

Nutrient Composition of Malaysian Marine Fishes

Tee E Siong, Siti M. Shahid, R. Kuladevan, Young Swee Ing and Khor Swan Choo

This communication presents the results of a study of the nutrient composition of marine fishes commonly available in the Kuala Lumpur and Petaling Jaya markets, Malaysia. Analyses were carried out on duplicate samples of each fish. All analyses were performed according to the methods given in the Laboratory Manual compiled by the Division of Human Nutrition, Institute for Medical Research, Malaysia.

A total of 50 species of marine fishes belonging to 31 families were analysed. Results obtained are presented in Table 1. The fishes are grouped according to their respective families. The common name of the fish is first given, followed by the scientific name. The last line, within parenthesis, gives the name of the fish in Bahasa Malaysia.

Since the names of the fishes in Bahasa Malaysia are familiar to investigators in the country, these are separately tabulated in Table 2, arranged in alphabetical order. The last column of the table indicates the item number of each fish as it is tabulated in Table 1, to enable easy reference to its nutrient composition.

There does not appear to be large variations in the proximate composition of the fishes. Percentages of refuse in the different varieties of marine fishes studied are fairly close, the majority having only 50% as the edible portion. Moisture and protein content of these fishes are also seen to be fairly similar, with a few exceptions. Mineral ash is also seen to be rather similar for all the fishes studied.

Of the nutrients commonly grouped under proximate composition, fat content shows the most variation amongst the fishes studied. Most of the fishes have a fat content ranging from 0.1 to 2%, commonly encountered in marine fishes. Some of the fishes studied are found to have a higher fat content, e.g. the Gizzard Shad, Bluetail Mullet, Catfish Eel, Indian Mackerel,

and the White Pomfret, with fat content ranging from 4 to 6%. The outstanding example is the Longtail Shad (*Ikan Terubok*; item no. 12), with an exceptionally high fat content of 23.0%.

As with the macro nutrients, mineral and vitamin contents of the marine fishes studied also show similar general trends, with a few occasional extreme values. There is, however, greater variability among the various species for these nutrients than those of the proximate composition.

The absence of large variations in the results obtained suggests that there are no distinctive differences in nutrient composition between the different families of fishes studied. The results also indicate that there would be no basis for grouping the fishes in terms of quality, based on the nutrients studied. Although fatty acid composition and protein quality have not been determined, one does not expect to find dramatic differences. Hence, the nutrient composition of the "lower quality" and cheaper fishes such as *ikan kembong* are not inferior to that of the more expensive fishes such as the pomfrets. Other characteristics of the fishes, such as texture of the meat and taste, may result in higher demand for the latter fishes and contribute to the much higher prices tagged onto these fishes.

Acknowledgements

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Table 1.
Nutrient Composition of Malaysian Marine Fishes

Item No.	Name of Fish	Refuse in as Purchased %	Composition of Nutrients in 100 g Edible Portion																	
			Proximate Composition					Minerals						Vitamins						
			Energy	Moisture	Protein	Fat	Carbohydrate	Ash	Calcium	Phosphorus	Iron	Sodium	Potassium	Retinol	Carotene	Total A Activity	Thiamine	Riboflavin	Niacin	Ascorbic Acid
			K Cal	%	g	g	g	g	mg	mg	mg	mg	mg	ug	ug	ug	mg	mg	mg	mg
BALISTIDAE																				
1	Starry Triggerfish <i>Abalites stellaris</i> (Jebong)	75.9	75	80.1	18.5	0.1	0	1.4	23	80	0.7	173	311	23	0	23	0.01	0.03	2.9	0.6
CAESIODIDAE																				
2	Yellowtail Fusilier <i>Caesio erythrogaster</i> (Delah)	45.8	92	77.4	21.1	0.8	0	1.4	52	235	0.4	47	487	19	0	19	0.05	0.16	2.8	0
CARANGIDAE																				
3	Dart, Ladyfish, Moonfish <i>Trachinotus blochii</i> (Nyior-Nyior)	46.6	95	76.7	21.7	0.9	0	1.3	41	234	0.7	85	455	21	0	21	0.06	0.16	3.3	0
4	Hairtail Scad <i>Megalaspis cordyla</i> (Cincaru)	58.0	105	73.7	21.0	1.0	2.9	1.4	64	277	2.5	72	263	29	0	29	0.05	0.25	3.6	0
5	Malabar Trevally <i>Carangoides malabaricus</i> (Rambai)	57.8	100	76.7	20.8	1.9	0	1.1	46	187	0.6	82	217	27	0	27	0.03	0.20	3.4	0

The authors are researchers in the Division of Human Nutrition, Institute for Medical Research, Kuala Lumpur, Malaysia.

Table 1.
Nutrient Composition of Malaysian Marine Fishes (continued)

Item No.	Name of Fish	Refuse in as Purchased %	Composition of Nutrients in 100 g Edible Portion																	
			Proximate Composition					Minerals						Vitamins						
			Energy	Moisture	Protein	Fat	Carbohydrate	Ash	Calcium	Phosphorus	Iron	Sodium	Potassium	Retinol	Carotene	Total A Activity	Thiamine	Riboflavin	Niacin	Ascorbic Acid
			K Cal	%	g	g	g	g	mg	mg	mg	mg	mg	ug	ug	ug	mg	mg	mg	mg
6	One-Finlet Scad Selar (Atule) mate (Selar Gelek)	50.1	93	76.8	20.6	1.1	0.2	1.3	77	101	1.1	52	300	30	0	30	0.08	0.10	3.2	0.9
7	Queenfish Chorinemus lysan (Talang)	51.4	94	76.2	20.5	1.1	0.6	1.6	146	319	0.7	81	351	14	0	14	0.18	0.15	3.8	1.2
8	Yellowtail Scad Caranx (Alepes) djeddaba (Pelata)	55.7	103	75.4	21.5	1.9	0	1.4	80	252	0.8	55	303	16	21	20	0.11	0.26	4.1	0
9	Yellow-banded Trevally Scleroides leptolepis (Selar Kuning)	52.1	106	75.5	21.4	2.3	0	1.4	54	260	0.9	43	391	18	2	18	0.05	0.22	3.4	0
CARCHARHINIDAE																				
10	Dog Shark Scoliodon sorrakowah (Yu Pasir)	65.5	104	75.6	25.6	0.2	0	1.1	13	219	0.4	74	300	12	0	12	0.04	0.07	3.3	1.2
CHIROCENTRIDAE																				
11	Wolf Herring Chirocentrus dorab (Parang-Parang)	40.0	101	75.9	21.8	1.5	0	1.4	23	246	0.5	67	276	26	0	26	0.02	0.05	3.4	0.9
CLUPEIDAE																				
12	Longtail Shad Hilsa (Clupea) macrura (Terubok)	45.5	281	59.4	18.4	23.3	0	1.1	35	198	1.1	67	227	34	3	35	0	0.17	2.5	0
13	Round Herring Dussumeria hasselti (Tamban Bulat)	50.9	118	73.7	21.5	3.5	0	1.4	77	274	1.3	97	318	24	0	24	0.13	0.29	4.2	0
14	Slender Shad Ilisha elongata (Belak Mata)	55.9	85	78.7	18.9	1.0	0	1.4	56	195	0.4	183	314	24	0	24	0	0.05	2.5	0
CYNOGLOSSIDAE																				
15	Long Tongue Sole Cynoglossus lingua (Lidah Pasir)	59.4	77	80.0	18.0	0.4	0.3	1.3	33	151	0.4	230	206	10	0	10	0.01	0.14	1.0	0.8
DREPANIDAE																				
16	Spotted Sickfish Drepane punctata (Daun Baharu)	55.8	92	76.3	19.8	0.5	2.1	1.3	33	198	0.5	82	299	24	10	26	0.01	0.11	3.5	2.0
DOROSOMIDAE																				
17	Gizzard Shad Anodontostoma chacunda (Selangai)	57.4	132	74.1	19.7	5.9	0	1.7	105	260	0.8	124	358	33	0	33	0	0.26	2.1	0
ENGRaulidae																				
18	Anchovy Stolephorus commersonii (Bilis Tembaga)	56.5	74	80.6	17.7	0.3	0	1.7	134	162	0.6	573	130	35	0	35	0.02	0.09	1.2	0.3
LATIDAE																				
19	Giant Sea Perch Lates Calcarifer (Siakap)	55.5	83	78.1	19.5	0.1	1.0	1.3	28	220	0.4	76	416	14	0	14	0.20	0.20	2.4	0
20	Sea Perch Lates Calcarifer (Siakap)	45.2	109	75.4	20.1	3.1	0.2	1.2	26	195	0.5	35	301	16	0	16	0.05	0.10	2.0	0
LEIOGNATHIDAE																				
21	Greater Ponyfish Leiognathus equulus (Kikek Gedebang)	49.6	77	79.8	19.3	0	0	1.4	54	213	0.6	99	227	12	0	12	0.01	0.07	2.8	0
LUTIANIDAE																				
22	Malabar Red Snapper Lutianus malabaricus (Merah)	49.7	104	75.5	20.8	2.3	0.1	1.3	26	216	0.3	81	359	37	0	37	0.08	0.10	3.4	0
23	Mangrove Red Snapper Lutianus argentimaculatus (Jenahak)	48.3	102	75.9	21.0	1.9	0.1	1.1	21	189	0.5	80	327	8	0	8	0.03	0.08	3.1	0.8
24	Russell's Snapper Lutianus russelli (Tanda)	58.8	88	77.0	20.1	0.3	1.3	1.3	80	250	0.5	85	321	4	0	4	0.04	0.10	2.2	0
25	Sharptooth Bass Pristipomoides typus (Kerisi Ball)	51.7	93	77.2	20.2	1.3	0	1.4	45	214	0.3	53	217	19	0	19	0.04	0.04	3.9	0

Table 1.
Nutrient Composition of Malaysian Marine Fishes (continued)

Item No.	Name of Fish	Refuse in as Purchased %	Composition of Nutrients in 100 g Edible Portion																	
			Proximate Composition					Minerals						Vitamins						
			Energy	Moisture	Protein	Fat	Carbohydrate	Ash	Calcium	Phosphorus	Iron	Sodium	Potassium	Retinol	Carotene	Total A Activity	Thiamine	Riboflavin	Niacin	Ascorbic Acid
			K Cal	%	g	g	g	g	mg	mg	mg	mg	mg	ug	ug	ug	mg	mg	mg	mg
MUGILIDAE																				
26	Bluetail Muller Valamugil sehehi (Belanak)	55.2	13.7	72.8	19.4	6.6	0	1.2	53	206	0.9	58	323	31	0	31	0	0.43	3.0	0
NEMIPTERIDAE																				
27	Japanese Threadfin Bream Nemipterus japonicus (Kerisi)	56.4	83	78.7	18.8	0.9	0	1.7	53	200	0.8	246	279	21	0	21	0.03	0.13	2.1	0
PLECTORHYNCHIDAE																				
28	Painted Sweetlip Spiotichthys pictus (Kachi)	57.2	83	78.2	19.8	0.2	0.5	1.3	39	211	0.4	84	365	29	0	29	0.01	0.09	3.1	0
PLOTOSIDAE																				
29	Catfish Eel Plotosus canius (Semilang)	40.5	120	75.2	17.5	5.0	1.2	1.1	14	177	0.8	76	275	41	0	41	0.01	0.04	1.8	1.6
POLYNEMIDAE																				
30	Threadfin Eleutheronema tetradactylum (Senangin)	43.2	117	74.2	21.7	3.4	0	1.3	16	227	0.6	32	254	10	2	11	0.17	0.07	4.0	1.4
31	Threadfin Polynemus indicus (Kura)	—	92	77.0	21.5	0.7	0	1.1	9	169	0.6	51	286	8	0	8	0.05	0.03	2.8	1.2
POMADASYIDAE																				
32	Silver Grunter Pomadasyus hasta (Gerut-Gerut)	61.9	84	78.3	19.5	0.4	0.5	1.3	23	219	0.7	58	460	14	5	15	0.01	0.10	3.1	0
PSETTODIDAE																				
33	Indian Halibut Psettodes erumei (Sabelah)	50.6	81	78.6	19.4	0.2	0.5	1.3	43	216	0.4	101	420	25	0	25	0.04	0.06	3.4	0
SCIAENIDAE																				
34	Brown Jewfish Sciaena dussumieri (Gelama Kling)	61.9	93	77.3	19.4	1.5	0.4	1.4	42	191	0.4	129	340	29	0	29	0.10	0.16	2.0	0
35	Silver Jewfish Johnius (Pseudos- caena) soldado (Gelama papan)	50.3	97	76.8	18.7	1.9	1.2	1.4	34	211	0.4	91	405	19	0	19	0.08	0.14	2.7	0
SCOMBEROMORIDAE																				
36	Barred Spanish Mackerel Scomberomorus commersoni (Tenggiri Batang)	50.0	109	75.5	21.5	2.6	0	1.4	25	231	0.5	67	324	22	0	22	0.06	0.31	3.2	0
SCOMBRIDAE																				
37	Indian Mackerel Rastrelliger kanagurta (Kembong)	45.7	136	71.2	22.4	5.2	0	1.4	27	268	1.3	59	370	24	4	24	0.05	0.15	4.9	0
38	Little Tuna, Bonita Euthynnus affinis (Ava Kuriki)	45.9	117	72.7	23.2	2.7	0	1.4	20	273	1.6	51	344	13	0	13	0.10	0.22	7.1	0
SERRANIDAE																				
39	Coral Cod Epinephelus sexfasciatus (Kerapu)	58.2	80	79.5	18.4	0.5	0.4	1.2	48	184	0.4	109	260	13	0	13	0.02	0.04	1.4	1.1
40	Greasy Grouper Epinephelus tauvina (Kertang)	55.9	82	79.1	19.5	0.4	0	1.2	64	180	0.5	76	344	10	0	10	0.03	0.10	1.6	0
SIGANIDAE																				
41	Streaked Rabbitfish Siganus javus (Dengkis)	46.8	90	77.4	20.2	0.8	0.4	1.2	23	203	0.3	66	342	20	0	20	0.13	0.44	3.4	0
SILLAGINIDAE																				
42	Silver Whiting Sillago sihama (Bulus-bulus Putong Damar)	49.8	87	78.0	20.5	0.6	0	1.3	61	223	0.3	78	350	18	0	18	0.07	0.05	2.0	0
43	Trumpeter Whiting Sillago maculata	54.8	81	78.7	19.6	0.2	0.1	1.4	50	222	0.4	97	335	16	0	16	0.04	0.04	2.3	1.7
SPHYRAENIDAE																				
44	Blunt-jawed Sea Pike Sphyræna obtusata (Kacang-Kacang)	41.7	87	78.5	20.0	0.8	0	1.4	30	227	0.4	95	381	18	0	18	0.06	0.15	2.5	0

Table 1.
Nutrient Composition of Malaysian Marine Fishes (continued)

Item No.	Name of Fish	Refuse in as Purchased %	Composition of Nutrients in 100 g Edible Portion																	
			Proximate Composition					Minerals						Vitamins						
			Energy	Moisture	Protein	Fat	Carbohydrate	Ash	Calcium	Phosphorus	Iron	Sodium	Potassium	Retinol	Carotene	Total A Activity	Thiamine	Riboflavin	Niacin	Ascorbic Acid
			K Cal	%	g	g	g	g	mg	mg	mg	mg	mg	ug	ug	ug	mg	mg	mg	mg
STROMATEIDAE																				
45	Black Pomfret <i>Parastromateus niger</i> (Bawal Hitam)	44.0	104	75.0	20.0	2.4	0.6	1.4	39	247	0.5	57	226	48	0	48	0.28	0.18	4.2	0
46	Chinese Pomfret <i>Pampus chinensis</i> (Bawal Tambak)	54.0	96	78.4	17.7	2.8	0	1.5	28	217	0.2	153	283	47	0	47	0.60	0.10	1.9	0
47	White Pomfret <i>Pampus argenteus</i> (Bawal Puteh)	42.0	113	76.1	19.3	4.0	0	1.2	16	182	0.5	123	316	27	0	27	0.19	0.09	1.9	0.6
TACHYSURIDAE																				
48	Giant Sea Catfish <i>Netuma thalassina</i> (Jahan)	57.7	78	79.5	18.3	0.2	0.7	1.3	16	189	0.5	83	434	19	0	19	0.05	0.08	2.0	0
TRICHIURIDAE																				
49	Ribbonfish <i>Trichiurus haumeia</i> (Timah)	55.8	88	78.4	19.1	1.2	0.1	1.2	32	197	0.5	105	280	15	0	15	0.11	0.09	2.1	0
TRYGONIDAE																				
50	Sting Ray <i>Dasyatis zugei</i> (Pari Nyuru)	—	100	76.1	24.2	0.3	0	1.3	10	106	0.7	87	240	12	2	12	0.04	0.06	2.9	0

Table 2.
List of Marine Fishes Analysed

Malay name	Common name	Family	Scientific name	Item No. in Table 1
1. Ikan Aya Kurik	Little Tuna, Bonita	SCOMBRIDAE	<i>Euthynnus affinis</i>	38
2. Ikan Bawal Hitam	Black Pomfret	STROMATEIDAE	<i>Parastromateus niger</i>	45
3. Ikan Bawal Tambak	Chinese Pomfret	STROMATEIDAE	<i>Pampus chinensis</i>	46
4. Ikan Bawal Puteh	White Pomfret	STROMATEIDAE	<i>Pampus argenteus</i>	47
5. Ikan Belanak	Bluetail Mullet	MUGILIDAE	<i>Valamugil seheli</i>	26
6. Ikan Beliak Mata	Slender Shad	CLUPEIDAE	<i>Ilisha elongata</i>	14
7. Ikan Bilis Tembaga	Anchovy	ENGRAULIDAE	<i>Stolephorus commersonii</i>	18
8. Ikan Bulus-bulus/ Puntong Damar	Silver Whiting	SILLAGINIDAE	<i>Sillago sihama</i>	42
9. Ikan Bulus-bulus/ Puntong Damar	Trumpeter Whiting	SILLAGINIDAE	<i>Sillago maculata</i>	43
10. Ikan Cincaru	Hairtail Scad	CARANGIDAE	<i>Megalaspis cordyla</i>	4
11. Ikan Daun Baharu	Spotted Sickfish	DREPANIDAE	<i>Drepane punctata</i>	16
12. Ikan Delah	Yellowtail Fuisilier	CAESIODIDA	<i>Caesio erythrogaster</i>	2
13. Ikan Dengkis	Streaked Rabbitfish	SIGANIDAE	<i>Siganus javus</i>	41
14. Ikan Gelama Kling	Brown Jewfish	SCIAENIDAE	<i>Sciaena dussumieri</i>	34
15. Ikan Gelama Papan	Silver Jewfish	SCIAENIDAE	<i>Johnius (Preudosciaena) soldado</i>	35
16. Ikan Gerut-Gerut	Silver Grunter	POMADASYIDAE	<i>Pomadasys hasta</i>	32
17. Ikan Jahan	Giant Sea Catfish	TACHYSURIDAE	<i>Netuma thalassina</i>	48
18. Ikan Jebong	Starry Triggerfish	BALISTIDAE	<i>Abalistes stellaris</i>	1
19. Ikan Jenahak	Mangrove Red Snapper	LUTIANIDAE	<i>Lutianus argentimaculatus</i>	23
20. Ikan Kacang-Kacang	Blunt-jawed Sea Pike	SPHYRAENIDAE	<i>Sphyræna obtusata</i>	44
21. Ikan Kaci	Painted Sweetlip	PLECTORHYNCHIDAE	<i>Spilotichthys pictus</i>	28
22. Ikan Kembong	Indian Mackerel	SCOMBRIDAE	<i>Rastrelliger kanagurta</i>	37
3. Ikan Kerapu	Coral Cod	SERRANIDAE	<i>Epinephelus sexfasciatus</i>	39
4. Ikan Kerisi	Japanese Threadfin Bream	NEMIPTERIDAE	<i>Nemipterus japonicus</i>	27

Table 2.
List of Marine Fishes Analysed (continued)

	Malay name	Common name	Family	Scientific name	Item No. in Table 1
25.	Ikan Kerisi Bali	Sharptooth Bass	LUTIANIDAE	<i>Pristipomoides typus</i>	25
26.	Ikan Kertang	Greasy Grouper	SERRANIDAE	<i>Epinephelus tauvina</i>	40
27.	Ikan Kikek Gedebang	Greater Ponyfish	LEIOGNATHIDAE	<i>Leiognathus equulus</i>	21
28.	Ikan Kurau	Threadfin	POLYNEMIDAE	<i>Polynemus indicus</i>	31
29.	Ikan Lidah Pasir	Long Tongue Sole	CYNOGLOSSIDAE	<i>Cynoglossus lingua</i>	15
30.	Ikan Merah	Malabar Red Snapper	LUTIANIDAE	<i>Lutianus malabaricus</i>	22
31.	Ikan Nyior-Nyior	Dart, Ladyfish, Moonfish	CARANGTIDAE	<i>Trachinotus blochii</i>	3
32.	Ikan Parang-Parang	Wolf Herring	CHIROCENTRIDAE	<i>Chirocentrus dorab</i>	11
33.	Ikan Pari Nyiru	Sting Ray	TRYGONIDAE	<i>Dasyatis zugei</i>	50
34.	Ikan Pelata	Yellowtail Scad	CARANGIDAE	<i>Caranx (Alepes) djeddaba</i>	8
35.	Ikan Rambai	Malabar Trevally	CARANGIDAE	<i>Carangoides malabaricus</i>	5
36.	Ikan Sabelah	Indian Halibut	PSETTODIDAE	<i>Psettodes erumei</i>	33
37.	Ikan Selangat	Gizzard Shad	DOROSOMIDAE	<i>Anodontostoma chacunda</i>	17
38.	Ikan Selar Gelek	One-Finlet Scad	CARANGIDAE	<i>Selar (Atule) mate</i>	6
39.	Ikan Selar Kuning	Yellow-banded Trevally	CARANGIDAE	<i>Selaroides leptolepis</i>	9
40.	Ikan Sembilang	Catfish Eel	PLOTOSIDAE	<i>Plotosus canius</i>	29
41.	Ikan Senangin	Threadfin	POLYNEMIDAE	<i>Eleutheronema tetradactylum</i>	30
42.	Ikan Siakap	Giant Sea Perch	LATIDAE	<i>Lates calcarifer</i>	19
43.	Ikan Siakap	Sea Perch	LATIDAE	<i>Lates calcarifer</i>	20
44.	Ikan Talang	Queenfish	CARANGIDAE	<i>Chorinemus lysan</i>	7
45.	Ikan Tamban Bulat	Round Herring	CLUPEIDAE	<i>Dussumieria hasselti</i>	13
46.	Ikan Tanda	Russell's Snapper	LUTIANIDAE	<i>Lutianus russelli</i>	24
47.	Ikan Tenggiri Batang	Barred Spanish Mackerel	SCOMEROMORIDAE	<i>Scomberomorus commersoni</i>	36
48.	Ikan Terubok	Longtail Shad	CLUPEIDAE	<i>Hilsa (Clupea) macrura</i>	12
49.	Ikan Timah	Ribbonfish	TRICHIURIDAE	<i>Trichiurus haumela</i>	49
50.	Ikan Yu Pasir	Dog Shark	CARCHARHINIDAE	<i>Scolidon sorrakowah</i>	10