesh size and are of double strand in order to increase their strength. Behind this part of the trawl comes a large cylinder called the tunnel (lengthening piece), the ultimate part of the tunnel is the codend. The tunnel is manufactured of double strand meshes; it has a length of 110-170 meshes, varying according to the size of the trawl.

The ultimate part, which is subjected to the greatest pressure during trawling, has to be protected in its lower part by cowhides. In the upper part it has additional nets of the same mesh size as those which are used for the tunnel. They are arranged in the following way: from the extreme end of the codend and towards the mouth of the trawl is a sheet of net of 50 meshes length; outside this still another one of only 25 meshes, beginning 1m. from the end of the codend (see Figure 1).

The two sheets are sewn to the sides of the trawl, being left free in the front and behind.

All the trawls now used by the Spanish vessels are of hemp.

The measurement of the meshes, measured with a Scotch spring gauge, are shown at the end of this paper. These lengths are about 3mm. smaller than those found by measurement with a plane calibrator. The pressure used during measurement has been 12 lbs.

It is the custom of the net manufacturers to measure one of the four sides of the mesh and to double this measurement to learn the actual size of the mesh. It is said that if the side measures 75mm. the mesh will be 150mm. In Spanish papers, as a rule, the mesh is said to be 75mm. in quadrate. In other cases the trawls are indicated by numbers thus: Trawl No. 3, 4 or 5, of these No. 3 is the largest and No. 4 has 60m. of length.

The total length of the trawl varies between 40 and 60m.

The twine for the nets is indicated according to the number of meters of each class which makes up one-half kilogram. Thus the twine No. 75, 80 or 100 signifies that one-half kg. gives 75, 80 or 100m. of twine.

The thickness of this twine is 3-4mm. in diameter.

B. Trawls Used by the Pair Trawlers

The pair trawlers use also trawls but these differ in certain ways from the trawls used by the trawlers.

The mouth of the trawl has a smaller width than that of the trawlers. The head rope has floaters of glass or aluminium and the ground rope carries a chain instead of rollers.

The length of the trawl varies generally between 40 and 60m. This trawl does not have doors; the mouth is kept open owing to the hauling of the two vessels which make up the pair. The distance between the two vessels fishing together is around one-half km.

The tunnel and the codend do not have any protection, mostly because the pair trawlers fish in areas with a rather clean bottom - sand, shells, etc., and also because the net is, when full of fish, not hauled onto deck. Also fishing on clean bottom, they do not carry any protective covers on the lower part of the codend (cowhides). When the net is hauled it is not taken on board but remains beside the vessels and the fish is taken out of the trawl by means of a dip-net. Only when the quantity of fish is very small, the trawl itself is hauled onto the deck. For this reason, the trawl generally does not carry as great a weight as the trawlers and does not need any protection (chafing gear).

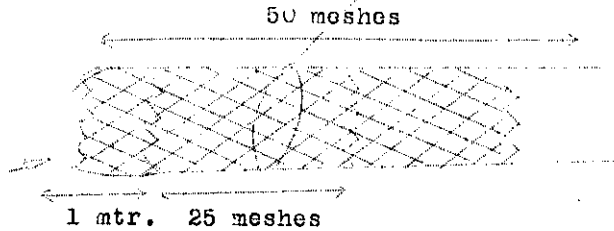
The codends of the pair trawls are of single strand.

The meshes of the tunnels of the pair trawls are larger than those fixed in the regulations for Subareas 3 and 4, i.e. the areas where nearly all the fishery of the pair trawlers is carried out. The wet and used meshes measured by me have shown high figures, between 102 and 139mm.

All the measurements were taken with a Scotch spring gauge which gives a measurement 3mm. smaller than that taken by a plane calibrator.

Final observation - The detailed measurements which were taken in the years 1955 and 1956 are shown at the end of this paper. Some few meshes do not quite reach the regulation mesh sizes, but this is only the case for measurements taken before the new regulations were enforced.

In accordance with the information received from the fishing companies, the new measures are made with a size of 150-165mm. which, with the shrinkage of the manila of 27% found through investigations carried out, gives a reduction to 110 and 120mm. respectively.



Measurements of Meshes

Note: All Measurements were made with a Scotch spring gauge. Therefore 3mm. have to be added to each measurement.

1. SANTA ELVIRA Date 11 July, 1955.
New net 150.00mm.
Net used and wet, after 1 month's use 99.71mm.
Net made of manila with tunnel of double strand
2. Pair MARINEMI Date 20 May, 1955
MARIBLANCA
New net 130.00mm.
Net used and wet, after 1 week's use. 114.40mm.
Net made of manila without protective covers of the ceiling
3. Pair MONTE JAIZQUIBEL Date 10 May, 1955
MONTE SAN MARCOS
Net used and wet 125.60mm.
Net made of manila
4. Pair TXINDOQUI Date 20 May, 1955
GAMBO
Net used and wet, after 1 month's use 110.49mm.
Net made of manila
5. Trawler SANTA INES Date 5 May, 1955
Net used and wet, after 1 month's use 107.40mm.
Net made of manila
6. Trawler SANTA EUGENIA Date 5 April, 1955
Net used and wet, No.3, after 10 days' use 90.26mm.
Net used and wet, No.4, after 6 days' use 127.51mm.
7. Trawler TORNADO Date 29 March, 1955
Net used and wet, after 5 days' use 101.18mm.
8. Trawler MAREIRO Date 29 March, 1955
Net used and wet, after 6 days' use 89.17mm.
Net made of manila
9. Trawler SOLANO Date 29 March, 1955
Net used and wet, after 1 week's use 96.84mm.
Net made of manila with two covers on ceiling
10. Trawler ALISIO Date 12 May, 1955
Net used and wet, after 20 days' use 89.76mm.
Net made of manila
11. Trawler REGANON Date 14 May, 1955.
Net used and wet, after 10 days' use 91.81mm.
12. Trawler VENDAVAL Date 5 May, 1955
Net made of manila, used and wet after 20 days' use 93.34mm.
13. Pair BAHIA DE PASAJES Date May, 1956
ABRA DE BILBAO
Net used and wet 129.25mm.
14. Pair VIRGEN DE LA PASTORA Date July, 1956
VIRGEN DEL CORO
Net used and wet 120.66mm.
15. Pair APOSTOL SAN PEDRO Date July, 1956
APOSTOL SAN PABLO
Net used and wet 110.13mm.
16. Pair VISPON Date July, 1956
MUELA
Net used and wet 130.68mm.

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|-----|----------------|---|----------------------|-----------|
| 17. | <u>Pair</u> | BAHIA DE PASAJES ABRA DE BILBAO | Date 21 July, 1956 | |
| | | Net used and wet, after 2 hours' use | | 108.04mm. |
| | | Net used and wet, after 12 hours' use | | 112.03mm. |
| 18. | <u>Pair</u> | APOSTOL SAN PEDRO APOSTOL SAN PABLO | Date 20 August, 1956 | |
| | | New net, of single strand | | 125.64mm. |
| | | Net used and wet, after 20 days' use, double strand | | 113.16mm. |
| 19. | <u>Pair</u> | COSTARENCALA PLA YLSU | Date 20 August, 1956 | |
| | | New net | | 119.00mm. |
| | | Net used and wet, after 8 days' use | | 115.60mm. |
| 20. | <u>Pair</u> | SANTA CRUZ DE LLANERA SANTA CRUZ DE BEZANA | Date 20 August, 1956 | |
| | | Net used and wet, after 1 month's use | | 97.64mm. |
| 21. | <u>Pair</u> | ESTRELLA AZUL ESTRELLA BLANCA | Date 20 August, 1956 | |
| | | New net | | 150.00mm. |
| | | Net used and wet after 17 days' use | | 138.90mm. |
| 22. | <u>Pair</u> | PARROTE PALLOZA | Date 20 August, 1956 | |
| | | New net | | 130.00mm. |
| | | Net used and wet, after 10 days use | | 117.53mm. |
| 23. | <u>Pair</u> | RIO NARCEA RIO DOBRA | Date August 1956 | |
| | | New net | | 130.00mm. |
| | | Net used and wet after 2 weeks' use | | 117.17mm. |
| 24. | <u>Trawler</u> | GALERNA | Date April, 1957 | |
| | | New net | | 130.00mm. |
| | | Net used and wet, after 20 days' use | | 92.91mm. |
| 25. | <u>Trawler</u> | SANTA INES | Date April, 1957 | |
| | | New net | | 150.00mm. |
| | | Net used and wet | | 105.86mm. |
| 26. | <u>Trawler</u> | PUERTO DE NAVACERRADA | Date March, 1957 | |
| | | New net | | 130.00mm. |
| | | Net used and wet, after 8 days' use | | 100.44mm. |
| 27. | <u>Trawler</u> | PUERTO DE FONTEFRIA | Date April, 1957 | |
| | | New net | | 150.00mm. |
| | | Net used and wet, after 2 days' use | | 112.63mm. |