



Serial No. 1516
(D.c. 7)

Research Document No. 51

ANNUAL MEETING, 1965

Review Of Conversion And Yield Factors

1. Following the concern expressed by Member Countries regarding the validity and use of the conversion factors which are reported in the ICNAF Statistical Bulletin (Stat. Bull. Vol. 12, p. 13), a circular letter dated 11 December, 1964 was distributed asking that each country review its data and procedures with special reference to the following points:

- (a) Are the factors as listed in the Statistical Bulletin correct and complete? Do member countries report conversion factors with their annual statistical submissions?
- (b) What data are used to calculate conversion factors? Does the Calculated average factor take account of changing fish processing procedures, sizes of fish, area and season of catch, length of storage, etc.?

2. The following returns have been received for consideration under Item 9 (Statistics) (f) of the Agenda for meetings of the Standing Committee on Research and Statistics:

CANADA (MARITIMES)

"In reply to the questions in your letter of December 11, 1964, concerning conversion and yield factors, the following points apply for Canada (Maritimes):

- 1. Biologists involved with the various species listed in the Statistical Bulletin have been circulated here. They are generally satisfied with the factors as listed except for:
 - (a) swordfish - new data here indicate that a conversion factor of 1.4 would be more accurate than 1.5
 - (b) tuna - the conversion factor listed in the 1962 Bulletin is 1.5. This should be 1.25 as used in previous years; there are no new data that indicate a change
- 2. We report conversion factors each year with our submission.
- 3. The data used to calculate conversion factors have generally been summaries of measurements on individual fish. If there were drastic changes in processing for any species, new factors would be calculated. Such factors as area, season and size of fish are averaged out to obtain one factor per species at present."

CANADA (NEWFOUNDLAND)

<u>Cod:</u>		<u>1960</u>
Gutted, hd.-on	to Round	- 1.2
Gutted, hd.-off	to Round	- 1.6
Gutted & Gilled	to Round	- 1.26
Salted, light	to Round	- 4.88
Salted, heavy	to Round	- 2.7
Round	to Gutted, hd.-on	- 0.83
Split, fresh	to Gutted, hd.-on	- 1.4545
Gutted, hd.-off	to Gutted, hd.-on	- 1.33
 <u>Haddock:</u>		
Gutted, hd.-on	to Round	- 1.2

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CANADA (NEWFOUNDLAND) (cont'd)

<u>Plaice:</u>			
Gutted, hd.-on	to Round	-	1.1
<u>Halibut:</u>			
Gutted, hd.-on	to Round	-	1.15
Gutted, hd.-off	to Round	-	1.35
Gutted, hd.-on	to Gutted, hd.-off	-	0.85
<u>Wolffish:</u>			
Gutted, hd.-on	to Round	-	1.2
<u>Pollock:</u>			
Gutted, hd.-on	to Round	-	1.2
<u>Hake:</u>			
Gutted, hd.-on	to Round	-	1.2

DENMARK (GREENLAND)

The conversion factor listed in Stat. Bull. is correct given as 2.7 for cod, green salt, wet to round fresh (the actual factor used is 2.68).

The Greenland fishing industry is now producing so many kinds of fish products that other conversion factors than green salt, wet have been introduced. The following factors are used since January 1st, 1964.

<u>Cod:</u>	
<u>from:</u>	<u>to round fresh</u>
Green Salt, Wet	2.68
Gutted, Head On	1.22
Gutted, Head Off	1.52
Splitted	1.67 (before 1964 the factor was 1.62)
Dry (Head Off)	7.60
<u>Salmon and char:</u>	
Gutted, head on to round fresh	1.11
<u>Halibut and Greenland halibut:</u>	
Gutted, head on to round fresh	1.05
<u>Striped and spotted wolffish:</u>	
Gutted, head off to round fresh	1.66
Gutted, head on to round fresh	1.15

The factors have been calculated by The Royal Greenland Trade Department on the basis of practical results in the Greenland fishing industry. There are slight differences in the conversion factors from place to place and from season to season. The factors given above are the best estimate of a mean throughout the year. The length of storage of fish on ships is not taken into account, but as all fish are normally landed and weighed within the day of catching them, the length of storage is not believed to affect the calculations very much.

FEDERAL REPUBLIC OF GERMANY

We enclose a list of our conversion factors for species caught in the ICNAF area. In "Jahresbericht über die Deutsche Fischwirtschaft" (for 1963 on page 117) each year is given a full list of conversion factors, too for the species of the ICES-area. This list has two parts:

1. Conversion factors for computing the landed weight (landings) of fishes and fishery products processed on board to "Frischfischanlandegewicht" i.g. the weight of fish landed by a normal trawler which transports the fish on ice (mostly gutted weight, redfish, mackerel and herring ungutted).

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FEDERAL REPUBLIC OF GERMANY (Cont'd)

2. Conversion factors to convert the "Frischfischanlandegewicht" into the "Nominal Catch".

The conversion factors were gained from long series of weighing experiments in the fishing industry, at the markets, and on board of trawlers and research ships. We try to take account of the current changes in fish processing procedures but not for sizes of fish, areas and season of catch. The only exception is the factor for salted cod. Here we took account of the special conditions off Greenland and the length of storage (average 45 days). At the moment our statisticians work with 90 different conversion factors in the North Atlantic!

A. fish on ice

<u>1. not gutted, head on</u>		
redfish		1.07
herring		1.08
<u>2. gutted, head on</u>		
halibut, Greenland halibut and flounders		1.11
cod		1.24
haddock		1.20
saithe		1.24
ling		1.18
cusk		1.17
redfish, giants		1.21
catfish		1.25
<u>3. gutted, head off</u>		
redfish		2.02

B. fish salted

<u>1. gilled, head on</u>		
herring		1.46
<u>2. head off</u>		
herring		1.61
<u>3. Green salt, wet</u>		
cod		2.74
saithe		2.55
<u>4. fillet, with skin</u>		
cod		4.53
saithe		3.77
<u>5. fillet, without skin</u>		
cod		5.04
saithe		4.15

C. fish, deep frozen

<u>1. gutted, head on</u>		
halibut and Greenland halibut		1.11
cod		1.18
haddock		1.14
saithe		1.18
ling		1.12
redfish, giants		1.21
catfish		1.15

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FEDERAL REPUBLIC OF GERMANY (Cont'd)

C. fish deep frozen (cont'd)

2. gutted, head off

halibut and Greenland halibut	1.39
cod	1.71
haddock	1.54
saithe	1.51
ling	1.40
redfish	1.92
catfish	1.68
herring	1.11

3. fillet, with skin

halibut	2.31
cod	2.64
herring	2.00

4. fillet, without skin

cod	2.94
haddock	2.99
saithe	2.43
ling	2.30
redfish	3.00
catfish	3.27

D. Fishmeal 5.00

NORWAY

ICNAF-area. Conversion factors from landings (the weight of fish and fish products brought ashore) to nominal catch (the live weight equivalent of the landings), used in Norwegian fishery statistics 1964:

Cod, salted	2.99
Cod, frozen	1.54
Cod fillet, frozen	3.52
Haddock, salted	2.24
Haddock, frozen	1.3
Torsk (tusk), salted	2.41
Torsk (tusk), frozen	1.4
Redfish, frozen	1.0
Redfish fillet, frozen	2.89
Halibut, frozen	1.4
Greenland Halibut, frozen	1.2
Catfish	1.0
Tuna, frozen	1.29
Porbeagle, frozen	1.3

The Norwegian biologists have not sufficient figures to indicate conversion factors to calculate the weight of the seals.

POLAND

In reply to your letter of the 11th December, 1964 concerning the "Conversion and Yield Factors", we wish to inform that we have no need to use those factors in preparing the statistics of catch. The data we get from the fishing enterprises are round fresh weights, not landing weights, and that is why the "Conversion and Yield Factors" are not used by us.

PORTUGAL

Answering to a letter received from Mr. B.F.C. DeBaie, dated 11th December, 1964, under the heading "CONVERSION AND YIELD FACTORS", I beg to inform you that:

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PORTUGAL (Cont'd)

1. The conversion factor (3) used for the Portuguese cod catches and reported in our annual statistical submissions, is the average of several sets of data corresponding to Subareas 1, 2 and 3.
2. These data have been obtained during 1953, 1954 and 1955 and represent two sources of information:
 - 2.1 The first one corresponds to the information given by the masters who have made the observations according to the instructions given by Dr. J. M. Figueiredo.
 - 2.2 The second one corresponds to direct observations made on board of the fishing vessels by Dr. M. Ruivo.
3. The conversion factor then calculated has not been re-examined in as much as we have made no change in fishing processing procedures.
4. In the observations, attention has been paid to the size of fish, area and season of catch, length of storage, position of the fish in the hull, etc. According to Dr. Ruivo - only in what respects the size of the fish - there may be a slight influence in the conversion factor that seems to increase according to the size of the fish that under the feasible aspect cannot be considered. However, the mixture of lots of different sizes gives the due compensation of the possible different values of those factors corresponding to the different sizes.

SPAIN

Data on a conversion factor obtained for cod landed by a Spanish pair trawler operating in the ICNAF Area in 1962 ----- Orestes Cendrero, Instituto Espanol de Oceanografia, Santander, Spain

Data were collected from the second half of February to the third week of April, 1962. The first cod sampled spent four months in the hold of the pair trawler which returned to her home port at the beginning of June. The last cod sampled were only some seven weeks from the time they were caught until they were landed.

The following table shows that the cod lost 38.7% of their weight when split. Fresh split fish lost on the average another 39.6%. The total loss was 62.9%.

Conversion factor. Weights (kg) of codfish samples in February-April, 1962.

- 1) Beheaded and gutted
- 2) When landed at the factory

Round fresh	Fresh split ¹⁾	Salted ²⁾	Round fresh	Fresh split ¹⁾	Salted ²⁾
10.00	6.00	4.00	2.50	1.50	1.00
8.75	5.50	3.25	2.25	1.50	1.00
7.25	3.75	2.50	2.25	1.50	1.00
6.25	3.25	2.00	2.25	1.50	1.00
5.75	3.50	2.00	2.25	1.50	0.75
5.50	3.25	2.00	2.25	1.50	0.75
5.00	3.00	2.00	2.25	1.50	0.75
5.00	3.25	2.00	2.25	1.50	1.00
5.00	3.00	2.00	2.25	1.25	0.75
4.50	2.00	1.00	2.00	1.25	0.75
4.50	2.50	1.50	2.00	1.25	0.75
4.00	2.25	1.25	2.00	1.50	1.00
4.00	2.50	1.50	2.00	1.25	0.75
3.75	2.50	1.50	2.00	1.25	0.75
3.75	1.75	1.00	2.00	1.00	0.75
3.75	2.25	1.25	2.00	1.25	0.75
3.75	2.25	1.50	2.00	1.25	0.75

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SPAIN (Cont'd)

Conversion factor. Weights (kg) of codfish samples in February-April, 1962.

- 1) Beheaded and gutted
2) When landed at the factory

Round Fresh	Fresh split ¹⁾	Salted ²⁾	Round fresh	Fresh split ¹⁾	Salted ²⁾	
3.50	2.25	1.50	2.00	1.00	0.75	
3.50	2.25	1.50	2.00	1.25	0.75	
3.25	1.50	0.75	2.00	1.50	1.00	
3.00	1.75	1.25	2.00	1.50	1.00	
3.00	1.75	1.00	2.00	1.25	0.75	
3.00	2.00	1.25	2.00	1.25	0.75	
3.00	2.00	1.00	2.00	1.25	0.75	
3.00	1.75	1.25	1.75	1.00	0.75	
3.00	2.00	1.00	1.75	1.00	0.75	
2.75	1.50	1.00	1.75	1.00	0.75	
2.75	1.75	1.00	1.75	1.00	0.75	
2.75	1.50	1.00	1.75	1.25	1.00	
2.75	1.75	1.00	1.75	1.00	0.75	
2.50	1.50	1.00	1.75	1.00	0.75	
2.50	1.75	1.00	1.75	1.00	0.75	
1.50	1.00	0.75	1.25	0.75	0.50	
1.50	1.00	0.50	1.25	0.50	0.50	
1.50	1.00	0.75	1.25	0.75	0.50	
1.50	1.00	0.50	1.25	1.00	0.50	
1.50	1.00	0.50	1.25	1.00	0.50	
1.50	1.00	0.50	1.25	0.75	0.50	
1.50	1.00	0.50	1.25	0.75	0.50	
1.50	1.00	0.50	1.25	1.00	0.50	
1.50	1.00	0.50	1.25	0.75	0.50	
1.50	1.00	0.50	1.25	0.75	0.50	
1.50	1.00	0.50	1.00	0.50	0.25	
1.50	1.00	0.50	1.00	0.75	0.50	
1.50	1.00	0.50	1.00	0.75	0.50	
1.25	1.00	0.50	1.00	0.75	0.50	
1.25	0.75	0.50	0.75	0.50	0.25	
1.25	0.75	0.50				
			Total	266.75	163.50	98.75

Conversion factor of cod: Gutted head-off to Round fresh 1.63
Salted to Round fresh 2.70

The conversion factor for round fresh cod to salt cod landed for this pair trawler was calculated to be 2.7, a little less than that found for Spanish otter trawlers, which was estimated to be 3.0.

We understand that perhaps the conversion factor is not bigger than 2.5 for pair trawlers, but this cannot be substantiated because of the lack of data from the last weeks' catches.

UNITED STATES

Conversion Factors Used by the United States in Submitting Statistics to ICNAF

The conversion factors used by the United States in producing statistics for ICNAF differ somewhat from those listed in the ICNAF Statistical Bulletin. Both sets of values are presented in Table 1. Conversion factors have not been routinely included with the annual statistical submission to ICNAF at least for the past two years; the origin of the erroneous figures listed by ICNAF is not known.

The basis of the U. S. conversion factors is obscured in history. The original data used to calculate them is not available. Presumably these factors

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UNITED STATES (Cont'd)

were determined from data collected in the 1930's. There have been attempts to verify at least some of these statistics since then. No major discrepancies have been found but the samples taken to study conversion factors have generally been small and not designed to evaluate changes as might be caused by such factors as season, area, etc.

Only for haddock do the recent data approach adequacy. In analyzing these data seasonal trends were not found and size differences did not seem to affect the conversion factors. A value of 1.15 appeared to be the best estimate available for converting gutted to round weight. This is close to the 1.14 figure now used.

There are, however, seasonal changes in the processing of haddock and these are not at present considered in converting dressed and round weights. From November through March the fish are gutted, but during the other months the gills are also removed. A limited number of samples indicate that for converting gutted and gilled to round weight a figure of 1.18 would be more accurate than 1.14. However, if this seasonal change in processing is taken into consideration, only a 2 percent increase on the yearly estimate of metric tons landed results. This difference is not large enough to warrant the extra effort involved in adjusting for changes in processing.

Table 1. -- Factors used to convert landed weight of certain fish and shellfish to round, fresh.

Species	U. S. factors gutted (dressed) to round, fresh	Factors listed in ICNAF Bulletin
Bluefish	1.09	1.2
Cod	1.17	1.2
Cusk	1.13	1.2
Haddock	1.14	1.2
Hake (white)	1.34	1.35
Halibut	1.15	1.15
Pollock	1.13	1.2
Shark	1.20	1.2
Silver hake	1.66	1.67
Sturgeon	1.20	1.25
Swordfish	1.25	1.25
Tilefish	1.09	1.2
Wolffish	1.20	1.6
Weakfish	1.09	1.2
Misc. round fish, etc.	1.00	1.0
Scallops	8.333	8.3
Clams, hard	7.1	7.1
Clams, soft	3.9	3.9
Clams, razor	2.8	2.8
Conchs	3.9	3.9
Oysters	9.8	9.8
Periwinkles	4.1	4.1
Mussels	3.5	3.5