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Recent experiments with net of hexagonal meshes in purse seines

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Our experiments with net of hexagonal meshes (H-net) in purse seine started in 1976. The work up to 1980 has been reported by BELTESTAD (1977) and OLSEN & BELTESTAD (1979).

In cooperation with the fishing gear manufacturing industry a project was started in 1979 to solve the problems of producing a H-net with the same thread thickness in all bars of the mesh. An ideal H-net without the double bars would be about 25% lighter than with double bars. We succeeded to produce a H-net which was 17% lighter, i.e. nearly the same thickness in all the bars. With the equipment available the production was rather problematic and this type of netting is, therefore, not yet commercial available.

A new coalfish purse seine of this lighter type of netting was built in 1979. The length of the net was 643 m and the depth 165 m. The H-net of 60 mm mesh opening was hung to the floatline with a hang-in ratio of 25% and mounted with the longest axis of the meshes horizontally. The total amount of lead was 1242 kg with 1,5 kg/m in the middle section. The net was tried at the coast of Finnmark in October 1979 and May 1980.

During the trials the coalfish were generally located too deep for catching, but the sinking speed, operational depth and tension in the purse line during pursing were measured.

The sinking speed and operational depth were measured by means of Furuno netsonde with acoustic transmission. In Fig. 1 an example is given of such measurements. One transducer was attached to the middle purse ring and the two other on each wing of the net. The highest average sinking speed from 0 to 100 m was measured to about 14 m/min for the middle section of the net. The sinking speed is about the same as for a comparable coalfish purse seine with rhombic meshes (F-net), 865 x 170 m, with a mesh opening of 60 mm, a hanging ration of 45% and a total of 3000 kg lead (Fig. 2). This shows that the sinking speed for the H-net is high compared with the F-net.

From Fig. 1 and 2 it can be seen that the H-net achieved maximum stretched depth when allowed sufficient time to sink. Whereas the F-net only achieved about 80 - 85% of stretched depth.

The tension in the purse line during pursing was measured to be about 30% lower than for the seine with F-net.

This seine showed the same good operative qualities as the first coalfish purse seine (BELTESTAD 1977, OLSEN & BELTESTAD 1980).

The first commercial coalfish purse seine of H-net was built in July 1979. Up to May 1980 the total catch with this seine was about 1500 tons of coalfish, which is much better than for the other coalfish seiners working in the same area.

Because of the good results of H-net in coalfish purse seine, there has been an increasing interest among the Norwegian fishermen to try this type of netting in other purse seines. The first capelin purse seine with H-net was made early 1980.

The length of the net is 535 m and the stretched depth 156 m. The H-net, of the type with two double bars in each mesh, was also hung-in 25% to the floatline, and mounted with the longest axis of the meshes horizontally. The mesh opening was 19,2 mm. The total amount of lead was 4,2 tons. The seine was tried out during the winter capelin season on the Finnmark coast.

The vessel's catch quota of 1000 tons was taken in 8 sets, with catches up to 450 tons. Also this seine behaved very well during the whole catching operation. Giving time to sink, before pursing, also this seine

achieved maximum stretched depth. The highest sinking speed measured was 22 m/min., with an average of 17 m/min. This is high compared with other capelin and mackrel purse seines.

Although the tension in the purse line is not yet measured, it was observed from readings of the hydraulic oil pressure, that also this net was easy to purse compared with capelin seines made of F-net.

Similar to the coalfish purse seine, also this net kept its original round shape throughout the operation without the floatline curling in any way.

One feature of great importance was the fact that the floatline was not pulled down by the fish, even when great catches were taken. This was very common among the other seiners in the area. When this happened they lost most of the catch.

Another feature of great importance was that no capelin or bags of capelin occurred in the net during hauling. This is a very common problem in capelin seines made of F-net.

Experiments on sprat conducted in May showed that there are no difference in selectivity between H- and F-net with the same mesh opening. Nevertheless, the trials with the first coalfish purse seine in 1977 indicated that the coalfish was much less gilled in H-net than in F-net (OLSEN & BELTESTAD 1980). This is probably because the net remains clear and open during the whole hauling phase.

The high sinking speed achieved by the capelin seine of H-net indicate that this seine with advantages could also be used in catching mackrel and herring.

Considering that a H-net hung 25% achieves 15-20 % greater depth than a F-net hung 45%, means that a H-net of equivalent operational depth can be produced with less material than that of a F-net, even if the H-net is made with double bars. If a method to produce an ideal H-net without the double bars is developed, it would be possible to save at least 25-30 % in net materials, compared with a conventional seine with the same operational dimensions. Probably it would also be possible to reduce the rope dimension and the amount of lead and floats.

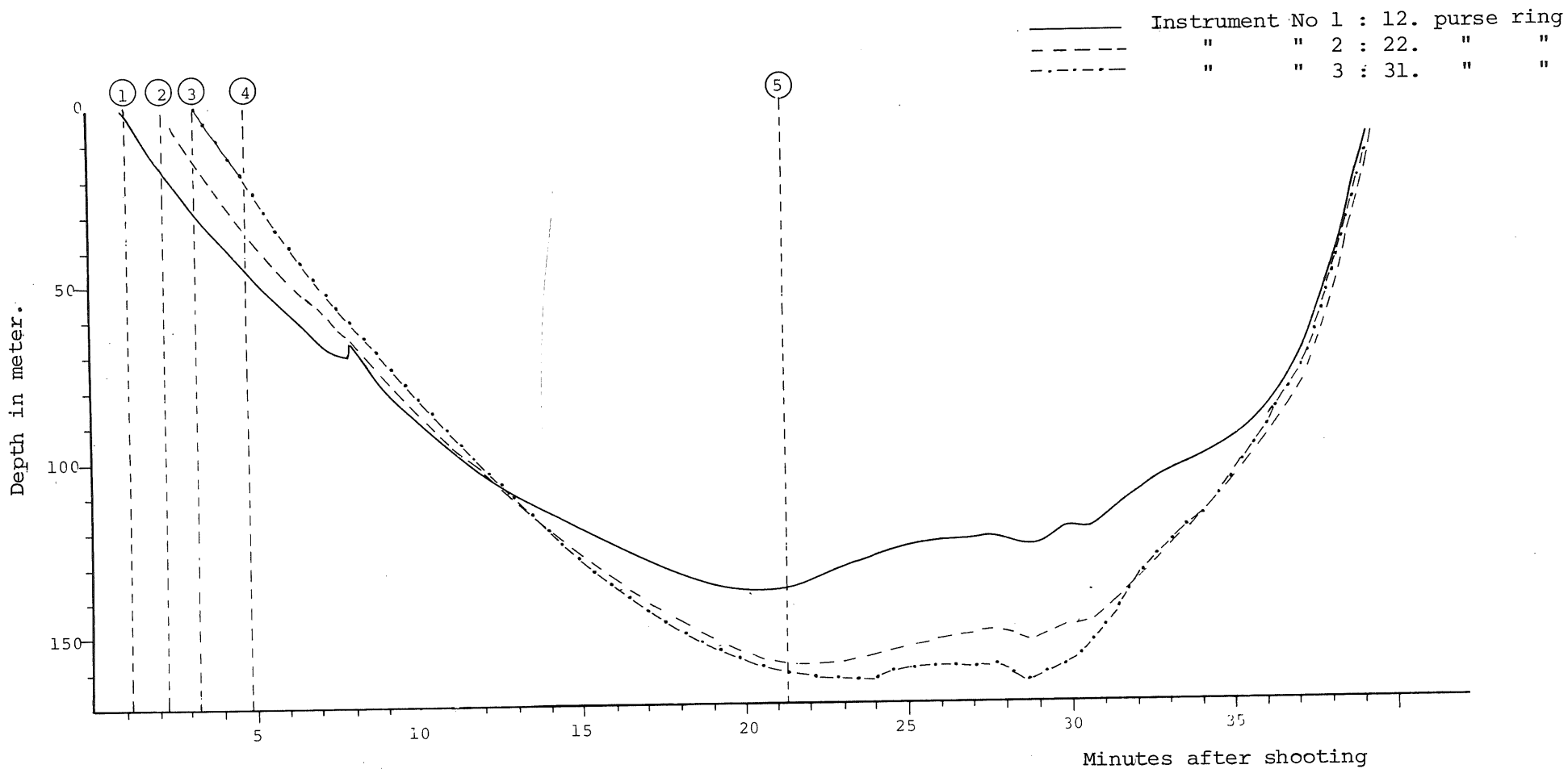
There is an increasing interest among Norwegian fishermen to use net of hexagonal meshes in purse seines. Up to this moment about 20-30 coal-

fish, capelin, mackrel and sprat purse seines are made and also some for export to foreign countries.

REFERENCES:

BELTESTAD, A.K. 1977. Experiments with net of hexagonal meshes in purse seine. Coun.Meet.inst.Coun.Explor.Sea, 1977 (B:39):1-3. (Mimeo)

OLSEN, S & BELTESTAD, A.K. 1980. Russian hexagon mesh is proved in Norway. Wld.Fishg. 29(2):47-50.



\_\_\_\_\_ Instrument No 1 : 12. purse ring  
 - - - - - " " 2 : 22. " "  
 - . - . - " " 3 : 31. " "

Fig. 1. Sinking depth diagram of coalfish purse seine with H-net.  
 1 - 3 : The instruments enter the water.  
 4 : Shooting completed.  
 5 : Pursing starts.

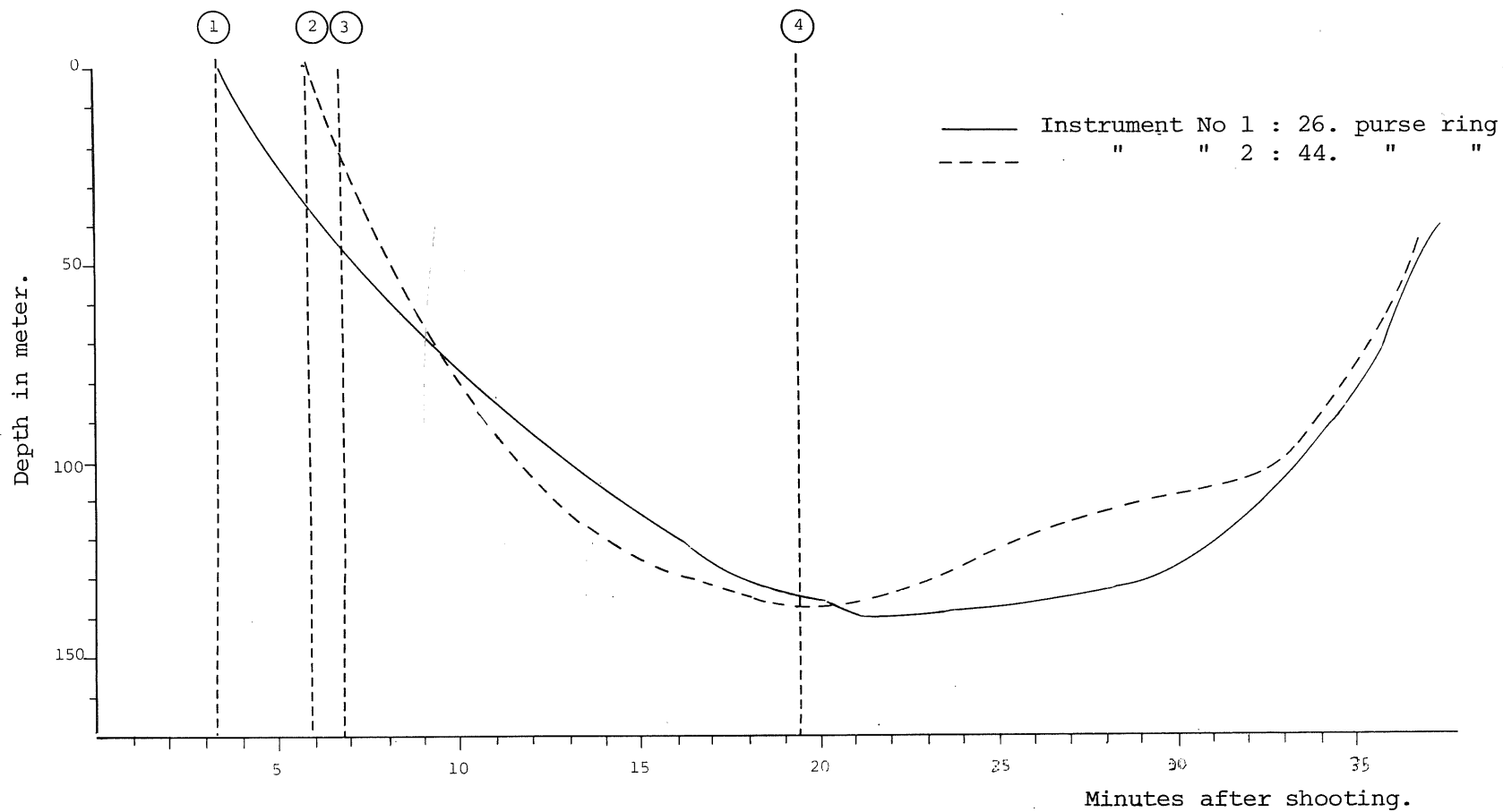


Fig. 2. Sinking depth diagram of coalfish purse seine with F-net.  
 1 - 2 : The instruments enter the water.  
 3 : Shooting completed.  
 4 : Pursing starts.