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Girth, length and weight measurements of cod  
and haddock from Subarea 4

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During October 1960 girths of cod from Division 4T and girths of haddock from 4W were measured from catches of the research vessel A. T. Cameron. In January cod girths from Division 4V were also measured. Besides girths, lengths and weights of the same fish were taken. All fish were measured and weighed in the round condition immediately after they were captured. Length of both species was taken from the snout to the mid-fork of the caudal fin and read to the nearest centimetre. Two sets of girth measurements were made: (a) opercular girth, and (b) first dorsal girth. In both cases a flexible steel tape graduated in millimetres was passed completely around the fish, without constriction, but making sure the tape fitted snugly to the body, and the total measurement taken to the nearest millimetre.

- (a) Opercular girth was measured with the forward edge of the tape placed at the posterior margin of the post operculum.
- (b) First dorsal girth was measured across the middle of the first dorsal fin, the pectoral fins being included within the circle of the tape for cod but excluded for haddock.

Numbers of fish, mean weights, mean girths and maximum-minimum girths in relation to length are presented in Tables I to III. These results show:

- (a) that for cod, opercular girth was greater than the first dorsal girth in both areas and seasons; the difference between the two was more in the Division 4V winter sample (about 2% of body length) than the Division 4T fall sample (about 1% of body length);
- (b) that cod girth measurements by one observer were consistently greater than those by the other (measuring cod during the same cruise but on different watches);
- (c) for haddock the first dorsal girth was slightly greater than the opercular girth for the Division 4W October samples;
- (d) for both species the girth-length ratio (both opercular and first dorsal) is greater for large fish than for small fish, but remains relatively constant across the mid portion of the length range examined, i.e., between 45 to 65 cm for cod and 35 to 45 cm for haddock.

Table I. Lengths, weights and girths of cod from Division 4T, October 1960. Cod measured round, freshly caught (see text for details of measurements).

Fork length cm.	Total no. fish	Mean weight round lb.	First dorsal girth Observer		Opercular girth Observer	
			A (Jean) Mean mm.	B (Martin) Mean mm.	A Mean mm.	B Mean mm.
15	1	.06	56		54	
16	5	.06	62	66	65	66
17	5	.13	64	69	66	70
18	3	.13	71		73	
19	1	.13	85		86	
20	0					
21	2	.19	81	94	84	92
22	3	.17	94	100	95	97
23	5	.25	97	96	99	97
24	4	.25	100	112	106	109
25	6	.23	108	103	108	102
26	3	.25	111	126	111	117
27	7	.29	115		120	
28	9	.45	115	126	116	127
29	7	.54	126	132	129	131
30	7	.47	130	137	133	132
31	14	.61	136	138	139	136
32	14	.77	141	140	140	139
33	19	.72	144	149	145	149
34	13	.70	146	157	151	155
35	11	.77	149	162	152	162
36	11	.80	154	155	157	157
37	13	.90	159	159	162	161
38	7	1.04	167	174	167	177
39	14	1.07	176	175	181	176
40	17	1.22	179	187	182	185
41	15	1.28	178	191	181	188
42	13	1.48	187	198	187	194
43	21	1.44	192	197	195	197
44	11	1.70	200	208	205	209
45	18	1.72	202	211	204	209
46	14	1.84	204	216	205	215
47	12	2.02	212	214	214	215
48	14	2.25	219	227	226	225
49	14	2.25	223	230	227	235
50	11	2.30	227	229	226	233
51	10	2.75	235	244	241	247
52	8	2.91	228	236	234	239
53	15	2.89	245	246	252	249
54	14	2.95	244	253	245	253
55	7	3.25	249	255	264	259
56	11	3.27	245	270	253	266
57	13	3.52	255	277	265	277
58	10	3.93	262	284	270	285
59	14	3.80	260	276	270	277
60	5	4.10	263	288	280	291
61	6	4.58	282	310	286	311
62	9	4.58	282	288	290	291
63	11	4.59	276	279	283	286
64	8	5.00	285	319	298	327
65	5	5.35	281	320	315	319
66	4	5.25	273	311	288	319
67	7	5.57	302	320	307	312
68	4	6.00	308	300	312	318
69	4	6.75	320		328	
70	3	6.42	312		311	349
71	4	7.00	311	342	317	351
72	1	7.25	325	344	362	
73	4	8.13	354		369	

TABLE I.

Fork length cm	Total no. fish	Mean weight round lb	First dorsal girth Observer		Opercular girth Observer	
			A (Jean) Mean mm	B (Martin) Mean mm	A Mean mm	B Mean mm
74	2	9.25	386		378	
75	1	9.25	380		370	
76	4	8.31	366		380	
77	3	8.92	363		375	
78	3	9.17	379	385	393	384
79	0					
80	0					
81	2	10.38	394		402	
82	0					
83	0					
84	0					
85	1	11.50	379		389	
86	0					
87	0					
88	0					
89	2	15.00	434		459	
90	0					
91	1	14.00	426		420	
92	1	14.00	393		430	
93	1	17.00	452		480	
94	0					
95	0					
96	0					
97	0					
98	0					
99	1	19.50	485		465	
100	1	17.25		459		452
101	1	20.50	472		500	
102	2	24.63	475	494	482	500
106	1	23.50	538		529	
107	1	24.00	506		512	
110	2	26.25	517		516	

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Table II. Lengths, weights and girths of cod from Division 4V, January 1961. Cod measured round, freshly caught (see text for details of measurements).

Fork length cm	Total no. fish	Mean weight lb	First dorsal girth Observer A (Jean) Mean mm	Opercular girth Observer A Mean mm
27	1	0.50	102	105
28	1	0.50	116	113
29	3	0.50	117	119
30	0			
31	2	0.50	130	131
32	1	0.75	131	138
33	2	0.63	138	140
34	4	0.75	140	147
35	2	1.00	150	160
36	3	0.92	155	158
37	1	1.00	161	163
38	4	1.13	163	173
39	4	1.13	163	173
40	5	1.25	172	182
41	9	1.36	175	183
42	8	1.44	179	187
43	6	1.54	190	199
44	10	1.80	199	204
45	9	2.06	200	205
46	9	1.94	199	209
47	15	2.03	202	216
48	10	2.20	210	223
49	9	2.42	222	232
50	9	2.39	219	230
51	15	2.72	228	234
52	13	2.71	233	238
53	17	3.00	232	244
54	17	3.13	233	243
55	7	3.25	239	251
56	11	3.52	253	253
57	17	3.61	253	263
58	7	2.48	256	267
59	10	4.03	266	278
60	7	4.25	264	280
61	8	4.36	268	278
62	16	4.70	276	289
63	12	5.06	287	289
64	8	4.84	278	287
65	4	5.81	301	319
66	7	6.00	302	310
67	4	6.06	304	315
68	8	6.19	327	329
69	7	6.57	325	335
70	6	7.88	354	350
71	6	7.38	339	355
72	4	7.75	349	345
73	1	6.75	314	339
74	6	8.00	336	348
75	2	8.50	360	361
76	1	8.25	330	340
77	0			
78	1	9.00	336	345
79	1	9.50	357	355
80	3	9.83	358	367

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Table II.

Fork length cm	Total no. fish	Mean weight lb	First dorsal girth Observer A (Jean) Mean mm	Opercular girth Observer A Mean mm
81	0			
82	2	10.88	366	396
83	1	10.75	383	385
84	1	13.50	418	441
85	1	14.00	430	418
86	0			
87	2	14.25	449	434
88	3	12.83	402	424
89	1	13.25	424	415
90	0			
91	1	19.00	484	450
92	2	17.13	458	466
93	1	21.00	516	482
94	0			
95	0			
96	0			
97	0			
98	1	21.00	512	502
99	0			
100	1	25.25	545	540
101	0			
102	1	24.00	530	555
103	0			
104	0			
105	0			
106	1	28.00	538	553
107	1	26.00	520	520

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Table III. Lengths, weights and girths of haddock from Division 4W, October 1960. Haddock measured round, freshly caught (see text for details of measurements).

Fork length cm	Total no. fish	Mean weight lb	First dorsal girth Observer C. (McCracken) Mean mm	Opercular girth Observer C Mean mm
23	1	0.31	112	105
24	2	0.31	122	119
25	9	0.33	118	116
26	5	0.34	125	120
27	10	0.44	130	126
28	10	0.44	135	131
29	3	no weights	141	141
30	0			
31	1	0.69	154	147
32	6	0.75	160	158
33	2	0.88	168	156
34	8	0.75	177	170
35	5	0.90	179	169
36	10	1.06	178	174
37	11	1.13	187	180
38	16	1.19	192	183
39	13	1.25	196	186
40	10	1.40	201	196
41	7	1.50	209	197
42	4	1.56	213	203
43	4	1.75	225	210
44	10	1.94	232	217
45	4	1.88	232	217
46	5	2.25	250	226
47	6	2.37	251	228
48	4	2.46	257	231
49	4	2.75	263	247
50	2	3.19	288	255
51	1	3.75	305	270
52	4	3.35	277	261
53	2	3.97	302	268
54	0			
55	0			
56	0			
57	0			
58	0			
59	0			
60	0			
61	1	6.50	372	323

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