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Southern Indian Ocean
Deepsea Fishers Association

Conversion Factors for Determining Whole Weights from Processed Weights for Some Deepwater Fishes Caught in the Southern Indian Ocean

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1. INTRODUCTION

Normal industrial practice on fishing vessels is to record only the processed weight of retained fishes. Usual product forms are dressed or fillets. Some species and sizes may be frozen whole though these tend to be smaller species or specimens. For resource management purposes scientists require weights of catches in terms of the whole weights and thus need to be able to back-calculate such weights from the processed weights that are recorded. Figure 1 shows an example of boarfish or pelagic armourhead that has been machine dressed, packed and frozen.

Dressed fish are headed and gutted and the pectoral fin is removed by cutting back along the fish and removing some of the belly flap and head meat. This processing is done when the fish are sold directly into the market in this form and the customer does not want the pectoral fin present. Dressing of fish is especially the case for alfonsino sold in Japan.

All orange roughy and alfonsino are dressed, as secondary processors usually have no wish to deal with pectoral fins, wings or bones when they are filleting large quantities of fish and certainly in machine filleting, this is undesirable. On occasion, smaller quantities (i.e. bycatch) of bluenose warehou, large butterfish and wreckfish (groper) will be landed in H&G form (New Zealand code is *HGU*). In practice, the wings will be removed from these species, but dependant on the final market.

Figure 1
Dressed boarfish or pelagic armourhead (*Pseudopentoceros spp.*): the removal of the pectoral fins is apparent.

Heading machines come in two basic types: (a) single blade – i.e. only capable of a straight cut but operator can vary angle and (b) two-blade; these make a V-cut up into the head. Both Baader and Pisces made versions of both straight and V cut heading machines. The "normal" universal heading machine from Baader is the 424 or a Josmar, which is essentially a Spanish-made copy of the Baader 424. The *F.V. Will Watch* is equipped with both types of machines. Almost all fish are processed with a diagonal head cut, unless a special consignment is being prepared in order to recover whole roes. In this case, a deeper, diagonal cut is not desirable.

Vessel operators, including their crews who are paid on landed weight, want to leave as much weight on the processed trunk as possible without unduly affecting the price a processor will pay. Processors want to minimise waste and processing costs. Recovery of processed product from the whole fish is constantly monitored. Processors had little or no regard for vessel recovery rates as they simply demand a trunk that has as many unusable bits as possible removed. Hence, the important issue for

operators is that their vessels maximise the amount of product they obtain from the fish that they catch and so they have an interest in these conversion factors as they provide an indication of the yields that are being obtained from the catch. High conversion factors indicate that poor yields are being obtained from the catch. This may imply that the processing equipment is poorly adjusted, such that they are removing too much of the body in the heading or filleting cutting operation and that the equipment is in need of adjustment. More likely, operator inattention, fatigue or disinterest may be the cause of lower conversion rates that are possible. Hence, no matter what processing equipment is being used, operator expertise and efficiency are important.

Documented observations by Data Recording Officers are relevant here. For example, AFMA 2008a (SC 48) note as follows.

> "Alfonsino (*Beryx splendens*) and Indian Ocean Trevalla (*Schedophilus labrynthica*) were processed using factory machinery on board the Southern Champion headed by a 424 Bader and operator. … The Baader 424 is set at a fixed speed, so the speed of the product being cut is governed by the amount of product applied to the machine. The head is removed with an angle cut intersect5ing just behind the head and the pectoral fin, the viscera and blood line is manually removed. … The product is now in the HGU state."

The value of conversion factors will vary depending on the species involved – a consequence of differing body morphology, and season of capture, especially if there are changes in the relative weight of gonads in the body cavity as would be expected. There may also be changes in the value of conversion factors for the same species from different oceans or regions.

While small changes in the value of conversion factors may have considerable significance for the profitability of the vessel operators, they are unlikely to result in major changes in management strategy. However, self-evidently it is preferably to accurately identify appropriate conversion factors to ensure that what these values should be are not an issue in resource management.

A further source of error is that freezer trays or cartons, were, and are, commonly packed to an estimated weigh, i.e. processed weight was determined not by scales but from 'volume'. This is believed to underestimate actual processed weights by 6 -7 %. For example, AFMA (2006a) notes that 'Trays were packed to an estimated weight ….' in referring to the operations of the *F.V. Southern Champion* – normal operating practice. Landed weights should be used in these cases. It is noted that the *F.V. Bel Ocean II*, *F.V. Ocean Explorer* and *F.V. Nikko Maru No. 1* also pack their catch by volume, i.e. estimated weight, as well

It is noted that the Baader 424 is the processing machine that is exclusively used by three of the vessels of the SIODFA fleet; the *F.V. Will Watch* used for a few seasons the 417 processor but now uses a high-recovery cut on the 423 and so obtains about the same yields as were being obtained with the Baader 417. This vessel also fillets most of their orange roughy and that the 423-cut fish feeds into the fillet machine a little better. By controlling both the at-sea and on-shore processing Sealords can make an aggressive head cut to minimise the flesh left on the head and pay a slightly higher processing fee to trim of any bone left around the head end of the trunk. Usually, the pectoral fin is left on in the head but cut at an angle to recover all the flesh in the top of the head. The most important objective is to recover the flesh, which requires fine judgement when feeding the fish into the machine as to which side of the pectoral fin the cut gets made. Operators must try to remove the fin but leave all the meat on the trunk. With orange roughy this means some of the bony head plate is left on the trunk but it is usually quite easily removed during processing.

This report is intended to be a 'living' document. As new conversion results are obtained, they will be recorded in revisions to this SIODFA Technical Document so as to provide a record of changes in the use of conversion factors and the receipt of new information.

It is stressed that reference in this report implies no recommendation of the use of any particular conversion values: the purpose of this report is only to document values that exist either in the literature or in practice.

2. SPECIES CONVERSION VALUES

2.1 Orange Roughy (*Hoplostethus atlanticus*)

Orange roughy (ORH) is usually processed in the form of fillets or dressed, commonly referred to as 'headed and gutted' – "H&G". In the experience of Sealord, the orange roughy dressed product from the Indian Ocean is different from, e.g. in New Zealand because of the larger size of the fish in the Indian Ocean, and the fact that it is reprocessed in China. In the Southern Indian Ocean fishery the fillet, or dressed product, is sometimes left with the pectoral fin on, or bone from the pectoral, and part of the head bone, still on as it is cheaper to remove this in China, than it is in New Zealand.

In the case of the *F.V. Will Watch*, in recent years all orange roughy catch has been during the winter roe season. The fillet produce on this vessel is 'very unprocessed' - it is essentially the trunk with the frame removed. - The fillets are not skinned or trimmed and have the full belly complete with ribs attached. These parts are removed is subsequent onshore processing.

Several sources of conversion values are available:

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru		2.0				
F.V. Ocean Explorer						
F.V. Southern Champion						
AFMA 2006b SC 39		2				
Lever 2004		2.00				From 580 kg
Cantwell		2.0				68 540 kg processed ungraded product
AFMA 2003b SC 28		2.00				No conversion factor tests undertaken.
F.V. Will Watch						
New Zealand Convention	1.10	2.00	2.10	3.50	3.50	

ii. *F.V. Will Watch*

A series of conversion analyses have been undertaken for Indian Ocean orange roughy. The results of this analysis are as follows.

No. of fish sampled	Gross weight (kg)	Mean weight (kg)	Dressed weight (kg)	Yield	Conversion Factor	Fillet weight	Yield	Conversion Factor
70	282.55	4.036	147.9	0.5235	1.91	115.25	0.4079	2.45
50	156.28	3.126	84.14	0.5384	1.86	66.75	0.4271	2.34
100	305.16	3.052	164.2	0.5381	1.86	125.98	0.4128	2.42
50	149.6	2.992	79.72	0.5329	1.88	62.98	0.4210	2.38

80	261.34	3.267	141.32	0.5408	1.85	112	0.4286	2.33
60	197.44	3.291	101.8	0.5156	1.94	80.24	0.4064	2.46
Totals:	1352.4		719.08			563.2		

These results give a weighted conversion factor of 1.88 for dressed product For what?? They H&G before filleting? DISCUSS in Raro? and 2.40 for fillets. Given the fairly large sample sizes the results indicate that it is probable that at least some of the sample means are significantly different to each other but without knowledge of the individual fish conversion factors this remains conjecture. This may reflect differences in season when the samples were measured and/or differences in the sex composition of the sample. If the gonads of male fish are relatively smaller compared to females, their yields should be higher. The good recovery rates of the F.V. Will Watch, despite the roe factor, are because the head cut recovers all of the head meat along with some of the bone of the head plate. (The head is removed before filleting as this is necessary for filleting by machine).

(iii) *F.V. Southern Champion*

Seven trails were undertaken during SC32 (2004) using 10 fish in each processed into "HGU". The results were as follows (Cantwell 2004).

Whole Weight	Processed Weight	Conversion Factor
27.41	13.71	1.99
27.19	13.28	2.04
34.88	18.64	1.87
20.57	10.73	1.91
25.66	13.4	1.91
15.02	7.95	1.88
41.42	21.01	1.97
Overall Average		1.93

(iv) New Zealand Practice – ORH

Conversion factors in New Zealand are:

H&G	2.00
Dressed	2.05
Skin-on fillets	3.50
Skin off fillets	3.50

2.2 Alfonsino (*Beryx splendens*) NZ: BYX; FAO

Graham: For alfonsino, the Baader 323 processor is used, for a straight cut. Alfonsino is diagonal cut using a Baader 424 on three, if not all, of the Indian vessels.

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru		1.4				
F.V. Ocean Explorer						
F.V. Southern Champion						
AFMA 2003a		2.04				1496.3 kg whole weight; 785 fish sampled. SC 25. See note below

AFMA 2003b SC 28		1.95				No conversion factor tests undertaken. All grades
AFMA 2006a		1.95				
AFMA 2006b		1.95				From factory production records; all grades
AFMA 2007a		2.01				SC 44 – see note below
AFMA 2007b		2.01				222kg gave 2.04; 226kg gave 1.99. Section 4.6.
AFMA 2008a		1.89				See comment below
AFMA 2007a		1.95				For ungraded, S, M, L & XL.
Lever 2004		1.95				For FLS/TSH and 5 different size classes
Cantwell 2004		1.95				For 5 size classes
McBride 2004		2.00				Based on 633 fish
Sutherland 1999		1.95				Based on "New Zealand MinFish conversion factors"
Taylor 2006		1.7				SC 39. All grades
F.V. Austral Leader AFMA 2002		1.98				AL 33. L Grade, based on 28.72 kg, 12 fish. Process weight 14.47 kg
AFMA 2003		2.04				785 fish, sample weight 1496.3 kg.
AMFA 2002		1.98				Based on sample of 28.72 kg of L grade fish
F.V. Will Watch		1.92				See note below
New Zealand Convention	1.10	1.40	1.95	2.30	2.85	
USSR 1984 Manual processing Machine processing		1.587 1.488				Pers. Comm. Valeriy Paramonov, Department of Live Biological Sources, Marine Research Institute (YUGNIRO), Kerch, Ukraine.

Anon (2003) notes that 55 bins of alfonsino with an average count of 15 fish a bin were used for the calculations. The fish were selected from a random sample and were not selected for size. Hattersley (2003) reports the results of three conversion factors analyses for alfonsino obtained during Cruise 24 by the F.V. Southern Champion. These are given below.

Grade	Weight of Fish	Average weight per fish (kg)	Processed weight	CF
XL	29.48	2.08	15.12	1.95
L	143.60	2.24	71.96	1.99
M	98.68	1.54	51.40	1.91
XL	34.10	2.84	16.76	2.03
L	26.02	1.73	13.70	1.89

Interestingly, the conversion factor is not consistent with grade size. The value reported by AFMA (2003) for Cruise 25 of the *F.V. Austral Leader* was 2.04 based on a sample of 785 fish with a whole weight of 1496.3 kg. Despite this, a conversion factor of 1.95 was used in reporting whole weights (!). We note,

however, that standard reporting practice is to use the New Zealand Ministry of Fisheries nominated conversion factors, irrespective of what conversion trails achieve what at sea.

A series of conversion factors for alfonsino were reported in McBride (2004) for the studies undertaken during Cruise 29 of the *F.V. Southern Champion*. Processing was done using a Baader 424 Header – as for the other vessels in the fleet. McBride notes that the head was removed "immediately posterior to the pectoral fins at an angle that would include some of the belly flap. But recorded as a head and gut conversion factor. The roe and viscera were removed by hand" though there is uncertainty that this was the case. The conversion factors achieved by four operators are documented as below.

Operator	No. of Samples	Weight of Fish	Quantity of Fish	Fillet weight	Range	
					Max.	Min.
1	13	451	196	115.25	2.05	1.86
2	9	302	139	66.75	2.08	1.95
3	7	310	148	125.98	2.13	2.00
4	3	106	50	62.98	2.05	1.92

MacBride (2004) notes that "as the trip progressed, the operators became more adept and consequently, more consistent." Samples were also measured without the knowledge of the processors and McBride reports that the results were not different to those obtained when the measurements were done with the cooperation of the operators. No explanation is given for the conversion factor of 2.00 which is 2.5% higher that than which is commonly reported for this species.

AFMA (2007a) reports the results of two conversion analyses for alfonsino during Cruise 44 on the *F.V. Southern Champion*. These are given below.

Date	Grade	Weight of Fish	Average weight per fish (kg)	Processed weight	CF
4/01/07	All	222.06	1.85	108.73	2.04
14/01/07	All	226.06	1.88	113.20	1.99

This result is lower that the conventionally used value of 1.9

AFMA (2008a) reports the results of three conversion analyses for alfonsino during Cruise 48 on the *F.V. Southern Champion* as follows.

Haul	Grade	No. of fish	Whole weight (kg)	Processed weight	CF
28	S	100	92.820	51.560	1.80
45	S	100	86.480	48.200	1.79
62	M-XL	50	92.130	47.770	1.92
69	M-XL	50	89.760	45.080	1.99
78	L-XL	56	123.360	62.850	1.96

The overall average was 1.89.

Results obtained by the *F.V. Will Watch* in February 2009 from a controlled analysis of 120 individual alfonsino measured during the peak spawning season showed that 227.10 kg of fish (mean weight 1.89 kg; standard deviation 0.30) resulted in 118.35 kg of product for a mean conversion factor of 1.92 (standard deviation of sample, 0.120; standard deviation of mean, 0.0109) . This is 1.5% less than the standard defined by the Ministry of Fisheries in New Zealand.

(iii) *New Zealand Practice – (BYX)*
Conversion factors in New Zealand are:

H&G	1.40
Dressed	1.95
Fillets	2.30
Skin off fillets	2.85

2.3 Oreos (Black Oreo [*Allocyttus niger*], Smooth Oreo [*Pseudocyttus maculates*] and Spiky Oreo [*Neocyttus rhomboidalis*]) NZ: OEO

Although one conversion factor is cited here, smooth oreo have a much better yield than do spiky or black oreo, this last has a notoriously small conversion value.

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern Champion						
AFMA 2006a		2.25				Ungraded – spikey, smooth & black
Lever 2004		2.25				Spikey oreo, smooth oreo
Cantwell 2004		2.25				Spikey oreo (5268kg processed weight) , Smooth oreo (13 728kg processed weight)
AFMA 2003b SC 28		2.25				For spiky and smooth oreo. No conversion factor tests undertaken. Ungraded
Taylor 2006		2.25				All oreos. Taylor 2006, SC 39
F.V. Will Watch						
New Zealand Convention	1.10	2.15	2.25	5.30	6.55	

i. *F.V. Nikko Maru*
Conversion value of 2.15 is used.

ii. *F.V. Southern Champion*
Cantwell (2004) gives the following results for two analyses for spikey oreo undertaken during SC32 (2004) using 10 fish in each processed into “HGU”.

Whole Weight	Processed Weight	Conversion Factor
10.28	4.69	2.3
9.65	4.02	2.4

Cantwell notes that the industry standard of 2.25 is difficult to achieve on small fish as was the case for those examined in this analysis.

iii. *New Zealand Practice:*
Conversion factors in New Zealand are:

Smooth oreo Oreo Dory (SSO)
Dressed fillets 2.35
Spiky oreo Oreo Dory (SOR)
Dressed fillets 2.15

Unspecified Dressed fillets 2.25

MacGibbon (pers comm.) For New Zealand:

		Gutted	H&G	Dressed	Fillet	Skin-off
Spiky Oreo	SOR	1.1	2.15	2.25	5.3	6.55
Black Oreo	BOE	1.1	2.15	2.25	5.3	6.55
Smooth Oreo	SSO	1.1	2.15	2.25	5.3	6.55

2.4 (Black) Cardinal fish (*Epigonus telescopes*) NZ: CDL
Note, cardinal fish are normally dressed.

	Gutted	**Headed & Gutted**	**Dressed**	**Fillets skin on**	**Fillets skin off**	**Comments**
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern Champion						
AFMA 2006a		1.8				Ungraded
Cantwell 2004		1.8				From 106 ungraded fish
AFMA 2003b SC 28		1.80				No conversion factor tests undertaken. Ungraded.
Taylor 2006		1.8				SC 39
F.V. Will Watch						
New Zealand Convention	1.10	1.40	1.55	2.00	2.50	

i. *F.V. Nikko Maru*
A conversion value of 1.5 is used.

iii. *New Zealand Practice – CDL*
The conversion factor used in New Zealand is:

Dressed 1.85
H&G 1.5

Conversion values used on the F.V. Ocean Explorer are:

	Gut	Head & Gut	Dressed	Fillet
Cardinal	1.1	1.5	1.85	2.5

2.5 Warehou or Blue-eye Trevalla[1] (*Hyperoglyphe antarctica*) NZ: BNS; Aust: BWA

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern Champion						
AFMA 2008a		1.50				Based on samples of 44 fish from tow 38 and 16 fish from tow 41. Grade: U/G
AFMA 2006a		1.7				Ungraded
Taylor 2006		1.7				SC 39
F.V. Will Watch						
New Zealand Convention	1.10	1.40	1.70	2.25	2.80	
USSR 1984						

i. *F.V. Nikko Maru*
A conversion value of 1.4 is used.

iii. *New Zealand Practice –BNS*
The conversion factor used in New Zealand is:

Dressed fillets 2.35

2.6 Indian Ocean Trevalla; Butterfish(Referred to as *Schedophilius labrynthica* on the *F.V. Southern Champion*[TBE, BYS], *S. velaini* on the *F.V. Ocean Explorer* [BBF])

Many familiar with this fish are concerned about its accurate identification. Two fishes with different appearances may be given the same market name. AFMA 2003a notes that they are similar in appearance: one has large deep blue eyes and a light blue body while the other is smaller with a smaller eye and a darker blue body. These reservations should be kept in mind.

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern Champion						
AFMA 2003a			1.72			72 fish, whole weight 211.8 SC 25. See note.
AFMA 2008		1.89				356 fish. 1.89
AFMA 2008a		1.51				SC 48. See details below
AFMA 2007b		1.52				98 fish. Results double

[1] Also Antarctic butterfish

						checked. (Section 4.5, p7). SC 47
AFMA 2007a		1.7				SC 44
AFMA 2006a,b		1.7				All
LEVER 2004		1.70				8278 processed weight
AFMA 2003b SC 28		1.70				Referred to as Ocean Trevalla. No conversion factor tests undertaken. Ungraded.
Hattersley 2003		1.74				Sample of 105.8 kg. Referred to as "Blue Eye Trevalla".
Taylor 2006		1.7				SC 39
F.V. Will Watch						
New Zealand Convention	1.10	1.40	1.70	2.25	2.80	
Soviet Union[2]		1.416				Pers. Comm. Valeriy Paramonov, Department of Live Biological Sources, Marine Research Institute (YUGNIRO), Kerch, Ukraine.

i. *F.V. Nikko Maru*

A conversion value of 1.4 is used. For dressed or HGU??

ii. *F.V. Southern Champion*

AFMA (2003) notes that a conversion factor of 1.70 was used for the trip SC 25, which would give an overestimate of 1.2% than this estimate indicates. AFMA (2008a) report as follows:

Haul	Grade	No. of fish	Whole weight (kg)	Processed weight (kg)	Conversion Factor
7	L-S	50	126.180	82.440	1.53
34	L	30	121.030	77.520	1.56
48	L-S	50	150.390	102.630	1.46

It is noted that most butterfish is dressed as a Baader 424 can easily process this species. Thus the SC25 estimate should be accurate.

iii. *New Zealand Practice – BOE What does this code refer to??...you used it for bluenose and black dory above, further backing the need to adopt a common set of codes.*

The conversion factor used in New Zealand is:

Dressed fillets 2.35

2.7 Oilfish (*Ruvettus pretiosus*)

A conversion factor of 1.45 is used on the F.V. Nikko Maru No. 1.

2.8 Pelagic armourhead (Boarfish) (*Pseudopentaceros richardsoni*). Aust.: EDR; BOII & OEBOR

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						

[2] Order № 662 from 14 December 1984 of Ministry of Fishery of the USSR about united standards of expenditure of round fish during procession of fish of special cutting frozen and non-frozen products from oceanic fish and sea products.

F.V. Ocean Explorer						
F.V. Southern Champion						
AFMA (2008a): SC 48		1.78				84 fish, U/G. U/G, 25 fish = 1.80; 30 fish = 1.82; 29 fish = 1.76
AFMA 2006a,b		1.8				
Cantwell 2004		1.8				66 fish; two size classes
Hattersley 2003		1.80				Referred to as "Blue Eye Trevalla".
Taylor 2006		1.8				SC 39. Two grades based on amount of flesh around the belly-rib cage.
F.V. Will Watch						
New Zealand Convention						

2.9 Rubyfish (*Plagiogeneion rubiginosus*) NZ: RBY; FAO:

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern Champion						
F.V. Will Watch						
New Zealand Convention	1.10	1.50	1.80	2.50	3.10	

2.10 Jack Mackerel (Trachus spp.)

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern Champion						
F.V. Will Watch						
New Zealand Convention	1.10	1.50	1.60	2.50	3.10	

2.11 Ribaldo NZ: RIB; FAO

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern		1.8				Taylor 2006, SC 39.

Champion						
AFMA 2003b SC 28		1.80				No evaluation; catch ungraded.
AFMA 2006a		1.8				
Cantwell 2004		1.8				679 kg processed fish
AFMA 2003b SC 28		1.80				No conversion factor tests undertaken. Ungraded.
F.V. Will Watch						
New Zealand Convention	1.10	1.50	1.80	3.50	4.35	

2.12 Wreckfish, Groper (HPB) NZ: HPB

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern Champion						
AFMA 2006a		1.7				
AFMA 2006b		1.4				
Taylor 2006		1.7				SC 39
F.V. Will Watch						
New Zealand Convention`	1.10	1.45	1.85	2.40	2.95	
Soviet Union	1.105	1.621				Pers. Comm. Valeriy Paramonov, Department of Live Biological Sources, Marine Research Institute (YUGNIRO), Kerch, Ukraine.

A conversion factor of 1.45 is used on the F.V. Nikko Maru No.1.

2.13 Frostfish (FRO) NZ: FRO; FAO

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern Champion						
AFMA 2006b		1.8				"TRK"
F.V. Will Watch						
New Zealand Convention	1.10	1.50	1.80	2.50	3.10	

2.14 (Black) Gemfish (GEM) (BGF)

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Nikko Maru						
F.V. Ocean Explorer						
F.V. Southern Champion		1.55				Taylor 2006 SC 39
AFMA 2008a		1.41				U/G, 100 fish.
AFMA 2006a		1.55				
F.V. Will Watch						
New Zealand Convention						

2.15 Indian Mackerel (Blue Mackerel)

	Gutted	Headed & Gutted	Dressed	Fillets skin on	Fillets skin off	Comments
F.V. Southern Champion AFMA 2006a		1.8				SC 39

3. DISCUSSION

Careful monitoring of yields after processing will enable accurate estimates of the whole weights of catches and help operators ensure that processing machinery is adjusted to ensure minimum waste from the catch that is processed. It should be expected that yields, and thus conversion factors (and actors) will vary by season and area where there are size differences. However, it is not expected that such differences in yields will result in different management strategies being adopted.

It is noted that standard operating practice in the use of conversion factors by the SIODFA fleet is to use the New Zealand Ministry of Fisheries conversion factors, not matter the result of conversion efficiency trails that are undertaken at sea. Useful information on definitions as used in New Zealand relating to at-sea processing of fish is available at < http://www.fish.govt.nz/en-nz/Commercial/ Quota+Management +System/CF.htm?wbc_purpose=Basic&WBCMODE=PresentationU>.

SIODFA operators are investigating the feasibility of a comprehensive programme of monitoring of yields to:

i. Identify different condition factors in different areas for the same species and
ii. Ensure that maximum yields are obtained from the catch thus minimizing any product wastage and offal discharge.

4. LITERATURE CITED

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Appendix

Conversion Factors Use in New Zealand

< http://www.fish.govt.nz/NR/rdonlyres/E264B2E8-4B02-4FA5-8540-91B737D45499/0/CFNoticeSchedules.pdf>

Greenweight equivalent

Species	Gutted	Headed & Gutted	Dressed	Fillets	Skinned Fillets
Alfonsino (BYX) (*Beryx splendens and Beryx decadactylus*)	1.10	1.40	1.95	2.30	2.85
Bluenose (BNS) (*Hyperoglyphe antarctica*)	1.10	1.40	1.70	2.25	2.80
Cardinal fish (CDL) (*Epigonus telescopus*)	1.10	1.50	1.85	2.50	3.10
Common (blue) warehou (WAR) (*Seriolella brama*)	1.10	1.40	1.55	2.00	2.50
Frostfish (FRO) (*Lepidopus caudatus*)	1.10	1.50	1.80	2.50	3.10
Gemfish, southern kingfish (SKI) (*Rexea* spp)	1.10	1.50	1.55	2.15	2.65
Hapuku and bass (HPB) (*Polyprion oxygeneios,Polyprion americanus*)	1.10	1.45	1.85	2.40	2.95
Jack mackerel (JMA) (*Trachurus declivis, T.novaezelandiae, T. murphyi*)	1.10	1.50	1.60	2.50	3.10
Orange roughy (ORH) (*Hoplostethus atlanticus*)	1.10	2.00	2.10	3.50	3.50
Oreos (OEO) (*Allocyttus niger; Allocyttus verrucosus, Pseudocyttus maculatus; Neocyttus rhomboidalis*)	1.10	2.15	2.25	5.30	6.55
Ribaldo (RIB) (*Mora moro*)	1.10	1.50	1.80	3.50	4.35
Ruby fish (RBY) (*Plagiogeneion rubiginosum*)	1.10	1.50	1.80	2.50	3.10
School shark (SCH) (*Galeorhinus galeus*)	1.65	1.85	1.95	2.15	2.70
Silver warehou (SWA) (*Seriolella punctata*)	1.10	1.55	1.70	3.90	4.85
White warehou (WWA) (*Seriolella caerulea*)	1.10	1.50	1.75	2.50	3.10

Table 1
General Hierarchy of Processed States
from
http://www.fish.govt.nz/NR/rdonlyres/BB9BAF3F-B57E-4586-903C-8030FA84266F/0/CFNoticeBackgroundAndIntroduction.pdf

State	Reporting Code	Conversion Factor
Gutted	GUT	1.10
Headed and Gutted	HGU	1.50
Dressed	DRE	1.80
Fillets, skin on	FIL	2.50
Fillets, skin off	SKF	3.10
Fish meal	MEA	5.60

Appendix III
From
http://www.fish.govt.nz/NR/rdonlyres/8BDBB85D-C6C6-44DF-9238-7A744BABD168/0/conversionFactorsNotice.pdf

"dressed" means, —

(a) in relation to all species of finfish not otherwise listed in paragraphs. For (b) to (e) below, the body of a fish from which the head and gut have been removed with:

(i) the anterior cut being a continuous straight line passing immediately behind the posterior insertions of both pectoral fins; and
(ii) the forward angle of the anterior cut not less than 90 degrees in relation to the longitudinal axis of the fish; and
(iii) no part of the tail cut shall be forward of the posterior base of either the hindmost dorsal fin or the hindmost anal fin, whichever is nearer the caudal fin; and
(iv) the belly-flap either intact or divided along the ventral midline:

(b) in relation to hoki, ling, rattails, frostfish and eels (being all fish in the Order *Anguilliformes*), the body of a fish from which the head and gut have been removed with:

(i) the anterior cut being a continuous straight line passing immediately behind the posterior insertions of both pectoral fins; and
(ii) the forward angle of the anterior cut not less than 90 degrees in relation to the longitudinal axis of the fish; and
(iii) no part of the tail cut forward of a line drawn perpendicular to the longitudinal axis of the fish where the vertical depth of the body of the fish is 60mm, or a line drawn perpendicular to the longitudinal axis of the fish at the anus, if the vertical depth of the body is less than 60mm at that line; and
(iv) the belly-flap either intact or divided along the ventral midline.

(c) in relation to all species of sharks and ghost sharks (including elephant fish), the body of a fish from which the head, gut, and fins have been removed with:

(i) the anterior cut being a continuous straight line passing immediately behind the posterior insertions of both pectoral fins; and
(ii) the forward angle of the anterior cut not less than 90 degrees in relation to the longitudinal axis of the fish; and
(iii) no part of the tail cut forward of the posterior base of the anal fin, or in ghost sharks, elephant fish and those species without an anal fin, forward of the posterior base of the second dorsal fin; and
(iv) the belly-flap may be removed by a cut, no part of which is dorsal to the cartilaginous backbone.

Alfonsino	headed and gutted	manual work	1,587
		mechanized work	1,488
Armour head	headed and gutted	manual work	1,587
		mechanizedwork	1,488
Butter fish	headed		1,416
	carcass		1,456
Wreck fish	headed		1,105
	headed and gutted		1,621

piece	1,934
carcass	1,897