

The trade in live reef foodfish: a Hongkong perspective

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The trade

In 1999, a total volume of 14,000 metric tons (mt) of live reef food fishes was imported into Hong Kong China according to the official government import figures from the Census and Statistic Department (CSD) and the Agriculture, Fisheries and Conservation Department (AFCD). However, this figure looks to have been underestimated because local fishing vessels are exempt from making trade declarations required by the CSD.

The actual amount of live reef fish imported annually has been estimated at around 30,000 to 35,000 mt¹ (with a total wholesale value of US\$490 million). Despite the enormous volume and monetary value, the trade is not well understood and what little information is available is out of date, particularly since fish prices from 1997 or before are still being quoted². In fact, fish prices tumbled by nearly 50 percent following the onset of the 1997 Asian financial crisis.

Although the economy of Hong Kong is recovering - the stock market rose to a level near its pre-crisis high and since slipped again - the prices for live reef fish remain low when compared to the prices before the crisis.

International Marinelife Alliance - Hong Kong (IMAHK) has been established for two and a half years and was officially incorporated with the



Hong Kong Government in November 1999. The IMAHK provides data on the dynamics of the live reef food fish trade from an importing country perspective, on import, wholesale and retail levels.

The IMAHK has been working with the Hong Kong Chamber of Seafood Merchants (HKCSM; the live fish importers' trade association) since its conception in 1998, and provides crucial links with the AFCD and other government departments, commercial companies, non-government organizations (NGOs) concerned with the live reef fish trade.

The objectives of this article are twofold. The first is to determine the values of imports, and countries of origin, of live reef food fish into HK in 1999 till August 2000 by compiling government statistics.

The second was to investigate the wholesale and retail prices of 10 common species by monthly market and restaurant surveys.

In general, the retailers, who in turn control the market distribution, purchase the fish from wholesalers (take a profit of 24 to 35%) and the restaurants are the main end users (mark the fish up to 100 to 150%)¹.

Import figures

Import figures on live marine fish are collected by the HKSAR Government through the CSD. The data are taken from Trade Declaration forms, with trade recorded in kilogrammes. However, Hong Kong registered vessels are not required to declare their catches as imports, excluding a significant proportion of imported fish from the official import statistics. Fortunately, monthly estimates of live marine fish transported into Hong Kong by Hong Kong vessels are available from the AFCD although the figures from the CSD and the AFCD cover only about 50% of all shipments of live reef fish imported into Hong Kong.

Figures from the CSD are divided into 13 categories under the Harmonized System (HS), with 12 categories relating to particular reef species and one to 'other marine fish. This harmonized system is being looked at by overseas governments for possible use or implementation.

Prior to 1999, the Hong Kong Imports and Exports Classification List (HS) used

for trade declaration purposes did not list some species. The new system gives more detailed information (quantity and countries of origin) on the trade of live reef fish which are susceptible to cyanide fishing.

In Hong Kong, there are approximately 800 Chinese seafood restaurants selling live reef fishes. A survey has been carried out on the monthly live reef fish (LRF) retail prices since November 1999 based on 726 seafood restaurants in 18 districts around Hong Kong.

Apart from the preliminary study last November (only 10% of restaurants were visited because of time constraint), 20% of the total number of restaurants per district were selected randomly.

The prices of 10 common species (*Cromileptes altivelis*, *Epinephelus coioides*, *Epinephelus fuscoguttatus*, *Epinephelus lanceolatus*, *Epinephelus polyphekadion*, *Plectropomus areolatus*, *Plectropomus laevis*, *Plectropomus leopardus*, *Cheilinus undulatus* and *Lutjanus argentimaculatus*), where available, were recorded for every restaurant.

Market survey

Kwun Tong Wholesale Fish Market is the only indoor live reef food fish market operated by the Fish Marketing Organization (FMO), while the markets in Aberdeen and Sam Shing (Tuen Mun) are adjacent to the Aberdeen Wholesale Fish Market and Castle Peak Wholesale Fish Market respectively.

Apart from these wholesaler-aggregated areas, some wholesalers (or distributors) operate in urban areas. In our survey, the wholesale prices of the 10 species were updated twice a week for the markets in Kwun Tong and Aberdeen.

For the wholesalers/distributors in Quarry Bay, Sam Shing and Wancha, prices were recorded once a month. The monthly Average Wholesale Price of Live Marine Products prepared by the AFCD Aquaculture Development Team (Au Tau) in which the prices were obtained from Aberdeen and Mong Kok) were also used as a reference for comparison.

Table 1. Imports (monthly) of live marine fish into Hong Kong by country in 1999.

Exporting country	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total (kg)
Australia	7,469	76,065	40,253	19,410	15,756	18,470	20,830	33,662	39,778	48,803	40,807	68,103	429,406
Brunei	-	-	91	140	204	3,153	2,851	1,836	1,867	1,003	566	213	11,924
Cambodia	1,330	1,854	644	1,917	596	949	2,663	2,247	1,320	3,654	2,482	738	20,394
Fiji	-	-	-	-	-	-	-	-	200	-	-	-	200
France	974	1,776	400	890	-	-	-	-	-	-	-	-	4,040
India	-	-	-	-	8,960	-	-	391	436	1,045	-	-	10,832
Indonesia	77,529	57,042	83,666	59,935	91,134	65,525	97,015	90,860	152,904	99,082	129,352	96,910	1,100,964
Japan	-	-	492	-	-	-	-	-	-	-	-	251	743
Kiribati	-	-	15,000	-	-	-	-	-	-	-	-	-	15,000
Korea	210	420	-	320	220	330	330	220	330	310	210	315	3,215
Mainland China	233,140	228,702	234,630	325,022	295,399	268,896	392,406	247,469	218,348	277,350	222,857	204,425	3,148,746
Malaysia	49,638	68,573	43,994	46,670	89,786	44,037	114,803	38,063	97,513	71,289	85,038	31,466	780,890
Maldives	-	-	14,500	-	18,000	16,500	-	-	17,500	-	-	-	66,500
Morocco	-	-	-	-	-	-	-	-	-	97	-	-	97
Myanmar	6,387	-	-	-	-	-	1,676	-	-	-	160	49	8,272
Philippines	50,322	39,583	44,619	30,987	57,722	38,422	78,306	49,637	65,960	79,890	66,010	56,376	657,834
Singapore	-	-	13,300	-	-	1,428	964	16,200	-	-	-	10,000	41,892
Sri Lanka	-	302	-	-	326	-	-	-	98	-	-	-	726
Taiwan	47,562	135,320	159,977	113,047	81,600	77,818	132,004	69,616	75,374	66,986	56,846	65,191	1,081,141
Thailand	541,512	374,502	345,875	292,251	327,302	214,708	272,491	261,582	214,258	242,819	217,407	232,070	3,533,974
Vietnam	5,476	18,699	16,305	12,688	19,993	15,264	13,295	20,037	32,540	12,608	15,465	4,957	187,327
Total (kg)	1,021,549	1,002,838	1,013,746	903,277	1,006,998	765,602	1,129,634	831,830	918,426	904,946	837,000	771,084	11,106,930

Table 2. Imports (monthly) of live marine fish into Hong Kong by country from January to July 2000.

Exporting country	Jan	Feb	Mar	Apr	May	Jun	Jul	Total (kg)
Australia	45,234	48,114	52,741	57,265	78,851	48,857	78,184	409,246
Brunei	-	84	168	368	1,631	924	574	3,749
Cambodia	1,556	2,325	3,096	1,397	6,592	3,586	3,909	22,461
Canada	-	-	-	103	-	-	-	103
Iceland	-	-	-	-	-	456	-	456
Indonesia	97,633	122,583	99,664	106,895	118,709	81,808	57,608	684,900
Japan	-	-	672	5,639	6,737	6,749	6,432	26,229
Korea	210	220	220	228	214	200	100	1,392
Mainland China	228,592	236,507	234,208	386,194	388,913	449,043	350,228	2,273,685
Malaysia	43,737	37,401	46,894	29,108	31,386	36,216	55,620	280,362
Maldives	-	-	-	18,500	-	-	-	18,500
Myanmar	-	-	118	-	95	-	-	213
Nauru	-	-	-	-	-	-	282	282
Philippines	71,743	87,191	91,812	76,633	105,108	125,154	119,524	677,165
Seychelles	-	25,000	-	-	-	-	-	25,000
Singapore	-	120	217	-	-	10,000	-	10,337
Taiwan	97,933	211,962	173,620	127,747	93,602	72,819	51,219	828,902
Thailand	188,935	236,304	184,853	216,932	326,642	274,582	272,206	1,700,454
Togo	-	-	-	-	-	-	840.00	840
Vietnam	11,565	14,729	21,587	34,244	12,604	10,097	9,301	114,127
Total (kg)	787,138	1,022,540	909,870	1,061,253	1,171,084	1,120,491	1,006,027	7,078,403

Table 3. Total imports of live marine fish into Hong Kong by species in 1999.

Species	Volume of import (kg)		Total (kg)
	CSD	AFCD	
Giant grouper	14,636	12,900	27,536
High-finned grouper	4,574	11,462	16,036
Green grouper	1,788,306	273,158	2,061,464
Tiger grouper	60,098	372,724	432,822
Flowery grouper	316,589	383,904	700,493
Leopard coral trout	1,439,185	271,296	1,710,481
Spotted coral trout	75,520	234,284	309,804
Other grouper	1,598,111	439,240	2,037,351
Humphead wrasse	4,587	85,442	90,029
Other wrasses & parrotfish	748	178,750	179,498
Snooks & basses	1,972,811	-	1,972,811
Mangrove snapper	566,115	1,079,260	1,645,375
Other marine fish	3,284,763	278,166	3,562,929
Total (kg)	11,126,043	3,620,586	14,746,629

Table 4. Total imports of live marine fish into Hong Kong by species from January to June 2000.

Species	Volume of import (kg)		Total (kg)
	CSD	AFCD	
Giant grouper	12,854	2,014	14,868
High-finned grouper	2,648	6,291	8,939
Green grouper	1,004,102	1,019,127	2,023,229
Tiger grouper	47,585	56,461	104,046
Flowery grouper	112,958	68,450	181,408
Leopard coral trout	994,090	224,612	1,218,702
Spotted coral trout	25,375	71,961	97,336
Other grouper	757,191	162,908	920,099
Humphead wrasse	36,249	23,206	59,455
Other wrasses & parrotfish	723	79,430	80,153
Snooks & basses	1,080,103	-	1,080,103
Mangrove snapper	165,061	207,210	372,271
Other marine fish	1,832,502	723,920	2,556,422
Total (kg)	6,071,441	2,645,590	8,717,031

Fish cage survey

From 16 March to 30 August 2000, IMAHK carried out regular field survey around the holding cages in 2 mariculture zones in Hong Kong by a 17-foot boat “So Mei” (So Mei is the local common name of the Humphead wrasse). The boat allowed IMA to access these areas to determine what quantities, countries of origin and species composition of fish are being held there at any time

Volume and sources of imports

Import figures in 1999 and 2000 (until October) are shown in Tables 1 to 4. In 1999, 14,727,516 kg of live marine fish were imported into Hong Kong (11,126,043 kg from the CSD and 3,620,586 kg from local fishing vessels). According to the CSD import data, live marine fishes were consigned to Hong Kong from 21 exporting countries, namely Australia, Brunei, Cambodia, Fiji, France, India, Indonesia, Japan, Kiribati, Korea, China, Malaysia, Maldives, Morocco, Myanmar, the Philippines, Singapore, Sri Lanka, Taiwan, Thailand and Vietnam. (Tables 1 & 2).

In 1999, Thailand (37%, 1,305,492 kg, of the imported fish from Thailand was the Green grouper) and China (63%, 1,972,811 kg, of the imported fish from China were the snooks and basses) were major suppliers of live marine fishes, followed by Indonesia, Taiwan, Malaysia, the Philippines and Australia (Table 1).

Until October 2000, imports totalled 14,256,298 kg (9,830,418 kg from the CSD and 4,425,880 kg as shown in Table 4). Based on the CSD import figures, 4 new exporting economies imported fishes into Hong Kong in 2000, namely, Iceland, Nauru, Seychelles and Togo. However, it

is questionable whether the declared 456 kg of Leopard coral trout came from Iceland or somewhere else in June 2000.

Apart from *E. areolatus* and *E. bleekeri*, the Green grouper (sometimes mixed with the Malabar grouper, *E. malabaricus*²) is the most common cultured grouper in Hong Kong. The wild-caught fish costs about 35-43% more than the cultured one. In restaurants, plate-sized individuals are usually sold per tail instead of per weight as this species is considered to be cheaper (like *L. argentimaculatus*) than other live food fishes.

The wholesale price was around HK\$ 120 per kg with the lowest (\$88.5 per kg) occurring in May 2000 (Table 5). The retail prices varied slightly from HK\$197.7 per kg to HK\$237.0 per kg (Table 6). The greatest difference was 143.8.0% in May 2000 while the least (85.3%) was in April 2000. Based on these findings, it appears that generally a bigger profit can be made from cheaper species.

Tiger grouper (*Epinephelus fuscoguttatus*). Individuals of size less than 3 catties (1.8 kg) are more popular than larger ones because of the assumed lower risk of contracting ciguatera and they are a better size for consumption (plate-sized). In fact, many restaurateurs claim that the Tiger grouper has a better taste than the Leopard coral trout and they prefer eating the Tiger grouper.

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According to the Explanatory Note No.5: Adjustments, “The trade figures are subject to adjustments. For example, goods declared may be subject to correction later. Errors affecting individual headings may also arise from various sources, such as misclassification of commodity or country/territory of consignment in the original document, wrong reporting of value or quantity, and lodgment of more than one declaration for the same consignment. Adjustments relations to earlier months of a particular year are incorporated in the cumulative totals of that year only. It follows that the sums of the monthly figures may differ from the cumulative totals”. As a result, the sums of monthly figures in 1999 and 2000 (see Table 1 & 2) are different from the cumulative totals (see Table 3 & 4). In this study, the more cumulative totals were used except where specified.



Wholesale price ranged from HK\$171.4 per kg in May to HK\$237.5 per kg in November (Table 5). Retail price peaked at HK\$413.4 per kg in January, with the lowest at HK\$ 332.6 per kg found in November (Table 6).

Giant grouper (*Epinephelus lanceolatus*). The Giant grouper is preferred by local people. Having a big (more than 10 catties, or 16.53 kg) Giant grouper for sale in a restaurant seems to be a striking issue and a restaurant usually posts an advertisement by its entrance. However, as the supply and demand for big individuals has decreased and consumers are now more interested in eating plate-sized fish, juvenile Giant groupers (less than 5 catties) are available in some premium-priced restaurants. It is not often found for sale in the seafood restaurants. There may be one on the display tank, the fish is not for sale because of “fung shui” purposes. From April to June, no Giant grouper was observed for sale in 400 randomly selected restaurants. The wholesale and retail prices varied from HK\$136.1 per kg to HK\$314.2 per kg (Table 5) and HK\$368.7 per kg to HK\$ 749.0 per kg (Table 6), respectively. The remarkable difference between wholesale and retail prices in March (276.0%) was due to the average retail price being based on small individuals while the wholesale price was estimated from both small (1.3 kg) and large (heavier than 3 kg) individuals. One of the largest importers in Hong Kong (P.S.W. Chan - Chair of the HKCSM, pers. comm.) claims that about 95% of the Giant groupers in the market are cultured (juveniles are available from hatchery e.g. in Taiwan) rather than wild-caught as suggested elsewhere².

Flowery grouper (*Epinephelus polyphekadion*). The Flowery grouper seems to be one of the cheapest wild-caught grouper in the local seafood market although a few wild-caught Green grouper are sold at similar price. Generally speaking, both wholesale and retail prices of the Flowery grouper are lower than the Tiger grouper. The prices of the Flowery grouper did not vary much from November 1999 to September 2000. Its wholesale price was about HK\$200 per kg (Table 5) while retail price fluctuated slightly at HK\$350 per kg (Table 6). The profit (percentage difference) made from this species ranged from 45.8% (November) to 107.0% (May).

Table 5. Monthly variations in the mean and standard deviation of the wholesale prices (HK\$ /kg) of 10 common species in Hong Kong from November 1999 to September 2000, with comparisons to the mean wholesale prices in 1997 (Lau & Parry-Jones, 1999).

HK\$ /kg	Species																			
	<i>C. altivelis</i>		<i>E. coioides</i>		<i>E. fuscoguttatus</i>		<i>E. lanceolatus</i>		<i>E. polyphkadiion</i>		<i>P. areolatus</i>		<i>P. laevis</i>		<i>P. leopardus</i>		<i>C. undulatus</i>		<i>L. argentimaculatus</i>	
Month	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Nov-99	583.5	139.2	122.6	21.4	237.5	66.8	314.2	143.2	207.7	32.6	206.7	11.7	297.6	140.3	331.4	90.9	554.5	169.5	48.6	3.4
Dec	532.3	76.5	135.0	36.2	193.5	75.3	148.8	--	212.4	45.8	248.0	70.2	198.4	--	376.5	57.8	495.7	109.8	74.7	39.0
Jan-00	526.1	97.7	103.3	17.0	213.6	47.3	278.1	182.1	185.7	43.5	256.7	45.6	238.2	22.3	362.0	41.5	531.2	81.9	46.8	9.5
Feb	526.4	100.4	122.0	60.5	180.5	64.2	205.3	94.8	201.9	60.2	222.9	55.1	192.9	19.5	356.9	87.6	468.7	152.3	58.9	33.5
Mar	457.5	94.5	106.3	34.6	201.6	69.8	164.2	25.4	177.9	74.4	199.8	87.1	163.8	38.3	296.5	64.2	420.5	139.7	59.4	26.3
Apr	494.4	107.0	116.3	51.7	189.8	66.3	171.6	42.3	170.9	66.3	156.8	36.7	--	--	265.9	77.5	398.8	143.1	54.5	13.1
May	512.2	82.5	88.5	21.7	171.4	74.9	201.0	44.6	164.6	72.9	180.2	74.2	396.8	--	266.6	89.7	402.8	160.0	55.3	2.8
Jun	522.3	56.7	94.6	23.9	173.5	49.8	201.6	51.4	167.2	66.5	217.3	77.8	--	--	290.0	88.5	437.2	173.2	66.4	18.1
Jul	529.3	89.6	100.1	30.6	185.4	69.8	201.6	51.4	178.9	73.9	155.0	56.1	--	--	295.5	96.2	417.9	157.2	69.0	16.5
Aug	493.8	24.3	100.0	30.5	194.4	54.5	201.6	51.4	169.5	74.5	140.9	47.5	--	--	261.0	81.3	397.4	149.5	55.3	2.8
Sep#	522.8	26.4	92.9	22.5	173.9	33.6	224.7	78.1	136.1	62.8	177.9	54.7	--	--	254.5	85.0	358.5	137.3	55.3	2.8
WWF 97*	708.4		177.1		284.9		581.4		234.9		308.0		--		400.4		423.5		138.6	

Statistics in September calculated from data from Kwun Tong Wholesale Fish Market.

* Lau, P. & Parry-Jones R. (1999). *The Hong Kong Trade In Live Reef Fish For Food*. TRAFFIC East Asia and World Wide Fund For Nature Hong Kong, Hong Kong.

Table 6. Monthly variations in the mean and standard deviation of the retail prices (HK\$ /kg) of 10 common species in Hong Kong from November 1999 to August 2000, with comparisons to the mean wholesale prices in 1997 (Lau & Parry-Jones, 1999).

HK\$ /kg	Species																				No. of restaurants surveyed
	<i>C. altivelis</i>		<i>E. coioides</i>		<i>E. fuscoguttatus</i>		<i>E. lanceolatus</i>		<i>E. polyphkadiion</i>		<i>P. areolatus</i>		<i>P. laevis</i>		<i>P. leopardus</i>		<i>C. undulatus</i>		<i>L. argentimaculatus</i>		
Month	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Nov-99	782.8	259.0	200.9	65.6	332.6	87.9	749.0	86.5	302.8	72.6	368.0	95.4	489.4	18.7	411.9	113.8	728.1	301.6	140.4	43.8	
Dec	804.1	282.1	234.7	78.0	362.5	91.5	575.1	196.0	355.9	81.6	390.4	101.4	412.9	121.8	481.6	162.0	787.6	319.5	166.6	56.8	
Jan-00	801.2	229.9	229.3	61.9	413.4	83.6	436.5	108.3	367.0	83.0	426.8	78.7	--	--	560.4	139.3	859.4	270.6	139.7	34.4	
Feb	820.7	237.5	237.0	56.7	408.9	69.0	525.8	116.9	389.7	78.9	479.8	115.8	466.6	13.2	591.0	146.2	811.6	279.4	135.4	25.4	
Mar	843.5	344.7	230.6	66.6	410.5	82.5	617.6	--	342.9	74.7	432.4	83.8	463.0	93.5	499.5	166.9	841.6	350.6	131.0	30.5	
Apr	835.7	284.3	215.5	57.0	372.3	75.1	--	--	324.5	66.8	361.8	111.5	386.4	101.4	440.5	151.6	812.9	278.9	128.5	31.7	
May	782.1	230.5	215.9	56.5	374.0	70.6	--	--	340.7	58.3	350.6	83.5	502.7	121.2	467.4	178.2	847.5	315.3	130.0	43.8	
Jun	848.8	313.7	216.1	65.8	350.7	79.8	--	--	339.5	89.7	397.6	87.5	484.5	--	458.5	153.6	859.7	375.0	123.5	20.8	
Jul	680.3	219.7	200.7	40.6	356.4	76.6	368.7	35.1	342.8	80.9	374.8	47.7	469.0	28.1	448.5	159.3	737.6	237.0	132.1	26.0	
Aug	811.1	343.8	197.7	49.7	379.4	73.9	--	--	334.4	72.1	388.1	80.2	471.4	60.3	496.3	177.9	935.2	350.7	120.7	25.6	
WWF 97*	1239.7		369.6		381.2		897.1		342.7		754.6		--		823.9		1024.1		192.3		

* Lau, P. & Parry-Jones R. (1999). *The Hong Kong Trade In Live Reef Fish For Food*. TRAFFIC East Asia and World Wide Fund For Nature Hong Kong, Hong Kong.

Table 7. Average wholesale price of 9 fish species from November 1999 to August 2000 prepared by the AFCD.

Species	Nov 99	Dec	Jan 00	Feb	Mar	Apr	May	Jun	Jul	Aug
<i>C. altivelis</i>	484.0	520.9	536.3	521.4	523.9	517.0	544.5	525.3	561.0	567.6
<i>E. coioides</i>	117.6	106.8	124.2	117.5	114.7	104.0	114.6	116.2	109.5	117.9
<i>E. fuscoguttatus</i>	152.6	129.5	154.0	154.4	148.5	146.1	145.0	149.8	166.7	188.9
<i>E. lanceolatus</i>	187.0	160.9	163.4	154.7	162.3	170.5	166.4	187.0	176.6	158.4
<i>E. polyphkadiion</i>	165.6	177.4	191.1	191.4	165.0	172.1	184.6	184.3	202.7	209.6
<i>P. areolatus</i>	179.9	201.1	273.4	222.8	186.5	185.0	197.1	207.6	201.5	229.6
<i>P. leopardus</i>	299.8	325.9	400.7	330.0	281.9	285.2	301.6	272.3	287.6	307.6
<i>C. undulatus</i>	420.8	458.7	508.2	495.0	489.5	470.3	519.8	495.0	523.3	570.9
<i>L. argentimaculatus</i>	69.6	76.7	69.2	62.3	53.1	74.0	72.5	67.8	65.4	62.2

Prices obtained from Aberdeen and Mong Kok.

Prepared by Aquaculture Development Team (Au Tau) & Fisheries Resources and Claims Section.



Spotted coral trout *Plectropomus leopardus*

Similar to the
Green grouper,
the Mangrove snapper
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in Hong Kong.

Spotted coral trout (*Plectropomus areolatus*). Apart from the Leopard coral trout, the Spotted coral trout seems to be the second most well-known *Plectropomus* species sold in restaurants. It is usually sold at a lower price than the Leopard coral trout, but at the same price as the Tiger grouper.

The wholesale price varied from HK\$140.9 per kg in August to HK\$256.7 per kg in January (Table 2). The retail price peaked at HK\$479.8 per kg in February while the lowest occurred at HK\$ 350.6 per kg in May.

Blacksaddled coral trout (*Plectropomus laevis*). The Blacksaddled coral trout is not commonly seen in the tanks of the restaurants. Its retail price lies between that of the Spotted coral trout and the Leopard coral trout.

It was not seen in the restaurants in January and no data was found in the wholesale market in April and from June to September (Table 5).

The wholesale price ranged from HK\$186.7 per kg to HK\$396.8 per kg while the retail price was between HK\$386.4 per kg in April and HK\$502.7 per kg in May.

Leopard coral trout (*Plectropomus leopardus*). The Leopard coral trout is the most common and famous grouper among local consumers. Most restaurants have this species in their tanks for sale. Because of its attractive body coloration (red skin with white meat), it is a very popular fish for banquets, especially at weddings.

In one restaurant in February, these were sold at a higher price (HK\$17 per tael) than those with pale red coloration (HK\$13 per tael). From November 1999 to September 2000, wholesale prices in December (HK\$376.5 per kg) and January (HK\$362.0 per kg) were higher than in other months (Table 5).

Similarly, the retail price increased remarkably in January (HK\$560.4 per kg) and February (HK\$591.0 per kg) (Table 6), mainly due to increased demand and reduced supply (cold season) for this popular species in banquets for the Chinese Lunar New Year.

From late last-March till May, a company with about 20 restaurants in Hong Kong sold this species at HK\$6.8 per tael (equivalent to HK\$174.1 per kg). In late April, another restaurant group launched a promotion for this species,

sold at HK\$4.8 per tael (equivalent to HK\$ 122.9 per kg) which is even lower than the average wholesale price in April.

Humphead wrasse (*Cheilinus undulatus*). The Humphead wrasse and the Giant grouper are the two well-known 'giants' sold in the local seafood market. Nowadays, plate-sized (below 5 catties) Humphead wrasse is more preferable than large individuals. Together with the Highfinned grouper and the Red grouper (*E. akaara*), the Humphead wrasse is one of the most expensive live reef food fish in the local seafood market. Wholesale prices for Humphead wrasse varied from HK\$358.5 per kg in September to HK\$554.5 per kg in November 1999 (Table 5). Its retail price ranged from HK\$728.1 per kg in November to \$935.2 per kg in August (Table 6). The percentage difference between retail and wholesale prices was lowest (31.3%) in November 1999, highest (135.3%) in August.

Mangrove snapper (*Lutjanus argentimaculatus*). As with the Green grouper, Mangrove snapper is another commonly cultured species that has a low market price and is usually sold per tail instead of per weight. The wholesale price of the Mangrove snapper was around HK\$60 per kg (Table 5) and retail price was about HK\$130 per kg (Table 6). The profit seems to be highest among 10 species (percentage differences ranged from 85.9% in June to 198.3% in January). Similar to the Green grouper, this species is the most profitable cultured fish in the restaurants in Hong Kong.

Comparative wholesale and retail prices, 1997-2000

Wholesale and retail prices for the 10 common species in 1997 and September 2000 are listed in Tables 5 and 6. When compared with the average wholesale prices in 1997 (Lau & Parry-Jones, 1999), the September 2000 prices for all species are much lower (38.6% to 84.7% of the prices in 1997). For retail prices, apart from the Tiger grouper and Flowery grouper which show little deviations, those in August 2000 for the other 7 species are lower than in 1997 (41.1% to 99.5%). This may be due to the prior economic crisis; people now are not so willing to eat expensive fish in restaurants.

Mariculture activities in 2 Hongkong mariculture zones

The Average Wholesale Price of Live Marine Products" was prepared by the Aquaculture Development Team (Au Tau), AFCD, with prices obtained from Aberdeen and Mong Kok. Our findings are similar to those of AFCD (Table 7).

However, the AFCD states the wholesale prices are originated from captured Giant grouper. This is unlikely to happen because the species sold in the local market are mostly cultured. Moreover, *P. laevis* is not in the AFCD list.

From 16th March to 30th August 2000, 10 regular visits to 2 mariculture zones (Sok Kwu Wan and Lo Tik Wan, Lamma Island) were carried out by the IMA boat "So Mei". Based on observations and conversations with the local mariculturists, the most common species being reared are:

- the snappers (e.g. *Lutjanus argentimaculatus*, *L. malabaricus*, *L. johnii*, *L. russellii*, *L. stellatus*),
- the Pompano (*Trachinotus blochii*),
- groupers (e.g. *Epinephelus areolatus*, *E. bleekeri*, *E. coioides*),
- sea-breams (e.g. *Acanthopagrus berda*, *A. latus*, *A. macrocephalus*, *Rhabdosargus sarba*),
- the Head grunt (*Pomadasys kaakan*),
- White spotted rabbitfish (*Siganus canaliculatus*),
- grunts (e.g. *Parapristipoma trilineatum*, *Plectorhinchus cinctus*),
- emperors (e.g. *Lethrinus haematopterus*),
- the Cobia (*Rachycentron canadum*),
- the Red drum (*Sciaenops ocellatus*) and
- the Greater amberjack (*Seriola dumerili*).

Some mariculturists held more valuable species like the Humphead wrasse and the Leopard coral trout in their fish rafts or cages mainly for temporary storage. Guard dogs were found on the fish cages.

During most of our visits, poor water quality (i.e. poor water flow, low visibility, many dead fish) was found in these two culture zones. Also, fish are usually kept under stressful conditions (e.g. over-crowding and disease) and fed with trash fish so that the efficiency of mariculture is further lowered.

Current status

Hong Kong is an important consumer of live reef food fish in the Asia-Pacific region. Although it was recorded that there were only 14,728 mt of live reef fish imported into Hong Kong in 1999, the actual volume was believed to be about 30,000 to 35,000 mt.

Of this, about 55 to 60% was re-exported to the People's Republic of China (PRC)¹. Estimates of 1997 imports are that there was a total of 32,000 mt imported into Hong Kong with only 13,994 mt declared³. The exemption of local fishing vessels to making trade declarations resulted in the 50% under-reporting of the quantity of fish imported into Hong Kong.

After the follow-up meeting on "the Hong Kong Trade In Live Reef Fish For Food" on 25th September 2000, a joint programme with the IMAHK, AFCD and HKCSM is now developing a better scheme for more accurate measures and monitoring of the trade.

A recently published WWFHK (World Wide Fund For Nature Hong Kong)² suggested that the Giant grouper and Humphead wrasse were popular species among local people, and that the latter was one of the most popular live reef food fish (the other 4 species were *Plectropomus leopardus*, *Lutjanus argentimaculatus*, *Epinephelus coioides* and *Lutjanus russellii*).

However others have stated that "Humphead Wrasse and Giant Grouper were the least common species in the restaurants" and it was quite rare to see the Humphead wrasse and Giant grouper in the display tanks in the restaurants during our restaurant survey.

The word "popular" in the WWF 2000 report should be understood and used with care. Currently the most commonly seen fish include the Leopard coral trout, Flowery grouper, Tiger grouper, Green grouper and Mangrove snapper with the latter two species are common cultured fish.

An in-depth report on the current status of the live fish trade industry in Hong Kong has been produced that addresses several difficulties experienced in the trade from wild-caught fish supply and prospects for mariculture development⁴. In 1999, public concern about the safety of eating ciguatoxic fish arose which directly

affected the consumption of live reef food fish.

In fact, this has helped the mariculture industry which produces virtually ciguatera-free food fish. However, because of red tides, the small mariculture sector only produced just over 1,000 metric tonnes of fish (through grow-out of wild-caught, imported juveniles in net cages) which has an annual production of 3,000 metric tonnes normally⁴.

Misconceptions (e.g. that all fish imported are caught with cyanide) about the live reef food fish industry also create an adverse effects on the development of the live reef food fish and aquarium fish trade industry in Hong Kong.

Recommendations and future activities

It is important to let everyone involved in the live reef fish trade know the most up-to-date situation instead of using old information (e.g. Humphead wrasse used to fetch US\$120/kg wholesale prior to 1997, but in January 2001 was only fetching US\$ 57/kg wholesale). Putting the monthly wholesale and retail prices on the world wide web may be a good idea for this (at least for those who have accesses to the web).

Secondly, the existing mariculture ordinance should be revised in order to save this potential solution to global problem of overfishing. The development of hatcheries to produce vaccine-treated fry/fingerlings instead of buying wild-caught juveniles overseas along with consideration of on-land grow-out facilities, production of cheap, good-quality pellet fish feed, and reduction on the consumption of wild-caught fish for fish-feed purposes could also be of benefit⁴. The growing market for live reef (food and aquarium) fish in PRC is another concern for the industry.

On 25th July 2000, IMAHK visited the seafood wholesale market in Huang Sha, Guangzhou, finding that there were at least 200 shops selling live reef fishes, shellfishes, crustaceans and freshwater fishes. The price (wholesale) resembled the retail price in the restaurants in Hong Kong, and the species composition was very similar to that of Hong Kong. IMAHK is planning to investigate other wholesale markets

in other cities of PRC in the future. While not a big market in global terms, Hong Kong is the second largest importer of marine aquarium fish in Asia after Japan.

Chan and Sadovy (1998) estimated a sum of HK\$57,453,780 was valued in the trade in 1997, involving 342 marine aquarium fish species from 49 families. IMAHK has developed links with one of the largest marine aquarium trade in Hong Kong, Yat Wong aquarium. Yat Wong import and re-export marine aquarium fish and the Managing Director is strongly against cyanide fishing. Yat Wong has proposed that the company purchase fish from fishers trained in barrier-net collection under the Indo-Pacific Destructive Fishing Reform Initiative (DFRI) program.

IMAHK also hopes to persuade Yat Wong to label the various display tanks in the shop, stating that the fish are cyanide-free and caught using non-destructive techniques. This small step will help inform the aquarists to a side of their hobby they may not be aware of and play a leading role which other marine aquarium shops can follow.

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