

SELECTIVITY EXPERIMENTS WITH TOPSIDE CHAFERS.

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During a cruise with the R/V JOHAN HJORT to the Barents Sea in July 1958 some selectivity experiments were carried out with and without a chafing gear mounted on the upper side of cod end. A wide, finemeshed cover was used to retain the escaping fish. The grounds worked were East Finnmark- and the Kildin Banks.

The chafing gear. The chafing gear was constructed according to the ICNAF specifications: A piece of net of double twine, mesh size appr. 11 cm, and with dimensions 18 meshes long and one and a half time the width of cod end was attached along the lateral edges and at its forward edge so that it ranged from four meshes in front of the splitting strap to four meshes in front of the cod line. At first a piece of new unused net was used. The shrinkage of this net, which was not under any strain, was very heavy, and from inspections on deck after a few hauls it seemed probable that approximately ten of the aftermost meshes of the cod end were not covered by this chafing gear. This new net was then replaced by another one, made of an old worn out cod end attached in the same way. Deck inspections indicated that this chafing gear probably left the last six meshes free. After a number of hauls with no chafing gear, the chafing gear was again mounted, but this time so that it was attached from only two meshes in front of the cod line to two meshes in front of the splitting strap. Inspections indicated that this mounting probably left the after four meshes free.

The trawl and the mesh size. A trawl with a headline of 60 feet and a cod end of double white manilla was used. Only six hauls had been made previously with this cod end, and accordingly the mean mesh size increased slightly during the work. Series of meshes of approximately ten each were

measured from the cod line and forward:

Table 1. Mesh measurements. (The Aberdeen pressure gauge).

Date	Number of meshes	Mean	Standard Dev.
July 13th	50	108,3 mm	5.19 mm
" 14th	74	111,3 mm	4.66 mm
" 18th	56	112,7 mm	4.97 mm

The results. Fourteen successful hauls were made. The catches were smallish, usually 20 - 25 baskets, and consisted mostly of cod of sizes within the selection range. A natural grouping of the hauls according to time, place and method is shown in table 2.

Table 2. Grouping of the material.

Series A.	Hauls no. 7, 8, 10,	Chafing gear. 10 last meshes free?
" B.	" " 11, 12.	" " 6 " " "
" C.	" " 13.	No chafing gear.
" D.	" " 15, 16, 17, 18, 19.	"
" E.	" " 20, 21.	"
" F.	" " 22.	Chafing gear. 4 last meshes free?

Fig. 1 shows the selection curves of each of these series. There is seen to be a considerable variation of escapement between the various series. This is also clearly demonstrated by the selection factors shown in table 3.

Table 3. 50 per cent lengths and selection factors.

Series	50 per cent length.	Estimated mesh size.	Selection factor.	Estimated towing speed.
A	39.5 cm	108 mm	3.66	3.60 knots
B	40.5 "	109 "	3.72	3.75 "
C	44.5 "	110 "	4.05	3.15 "
D	40.5 "	111 "	3.65	3.85 "
E	39.0 "	112 "	3.48	3.78 "
F	44.5 "	113 "	3.94	3.47 "

The average selection factor of the series A, B and F (with chafing gear) is 3.77, while that of the series C, D and E (without chafing gear) is 3.73.

The variability of the results of the various series can not have been caused by the relatively small variations which occurred in the size of the catches or the duration of the hauls. But considerable variations were found to have taken place in the towing speed as estimated from the electric log (cfr. table 3). In fig. 2 the selection factors have been plotted against towing speed. There is seen to be a clear tendency of high speeds to give low escapement and vice versa.

The four hauls no. 15 - 19 (series D for cod) provided a small number of haddock of sizes within the selection range, cfr. table 4, series G. The 50 per cent length of 35 cm give a selection factor of 3.2. The corresponding selection factor for cod was 3.6. The same difference between the escapement of these two species has been found in previous experiments in this area.

Conclusions. The results indicate that when mounted according to the ICNAF specifications the presence of a chafing gear has no influence on the escapement from the cod end. One should note, however, that the catches in these experiments were small. A complete study of the problem would have to be based on further material, especially from larger catches.

The relationship which was found between the speed of towing and the escapement suggests that this factor may have been underestimated as a cause of variation in selectivity experiments.

Table 4. Number of fish in selection range. Cod^x. Cov. - cover. C. e. - cod end.

	Series A		Series B		Series C		Series D		Series E		Series F		Series G	
	Cov.	C. e.	Cov.	C. e.	Cov.	C. e.	Cov.	C. e.	Cov.	C. e.	Cov.	C. e.	Cov.	C. e.
30	13	7	8		3	20	3	10	2	4	1	15		
1	23	4	6	8	2	12	3	22	7	11		20	6	
2	21	7	14	5	1	21	4	20	6	6	2	18	9	
3	21	7	22	9	2	20	4	24	9	8	2	12	1	
4	33	15	26	9	17	30	15	30	14	8	4	10	2	
35	31	18	20	17	2	21	9	23	18	17		8	12	
6	30	27	30	15	8	34	9	33	21	14	5	11	13	
7	41	25	36	19	4	24	16	32	27	14	6	15	22	
8	37	31	40	21	4	33	14	29	43	15	5	9	17	
9	43	28	39	35	10	13	19	42	35	24	7	8	23	
40	30	32	40	36	14	23	15	37	37	28	7	4	27	
1	25	41	37	49	13	25	23	33	41	29	13	8	27	
2	32	43	34	44	11	17	18	32	46	25	12	2	24	
3	18	53	45	79	16	16	21	28	59	25	23	4	28	
4	13	50	38	76	20	9	21	25	62	29	16	4	38	
45	9	41	27	85	14	11	19	29	74	14	20	2	39	
6	6	44	18	85	21	8	18	16	61	16	28	27	27	
7	7	47	16	113	26	5	21	23	80	16	25	17	17	
8	4	36	19	97	28	2	20	8	73	19	24	1	18	
9	10	41	10	92	32	3	17	9	65	9	29			
50	1	29	4	83	26	2	23	10	69	6	21			
1		42	4	64	27		14	4	71	3	39			
2		35	1	68	22	3	17	3	52	4	33			
3	1	30	1	54	18	1	12	1	58	4	29			
4		27	1	50	19	1	9	3	70	3	34			
55		26		43	16	1	12	59	59	24	24			
6		26			12		7	43	43	25	25			
7		19			7		7	35	35	22	22			
8		16			8		2	30	30	13	13			
9		15			6		10	36	36	9	9			
60		15			10		4	16	16	8	8			
N	449	877	542	1262	353	402	349	406	523	1319	352	486	147	350

^x Cod, series A - F. Haddock, series G from same group of hauls as the cod of series D.

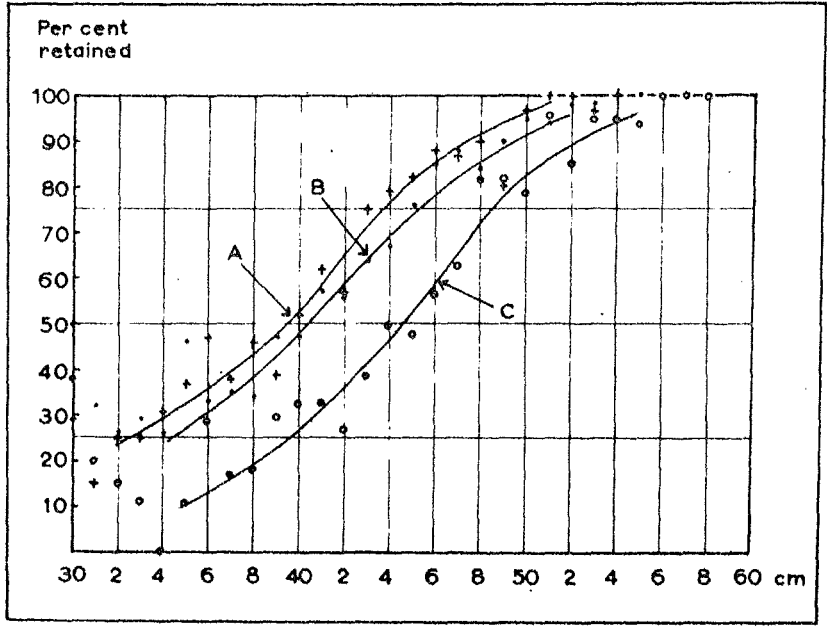
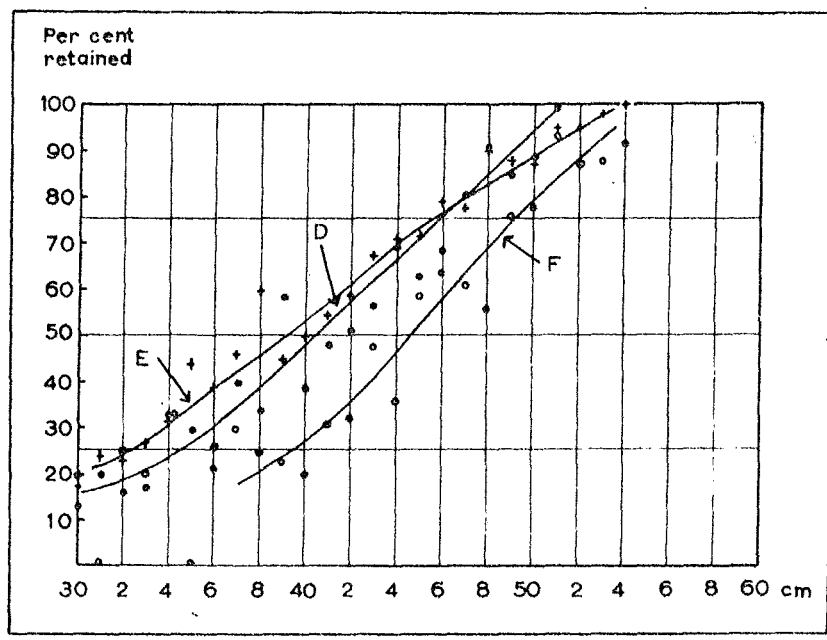


Figure 1. Selection curves for cod. Cfr. tables 2 and 4.

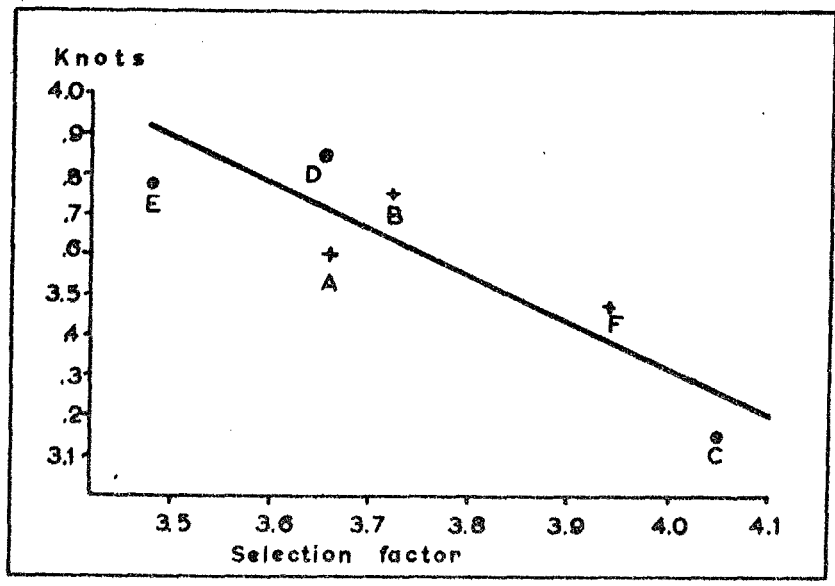


Figure 2. Relation between selection and towing speed.