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Results of experiments on Conversion Factors made by Portuguese cod fishing vessels during the season of 1953.

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The preliminary studies by Portugal concerning the determination of conversion factors for cod were started in 1953. The conversion factor is the figure by which the weight of a certain quantity of fish when landed has to be multiplied in order to find the weight of the same quantity of fish as fresh round directly from the sea. Some time ago recommendations by ICNAF as well as by the FAO Fisheries Division expressed the growing necessity for the determination of conversion factors. Conversion factors are necessary to achieve exact yearly figures for the quantities of entire fresh fish taken from the sea by the various countries participating in these organizations.

It is felt that such an investigation should be made on an international basis, to the effect that it would cover all the areas where fishery is carried out.

An investigation like this is also of interest to Portugal itself, since the cod, more than any other species of fish, is subjected to treatment on board the vessel which reduces the original weight. The magnitude of these reductions is not sufficiently known in the Portuguese statistics, and thus the quantities in weight of round fresh cod taken from the sea cannot be assessed. The lack of knowledge of the magnitude of these reductions constitutes an inconvenience for the national statistics, perhaps most felt in the present case where we are working with yields of a product in being, that is in the case of the cod, with yields which the operations of heading, gutting, and salting are influencing to a high degree.

Also the international statistics are subjected to difficulties arising from the same source when, by summing up the statistics by the collaborating countries, it is attempted to ascertain the importance of the different fish stocks in the open sea for the nutrition and the commerce of the nations.

Further these difficulties are felt in fisheries science when, by establishing the background or starting point for the relevant studies, it is necessary to know the absolute extent of the inroads caused on the stock of commercial fish through the act of fishing.

Finally the fishing industry is interested in such studies, not only because they give information as to the most economical exploitation of the stocks, but also as they furnish conclusions as to how the losses caused by gutting and salting vary seasonally and regionally. It is to be supposed that the fishing industry

by the knowledge gained through such studies could avoid fishing on those stocks causing the greatest losses, or what would be the same, those stocks which have the highest conversion factors.

In our opinion the question of conversion factors for cod in the ICNAF area is complicated by three series of different circumstances. These circumstances make it difficult or even impossible to arrive at one single figure for conversion factor to be used by all countries concerned. These three series could be stated as follows:

1. Even though the fishery is carried out on practically the same stocks and in the same season by the ships of the various nations, the methods of fishing are not the same for these nations. Therefore the samples taken from the fish caught will vary from country to country.

2. The methods used in the handling on board of the fish captured will also vary in accordance with the industrial and commercial requirements of the various countries.

3. It is to be expected that also the ecology of the principal stocks of cod differ and a certain variation of the biological reactions of these stocks must therefore be admitted. Thus the growth rate of the cod will not be the same in all the areas concerned. Also climatic changes, as demonstrated within the Convention Area for the last twenty years, are apt to cause variations in the growth rate of the cod.

These difficulties will make it necessary that every country concerned carry out its own determinations as to the appropriate conversion factor to be used by their fishery. In case a country carry out cod fisheries in various areas it will be necessary that such research work is done in all the main areas where the fishery takes place.

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The Portuguese investigations on conversion factors were started in May 1953. During the following month a form to be filled out was distributed to the captains of the Portuguese cod fishing vessels. The captains were asked to enter on that form the various figures necessary for the calculation of the conversion factor. In the form was asked also for figures giving the weight of the various bi-products, heads, air bladders, livers, etc. of the cod fishery. A sample of the form is attached to this paper (Appendix 1).

Up to this date, December 1953, we have received 38 of these forms completed by the captains of the corresponding number of boats. The forms returned constitute more than half of those distributed, and as the boats are still coming back from the fishing banks it is expected that additional completed forms will be available in the near future. We have been very happy to receive the full co-operation of the captains of our cod-fleet.

These 38 forms, referring to a weight of 3,800 kg. cod (fresh round), have been considered in the present report. It has, however, been necessary to reject two of them as some of the figures for the weighings were obviously wrong. The single samples used in the investigation contained 100 kg. of cod, and in the different weighings only an accuracy down to 1 kg. was expected.

Great difficulties are met in carrying out the weighings asked for in the form, as they have to take place on board rather small vessels in the open sea, and in cases under unfavouable weather conditions. Moreover there are additional difficulties caused by the nature of the material to be weighed. After heading and gutting the fish is slippery and difficult to handle. During this process there is a certain loss of blood and slime. During the gutting, or earlier, through the vomiting by the fish, a smaller or larger part of the stomach content is lost. Losses through these two causes could not be fully accounted for. Expecially the loss of stomach content is causing disagreements in the results. The losses caused in this way can be highly varying, reaching in some individuals nearly 3 kg., whereas in others of the same size it is only some grammes. As an error of lesser importance for the accuracy of the analyses should be mentioned that in the tables of the report there are six cases where, judging from the figures, the whole head and not only the cheeks and tongues had been weighed. The general practice in handling is for the very large cod to separate the tongues from the cheeks, using both, for the mediumsized cod to use the cheeks together with the tongues, whereas in the smallest cod both these items are discarded. It is evident that this practice to some degree will have influenced the figures given in the present paper.

The greater deficiency in the present work is found in the neglect of two factors of very unequal influence: the place of the fish in the pile, and the chemical composition of the salt used. The first question, the most important one, was not asked in the form sent out to the captains, and we have therefore not been able to consider it. It must however be admitted that the pressure on the fish near the bottom can be comparatively large. This pressure will further be increased through the movements of the vessel in stormy weather.

The other factor not considered, the composition of the salt used, is of less importance. However, the chemical composition of the salt can influence the velocity of the dehydration. Also the size of the salt grains is of importance.

It is hoped that the studies of 1953 will be continued in 1954 and in the whole of the fleet. Deficiencies found in the material collected in 1953 will be remedied as far as possible in 1954.

Tables 1 and 2 give, for Newfoundland and for Greenland respectively, for each sample the separate weighings and the later calculations based on these weighings. Table 3 gives a comparison of the means from the two series of samples.

The first ten figures counted from above in the vertical columns of the tables 1 and 2, as well as the last one which refers to the quantities of salt used, were determined by measurements on board the vessels. The other seven figures were calculated in the laboratory and based on the other figures determined and furnished on board.

The number of days in the hold were always counted, including the two extreme dates, that of fishing and that of landing in Portugal. This figure varies considerably, and for the samples from Newfoundland it varies up to 40 days.

The number of specimens necessary to make a sample of 100 kg. also varied considerably from vessel to vessel. This, to a certain degree, shows that the captains fortunately have not made any choice as to the size of fishes used in the samples. This variation in size is of special value as it makes it possible to show that the conversion factor does not vary in correlation to the size of the fishes: a sample of fish of larger size (1.18 m.) shows a conversion factor of 2.83 which comes very near to the factor 2.89 which refers just to the sample of the smallest fishes, namely 0.61 m. This refers to cod from Newfoundland. As to Greenland a sample of very small cod (0.56 m.) gives a conversion factor of 2.89, viz. the same as the small fish from Newfoundland. But for Greenland the sample of the biggest fish with a mean size of 1.11 m. shows a rather different conversion factor, viz. 2.50.

The mean of the conversion factors for cod from Newfoundland was 2.92, against a value of 2.62 achieved for cod from the Greenland waters. The number of the samples investigated was about the same in both cases, viz. respectively 19 and 17.

The mean weights at landing for the samples of 100 kg. differ for Newfoundland between 28.0 and 40.0 and for the cod from Greenland between 32.0 and 49.0. In case of Newfoundland the mean percentage of the landed weight was 34.57. In the variations of these means no coincidence was found with other factors. For Greenland, however, we had the special case (which may need more verification) that the highest figure at landing, namely 49.0, coincides with the sample of the smallest fishes of which 50 were necessary to make 100 kg. Thus the highest value at landing was furnished by very small fishes whose individual weight was around 2 kg.

As to the determination of percentages of cheeks and tongues we have already mentioned that in six samples it was obviously not just the weight of the cheeks and tongues that was determined, but the weight of the whole head. When we reject these extreme high variants, which otherwise could be of interest, the means found for the bi-products constituted by cheeks and tongues were for Newfoundland and for Greenland respectively 8.27 and 7.73.

As far as livers are concerned there is no reason to go further into details than to note that this organ represents a very useful indicium as to the general stage of nutrition of the fish. As already indicated further studies will give added information on this question.

The values found for the entrails in the various samples confirm the already mentioned great extension of their variation: 18.0. The means are fixed to 13 and 12 of the 100% represented by the whole fresh fish for the two regions.

The air bladder makes up about 1% of the total weight of the fish and the values found for the different samples vary only slightly. The figure for the air bladder is also of interest in the determination of the total produce of the cod. However, as it is known, there is hardly a constant practice within the fisheries for their utilization, and as far as the small fish are concerned they are hardly ever considered. The same can be said as to the first third of the vertebral column. However, it represents a certain amount in weight, namely 5% of the total weight of the fish.

The mean of the weights of fish ready for salting is just a little higher in the samples from Greenland than in the samples from Newfoundland, respectively 60.3 and 58.1. The extreme values, viz. 69 and 53, were both found in the samples from Newfoundland. All the values found for Greenland vary very little and around 59.

With "loss until salting" we understand the difference between weight of the body of the fish when ready for salting, which means the weight of the fish when put in the hold, and the weight of the same fish when they were complete and un-gutted, this is as they come from the sea. These values are of special interest to the industry as they account for some of the by-products, cheeks, air bladders, livers and backbone. The figures vary only little and round 40%, this being a rather high figure.

With "loss from salting to landing" we refer to the difference between the weight of the fish when put in the hold and the weight of the same amount of fish when landed in port. This figure is used for the determinations of the mean loss per day. This is the loss suffered by the fish when kept in salt in the hold; it is due above all to the loss of liquids through the dehydrating effect of the salt and from the pressure by the surrounding fish.

These losses of weight caused by the action of the salt and from the pressure in the hold vary around 21-33%. The extreme values spread between 14.3 and 29%. This great variation is due to the difference in length of time in the hold and to the various positions of the fish in the hold.

The term "difference from round fresh to landed fish" does not need further comments. These values give a very clear idea of the difference which exists between the total weight of cod taken from the sea and that which in the end is landed in port. The losses occurred are around 65% for the cod from Newfoundland and around 61% for those from Greenland, the extremes being 72 and 51.

The "total recoverable" includes the weight of the fish ready for salting together with the figures for the weight of that which could be used and which already partly is used by the industry, namely cheeks, airbladders, livers and the first third of the backbone. The values of these items taken together, the "total recoverable", permit: by comparison with the value of the fresh round fish the assessment of the magnitude of the real wastages by the industry. They are also a sure indicium of the importance which should be paid to a perfect handling of the fish on board. The mean values are 78% for the fish from Newfoundland and 82% for those from Greenland.

As it can be easily understood the "loss per day in hold" is represented by the quotient between the figures of the item "days kept in the hold" and the figures giving the "difference between weight when ready for salting and weight landed". Although we could point out the different ranges of the daily losses suffered by the split fish from the two sources (salting and pressure), it seems too early to draw definite conclusions because one of the supposed decisive factors, viz. the position of the fish in the pile, was ignored.

The figures in the last line of the table, that is the figures for the number of kg. of salt needed for the salting of the samples, vary considerably. The variation is for fish from Newfoundland from 14-26, and from Greenland between 18-40. The general means for the two areas are 18.5 kg. for Newfoundland and 22.0 for Greenland. Incidentally, it is of interest to mention that for both areas the mean quantity of salt used for the samples represents practically 4/7 of the weight of the samples when landed.

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The main object however of this study which was carried out in nearly the whole of the Portuguese cod-fleet, was to determine the conversion factor, as is also indicated by the title of the paper.

The extreme values found for Newfoundland as well as for Greenland were 3.57 and 2.05.

The extreme superior value 3.57 is not followed by any disagreement in the values of the other items, neither within the sample from which it is calculated nor in comparison with corresponding values in the samples from other ships. Only that same sample has one of the lowest values for the weight at landing, 28.0, and this seems to be corresponding to the minimum which is also observed in the "weight ready for salting", 54.0. This fact, which in itself is obvious, is in correlation with the maximum found in the difference between weight landed and weight of fresh round fish (72.0).

Let us now consider the lowest conversion factor, 2.05, which is found in a sample from Greenland. The sample in which it was found does not present other minima in the values found on board, but there is in the sample two maxima, namely 50 and 49.0 for respectively the number of fishes necessary to make the 100 kg. and for the landed weight. We have already mentioned earlier

that this sample was composed of fishes of a very small size whose individual weight was around 2 kg. only. However, the other values found for the same sample were rather close to the means found for the two series of samples.

These means of the two series from Newfoundland and from Greenland differ to some degree from one another, being respectively 2.92 and 2.62. The mean of the two series of samples is 2.77. These mean values are however arrived at purely arithmetically and conclusions are somewhat modified if we base them on the determinations of the frequencies found for various groups of means.

These results, rendering a better picture of the reality, are shown in table 4. From the figure it is seen that for Newfoundland as for Greenland there is a very clear accumulation of frequencies (47% and 42%) for the group made up by conversion factors between 2.75 and 2.99.

On the other hand it is a fact that for the two regions there is a certain disagreement in the way in which the frequencies are distributed in the other groups (above 2.99 and below 2.75). Thus it is clearly seen that there is an accumulative tendency of values below 2.75 for Greenland; the samples of these negative variants amount for Greenland to 47% of the total number of samples against 26% only for Newfoundland. However, the opposite is the case for Newfoundland, where the positive variants (or those above 2.99) amount to no less than 31%, against 6% only for Greenland.

From these results it is clearly seen that the conversion factor to be adopted for Portugal can hardly be one single factor determined as the value between those two extremes, 2.75 and 2.99. Obviously it will be necessary to establish two different conversion factors, one for each of the two big fishing areas.

In concluding the report of this first tentative determination of conversion factors for cod caught by the Portuguese fishermen let us just pause for a moment considering the accuracy of the results obtained. This accuracy can be judged from the fact that, notwithstanding that the researches are in the initial stage, some 3,600 kg. of fish, or 900 specimens, have been the object of study.

- THE END -

Appendix 1.

FORM TO BE USED IN THE DETERMINATION OF CONVERSION FACTORS FOR COD

Name of Captain . . . . . Name of vessel . . . . . .

Day, length and year of capture of sample of cod referred to in this form . . . . . / . . . . . / . . . . . Name of fishing bank . . . . . .

Weigh a sample of 100 kg. of cod as they come from the water. Tag each fish in the tail with a fine cablewing and make the following determinations:

1. The number of fish in the sample of 100 kg. of cod .....

2. In this number of .... fishes, the most common length of the cod from the snout to the point of the tail was ..... cm.

In the sample of 100 kg. of fresh cod determined:

3. Weight of whole heads when cut .....kg.
4. Weight of fresh livers when taken out .....kg.
5. Weight of fresh ovaries when extracted .....kg.
6. Weight of fresh entrails (intestines) .....kg.
7. Weight of fresh airbladder when extracted .....kg.
8. Weight of backbone .....kg.
9. Total weight of sample of fresh fish when put in the hold .....kg.
10. Approximate weight of salt used for salting of the sample .....kg.
11. Total weight of sample when landed in Portugal .....kg.
12. Date of landing of fish in Portugal .../...../.....
13. Number of days when the sample was kept in the hold .....
14. Position of the sample in the hold (in the middle, on the bottom or on the top) .....

Date ...../...../..... Signature:

Table 1.

FISHING VESSELS WORKING ON THE NEWFOUNDLAND BANKS

	Vessel no. 1	Vessel no. 2	Vessel no. 3	Vessel no. 4	Vessel no. 5	Vessel no. 6	Vessel no. 7	Vessel no. 8	Vessel no. 9	Vessel no. 10
No. of days in hold	53	40	36	14	21	21	21	12	30	41
No. of fishes per 100 kg.	18	8	32	31	24	37	14	33	24	20
Mean length of specimens	90	118	69	68	80	66	90	75	70	88
Landed weight	35.1	35.3	32.0	28.0	34.0	32.9	35.5	35.0	37.0	40.0
Weight of cheeks and tongues	9.5	10.5	7.6	7.5	8.4	7.0	8.5	7.0	8.3	9.7
Weight of livers	3.5	2.5	5.0	4.7	6.3	4.5	5.5	5.5	5.3	4.9
Weight of entrails	20.2	17.5	11.7	12.2	10.1	13.0	25.0	13.4	11.5	6.8
Weight of airbladder	0.8	1.2	1.0	1.0	1.0	1.0	1.0	0.7	0.8	1.1
Weight of anterior third of backbone	4.4	5.5	4.9	4.5	5.1	4.0	5.5	4.6	5.0	7.0
Weight of body ready for salting	60.5	60.7	58.0	54.0	59.2	57.0	56.0	58.0	58.0	69.0
loss until salting	39.5	39.3	42.0	46.0	40.8	43.0	44.0	42.0	42.0	31.0
Loss from salting to landing	25.4	25.4	26.0	26.0	25.2	24.1	20.5	23.0	21.0	29.0
Diff. from round fresh to landed fish	64.9	64.7	68.0	72.0	66.0	67.1	64.5	65.0	63.0	60.0
Total recoverable	78.7	80.4	76.5	71.7	80.0	73.5	76.5	75.8	77.4	91.7
Loss per day in hold	0.479	0.635	0.722	1.857	1.200	1.147	0.976	1.916	0.700	0.707
Conversion factor	2.85	2.83	3.12	3.57	2.94	3.03	2.81	2.85	2.70	2.50
Conv. fact. of fish for salting	1.65	1.64	1.72	1.82	1.68	1.75	1.78	1.72	1.72	1.44
Kg. of salt used in sample	21.5	21.0	11.5	20.0	20.2	20.0	12.0	14.0	14.0	22.0

Table 1 continued

FISHING VESSELS WORKING ON THE NEWFOUNDLAND BANKS

	Vessel no. 11	Vessel no. 12	Vessel no. 13	Vessel no. 14	Vessel no. 15	Vessel no. 16	Vessel no. 17	Vessel no. 18	Vessel no. 19	Mean %	No. of samples
No. of days in hold	39	24	18	22	14	26	13	48	36	27.84	19
No. of fishes per 100 kg.	22	47	9	24	31	45	17	29	9	24.94	19
Mean length of specimens	77.5	61	1.00	76	68	61	83	70	1.15	80.31	19
Landed weight	38.0	33.0	31.5	38.0	28.0	34.5	36.0	39.5	33.5	34.57	19
Weight of cheeks and tongues	7.5	7.0	10.0	8.5	7.5	7.5	7.0	10.0	22.0	8.27	18
Weight of livers	5.3	6.0	4.5	5.5	4.7	4.8	5.0	5.0	3.8	4.85	19
Weight of entrails	8.8	13.0	14.0	13.5	12.2	13.5	12.0	11.0	9.0	13.07	19
Weight of airbladder	1.3	0.7	1.0	0.4	1.0	0.7	1.0	1.0	0.8	0.92	19
Wgt. of anterior third of backbone	4.3	4.3	5.0	6.5	4.5	5.0	4.0	5.0	6.0	5.00	19
Weight of body ready for salting	57.9	60.0	52.5	55.0	55.0	57.0	54.0	68.0	54.5	58.12	19
Loss until salting	42.1	40.0	47.5	45.0	45.0	43.0	46.0	32.0	45.5	41.88	19
Loss from salting to landing	19.9	27.0	21.0	17.0	27.0	22.5	18.0	28.5	21.0	23.55	19
Diff. from rd. fresh to landed fish	62.0	67.0	68.5	62.0	72.0	65.5	64.0	60.5	66.5	65.43	19
Total recoverable	76.3	78.0	73.0	75.9	72.7	75.0	71.0	89.0	87.1	77.90	19
Loss per day in hold	0.510	1.125	1.166	0.772	1.928	0.865	1.384	0.594	0.583	0.846	19
Conversion factor	2.63	3.03	3.17	2.63	3.57	2.89	2.77	2.53	2.98	2.92	19
Conv. fact. of fish for salting	1.72	1.66	1.90	1.81	1.82	1.75	1.85	1.47	1.83	1.72	19
Kg. of salt used in sample	25.0	18.0	18.0	16.0	20.0	15.5	17.0	19.0	26.0	18.45	19

Table 2.

FISHING VESSELS WORKING OFF WEST GREENLAND

	Vessel no. 1	Vessel no. 2	Vessel no. 3	Vessel no. 4	Vessel no. 5	Vessel no. 6	Vessel no. 7	Vessel no. 8	Vessel no. 9	Vessel no. 10
No. of days in hold	38	43	23	32	38	23	35	72	43	59
No. of fishes per 100 kg.	14	24	22	29	26	28	27	10	14	22
Mean length of specimens	93	77	85	75	71	70	70	111	90	84
Landed weight	36.0	38.0	42.0	40.0	47.3	41.0	36.0	40.0	34.5	36.2
Weight of cheeks and tongues	8.5	17.9	8.5	18.5	19.0	7.3	6.7	10.0	22.0	6.0
Weight of livers	5.2	4.7	3.5	4.5	4.2	6.3	3.2	6.0	3.3	4.0
Weight of entrails	19.5	9.1	18.5	9.0	10.2	8.2	20.4	15.0	9.9	6.5
Weight of airbladder	1.2	0.9	1.0	1.3	0.9	1.4	1.3	2.0	1.0	1.0
Weight of anterior third of backbone	4.4	5.2	5.5	4.8	5.5	3.6	4.3	5.0	5.7	4.0
Weight of body ready for salting	58.0	60.0	58.0	61.5	60.0	63.9	59.7	66.0	58.0	58.0
Loss until salting	42.0	40.0	42.0	38.5	40.0	36.1	40.3	34.0	42.0	42.0
Loss from salting to landing	22.0	22.0	16.0	21.5	12.7	22.9	23.7	26.0	23.5	21.8
Diff. from round fresh to landed fish	64.0	62.0	58.0	60.0	52.7	59.0	64.0	60.0	65.5	63.8
Total recoverable	77.3	88.7	76.5	90.6	89.6	82.5	75.2	89.0	90.0	73.0
Loss per day in hold	0.579	0.512	0.695	0.672	0.334	0.995	0.677	0.361	0.546	0.369
Conversion factor	2.77	2.63	2.38	2.50	2.11	2.43	2.77	2.50	2.89	2.76
Conv. fact. of fish for salting	1.72	1.94	1.72	1.62	1.66	1.56	1.67	1.51	1.72	1.72
Kg. of salt used in sample	18.0	23.0	30.0	40.0	24.0	18.6	23.0	22.0	24.0	18.0

Table 2 continued

FISHING VESSELS WORKING OFF WEST GREENLAND

	Vessel no. 11	Vessel no. 12	Vessel no. 13	Vessel no. 14	Vessel no. 15	Vessel no. 16	Vessel no. 17	Mean %	No. of samples
No. of days in hold	64	68	96	72	95	88	94	57.82	17
No. of fishes per 100 kg.	27	50	25	32	25	18	37	25.29	17
Means length of specimens	76	60	82	56	73	82	66	77.70	17
Landed weight	34.5	49.0	45.0	34.5	32.0	35.5	34.9	38.61	17
Weight of cheeks and tongues	17.0	7.3	7.8	18.9	7.9	8.0	7.1	7.73	11
Weight of livers	4.6	1.5	0.5	5.1	3.0	5.3	4.1	4.06	17
Weight of entrails	8.0	18.5	18.2	9.5	9.0	9.0	7.9	12.14	17
Weight of airbladder	1.4	0.8	1.1	1.3	0.8	1.0	1.0	1.14	17
Weight of anterior third of backbone	5.6	6.2	5.7	5.1	6.5	5.7	4.7	5.15	17
Weight of body ready for salting	61.0	63.3	59.3	59.7	58.7	60.0	61.0	60.36	17
Loss until salting	39.0	36.7	40.7	40.3	41.3	40.0	39.0	39.64	17
Loss from salting to landing	26.5	14.3	14.3	25.2	26.7	24.5	34.1	22.22	17
Diff. from round fresh to landed fish	65.5	51.0	55.0	65.5	68.0	64.5	65.1	61.38	17
Total recoverable	89.6	79.1	74.4	90.1	76.9	80.0	77.9	82.37	17
Loss per day in hold	0.414	0.210	0.149	0.350	0.281	0.278	0.362	0.384	17
Conversion factor	2.89	2.05	2.22	2.89	3.12	2.81	2.86	2.62	17
Conv. fact. of fish for salting	1.63	1.57	1.68	1.67	1.70	1.66	1.53	1.67	17
Kg. of salt used in sample	18.0	23.0	19.0	18.0	18.0	18.0	18.0	21.91	17

Table 3.

P O R T U G A L - 1953 - EXTRACTION RATES FOR COD IN %

SUBAREA 3 - NEWFOUNDLAND		SUBAREA 1 - DAVIS STRAIT
19 vessels		17 vessels
1,900 kg. of round fresh fish in 100-kg. lots 474 fishes, average length: 0.80 m. from 0.61 to 1.18 m. length		1,700 kg. of round fresh fish in 100-kg. lots 430 fishes, average length: 0.77 m. from 0.56 to 1.11 m. length
27.8	Days kept in hold (in salt)	57.8
24.9	Number of fishes per 100 kilo round weight	25.2
8.27 (18 samples)	Cheeks and tongues	(11 samples) 7.73
4.85	Liver	4.06
13.07	Entrails (livers out)	12.14
0.92	Air bladder	1.14
5.00	Anterior 1/3 backbone	5.15
58.12	Body ready for salting	60.36
41.88	Loss until body ready for salting	39.64
23.55	Difference from body ready for salting to landed fish	22.22
65.43	Difference from landed fish to round fresh fish	61.38
77.90	Total recoverable	82.37
18.45	Salt used	21.91

Table 4.

P O R T U G A L 1953

RESULTS OF THE CONVERSION FACTOR STUDIES ABOARD 36 COD FISHING VESSELS

FREQUENCIES IN %

SUBAREA 1, DAVIS STRAIT COD		SUBAREA 3, NEWFOUNDLAND COD
17.64%	2.00 a 2.24	. . . .
11.76%	2.25 a 2.49	. . . .
17.64%	2.50 a 2.74	26.31%
47.04%	2.75 a 2.99	42.10%
5.88%	3.00 a 3.24	21.05%
. . . .	3.25 a 3.49	. . . .
. . . .	3.50 a 3.74	10.52%

AVERAGE CONVERSION FACTOR FOR SUBAREA 1: 2.62

Results from:
1,700 kilos of fish, round, fresh
430 fishes, between 0.56-1.11 m.
aboard 17 fishing vessels

AVERAGE CONVERSION FACTOR FOR SUBAREA 3: 2.92

Results from:
1,900 kilos of fish, round fresh
474 fishes, between 0.6101.18 m.
aboard 19 fishing vessels

TOTAL AVERAGE FOR THE CONVERSION FACTOR: 2.77

Accumulation of Frequencies: 2.75 to 2.99

D1