

Northwest Atlantic



Fisheries Organization

Serial No. N1241

NAFO SCR Doc. 86/114

SCIENTIFIC COUNCIL MEETING - SEPTEMBER 1986

Variations in the Gonad Weight and the Percentage Occurrence  
at Length of Maturing Female Cod on the Flemish Cap

by

R. Wells

Science Branch, Department of Fisheries and Oceans  
P. O. Box 5667, St. John's, Newfoundland, Canada A1C 5X1

INTRODUCTION

If the number of female cod maturing to spawn in the current year is known, and a fecundity relationship applied, estimates of potential egg production can be derived. Egg production may be related to eventual year-class success.

MATERIALS AND METHODS

Observations were made on the maturity stages of cod during winter cruises to the Flemish Cap in 1978-85. Female cod maturing to spawn in the immediate spawning season have opaque eggs clearly visible to the naked eye. From samples returned to the laboratory, gonad weights were observed.

RESULTS

The average ovary weight of maturing females increases with length (Table 1). Sample sizes were usually small (Table 2).

Of the total cod observed, the proportion which were females maturing to spawn in the current year increases from a few percent at length 40 cm to 50 percent by about 90 cm. There is a clear tendency for cod greater than about 90 cm to leave more than half their number as maturing females.

In 1978 and 1979, there appear to be clear discontinuities in the pattern of increasing percentages. In 1978, percentages in the range 55 cm to 82 cm were rather lower than expected, while in 1979 the dip extended from about 64 cm to 79 cm. Such anomalies do not appear in the other years.

There appears to be a trend towards maturing to first spawning for females at a somewhat greater length from 1978-84. The lengths at which first maturing occurred were:

1978	34
1979	40
1980	46
1981	43
1982	52
1983	58
1984	58
1985	40

It is notable that the trend seems to have been reversed in 1985 when at least some females were maturing to spawn at each of lengths 40, 43, 46, 49, 52, and 55 cm.

SPECIAL SESSION ON RECRUITMENT



Table 2. Number of observations of ovaries in the opaque egg stage used to derive average weights in Table 1.

Length group	1978	1979	1980	1981	1982	1983	1984	1985	All years
43								1	1
46	2								2
49	2	2						1	5
52	1	2			1				4
55	2	2		1	1				6
58	1			1	2				4
61		2	2	2	1	1			8
64			1	2	2	2	1		8
67	1		2		1	3		5	12
70	1		5	1	3	4		4	18
73	1		1	3	3	5	2	5	20
76	1		1	2	2	2	2	3	13
79			2	2	5	3	1	2	15
82	1	1	3	4	4	7	3	3	26
85	3		3	2	1	1	6	1	17
88		1	2	2	2	2	3	5	17
91	2		3	5	1		3	3	17
94	1	1	2	4	2	1	5	3	19
97	2	1	2	2	5	2	3	1	18
100	3	1		4	5	2		1	16
103	3			2	1	1	1		8
106	2	2		2	4	3	2		15
109		1			2	2		1	6
112	2	1	1		1	1		5	11
115						1	1	1	3
118		1	1			1	1		4
121	1		1					1	3
124		1							1
127	-	-	-	-	-	-	-	-	-
130		1					1		2
133						1			1
Total	32	20	32	41	49	45	35	46	300

Table 3. Percentage of cod which are females maturing to spawn in the year of observation, that is, with opaque eggs present.

	1978	1979	1980	1981	1982	1983	1984	1985	Total
34	.2	0	0	0	0	0	0	0	+
37	0	0	0	0	0	0	0	0	0
40	2.6	.3	0	0	0	0	0	.7	.5
43	14.5	.9	0	.9	0	0	0	1.2	2.2
46	25.1	1.8	3.7	1.6	0	0	0	1.8	4.3
49	25.0	9.8	5.8	3.0	0	0	0	2.4	5.8
52	21.5	24.4	10.4	2.6	3.0	0	0	.7	7.8
55	10.4	35.6	7.7	10.1	9.3	0	0	1.0	9.3
58	5.4	38.7	24.8	16.4	12.1	13.6	1.5	.7	14.2
61	2.6	34.2	30.4	26.0	26.1	10.6	1.6	7.1	17.3
64	1.4	10.3	42.7	29.7	40.4	26.6	7.1	6.3	20.6
67	3.8	16.9	39.4	37.0	25.0	19.8	0	40.0	22.7
70	.8	11.4	61.7	32.7	50.0	37.8	0	26.7	27.6
73	2.9	0	52.4	46.9	57.1	31.3	33.3	40.0	33.0
76	17.1	18.8	58.8	47.5	27.3	50.0	28.6	29.2	34.7
79	14.3	9.1	58.0	48.4	55.6	35.7	25.0	17.7	33.0
82	14.3	40.0	53.7	63.6	50.0	54.2	50.0	37.5	45.4
85	25.0	25.0	50.0	44.4	40.0	42.9	63.2	16.7	38.4
88	24.0	25.0	57.1	35.0	75.0	33.3	58.3	55.6	45.4
91	38.5	0	50.0	58.8	50.0	0	69.2	44.4	38.9
94	25.0	25.0	75.0	60.9	100.0	33.3	53.9	75.0	56.0
97	83.3	50.0	100.0	42.9	83.3	60.0	60.0	25.0	63.1
100	87.5	25.0	-	71.4	83.3	100.0	33.3	50.0	64.4
103	84.6	50.0	0	100.0	33.3	33.3	50.0	-	50.2
106	100.0	100.0	0	66.7	80.0	80.0	100.0	0	65.8
109	100.0	100.0	100.0	0	100.0	66.7	0	33.3	62.5
112	83.3	33.3	50.0	-	100.0	100.0	0	100.0	66.7
115	50.0	0	-	0	0	100.0	100.0	100.0	50.0
118	100.0	100.0	50.0	-	-	100.0	100.0	-	90.0
121	100.0	0	100.0	-	-	-	-	100.0	75.0
124	100.0	50.0	-	-	-	-	-	-	75.0
127	-	-	-	-	-	-	-	-	-
130	-	100.0	-	-	-	-	100.0	-	100.0
133	-	-	-	-	-	100.0	-	-	100.0
Total									
Grand Total	1627	311	455	409	114	205	106	93	
	13246	3194	3262	4778	1020	3768	3361	4250	