Cruise Report
Cruise no. 0332

Joint investigations on the environment and pelagic fish in the Faroese area and in the Norwegian Sea

30. April - 28. May 2003

R/V Magnus Heinason OW2252

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INTRODUCTION

The main aims of this survey was to investigate the distribution and abundance of postspawning blue whiting in the Faroese area and to investigate the distribution and stock size of Norwegian spring spawning herring in the Faroese area and the Norwegian Sea. Hydrographic data were collected along the cruise tracks and along the Faroese standard section North (north along 6°W north of the Faroes). Plankton samples were taken at each hydrographic station.

The cruise was part of an joint international survey (Faroes, Norway, Iceland and EU, EU did not participate in 2002-2003) coordinated by the ICES Planning Group on Surveys on Pelagic Fish in the Norwegian Sea (PGSPFN). Cooperating vessel during this investigation was R/V *G.O. Sars* from Norway. Data from both vessels will be incorporated in a comprehensive report from PGSPFN covering research surveys in the Norwegian Sea during the summer 2003 (ICES CM 2003/D:06).

This report is based only on data from the *Magnus Heinason*, and therefore no estimate of herring is given due to incomplete coverage in the Norwegian Sea.

MATERIAL AND METHODS

The area was covered from south to north. The first part of the survey (30/4-12/5) covered the blue whiting concentrations in the southern part of the Faroese area. The second part of the survey (13-28/5) covered blue whiting in the eastern and northern part of the Faroese area and in the Norwegian Sea (Fig. 1).

Cruise tracks with hydrographic stations (CTD), plankton stations (WP2 net 0-200m), and trawl stations in the Faroese area are shown in Fig. 1. Acoustic data were recorded with a Simrad EK-500 echo sounder. Data from the hull mounted 38 kHz transducer were logged at sea and used in the fish abundance estimation. The area backscattering recordings (s_A) per nautical mile were averaged by each 5 nautical mile and the recordings were and scrutinised on a daily basis and allocated to either blue whiting, herring, plankton or other fish (e.g. lantern fish).

The 38 kHz Echo sounder was operating with the following settings, as obtained from a copper sphere calibration prior to the survey:

Max. Power	2000 W
Time varied gain	20 log R
Pulse length	Medium
Bandwidth	Wide
Angle sensitivity	21.9 dB
2-way beam angle	-20.6 dB
Sv transducer gain	27.12 dB
TS transducer gain	27.29 dB
3 dB beam width	6.9/7.1 dg
Along ship offset	0.26 dg
Athw. ship offset	-0.07 dg

For zooplankton sampling a standard WP-2 net with 180 µm meshes was used for vertical hauls 0-200m.

A CTD was used to record temperature and conductivity (salinity) down to 1000 m depth or to the bottom. Water samples were taken from each station, with water bottles mounted on the CTD, for analysis of nutrients. Samples for chlorophyll were collected from the upper 100m. CTD and WP-2

stations were taken every 10-20 nm in the southern part of the Faroese area and every 25-30 nm in the northern part of the area and in the Norwegian Sea.

RESULTS

The average s_A values of blue whiting by statistical square from the *Magnus Heinason* survey are shown in Fig 2. In the southern part of the Faroese EEZ the highest concentrations of post spawning blue whiting were recorded along the eastern edge of the Faroe bank and on the Monk ("Munkagrunnurin"). In the northern area blue whiting was observed in most of the Norwegian Sea except in the northernmost stations, where the influence of the cold East-Icelandic current had its influence (Fig. 2). The length and weight distributions of blue whiting in the Faroese area is shown in Fig. 4 and 5, respectively. In the southern area the 2002 and the 2000 year-classes dominated, while the 2000 year-class dominated in the northern part of the Faroese EEZ (Fig. 6). The total biomass estimate of blue whiting in the Faroese area in May 2003 was 4.8 million tonnes (Table 1).

The average s_A values of herring by statistical square from the *Magnus Heinason* survey are shown in Fig 3. The highest concentrations of herring observed by *Magnus Heinason* were located in the area from 63°30'-66°00'N and 2°00'-8°30'W. The herring was large (35.5 cm and 355 g on average, Fig. 7 and 8). The age of the herring was determined from otholit readings and indicate that old herring was dominating the in the area, including the 1998-1994 year-classes, with the 1996 and 1995 year-classes dominating (Fig. 9).

Combined abundance estimates of herring will be given in the 2003 PGSPFN report to ICES (ICES CM 2003/D:06), at a meeting in Tórshavn in late August 2003. Similarly the distribution and biomass of plankton and temperature charts by depth will be combined (Faroese, Norwegian and Icelandic data) and presented in the PGSPFN report (ICES CM 2003/D:06).

REFERENCES

ICES 2003. Report of the Planning Group on Surveys on Pelagic Fish in the Norwegian Sea 2003. ICES CM 2003 (D:06)

Table 1. Age stratified abundance estimates of post-spawning blue whiting in the Faroes area during May 2003. Data from R/V *Magnus Heinason*. Biomass in thousand tonnes, numbers in millions, L= mean total length (cm), and W= mean weight (g). Target strength used for blue whiting, TS= 21.8 log(L)-72.8 dB.

Faroese area				Age				
May 2003	1	2	3	4	5	6	7	Total
Northern area								
Biomass	62	314	1,030	479	165	68	7	2.125
Numbers	1,085	3,415	9,587	3,449	1,040	368	27	18.971
L (cm)	20.4	24.0	25.6	28.1	29.6	31.0	34.5	25.8
W (g)	58	92	107	139	159	183	266	112
Southern area								
Biomass	786	477	1,159	204	19	7	0	2.652
Numbers	19,821	6,917	14,824	1,974	138	51	0	43.725
L (cm)	19.2	23.4	25	27.7	30.3	29	0	22.2
W (g)	40	69	78	103	134	132	0	61
Total area								
Biomass	848	791	2,189	683	184	75	7	4.777
Numbers	20,906	10,332	24,411	5,423	1,178	419	27	62.696
L (cm)	19.2	23.6	25.2	28.0	29.7	30.8	34.5	23.4
W (g)	41	77	90	126	156	177	266	77.3

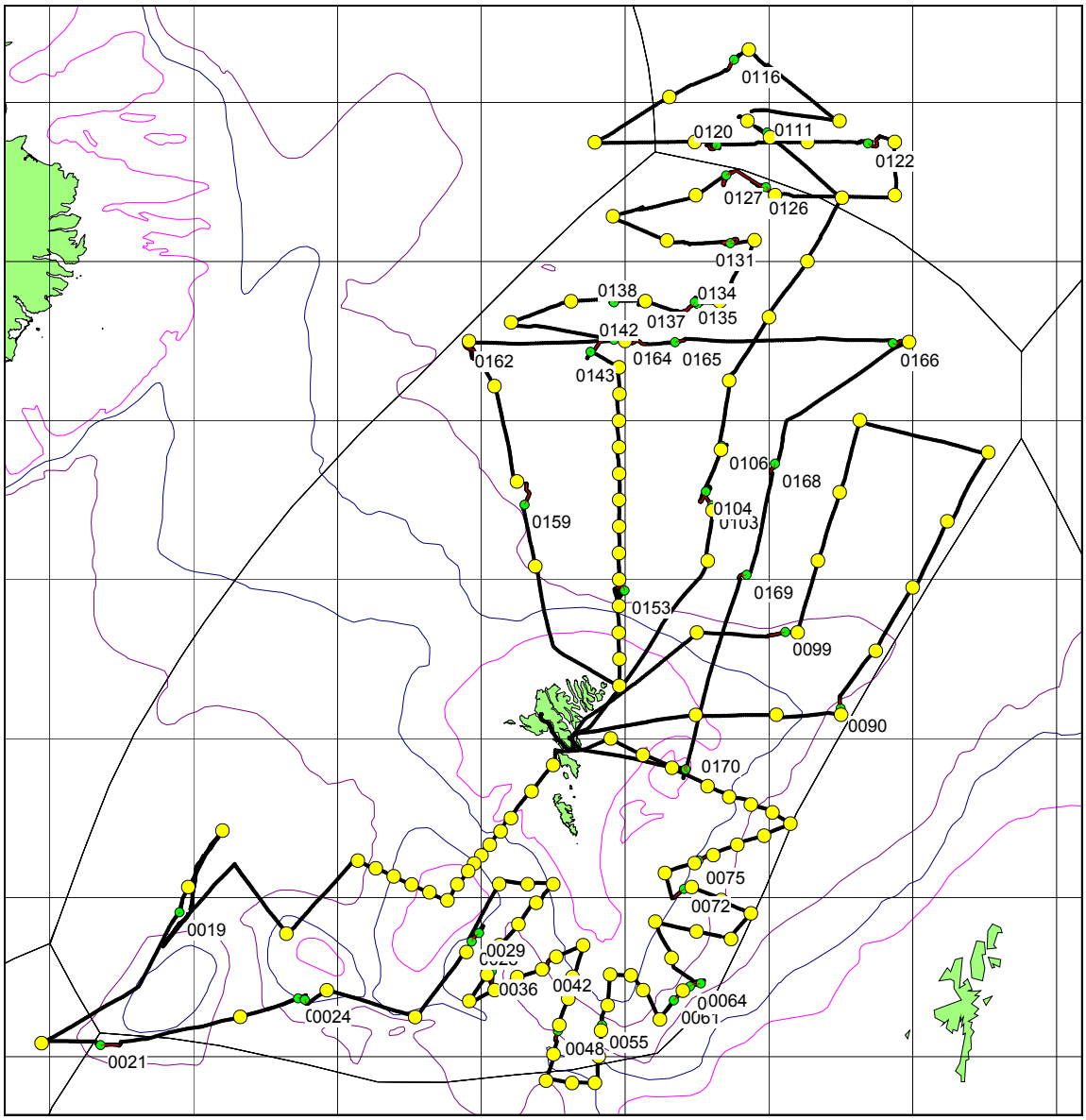

Fig. 1. Cruise tracks with hydrographic stations and trawl stations in the Faroese area and in the southern part of Norwegian Sea, *Magnus Heinason* 30/4-28/5 2003.

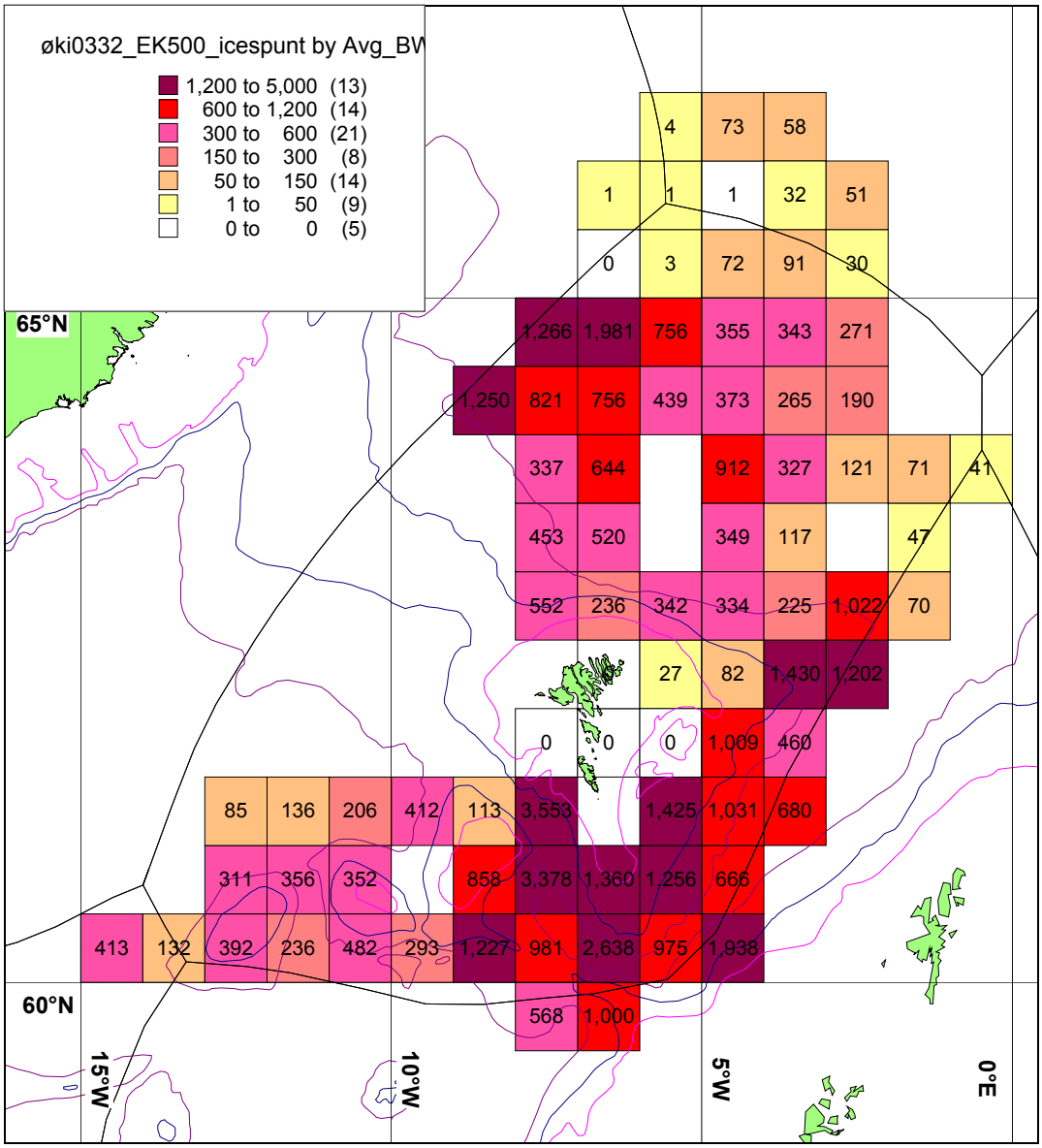

Fig. 2. Mean integration values (s_A, m^2/nm^2) of blue whiting per statistical square, May 2003.

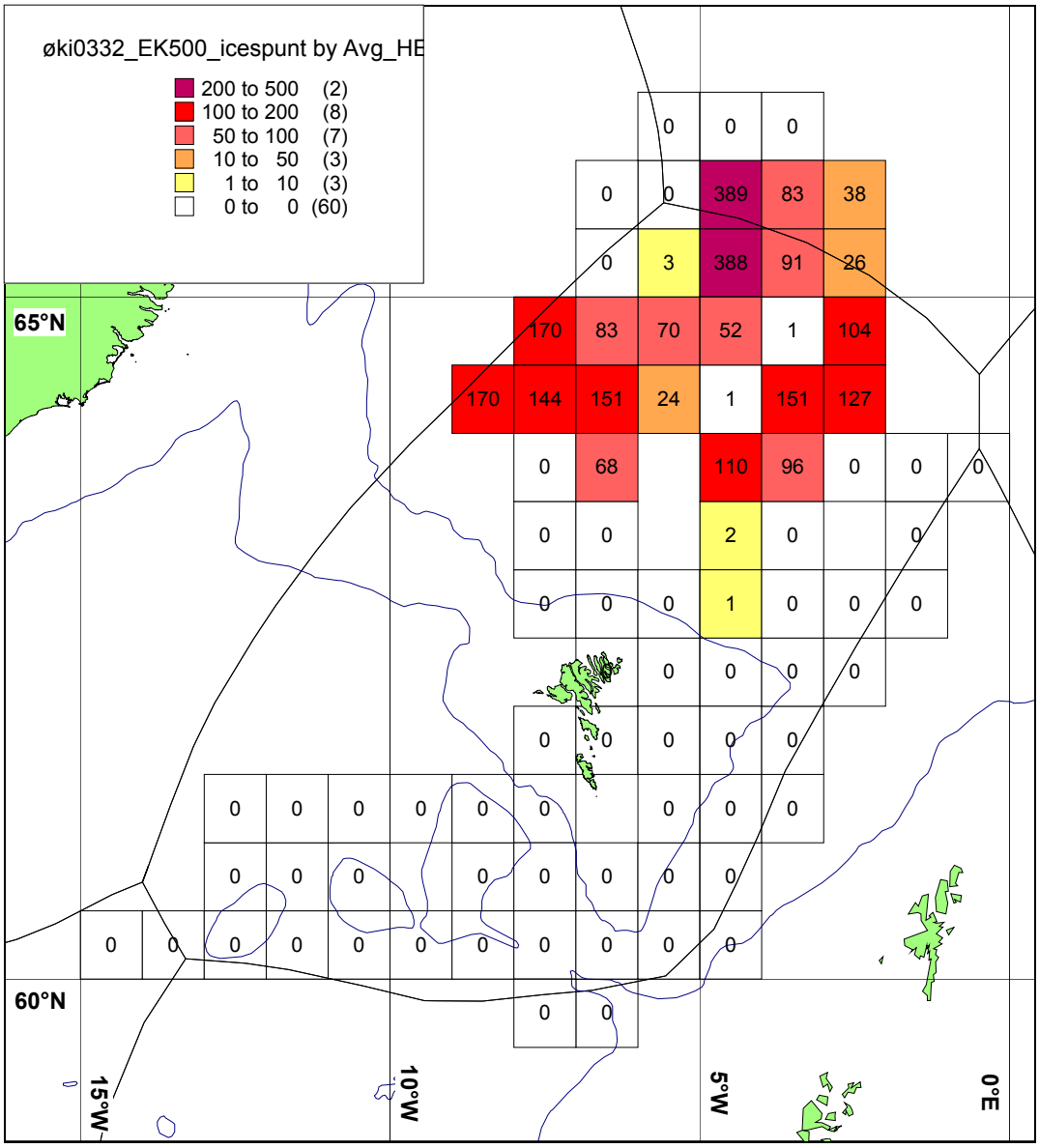

Fig. 3. Mean integration values (s_A, m^2/nm^2) of herring per statistical square, May 2003.

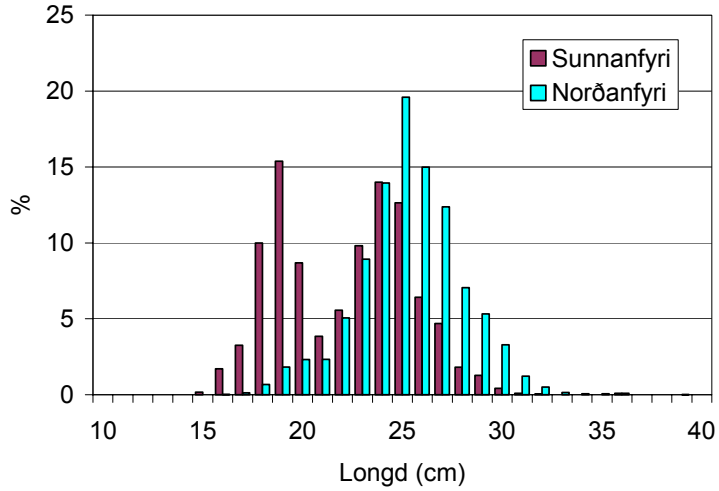

Fig. 4. Length distribution of blue whiting in the southern part (< 62°N, dark bars) and in the northern of the Faroese area sampled from *Magnus Heinason*, May 2003.

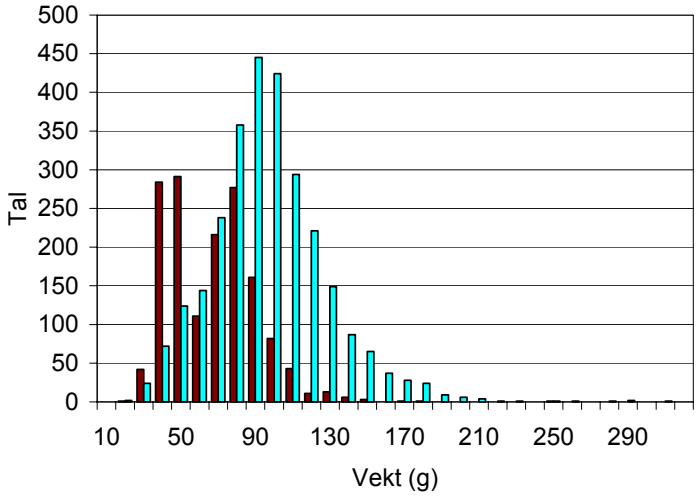

Fig. 5. Weight distribution of blue whiting in the southern part (< 62°N, dark bars) and in the northern of the Faroese area sampled from *Magnus Heinason*, May 2003.

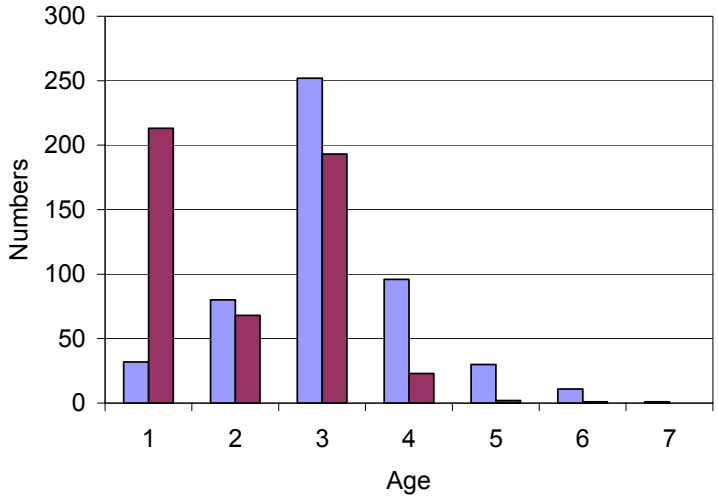

Fig. 6. Age distribution of blue whiting in the southern part (< 62°N, dark bars) and in the northern of the Faroese area sampled from *Magnus Heinason*, May 2003.

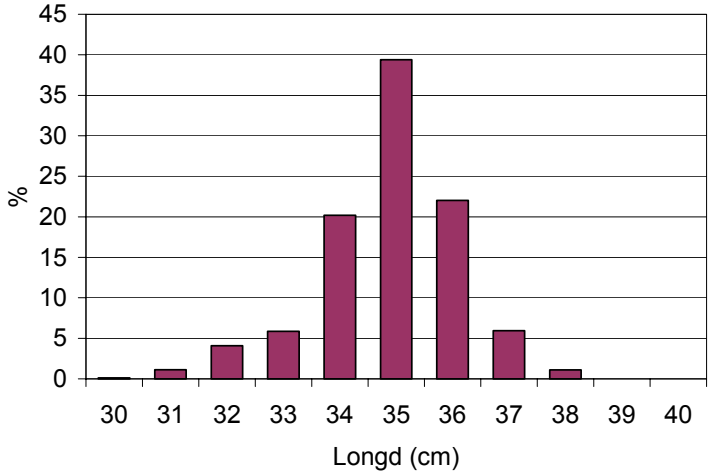

Fig. 7. Length distribution of herring in the northern part of Faroese area (and in the southern part of Norwegian Sea) sampled from *Magnus Heinason*, May 2003.

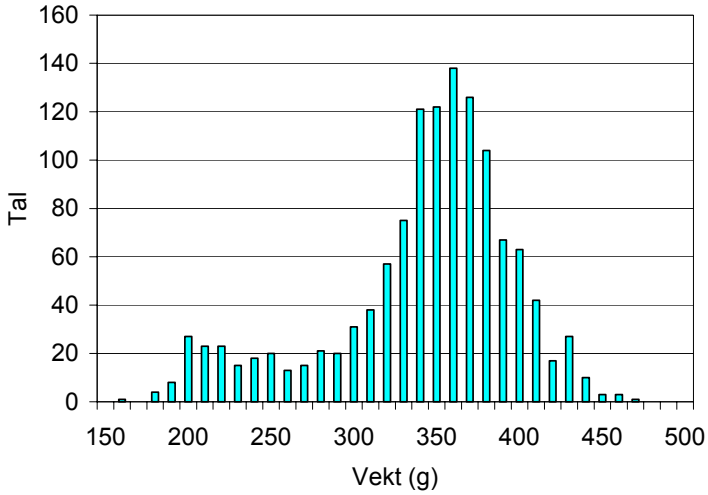

Fig. 8. Weight distribution of herring in the northern part of Faroese area (and in the southern part of Norwegian Sea) sampled from *Magnus Heinason*, May 2003. The herring was rather thin compared to length, but the stomach and gut was full of prey (*Calanus finmarchius* and *Meganyctiphanes norvegica*).

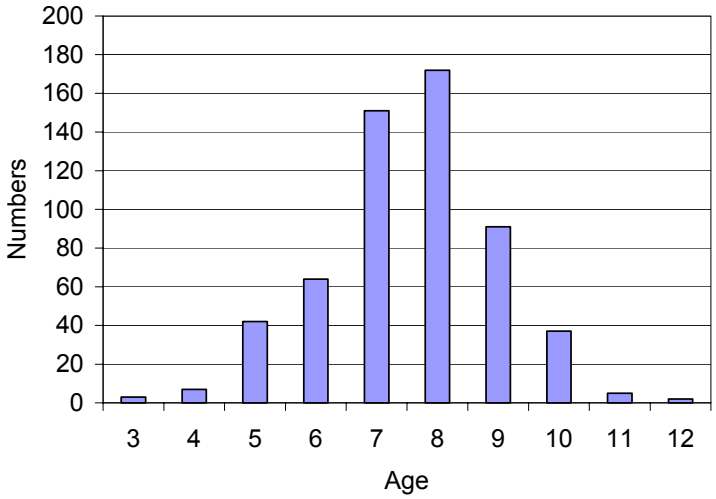

Fig. 9. Age distribution of herring in the northern part of Faroese area (and in the southern part of Norwegian Sea) sampled from *Magnus Heinason*, May 2003.