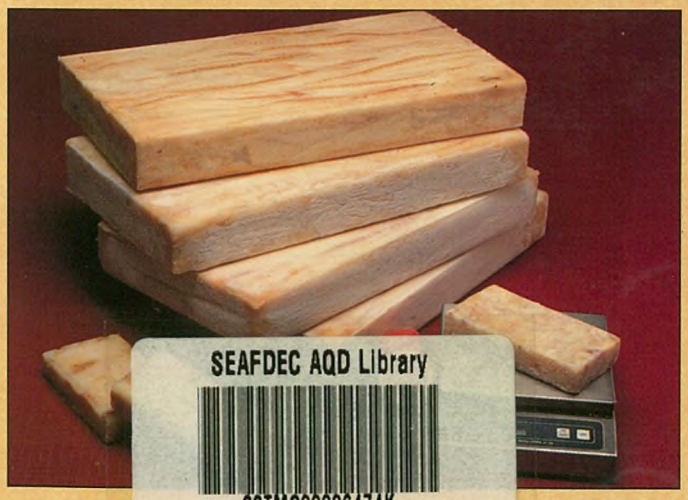
Southeast Asian Fish Products

Second Edition, 1991



Marine Fisheries Research Department
Southeast Asian Fisheries Development Center
Singapore

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Second Edition, 1991

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SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

The Southeast Asian Fisheries Development Center (SEAFDEC) is a technical organisation devoted to the accelerated development of fisheries in the region. The member countries of SEAFDEC are Japan, Malaysia, Philippines, Singapore and Thailand. SEAFDEC has three departments, viz, the Marine Fisheries Research Department in Singapore, Training Department in Thailand and the Aquaculture Department in the Philippines.

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Note: The mention of trade names in this publication does not imply endorsement of the product.

PREFACE TO THE SECOND EDITION

This edition was prepared from the results of a survey conducted among six ASEAN countries. The Marine Fisheries Research Department of the Southeast Asian Fisheries Development Center conducted the survey in 1989, similar to that undertaken in a survey during 1985. The challenge to conduct the present survey was raised at the 20th SEAFDEC Anniversary Seminar on Development of Fish Products in Southeast Asia in October, 1987 in Singapore.

Participants at that Seminar welcomed the publication and recommended periodic updating of information for use by researchers, food scientists, fish technologists, administrators, and fish traders and others in the private sector.

The compilers were also encouraged by the demand and compliments on the first edition. Requests for copies soon depleted the original stock, and made it necessary to replenish the supply. During preparations for reprinting, the compilers began the job of building improvements into the present edition.

Several improvements and new features such as a brighter appearance, easier to use formating and layout, more fish products and an index were included. This edition, in fact, looks very different, but attention was paid to ensure that there was continuity with the first edition.

This edition has been published to coincide with the SEAFDEC Seminar on Advances in Fishery Post-Harvest Technology in Southeast Asia in May 1991. At that meeting a Workshop will also be held to deliberate on this publication; suggestions for improvement can then be included in the third edition. Comments from other users are also welcomed.

PREFACE

Fish is a major traditional source of animal protein in the Southeast Asian region. There are many varieties of fresh water and marine fish which is widely accepted by most peoples and religions.

These fish are also available as traditional fish products and these are listed in this report. They are broadly classified as dried, salted and fermented fish products, minced and powdered fish, and fish sauces, etc. More recently, fish products have been developed to meet the requirements of foreign markets.

In 1976, the SEAFDEC Council requested the government of Japan to send a Survey Mission to SEAFDEC Member Countries to determine the status of fish processing and preservation in order to decide on the priorities of a research and development program. The program identified was carried out by the MFRD.

In 1984, the MFRD was requested to compile an inventory of fish products in Southeast Asia. The objective of the survey was to list the fish products available in countries in the region and the technical problems and constraints in meeting market requirements.

This report is a comprehensive record of fish products in the region, and will be of interest to researchers, food scientists, fish technologists and administrators. It will also be useful for fish traders, and may be used as a reference for further improvement of the quality of these products in the region.

CONTENTS

INTRODUCTION

The objectives of this survey were to

1. update basic information on fish products,
2. identify their quality level, and
3. identify the constraints in their marketing and promotion

among the participating countries.

Six ASEAN countries participated in this survey; they were Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Thailand.

Based on critical responses received to the first edition of this inventory, the products were classified into the following 11 main categories (alphabetical):

a) Boiled
b) Canned
c) Comminuted (eg. fish jelly products, fish fingers)
d) Cured (eg. salted (not dried), pickled)
e) Dried (including salted/dried, semi-dried)
f) Fermented (eg. fermented fish, fish paste, sauce)
g) Fish meal
h) Frozen
i) Powdered/flaked
j) Smoked
k) Others (eg. crackers, barbecued fish).

A questionnaire was drawn up and sent in August 1989 together with invitations to the countries to participate in the survey. The questionnaire incorporated suggestions from users of the first inventory and attempted to be as comprehensive as possible in including all the background information on fish products.

Photographs were requested from respondents to illustrate the publication and to provide visual explanation to users, in particular those from outside this region, who may be unfamiliar with the products.

This inventory is designed as a follow up on the first edition and therefore has common and updated features and information. These include details of fish products from the participating countries, and the problems listed by them. The data is updated to 1987; NA" denotes data not available.

In addition, this compilation has several improved and new features. These include a format which is more user-friendly, such as summary tables to highlight information and problems. A brighter presentation is also achieved by including selected colour photographs which also introduce products of the region to readers unfamiliar with them.

More information has also been gathered in comparison with the earlier edition. These include additional products such as those shown in the comminuted products category, and include fish burger, fish dumpling, cuttlefish ball, sausages made from fish, prawn and cuttlefish, and imitation crab meat. Some information on prices of both raw and finished products are documented, together with related packaging methods and materials, storage conditions and shelf life. The exchange rate was arbitrarily fixed for January 1990, which was:

US$1 = Rp1709.1 = ₱ 22.437 = M$2.6918 = S$1.88 = ฿ 25.445

Advances in printing technology also allowed us to make the publication more appealing and easier to use; we hope users will also appreciate the index and the combination of portrait and landscape formats.

OVERVIEW OF FISH PRODUCTS

In this overview, information gathered from the survey on 11 categories of fish products are summarised. They are arranged to facilitate comparison on the same product among ASEAN Countries.

Boiled Products

Boiled products are available in all participating countries except the Philippines and Brunei Darussalam. They are produced either by cooking in boiling water or in steam. They are also generally described by most countries as salted and boiled fish. They can be eaten either plain, with chilli paste or curry and are consumed together with rice or porridge. Their retail prices are shown in Table 1 (end 1989).

TABLE 1. COST OF RAW MATERIALS AND BOILED PRODUCTS.

Category	Product	Local name	Country	Cost (US$/kg)	
				Raw material	Boiled product
Boiled	Fish	*Ikan pindang*	IND	0.59	1.76
Boiled	Fish	*Ikan rebus*	MAL	NA	NA
Boiled	Fish, cooked	*Sek-hu*	SIN	1.33 – 2.13	2.13 – 3.19
Boiled	Fish, steamed	*Pla nung*	THA	0.24 – 0.71	0.47 – 1.57

Pelagic fish are most commonly used eg Indian mackerel (*Rastrelliger kanagurta*), horse mackerel (*Selar*), scad (*Caranx* spp.), anchovy (*Stolephorus* spp.), trevallies, etc.

The fish is cleaned and arranged onto the bamboo basket (Fig. 1) or ceramic basin. Salt can be added in between the layers of fish. The fish can be cooked either by immersing the basket of arranged fish into the boiling brine water or by steaming.

Directorate Fish. Indonesia

Fig. 1. Boiled fish. The fish together with salt is arranged in the bamboo baskets. The baskets are then immersed in boiling water to cook the fish.

It is then cooked and prepared for marketing (Fig. 2). Between '84 and '87 Indonesia produced and consumed 95,500 MT/year of boiled fish compared to Malaysia's 3,608 MT, Thailand's 8,543 MT, and Singapore's 245 MT. The production of this product from 1984-1987 is shown in Table 2. It showed Singapore's dramatic increase from 154 MT in 1984 to 385 MT in 1987.

TABLE 2. PRODUCTION VOLUME OF BOILED FISH PRODUCTS (MT).

			Production				Export			
Category	Product	Country	'84	'85	'86	'87	'84	'85	'86	'87
Boiled	Fish	IND	96,396	97,619	92,487	NA	NA	NA	NA	NA
Boiled	Fish	MAL	6,472	56,297	743	1,922	NA	NA	NA	NA
Boiled	Fish, cooked	SIN	154	159	283	385	0	0	0	0
Boiled	Fish, steamed	THA	NA	9,285	7,801	NA	NA	NA	NA	NA

Data on the export volume is not available. The main reason is that these products are consumed in the countries where they are produced.

In some countries, the cooked fish is packed in polyethylene bag when sold on-demand. The shelf life of these products is wide and varies from a few days to several months, as indicated in Table 3.

Most countries did not indicate problems on this product except Thailand which suggested improvements to the processing method and storage life.

TABLE 3. SHELF LIFE OF BOILED PRODUCTS.

Category	Product	Country	Storage periods and conditions
Boiled	Fish	IND	3-7 days at room temperature
Boiled	Fish	MAL	3-4 months at cool and dry place or cold room of –4° to 2°C
Boiled	Fish, cooked	SIN	1 week at 4°C
Boiled	Fish, steamed	THA	3 days in refrigeration

Fig. 2. Processing boiled fish
a) mixing with salt
b) arranging in bamboo baskets
c) boiling
d) cooked fish, ready for market

MFRD/SEAFDEC

2a

2b

2c

2d

Canned Products

Canned products are processed in Indonesia, Philippines and Thailand. These products are best described as fish which has been processed and sealed hermatically in can containers. The sealed product is subjected to high temperature to destroy the spoilage micro organisms. It can be consumed directly or re-cooked. The canned fish can be served with salad, dressing or as a spread. The retail prices of raw materials range from 89 cents to $1.56 per kg while the canned produce range between 20 cents and $2.93 per can. These prices are shown in Table 4 (end 1989).

TABLE 4. COST OF RAW MATERIALS AND CANNED PRODUCTS

Category	Product	Local name	Country	Cost (US$)	
				Raw material	Canned product
Canned	Babyclam	*Hoy lai krapong*	THA	NA	NA
Canned	Crabmeat	*Poo krapong*	THA	NA	NA
Canned	Fish in tomato sauce	*Pla krapong*	THA	NA	0.20 – 0.40
Canned	Mackerel in tomato sauce	*Galonggong*	PHI	0.89 –1.12	NA
Canned	Milkfish in oil	*Bangus*	PHI	1.25 – 1.56	NA
Canned	Milkfish in tomato sauce	*Bangus*	PHI	1.25 – 1.56	NA
Canned	Milkfish, Salmon style	*Bangus*	PHI	1.25 – 1.56	NA
Canned	Product	*Ikan kaleng*	IND	NA	2.93
Canned	Sardine in tomato sauce	*Tamban*	THA	1.03 – 1.12	NA
Canned	Shrimp	*Gung krapong*	THA	NA	NA
Canned	Tuna	*Pla tuna krapong*	THA	NA	0.59 – 1.18
Canned	Tuna in oil	*Tambacol*	PHI	0.89 – 1.12	NA

The principle of canning is similar in most countries. The fish must be cleaned and gutted before use. It is packed in can and precooked in exhaust before filling with sauce or liquid. After seaming, the canned product is sterilized and cooled before labelling.

Thailand's production of canned fish products put it among the world's top producers. It's export volume also increased from 1984 to 1986. Sardine in tomato sauce was also exported in increasing volume from the Philippines. The amount of canned fish products produced and exported are shown in Table 5.

TABLE 5. PRODUCTION OF CANNED PRODUCTS (MT).

Category	Product	Country	Production				Export			
			'84	'85	'86	'87	'84	'85	'86	'87
Canned	Baby clam	THA	50,507	83,726	101,232	NA	6,710	8,462	8,808	NA
Canned	Crab meat	THA	22,356	22,233	30,432	NA	6,988	6,378	8,173	NA
Canned	Fish in tomato sauce	THA	324,109	289,511	303,041	NA	2,412	3,012	8,782	NA
Canned	Mackerel in tomato sauce	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Canned	Mackerel, tuna, sardine	IND	9,567	4,621	3,541	NA	NA	NAS	NA	NA
Canned	Milkfish in oil	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Canned	Milkfish in tomato sauce	PHI	NA	NA	NA	NA	NA	47	37	74
Canned	Milkfish, saloon style	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Canned	Sardine in tomato sauce	PHI	NA	NA	NA	NA	NA	6	48	198
Canned	Shrimp	THA	137,336	127,643	141,174	NA	11,631	12,231	14,444	NA
Canned	Tuna	THA	76,838	86,881	93,772	NA	39,862	87,134	141,759	NA
Canned	Tuna in oil	PHI	NA	NA	NA	NA	22,598	25,467	26,401	26,061

The canned product is packed in fiberboard carton box or carton box and stored in a dry place. The shelf life of this product is about 1 year (Table 6). The respondents did not indicate that there was any problem in the production of canned products.

TABLE 6. SHELF LIFE OF CANNED PRODUCTS.

Category	Product	Country	Storage periods and conditions
Canned	Babyclam	THA	1 year in dry place
Canned	Crabmeat	THA	1 year in dry place
Canned	Fish in tomato sauce	THA	1 year in dry place
Canned	Mackerel in tomato sauce	PHI	1 year in cool, dry place
Canned	Milkfish in oil	PHI	1 year in cool, dry place
Canned	Milkfish in tomato sauce	PHI	1 year in cool, dry place
Canned	Milkfish, Salmon style	PHI	1 year in cool, dry place
Canned	Product	IND	1 year at room temperature
Canned	Sardine in tomato sauce	PHI	1 year in cool, dry place
Canned	Shrimp	THA	1 year in dry place
Canned	Tuna	THA	1 year in dry place
Canned	Tuna in oil	PHI	1 year in cool, dry place

Comminuted Products

Comminuted products are produced and consumed in all member countries. These products are made from minced meat and surimi. The products include fish jelly products, fish and prawn sausages and burgers.

These products are eaten by themselves, or in soups, and cooked with noodles, rice or vegetables. The prices of the raw materials range between 37 cents and $2.66 while the comminuted products are between $1.12 and $13.76. Table 7 shows the retail prices of various raw materials and the boiled products.

The raw materials used are generally surimi and fishes. Surimi is the name of a frozen fish mince meat mixed with permitted food additives; Thailand is the only country producing it among ASEAN members. However at present, no data is available on the production. The fishes used are threadfin bream (*Nemipterus* spp.), bigeye snapper (*Priacanthus* spp.), jewfish (*Sciaena* spp.)and lizard fish. The subingredients are polyphosphate and sugar. Thailand indicates that the producers of surimi are working for a product which is whiter and of higher gel strength.

Comminuted products are often produced directly from fresh fish. The species used are *Stegrotoma faseiatom*, *Chiloselyllium* spp., wolf-herring (*Chirocentrus nudus*), barracuda (*Sphyraena* spp.), bigeye snapper, *Scomberomorus* spp., threadfin bream, lizardfish, round herring (*Dussumieria* spp.), scad, Indian mackerel, tuna (*Thunnus tonggol, Euthynnus afinis, Katsunwonus pelamis, Thunnus alalunga*) and other species.

TABLE 7. COST OF RAW MATERIALS AND COMMINUTED PRODUCTS.

Category	Product	Local name	Country	Cost (US$/kg)	
				Raw material	Comminuted product
Comminuted	Cuttlefish ball	*Bebola sotong*	MAL	NA	2.23
Comminuted	Cuttlefish/squid ball	NA	SIN	2.13 - 2.66	3.72 - 5.85
Comminuted	Fish burger	*Burger ikan*	MAL	NA	3.35
Comminuted	Fish burger	*Fish burger*	PHI	0.89 - 1.12	NA
Comminuted	Fish noodle	*Ba mee pla*	THA	NA	NA
Comminuted	Fish sausage	*Sosej ikan*	MAL	0.37	3.35
Comminuted	Fishball	*Bebola ikan*	BRU	NA	3.72
Comminuted	Fishball	*Bakso ikan*	IND	0.37	NA
Comminuted	Fishball	*Bebola ikan*	MAL	NA	NA
Comminuted	Fishball	*Bola-bola*	PHI	1.12 - 1.25	NA
Comminuted	Fishball	*Luk-chin pla*	THA	NA	1.18 - 3.54
Comminuted	Fishball/fishcake	*Hi-ei/hi-kwei*	SIN	NA	1.49 - 2.66
Comminuted	Fishcake	*Kek ikan*	BRU	NA	3.46
Comminuted	Fishcake	*Tauhu ikan*	MAL	NA	NA
Comminuted	Fresh prawn dumpling	NA	MAL	NA	1.12
Comminuted	Fresh prawn wantan	NA	MAL	NA	NA
Comminuted	Imitation crabmeat	*Pu tium*	THA	1.38 - 1.97	5.90 - 13.76
Comminuted	Imitation crabmeat sticks	NA	SIN	1.60 - 2.13	6.38 - 10.64
Comminuted	Native sausage	*Longanisa*	PHI	0.89 - 1.12	NA
Comminuted	Otak-Otak	*Otak-otak*	MAL	NA	NA
Comminuted	Prawn burger	*Burger udang*	MAL	NA	4.46
Comminuted	Prawn sausage	*Sosej udang*	MAL	NA	NA
Comminuted	Scallop flavour fishcake	*Scallop cake*	MAL	NA	NA
Comminuted	Surimi	*Surimi*	THA	0.28 - 0.59	1.38 - 1.97
Comminuted	Cuttlefish sausge and cocktail	*Sosej sotong*	MAL	NA	3.53

The processing of comminuted product involves washing the fish mince, mixing, forming, cooking, cooling and packing. The main machineries used are meat-bone separator, mincer, mixing/grinding machine, forming machine, water-bath and cooking facilities. The ingredients used are salt, sugar, oil, flour, monosodium glutamate, water and vegetables, etc.

It is apparent from Table 8 that although a variety of comminuted products is produced, little data on their production and export is available. This is true not only of relatively new products such as imitation crab meat, but also traditional products such as fishballs. Perhaps more attention can be directed at this problem in the future. However it can be observed that there are a wide varieties of comminuted products viz fish sausages, burgers, imitation crab meat (also called imitation crabstick), cuttlefish ball, etc. (Fig. 3).

TABLE 8. PRODUCTION OF COMMINUTED PRODUCTS (MT).

			Production				Export			
Category	Product	Country	'84	'85	'86	'87	'84	'85	'86	'87
Comminuted	Cuttlefish ball	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Cuttlefish sausage & cocktail	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Cuttlefish/squid ball	SIN	188	193	181	75	30	12	3	0
Comminuted	Fish burger	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Fish burger	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Fish noodle	THA	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Fish sausage & cocktail	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Fishball	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Fishball	IND	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Fishball	MAL	1,966	1,264	976	1,705	NA	NA	NA	NA
Comminuted	Fishball	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Fishball	THA	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Fishball/fishcake	SIN	412	599	395	435	0	11	4	23
Comminuted	Fishcake	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Fishcake	MAL	10	25	19	21	NA	NA	NA	NA
Comminuted	Fishcake, scallop flavour	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Imitation crab meat	THA	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Native sausage	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Otak-otak	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Prawn burger	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Prawn dumpling, fresh	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Prawn sausage & cocktail	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Prawn wantan, fresh	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Comminuted	Surimi	THA	NA	NA	NA	NA	NA	NA	NA	NA

Fig. 3. Variety of fish jelly products.
(a) Comminuted products in Thailand.
(b) Comminuted products in Malaysia.

Sirilak Suwanrangsi

3a

Dept. Fish. Malaysia

3b

The products are normally packed in polyethylene bag, palm leaf, styrofoam tray covered with wrapping film, vacuum pack or wrapped up at time of sale to consumers (Fig. 4). The shelf lives of these products range from 3 days at room temperature to 6 months when frozen in vacuum packs. Freezing facilitates export to other countries. Table 9 shows the different shelf lives when the products are stored at room temperatures, in cool/refrigerated temperatures or when frozen.

Most countries did not indicate problems on this product except Thailand and Brunei Darussalam who have suggested improvement on the packaging methods and to extend its presently short storage life.

Fig. 4. Fishballs sold in Brunei Darussalam.
(a) Wet market fishballs.
(b) Supermarket fishballs.

Dept. Fish. Brunei Darussalam

4a

Dept. Fish. Brunei Darussalam

4b

TABLE 9. SHELF LIFE OF COMMINUTED PRODUCTS.

Category	Product	Country	Storage periods and conditions
Comminuted	Cuttlefish ball	MAL	6 months at –20°C
Comminuted	Cuttlefish sausage and cocktail	MAL	6 months at –20°C
Comminuted	Cuttlefish/squid ball	SIN	3-6 months at –18°C or below
Comminuted	Fish burger	MAL	6 months at –20°C
Comminuted	Fish burger	PHI	1-3 months at (2-3)°C or –10°C
Comminuted	Fish noodle	THA	3 days at room temperature or 7 days in refrigerator
Comminuted	Fish sausage	MAL	6 months at –20°C
Comminuted	Fishball	BRU	1-2 weeks in refrigerator
Comminuted	Fishball	IND	3 weeks at cool, dry place
Comminuted	Fishball	MAL	NA
Comminuted	Fishball	PHI	1-6 days at 5°C
Comminuted	Fishball	THA	3 days in refrigerator
Comminuted	Fishball/fishcake	SIN	2-3 days at chilled condition or 3-6 months frozen and vacuum packed
Comminuted	Fishcake	BRU	1-2 weeks in refrigerator
Comminuted	Fishcake	MAL	NA
Comminuted	Fresh prawn dumpling	MAL	3 months at –20°C
Comminuted	Fresh prawn wantan	MAL	3 months at –20°C
Comminuted	Imitation crabmeat	THA	NA
Comminuted	Imitation crabmeat sticks	SIN	6-12 months at –18°C or below
Comminuted	Native sausage	PHI	1-6 days at 5°C
Comminuted	Otak-otak	MAL	NA
Comminuted	Prawn burger	MAL	6 months at –20°C
Comminuted	Prawn sausage	MAL	6 months at –20°C
Comminuted	Scallop flavour fishcake	MAL	6 months at –20°C
Comminuted	Surimi	THA	NA

Cured Products

Cured products are only produced and consumed in the Philippines (Fig. 5). They are generally processed by pickling or salting without drying and is known in the Philippines as *Kench*-style cured fish. The fishes used are skipjack, herring, roundscad, sardine and mackerel. The cost of the raw materials and products is not available.

Fig. 5. Various types of cured products from the Philippines.

The ingredients used for processing the cured products are mainly fish and salt. The processing generally involves washing the raw materials and saturating it with salt. It is then washed with 2% salt. The salt water is drained away before packing the fish in wooden boxes. It is packed in layers of fish and salt. The equipment used are simple, viz barrel, jar, pot or tank.

The *Kench*-style cured fish is produced mainly for local consumption. Data for production and export volume is not available. The cured product is usually packed in glass bottles, wooden boxes or plastic containers. The shelf life of this product is about 90 days at room temperature.

The problems encountered in this production are mainly concerned with handling and sanitation. This resulted in reddening, souring, salt burn or slimy products. The Philippines has suggested on improvement of the quality of the product by improved methods of processing, handling, transportation, marketing and packaging.

Dried Products

Dried products are widely available and popular in all participating countries. The products are commonly described by most countries as salted dried product. They are usually steamed, boiled, broiled or deep fried in oil before serving. The salted dried fish is consumed in many ways. For example, it can be used in soup, porridge, cooked with noodles, vegetables, meat and many local dishes.

The prices of raw materials vary widely - from 27 cents for fish to a high price of $106.38 for shark fin. Since the price of shark fin is not available as an end product, the boiled product price only ranged from 53 cents to $9.83 for dried shrimp. Retail prices for raw and boiled end products are shown in Table 10.

The raw materials used are generally fish, shrimp and squid. Salt is commonly used to process the dried product. The processing involves mainly washing or cleaning of the raw materials, precooking, soaking with brine, boiling and finally drying (Fig. 6). The dried products are then ready for sale and consumption.

Indonesia produces the largest volume of salted fish products, and although this is increasing, is not concerned about its export to any significant extent. Details are shown together with the production and export figures of other countries in Table 11. The dried products are usually packed in polyethylene bags, hard cardboard boxes, wooden boxes, braided rattan/bamboo baskets, paper bags, sacks, barrels or containers during transportation. They are sometimes displayed at the retail outlets without packaging (Fig. 7).

TABLE 10. COST OF RAW MATERIALS AND DRIED PRODUCTS.

Category	Product	Local name	Country	Cost (US$/kg)	
				Raw material	Dried product
Dried	Abalone	*Sopas*	PHI	NA	NA
Dried	Anchovy	*Ikan bilis/bilis kering*	MAL	NA	NA
Dried	Anchovy	*Dilis*	PHI	0.89	2.23
Dried	Barracuda	*Torcillo*	PHI	1.12	1.78
Dried	Bigeye scad	*Matambaka*	PHI	1.12	1.56
Dried	Chilled sour salted fish	*Liking*	BRU	0.48	3.56
Dried	Cockles	*Keranf kering*	MAL	NA	NA
Dried	Crevalle	*Salay-salay*	PHI	1.03	1.56
Dried	Cuttlefish	*Sotong kering*	MAL	NA	NA
Dried	Deep-bodied herring	*Lapad*	PHI	1.12	1.78
Dried	Fimbriated herring	*Tonsoy*	PHI	1.12	1.78
Dried	Fish	*Lalap*	BRU	NA	4.42
Dried	Hairtail	*Balila*	PHI	1.12	1.56
Dried	Indian sardines	*Tamban*	PHI	1.56	2.01
Dried	Jelly fish	*Ubur-ubur*	MAL	NA	NA
Dried	Jelly fish	*Mang ka proon hang*	THA	NA	NA
Dried	Lizardfish	*Kalaso*	PHI	1.03	1.56
Dried	Long tailed Nemipterid	*Bisugo*	PHI	1.56	2.01
Dried	Milkfish	*Daeng na bangus*	PHI	1.56	2.01 – 2.23
Dried	Prawn	*Udang kering*	BRU	NA	NA
Dried	Prawn	*Udang kering*	MAL	NA	NA
Dried	Roundscad	*Galonggong*	PHI	1.12	1.56
Dried	Salted fish	*Pla chom*	THA	NA	1.18 – 3.15
Dried	Salted fish	*Ikan masin*	BRU	NA	NA
Dried	Salted fish	*Ikan kering/asin*	IND	0.27 – 0.80	0.53 – 3.19
Dried	Salted fish	*Ikan kering/masin*	MAL	NA	NA
Dried	Salted fish	*Pla chom*	THA	NA	1.18 – 3.15
Dried	Salted freshwater fish	*Pla chem*	THA	0.39 – 1.18	2.75 – 3.54
Dried	Sea cucumber	*Trepang*	PHI	NA	NA
Dried	Sea cucumber	*Hai-sim*	SIN	7.98 – 26.60	NA
Dried	Shark fin	*Pinatuyong palikpik ng pating*	PHI	0.45 – 0.67	5.35 – 5.80
Dried	Shark fin	*Hu-chi*	SIN	53.19 – 106.38	NA
Dried	Shellfish	*Siput kering*	MAL	NA	NA
Dried	Shellfish	*Hoi hang*	THA	0.79 – 1.18	2.36 – 2.95
Dried	Shrimp	*Hibe*	PHI	1.34 – 1.56	2.68
Dried	Shrimp	*Khong hang*	THA	NA	1.57 – 9.83
Dried	Slipmouth	*Sap-sap*	PHI	1.12	1.78
Dried	Soft-bodied mackerel	*Hasa-hasa*	PHI	1.56	2.23
Dried	Squid	*Pusit*	PHI	2.23 – 2.68	8.02
Dried	Squid	*Pla muk hang*	THA	NA	3.15 – 7.86
Dried	Striped mackerel	*Alumahan*	PHI	1.56	2.23

Fig. 6. Various types of dried products.
(a) salted mackerel before drying.
(b) sun-dried whole fish.
(c) sun-dried squid.
(d) sun-dried headed fish.
(e) sun-dried butterfly filleted fish.


Sirilak Suwanrangsi

6c


Sirilak Suwanrangsi

6a


Sirilak Suwanrangsi

6d


Sirilak Suwanrangsi

6b


Sirilak Suwanrangsi

6e

TABLE 11. PRODUCTION AND EXPORT VOLUME OF DRIED PRODUCTS (MT).

			Production				Export			
Category	Product	Country	'84	'85	'86	'87	'84	'85	'86	'87
Dried	Abalone	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Anchovy	MAL	6,962	4,682	6,046	11,054	NA	NA	NA	NA
Dried	Anchovy	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Cockle	MAL	735	NA	NA	NA	NA	NA	NA	NA
Dried	Cuttlefish	MAL	409	302	238	233	NA	NA	NA	NA
Dried	Fish	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Fish, chilled sour salted	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Fish, dried	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Fish, freshwater, salted	THA	20,762	11,240	25,767	NA	NA	NA	NA	NA
Dried	Fish, salted	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Fish, salted	IND	337,746	349,391	362,395	NA	NA	NA	NA	NA
Dried	Fish, salted	MAL	11,629	7,416	5,338	6,548	2,763	2,581	1,123	1,003
Dried	Fish, salted	THA	67,280	61,342	61,782	NA	2,826	4,812	6,007	NA
Dried	Jelly fish	THA	10,992	29,018	76,090	NA	NA	NA	NA	NA
Dried	Jelly fish	MAL	2,541	602	255	464	NA	NA	NA	NA
Dried	Mildfish	PHI	28,030	39,992	8,076	3,403	700	404	358	472
Dried	Prawn	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Prawn	MAL	667	883	638	702	224	188	332	226
Dried	Sea cucumber	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Sea cucumber	SIN	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Shark fin	PHI	NA	NA	NA	NA	10	NA	11	NA
Dried	Shark fin	SIN	20	19	14	21	20	10	20	0
Dried	Shellfish	MAL	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Shellfish	THA	9,641	6,240	3,214	NA	125	115	131	NA
Dried	Shrimp	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Shrimp	THA	42,809	37,765	36,124	NA	6,234	5,925	6,749	NA
Dried	Squid	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Dried	Squid	THA	38,764	46,414	45,871	NA	4,078	4,386	4,877	NA

Fig. 7. Various dried products.
(a) Prawn, and squid rings.
(b) Whole fish and whole squid packed individually in plastic bags.

Sirilak Suwangransi

7a

Sirilak Suwangransi

7b

The shelf life of dried products are vaguely documented, indicating that a wide range of factors influence it. Chilled sour salted fish could be refrigerated for between 2-3 weeks while 6 months was cited for several salted fish (Table 12). This is understandable because Asians like fish products with developed distinctive flavours.

Most countries emphasized on the problems of processing methods, packaging and storage of dried products, and on the hygiene and sanitation of processing areas.

TABLE 12. SHELF LIFE OF DRIED PRODUCTS.

Category	Product	Country	Storage periods and conditions
Dried	Abalone	PHI	Few months at clean, cool and dry place
Dried	Anchovy	MAL	1-6 months at cool, dry place
Dried	Anchovy	PHI	Few months at clean, cool and dry place
Dried	Barracuda	PHI	Few months at clean, cool and dry place
Dried	Bigeye scad	PHI	Few months at clean, cool and dry place
Dried	Chilled sour salted fish	BRU	2-3 weeks in refrigerator
Dried	Cockles	MAL	NA
Dried	Crevalle	PHI	Few months at clean, cool and dry place
Dried	Cuttlefish	MAL	NA
Dried	Deep-bodied herring	PHI	Few months at clean, cool and dry place
Dried	Fimbriated herring	PHI	Few months at clean, cool and dry place
Dried	Fish	BRU	1 month
Dried	Hairtail	PHI	Few months at clean, cool and dry place
Dried	Indian sardines	PHI	Few months at clean, cool and dry place
Dried	Jelly fish	MAL	NA
Dried	Jelly fish	THA	3-6 months at room temperature
Dried	Lizardfish	PHI	Few months at clean, cool and dry place
Dried	Long tailed Nemipterid	PHI	Few months at clean, cool and dry place
Dried	Milkfish	PHI	42 days at room temperature or 49 days in refrigerator
Dried	Prawn	BRU	6 months at cool, dry place
Dried	Prawn	MAL	3-6 months at cool, dry place
Dried	Roundscad	PHI	Few months at clean, cool and dry place
Dried	Salted fish	BRU	NA
Dried	Salted fish	IND	3 months at room temperature
Dried	Salted fish	MAL	6 months at cool, dry place
Dried	Salted fish	THA	3-6 months at room temperature
Dried	Salted freshwater fish	THA	3-6 months at room temperature
Dried	Sea cucumber	PHI	Few months at clean, cool and dry place
Dried	Sea cucumber	SIN	Indefinite period at cool, dry place
Dried	Shark fin	PHI	Few months at clean, cool and dry place
Dried	Shark fin	SIN	Indefinite period at cool, dry place
Dried	Shellfish	MAL	NA
Dried	Shellfish	THA	3-6 months at room temperature
Dried	Shrimp	PHI	Few months at clean, cool and dry place
Dried	Shrimp	THA	3-6 months at room temperature
Dried	Slipmouth	PHI	Few months at clean, cool and dry place
Dried	Soft-bodied mackerel	PHI	Few months at clean, cool and dry place
Dried	Squid	PHI	Few months at clean, cool and dry place
Dried	Squid	THA	3-6 months at room temperature
Dried	Striped mackerel	PHI	Few months at clean, cool and dry place

Fermented Products

Fermented products are processed in all countries surveyed except Singapore. The products are generally processed by the addition of salt to fish or shrimp or the liquefaction of fish, which is then allowed to ferment. This will result in the production of fermented fish, fish paste or shrimp paste (*belacan*); fermentation of the liquefaction of fish will give rise to fish sauce. The fermented products can be eaten with rice, cooked with vegetables, prepared with onion, chilli, spices or used in other ways. Raw materials cost between 8 cents and $2.93 while end products range from 20 cents to $6.38. Reported retail prices are shown in Table 13.

TABLE 13. COST OF RAW MATERIALS AND FERMENTED PRODUCTS.

Category	Product	Local name	Country	Cost (US$/kg)	
				Raw material	Fermented product
Fermented	Fish	*Budu ikan*	BRU	NA	1.07
Fermented	Fish	*Ikan peda*	IND	0.59	0.75
Fermented	Fish	*Budu*	MAL	NA	NA
Fermented	Fish	*Pla-ra*	THA	0.20 – 0.79	0.89 – 2.68
Fermented	Fish	*Pla som, pla jom, pla chao*	THA	NA	NA
Fermented	Fish paste	*Terasi/belachan*	IND	NA	0.48
Fermented	Fish paste	*Bagoong Isda*	PHI	0.89 – 1.12	0.45
Fermented	Fish sauce	*Kecap ikan*	IND	0.69	0.59
Fermented	Fish sauce	*Patis*	PHI	0.89 – 1.12	0.45
Fermented	Fish sauce	*Nam pla*	THA	0.08 – 0.16	0.20 – 0.98
Fermented	Fish sauce	*Budu*	THA	NA	0.39 – 0.79
Fermented	Fish stomach	*Budu perut ikan*	BRU	NA	1.07
Fermented	Mussel	*Budu kupang*	BRU	NA	1.07
Fermented	Picked shrimp	*Cincaluk*	BRU	0.91	1.07
Fermented	Pickled prawn	*Cincaluk*	MAL	NA	NA
Fermented	Prawn paste	*Otak udang*	MAL	NA	NA
Fermented	Shrimp paste	*Belacan*	BRU	0.91	6.38
Fermented	Shrimp paste	*Srimp paste*	MAL	NA	NA
Fermented	Shrimp paste	*Bagoong alamang*	PHI	0.45	0.89
Fermented	Shrimp paste	*Kapi*	THA	0.16 – 0.32	0.59 – 3.93

The raw materials used are shrimp, prawn, mussel and fish eg anchovy (*Stolephorous* spp.), sardine (*Sardinella* spp.) and mackerel. The processing of fermented products begins with washing the raw material and draining away the liquid. The material is mixed with salt and fried rice powder. Depending on the types of products, the mixture are packed in plastic bags, bamboo baskets or wooden tubs; and allowed to ferment at room temperature. They can also be sun-dried (Fig. 8) or left to ferment in fermenting vat, earthenware jar, concrete tank, plastic drum, oil drum or oil can (Fig. 9).

Fig. 8. Production of fermented, shrimp paste in Malaysia.
(a) Mincing/Mixing of shrimp and salt.
(b) sun-drying shrimp paste.
(c) Shrimp paste formed and packed for sale.


MFRD/SEAFDEC

8b


MFRD/SEAFDEC

8a


MFRD/SEAFDEC

8c

Fig. 9. Fermentation drum (a) and vat (b) for producing fish paste or fish sauce. The vat can be used for rather large-scale production.


BFAR Philippines

9b


BFAR Philippines

9a

Fermented fish products are not very well reported. However, records of export figures are being kept in the Philippines and Thailand. The production and export volumes of various fermented products for 1984-1987 are shown in Table 14.

TABLE 14. PRODUCTION AND EXPORT VOLUME OF FERMENTED PRODUCTS (MT).

			Production				Export			
Category	Product	Country	'84	'85	'86	'87	'84	'85	'86	'87
Fermented	Anchovy	MAL	115	90	237	87	NA	NA	NA	NA
Fermented	Fish	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Fermented	Fish	IND	7,146	6,928	6,738	NA	NA	NA	NA	NA
Fermented	Fish paste	IND	16,018	13,911	12,874	NA	NA	NA	NA	NA
Fermented	Fish paste	PHI	NA	NA	NA	NA	22	NA	167	194
Fermented	Fish sauce	IND	91	664	566	NA	NA	NA	NA	NA
Fermented	Fish sauce	PHI	NA	NA	NA	NA	12	NA	NA	NA
Fermented	Fish sauce, *budu*	THA	NA	NA	NA	NA	NA	NA	NA	NA
Fermented	Fish sauce, *nam pla*	THA	80,671	68,939	74,531	NA	8,754	9,109	10,711	NA
Fermented	Fish stomach	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Fermented	Fish, *pla chao*	THA	NA	NA	NA	NA	NA	NA	NA	NA
Fermented	Fish, *pla jom*	THA	NA	NA	NA	NA	NA	NA	NA	NA
Fermented	Fish, *pla ra*	THA	12,832	7,962	10,274	NA	NA	NA	NA	NA
Fermented	Fish, *pla som*	THA	NA	NA	NA	NA	NA	NA	NA	NA
Fermented	Mussel	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Fermented	Prawn paste	MAL	363	317	156	103	NA	NA	NA	NA
Fermented	Prawn, pickled	MAL	67	94	45	55	NA	NA	NA	NA
Fermented	Shrimp paste	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Fermented	Shrimp paste	MAL	2,818	3,146	3,283	3,883	NA	NA	NA	NA
Fermented	Shrimp paste	PHI	NA	NA	NA	NA	NA	NA	315	443
Fermented	Shrimp paste	THA	21,153	18,818	19,359	NA	247	80	152	NA
Fermented	Shrimp, pickled	BRU	NA	NA	NA	NA	NA	NA	NA	NA

The fermented products are packed in glass bottles (Fig. 10), jars or cans, polyethylene bags, glazed earthenware pots, bamboo baskets, tins, banana leaves or plastic boxes. The shelf life of fermented products varies, depending on the product, from 2-3 weeks eg fermented fish, fish stomach, mussel, to 3 years eg fermented fish sauce. The shelf life of other fermented products and the conditions of their storage is shown in Table 15.

Fig. 10. Bottled fish sauce.

Directorate Fish. Indonesia

TABLE 15. SHELF LIFE OF FERMENTED PRODUCTS.

Category	Product	Country	Storage periods and conditions
Fermented	Fish	BRU	3-4 weeks
Fermented	Fish	IND	2 weeks at room tempeature
Fermented	Fish	MAL	NA
Fermented	Fish	THA	2-3 weeks at cool, dry place
Fermented	Fish	THA	1-3 years at (29-33)°C
Fermented	Fish paste	IND	2 months at cool, dry place
Fermented	Fish paste	PHI	6-12 months
Fermented	Fish sauce	IND	1 year at room temperature
Fermented	Fish sauce	THA	1-3 years at cool, dry place
Fermented	Fish sauce	PHI	6-12 months
Fermented	Fish sauce	THA	more than 1 year at cool, dry place
Fermented	Fish stomach	BRU	3-4 weeks
Fermented	Mussel	BRU	3-4 weeks
Fermented	Picked shrimp	BRU	1 month in refrigerator
Fermented	Pickled prawn	MAL	NA
Fermented	Prawn paste	MAL	NA
Fermented	Shrimp paste	BRU	1-2 years
Fermented	Shrimp paste	MAL	NA
Fermented	Shrimp paste	PHI	3 weeks to 6 months
Fermented	Shrimp paste	THA	1-2 years at cool, dry place

Brunei Darussalam and the Philippines have suggested that attention should be directed at making improvements to storage, packaging and sanitation. The problems listed were on the long fermentation period, and rust on bottle caps used in packaging. Thailand listed as problems the spoilage caused by mold growth and insect or fly infestation.

Fish Meals

Fish meals are produced in all participating countries except Brunei Darussalam. The fish meals are not for human consumption, but used as animal feed and fertiliser. It is generally produced as a fish powder made from trash fish/trawl by-catch or from sardines. Malaysia is the only country that processes trawl by-catch into fish manure. The raw material used, as probably expected, is between 8 and 12 cents - the cheapest and narrowest range recorded. Fish meal cost between 43 and 67 cents. The prices in Indonesia, Singapore and Thailand are shown in Table 16.

TABLE 16. COST OF RAW MATERIALS AND FISH MEALS.

Category	Product	Local name	Country	Cost (US$/kg)	
				Raw material	Fish meal
Fish meal	Animal feed	*Tepung ikan*	IND	0.11	0.48 - 0.53
Fish meal	Animal feed	*Tepong ikan*	MAL	NA	NA
Fish meal	Animal feed	NA	PHI	NA	NA
Fish meal	Animal feed	NA	SIN	0.08	0.43
Fish meal	Animal feed	*Pla pon*	THA	0.08 - 0.12	0.51 - 0.67
Fish meal	Fish manure	*Ikan baja*	MAL	NA	NA

The raw materials used are trash fish/trawl by-catch, sardine and scraps from fish processing plants. The raw materials undergo the process of washing, cooking or boiling, pressing, crushing, drying, mincing and packing. Production of fish meal has tended to increase in recent years to cater for demands of a flourishing aquaculture industry among countries surveyed. Table 17 shows the average production and export volume of this product.

TABLE 17. PRODUCTION AND EXPORT VOLUME OF FISH MEAL (MT).

			Production				Export			
Category	Product	Country	'84	'85	'86	'87	'84	'85	'86	'87
Fish meal	Animal feed	IND	2,943	1,773	928	NA	NA	NA	NA	NA
Fish meal	Animal feed	MAL	27,097	21,867	22,877	43,621	2,249	3,099	2,397	3,945
Fish meal	Animal feed	THA	209,885	214,210	207,150	NA	85,487	74,791	68,114	NA
Fish meal	Animal feed	PHI	489	NA	67	606	<1	714	733	NA
Fish meal	Animal feed	SIN	3,158	2,647	1,926	1,602	NA	NA	NA	NA
Fish meal	Fish manure	MAL	4,396	2,095	2,655	6,174	NA	NA	NA	NA

The products are usually packed in gunny sack, kraft bag, jute bag, plastic bag or black-linen sack. The shelf life of products range from 4 months to a year. Table 18 shows the shelf life of fish meals in Indonesia, Malaysia the Philippines and Singapore.

TABLE 18. SHELF LIFE OF FISH MEALS.

Category	Product	Country	Storage periods and conditions
Fish meal	Animal feed	IND	more than 1 year at room temperature
Fish meal	Animal feed	MAL	NA
Fish meal	Animal feed	PHI	6 months at cool, dry place
Fish meal	Animal feed	SIN	4-5 months at room temperature
Fish meal	Animal feed	THA	NA
Fish meal	Fish manure	MAL	NA

Frozen Products

Frozen products are produced and exported from all the participating countries except Brunei Darussalam. The products are processed (Fig. 11) before they are quick frozen in blocks or individually. They are boiled, fried, steamed, pickled or cooked in various ways before serving. The raw materials are of medium to relatively high market value, ranging from $1.38 to $13.30 for prawn/shrimp. The end products range from $5.32 to $18.62. The retail price of the products is shown in Table 19.

TABLE 19. COST OF RAW MATERIALS AND FROZEN PRODUCTS

Category	Product	Local name	Country	Cost (US$/kg)	
				Raw material	Frozen product
Frozen	Cuttlefish/squid	NA	SIN	1.60 – 2.66	5.32 – 7.98
Frozen	Cooked shrimp	*Kung tom chae kang*	THA	NA	NA
Frozen	Cuttlefish	*Sotong beku*	MAL	NA	NA
Frozen	Cuttlefish	*Muek kra dong chae kang*	THA	2.16	NA
Frozen	Fish	*Ikan beku*	MAL	NA	NA
Frozen	Fish	*Pla chae kang*	THA	NA	NA
Frozen	Fish, fillet, steak and loin	NA	SIN	NA	NA
Frozen	Milkfish	*Bangus*	PHI	2.01 – 2.23	NA
Frozen	Octopus	*Muek sai chae kang*	THA	NA	NA
Frozen	Prawn	*Udang beku*	MAL	NA	NA
Frozen	Prawn	*Sugpo*	PHI	NA	NA
Frozen	Prawn/shrimp	*Sia*	SIN	2.13 – 13.30	5.32 – 18.62
Frozen	Product	*Product beku*	IND	NA	NA
Frozen	Raw shrimp	*Kung sod chae kang*	THA	NA	NA
Frozen	Shellfish	*Hoy chae kang*	THA	NA	NA
Frozen	Shrimp	*Suahe*	PHI	2.68	NA
Frozen	Squid	*Muek kuay chae kang*	THA	1.38	NA
Frozen	Tuna	*Tambakol*	PHI	NA	NA

Directorate Fish. Indonesia

11a

Sirilak Suwangransi

11b

Fig. 11. Processing of frozen products. Examples of modern processing factories in (a) Indonesia, producing frozen shrimp, and (b) Thailand, producing frozen squid.

The fishes processed are generally red snapper, painted sweetlip grant, malabar snapper, tilapia, catfish, dory, shark, sword fish, tuna, red mullet, grouper, mackerel, pomfret and seabream. The shrimps used are white shrimp, pink shrimp, black tiger shrimp and sand shrimp. The raw materials are cleaned, cut/filleted, cooked or raw, packed and finally frozen by air-blast, contact or IQF freezer (Fig. 12). The volume of frozen products tended to increase. Frozen products can be stored longer, and supports a significant move towards export, while at home frozen products are also gaining in acceptance with consumers. The production and export volume of frozen products are shown in Table 20.

TABLE 20. PRODUCTION AND EXPORT VOLUME OF FROZEN PRODUCTS (MT).

			Production				Export			
Category	Product	Country	'84	'85	'86	'87	'84	'85	'86	'87
Frozen	Cuttlefish	MAL	319	129	102	522	NA	NA	NA	NA
Frozen	Cuttlefish	THA	56,352	42,814	51,625	NA	1,599	470	3,834	NA
Frozen	Cuttlefish/squid	SIN	3,000	3,551	451	324	729	3,394	314	184
Frozen	Fish	SIN	1,271	3,756	4,766	5,645	356	2,713	3,242	4,992
Frozen	Fish	MAL	NA	2,348	2,060	2,426	NA	NA	NA	NA
Frozen	Fish	*THA	1,664,265	1,722,797	1,974,195	NA	75,254	96,444	118,911	NA
Frozen	Fish, shrimp, squid	IND	41,626	53,996	56,623	NA	NA	NA	NA	NA
Frozen	Mildfish	PHI	2,223	NA	1,813	747	1,155	1,522	1,810	1,689
Frozen	Octopus	THA	6,549	9,225	11,946	NA	NA	NA	NA	NA
Frozen	Prawn	MAL	NA	3,134	4,676	3,884	NA	NA	NA	NA
Frozen	Prawn	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Frozen	Prawn/shrimp	SIN	509	665	488	2,358	198	509	354	2,110
Frozen	Shellfish	THA	153,595	183,523	160,691	NA	11,156	12,732	22,395	NA
Frozen	Shrimp	PHI	1,839	NA	1,546	1,390	6,228	8,105	11,211	14,935
Frozen	Shrimp	THA	142,073	134,801	147,579	NA	19,428	24,041	28,729	NA
Frozen	Squid	THA	66,340	63,996	71,344	NA	NA	NA	NA	NA
Frozen	Tuna	PHI	3,333	NA	13,528	3,8340	13,387	11,899	9,168	11,250

* Source: Fishery Statistical Bulletin for South China Sea Area. SEAFDEC

Fig. 12. Frozen shrimp block.

The products are usually packed in polyethylene bags, cardboard boxes or small plastic trays. Generally the frozen products are stored at -18°C with shelf life of 6 to 12 months, as shown in Table 21. Respondent countries indicated there was no problem on the production of frozen products.

TABLE 21. SHELF LIFE OF FROZEN PRODUCTS.

Category	Product	Country	Storage periods and conditions
Frozen	Cuttlefish/squid	SIN	6-12 months at -18°C
Frozen	Cooked shrimp	THA	12 months at -18°C
Frozen	Cuttlefish	MAL	NA
Frozen	Cuttlefish	THA	12 months at -18°C
Frozen	Fish	MAL	NA
Frozen	Fish	THA	12 months at -18°C
Frozen	Fish, fillet, steak and loin	SIN	6-12 months at -18°C
Frozen	Milkfish	PHI	6 months at -(18 to 12)°C
Frozen	Octopus	THA	12 months at -18°C
Frozen	Prawn	MAL	NA
Frozen	Prawn	PHI	6 months at -18°C
Frozen	Prawn/shrimp	SIN	6-12 months at -18°C
Frozen	Product	IND	1 year at -18°C
Frozen	Raw shrimp	THA	12 months at -18°C
Frozen	Shellfish	THA	12 months at -18°C
Frozen	Shrimp	PHI	6 months at -18°C
Frozen	Squid	THA	12 months at -18°C
Frozen	Tuna	PHI	NA

Powdered Products

Powdered products are processed only in Malaysia and Thailand. They are also known as floss, granulated or flaked products. They are made from by-products of dried prawn or the mince from shark, ray (*Dasyatis* spp.), snapper (*Lutianus* spp.), or threadfin bream and mixed with ingredients to taste. They are served with bread or rice, used in soup or as a snack. The price of raw materials and the end product varies between 32 and 59 cents and between $4.72 and $5.90 respectively in Thailand (Table 22).

TABLE 22. COST OF RAW MATERIALS AND POWDERED PRODUCTS.

				Cost (US$/kg)	
Category	Product	Local name	Country	Raw material	Powdered product
Powdered	Fish floss	*Pla yong*	THA	0.32 - 0.59	4.72 - 5.90
Powdered	Prawn dust	*Tepong/kulit udang*	MAL	NA	NA

The ingredients used are generally soy sauce, salt and sugar. The process involves cutting the fish and soaking it in 2% brine for 10-15 minutes twice. The mince is then separated from the bones and skin. The fat is removed by washing the meat. The excess water is then removed by passing the washed mince through a screw press. The mince is heated and mixed with ingredients before finally drying.

Data on the production and export volume is not available.

The powdered products are usually kept in glass bottles or polyethylene bags. The shelf life of fish floss is reported to be between half to one year when stored at room temperature or in a refrigerator (Table 23).

Thailand has indicated mold growth during storage as a major problem and suggested improved packaging to improve the quality of the product.

TABLE 23. SHELF LIFE OF POWDERED PRODUCTS.

Category	Product	Country	Storage periods and conditions
Powdered	Fish floss	THA	6-12 months at room temperature or refrigeration
Powdered	Prawn dust	MAL	NA

Smoked Product

Smoked products are produced in all participating countries except Singapore. They are described as fish products preserved by smoking. The smoked product can be served fried or cooked with ingredients such as chilli, tamarind and salt. They are eaten with rice, salads or noodles. The price of raw materials used range between 89 cents and $1.56, while the price of the end products range from 59 cents to $5.90. Incidentally, these are the lowest and highest prices for end products and they are found in Thailand. Other prices are shown in Table 24.

TABLE 24. COST OF RAW MATERIALS AND SMOKED PRODUCTS.

Category	Product	Local name	Country	Cost (US$/kg)	
				Raw material	Smoked product
Smoked	Fish, dried	*Pla rom quan, pla krob*	THA	NA	0.59 – 5.90
Smoked	Milkfish, boneless	*Bangus*	PHI	1.25 - 1.56	2.01 - 2.33
Smoked	Dried fish	*Tahai*	BRU	NA	NA
Smoked	Fish	*Asap*	IND	NA	NA
Smoked	Herring	*Tamban*	PHI	1.03 - 1.12	1.56 - 1.78
Smoked	Milkfish	*Bangus*	PHI	1.25 - 1.56	1.78 - 2.01
Smoked	Roundscad	*Galonggong*	PHI	0.89 - 1.12	1.34 - 1.56
Smoked	Sardine	*Law-law*	PHI	1.12 - 1.34	1.78 - 2.01
Smoked	Sardine	*Tunsoy*	PHI	1.03 - 1.12	1.56 - 1.78
Smoked	Semi-dried fish	*Ikan salai*	BRU	NA	NA 1-2
Smoked	Tuna	*Ikan aya asap*	MAL	NA	NA NA

The fishes used are mainly horse mackerel, trigger fish (*Abalistes* spp.), tuna, *Actobatus* spp., *Ophicoephalus* spp., *Cyprinus carpio* and *Pangosius* spp.. The process generally includes washing the fish and soaking in brine. (Fig. 13). It is precooked and dried before smoking, cooling and packing (Figs. 14 & 15). It is then distributed for marketing. Table 25 shows the production and export volume from the Philippines and Thailand.

TABLE 25. PRODUCTION AND EXPORT VOLUME (MT).

			Production				Export			
Category	Product	Country	'84	'85	'86	'87	'84	'85	'86	'87
Smoked	Fish	IND	28,930	29,587	36,957	NA	NA	NA	NA	NA
Smoked	Fish, dried	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Smoked	Fish, dried	THA	2,925	46,870	2,833	NA	NA	NA	NA	NA
Smoked	Fish, semi-dried	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Smoked	Herring	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Smoked	Lizard fish	THA	648	507	464	NA	NA	NA	NA	NA
Smoked	Milkfish	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Smoked	Milkfish, boneless	PHI	310	48	96	14	NA	108	NA	190
Smoked	Other food fishes	THA	1,503	50	95	NA	NA	NA	NA	NA
Smoked	Roundscad	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Smoked	Sardine, *law-law*	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Smoked	Sardine, *tunsoy*	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Smoked	Tuna	MAL	NA	NA	NA	NA	NA	NA	NA	NA

The products can be stored in polyethylene bags, wrapped with paper, packed in basket with banana leaves or newspaper. The products are stored at room temperature, refrigerated or frozen, and their shelf life range from 1-2 days to 6 months when frozen. The shelf life and storage conditions are shown in Table 26.

Most countries have problems caused by the growth of mold and bacteria to the products. They emphasized on the improvement of proper handling and packaging of the products.

TABLE 26. SHELF LIFE OF SMOKED PRODUCTS.

Category	Product	Country	Storage periods and conditions
Smoked	Fish, dried	THA	NA
Smoked	Milkfish, boneless	PHI	NA
Smoked	Dried fish	BRU	2 months
Smoked	Fish	IND	1 month at cool and dry place
Smoked	Herring	PHI	3 days at room temperature, 15 days refrigerated or 3-6 months frozeen
Smoked	Milkfish	PHI	3 days at room temperature, 15 days refrigerated or 3-6 months frozen
Smoked	Roundscad	PHI	3 days at room temperature or 6 days refrigerated
Smoked	Sardine, *law-law*	PHI	3 days at room temperature or 6 days refrigerated
Smoked	Sardine, *tunsoy*	PHI	3 days at room temperature, 15 days refrigerated or 3-6 months frozen
Smoked	Semi-dried fish	BRU	1-2 days
Smoked	Tuna	MAL	NA


BFAR Philippines

Fig. 13. Philippine's boneless milkfish readied for smoking.


Directorate Fish. Indonesia

Fig. 14. An example of smoked fish from Indonesia

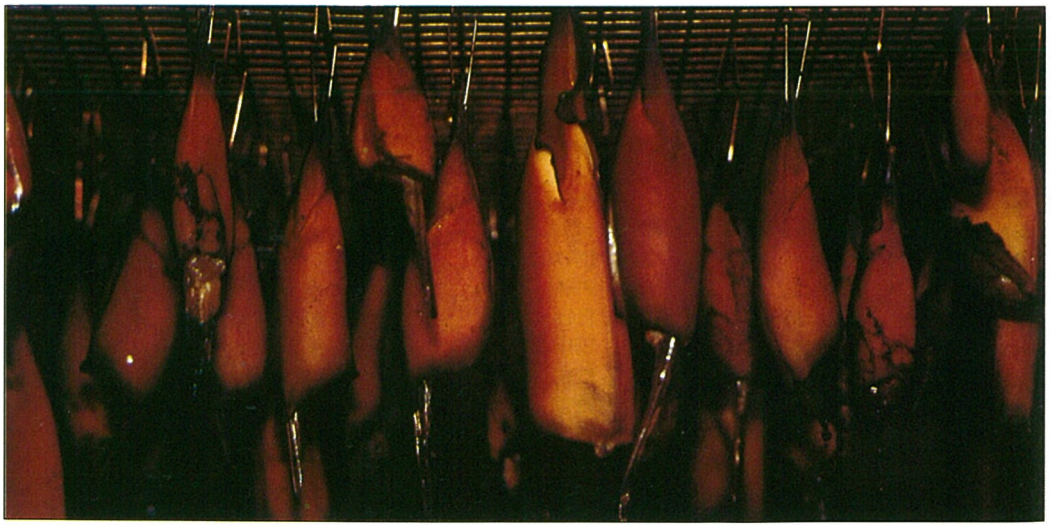
Directorate Fish. Indonesia

Fig. 15. Smoked squid suspended in a smoking chamber in Indonesia.

Other Fish Products

Other fish products include crackers made from prawn, squid or fish; babercued fish (*satay*), prepared cuttlefish and seaweed. The crackers are usually deep fried till expanded and give a crispy bite. They are eaten as a snack or together with rice and other dishes. Raw materials range from 24-32 cents in Thailand to $2.13 in Brunei Darussalam; the end products range from $2.13 to $6.22. The details of prices of raw materials and end products are shown in Table 27.

TABLE 27. COST OF RAW MATERIALS AND OTHER FISH PRODUCTS.

Category	Product	Local name	Country	Cost (US$/kg)	
				Raw material	Other product
Other	Cracker	*Kerupuk*	IND	NA	NA
Other	Fish cracker	*Keropok ikan*	BRU	2.13	4.47
Other	Fish cracker	*keropok ikan*	MAL	NA	NA
Other	Fish satay	*Sate ikan*	MAL	NA	NA
Other	Fish satay	*Pla satay*	THA	0.24 - 0.32	3.15 - 3.93
Other	Prawn cracker	*Keropok udang*	BRU	NA	2.13
Other	Prawn cracker	*Keropok udang*	MAL	NA	NA
Other	Prawn cracker	NA	SIN	NA	NA
Other	Prepared cuttlefish	NA	SIN	NA	NA
Other	Seaweed	*Gulamang dagat*	PHI	NA	NA
Other	Shrimp kropeck	*Sitsarong hipon*	PHI	NA	NA
Other	Shrimp or fish cracker	*Khau kriab pla*	THA	NA	3.15 - 3.93
Other	Squid cracker	*Keropok sotong*	BRU	2.13	6.22

The raw materials used for crackers are generally fishes, prawns, shrimps and squids. The ingredients added are tapioca flour, pepper, salt, baking powder, taste enhancer and water. The processing stages generally include mincing, mixing, forming, steaming, cooling, adding of colour, slicing or cutting, drying and finally packing (Fig. 16).

The babercued fish is prepared by soaking the fillets in seasonings before drying and baking until the product has a crispy texture (Fig. 17).

The average production and export volume is shown in Table 28. Seaweed is also included; the Philippines exported about 27,000 mt annually between 1985 and 1987.

TABLE 28. PRODUCTION AND EXPORT VOLUME OF OTHER FISH PRODUCTS.

			Production				Export			
Category	Product	Country	'84	'85	'86	'87	'84	'85	'86	'87
Other	Cracker, fish & shrimp	IND	NA	NA	NA	NA	NA	NA	NA	NA
Other	Fish cracker	MAL	6,126	5,429	1,475	10,611	NA	NA	NA	NA
Other	Fish cracker	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Other	Fish or shrimp cracker	THA	NA	NA	NA	NA	NA	NA	NA	NA
Other	Fish satay	MAL	NA	121	104	191	NA	NA	NA	NA
Other	Fish satay	THA	NA	NA	NA	NA	NA	NA	NA	NA
Other	Prawn cracker	MAL	38	55	41	30	NA	NA	NA	NA
Other	Prawn cracker	SIN	53	47	40	85	0	0	0	0
Other	Prawn cracker	BRU	NA	NA	NA	NA	NA	NA	NA	NA
Other	Prepared cuttlefish	SIN	105	199	160	131	32	90	43	29
Other	Seaweed	PHI	NA	NA	NA	NA	NA	23,749	29,426	26,563
Other	Shrimp kropoeck	PHI	NA	NA	NA	NA	NA	NA	NA	NA
Other	Squid cracker	BRU	NA	NA	NA	NA	NA	NA	NA	NA

These products are packed in airtight polyethylene or aluminium bags. The shelf life of crackers and seaweed is about a year at room temperature while satay fish lasts between 3 and 5 months (Table 29).

Most countries have suggested on the quality control of processing methods and improvement on packaging.

TABLE 29. SHELF LIFE OF OTHER FISH PRODUCTS.

Category	Product	Country	Storage periods and conditions
Other	Cracker	IND	1 year at room temperature
Other	Fish cracker	BRU	1 year at room temperature
Other	Fish cracker	MAL	NA
Other	Fish satay	MAL	NA
Other	Fish satay	THA	3-5 months at room temperature
Other	Prawn cracker	BRU	1 year at room temperature
Other	Prawn cracker	MAL	NA
Other	Prawn cracker	SIN	1 year at room temperature
Other	Prepared cuttlefish	SIN	1 year at room temperature
Other	Seaweed	PHI	12 months or more at cool and dry place
Other	Shrimp kropeck	PHI	12 months or more at cool and dry place
Other	Shrimp or fish cracker	THA	1 year at room temperature
Other	Squid cracker	BRU	1 year at room temperature

Fig. 16. Sun drying of crackers. They are deep fried before they are eaten.

Fig. 17. Sun drying of satay fish before they are marinated and barbecued.

TABLE 30. TABLE OF FISH PRODUCTS LISTED IN SURVEY.

Product	Brunei Darussalam	Indonesia	Malaysia
Boiled	NA	Boiled fish	Boiled fish
Canned	NA	Canned mackerel tuna sardine	NA
Comminuted	Fishball Fishcake	Fishball	Fishball Fishcake Scallop flavoured fishcake Fish sausage Prawn sausage Cuttle fish sausage Prawn dumpling Prawn burger Fish burger Otak-otak
Cured	NA	NA	NA
Dried	Salted fish Dried prawn Chilled sour salted fish Dried fish	Dried salted fish	Dried anchovy Dried/salted fish Dried prawn Dried cockle Dried cuttlefish Dried shellfish Dried jellyfish
Fermented	Fermented fish Fermented fish stomach Fermented mussel Shrimp paste Pickled shrimp	Fermented fish paste Fermented fish Fish sauce	Prawn paste Shrimp paste Fermented anchovy Pickled prawn
Fish meal	NA	Animal feed	Animal feed Fish manure
Frozen	NA	Frozen product: fish, shrimp, squid	Frozen cuttlefish Frozen prawn Frozen fish
Powdered	NA	NA	Prawn dust
Smoked	Smoked semi-dried fish Smoked dried fish	Smoked fish	Smoked tuna
Others	Prawn cracker Squid cracker Fish cracker	Cracker	Fish cracker Prawn cracker Barbecued fish

Philippines	Singapore	Thailand
NA	Cooked fish	Steamed fish
Milkfish in tomato sauce Milkfish, Salmon style Milkfish in oil Tuna in oil Sardine in tomato sauce Mackerel in tomato sauce	NA	Canned shrimp, babyclam, crab meat, fish in tomato sauce, tuna
Fishball Native sausage Fish burger	Fishball Fishcake Cuttlefish ball Imitation crab meat	Fishball Fish noodle Surimi Imitation crab meat
Cured fish	NA	NA
Dried anchovy Dried shrimp Dried squid Dried fishes: anchovy, milkfish, lizardfish, hairtail, mackerel, scad, nemiptarid, barracuda, cravalle, slipmouth, herring, sardine, shark fin, abalone, sea cucumber	Dried sea cucumber Dried shark fin	Dried salted fish Dried shrimp Dried squid Dried shellfish Dried salted freshwater fish Dried jelly fish
Shrimp paste Fish sauce Fish paste	NA	Fermented fish Fermented fish sauce Shrimp paste
Animal feed	Animal feed	Animal feed
Frozen product: milkfish, shrimp, prawn, tuna	Fish including fillet, steak, loin Prawn/shrimp Cuttlefish, squid	Fish Raw shrimp Cooked shrimp Cuttlefish Squid Octopus Shellfish
NA	NA	Fish floss
Smoked boneless milkfish Smoked sardine, roundscad, herring, milkfish	NA	Dried smoked fish
Shrimp kropeck Seaweed	Prawn cracker Prepared cuttlefish	Shrimp/fish cracker Fish *satay*

TABLE 31. SUMMARY TABLE OF TECHNICAL PROBLEMS RAISED IN SURVEY.

Products	Brunei Darussalam	Indonesia	Malaysia	Philippines	Singapore	Thailand
Boiled	NA	Nil	Nil	NA	NA	To improve processing method and short storage life.
Canned	NA	NA	NA	Low fish supply and high cost of tin cans	NA	Nil
Comminuted	Short storage life. To improve packaging.	Nil	Nil	Nil	Nil	Short storage life.
Cured	NA	NA	NA	Problem on handling and sanitation causes reddening, souring, salt burn and slimy product.	NA	NA
Dried	To improve packaging and storage life.	Low hygiene requirment due to traditional processing method.	Lack of quality control of dried anchovy. Turnover is based on dryness of product.	Problem on packaging, hygiene/sanitation.	Nil	To improve processing method
Fermented	To improve storage and package of product.	Nil	Fermented anchovy. Irregular supply of raw material. Poor sanitation of processing products.	Long fermentation period, rust on bottle caps.	NA	Fermented fish (*plara*)–spoilage caused by mold growth & insect/fly infestation during fermentation process and marketing. Fermented fish sauce (*nam pla*), fish sauce (*budu*), & shrimp paste–blackening of fish sauce which made the product unattractive. Good quality fish sauce must have clear red-brownish liquid. A good quality shrimp paste must have have a purple brown colour, smooth texture and salty krill flavour.
Fish meal	NA	Nil	Shortage of raw material & competition from imported fish meal.	Nil	Nil	Problem on price and freshness of raw material.
Frozen	NA	Nil	Nil	Nil	Nil	Nil
Powdered	NA	NA	Nil	NA	NA	To improve packaging of product. Mold growth during storage.
Smoked	To improve handling & packaging of product and prevent mold growth during storage.	Nil	Nil	Mold & bacterial spoilage during storage.	NA	Problem on packaging.
Others	To improve packaging of crackers.	Nil	Shortage of raw material	Nil	Nil	Problem on quality control during processing.

NA: Product not available. NIL: No problem indicated.

CONCLUDING REMARKS

The first inventory had helped to indentify the important fish products widely consumed in the region. This included traditional products such as those which are dried, fermented and smoked. It had also been stressed that some of the fish products can be upgraded to value-added products when attention is paid to quality and better packaging.

The compilers noted the following changes between the two surveys. In the comminuted products, there are new products such as sausage, burger, dumpling and fishcakes with various flavours from Malaysia; fishcake, cuttlefish ball and imitation crabmeat from Singapore; and imitation crabmeat from Thailand. Imitation crabmeat is a product which was only recently introduced into the region. Brunei Darussalam has added squid cracker in their production. A list of the fish products consumed in Southeast Asia is shown in Table 30.

Some of the problems in the production and marketing of fish products in Southeast Asia recorded in the 1985 inventory are again listed by the participating countries in the 1989 survey (Table 31). The main problems listed include short storage life and packaging of products, poor hygiene and sanitation of processing areas. In the case of the traditional products — dried, fermented and smoked products — the problems listed also included processing, with poor handling of raw materials and processing methods resulting in inconsistent quality of the final products. Examples are the traditional drying of dried products which affect the uneven quality, growth of mould and bacteria which accelerate spoilage during storage.

At the Seminar on Development of Fish Products in Southeast Asia organised by MRFD in 1987, it was suggested that the numerous problems faced by the fish processing industry in the region are influenced by socio-economic factors and technical deficiencies, and that such problems are best solved by technologists within the region as it is expected that they would have a better understanding of the problems and limitations of the industry. It was therefore suggested that cooperative studies among the specialists in the region should be further encouraged to harness the advantages which collaborative efforts have clearly demonstrated in the region.

The compilers welcome feedback from users of this second ediition.

ANNEXES

ANNEX 1: SURVEY INFORMATION SUBMITTED BY PARTICIPATING COUNTRIES

Category	Country	Product	Material	Method	Packaging
Boiled	IND	Boiled fish S$3.30/kg (US$1.76) *Ikan pindang* A type of salted and boiled fish which is eaten with rice.	Fish .Indian mackerel (*kembong*) S$1.10/kg (US$0.59) .Scad (*layang*) S$1.00/kg (US$0.53) .Cahalang Salt.	1 Fish. 2 Add salt. 3 Arrange fish in layers with salt in between. 4 Place inside bamboo basket/ceramic basin. 5 Boil.	Pack in bamboo basket or ceramic basin. Shelf life is 3-7 days at room temperature.
Boiled	MAL	Boiled fish *Ikan rebus* Product is salted and boiled fish. It is deep fried or cook in curry before serve.	Fish .Mackerel (*Rastrelliger* spp.)	1 Fresh fish. 2 Wash and keep in wooden tub in saturated brine for 3-4 hrs. 3 Arrange in baskets and boil in boiling satd. brine. 4 Cool for 24 hrs before storage or distribution.	Pack in baskets. Shelf life is 3-4 months at cool dry place or cool -4° to 1.7°C.
Boiled	SIN	Cooked fish S$4.00-6.00 (US$2.13-3.19) *Sek-hu* Boiled whole fish. Product is eaten with porridge.	Fish S$ 2.50-4.00 (US$1.33-2.13) .Indian mackerel (*Rastrelliger Kanagurta)* .Horse mackerel (*Caranx spp.*) .Anchovy (*Stolephorus spp*)	1 Whole fish. 2 Wash in water. 3 Rub with salt to prevent skin from peeling during boiling. 4 Arrange in bamboo basket. 5 Boil in brine for 10-15 mins using boiler. 6 Drain and cool.	Product is sold fresh and pack in polyethylene (PE) bag on the spot. Shelf life is 1 week at 4°C..
Boiled	THA	Steamed fish 12-40 baht/kg (US$0.47-1.57) *Pla nung* Steamed fish which has a salt content of 0.9-7.73%. Product is fried in oil or served with chilli paste especially for steamed Indo-Pacific mackerel.	Marine fish 6-18 baht/kg (US$0.24-0.71) .Indo-Pacific mackerel .Indian mackerel .Spotted tunny .Bonito .Trevallies .Bigeyes	1 Fish. 2 Gut. 3 Clean in brine solution. 4 Steam for 20 mins. 5 Distribute Suggestion raised: need to improve processing method and extend storage life.	Product is placed on bamboo tray. Shelf life is 3 days in refrigeration.
Canned	IND	Canned product *Ikan kaleng* Fish is processed and packed in sterilised can. It can be consumed directly or cooked.	Fish .Mackerel S$1.10/kg (US$0.59), salt .Tuna S$1.30/kg (US$0.69), sauce .Sardine S$0.40/kg, oil (US$0.21)	1 Raw material. 2 Dress and wash. 3 Precook in exhaust box. 4 Cool. 5 Cut and select. 6 Pack in can. 7 Weigh. 8 Add in liquid. 9 Seam. 10 Sterilise in retort. 11 Cool, pack can in box. 12 Store.	Canned product has a shelf life of more than 1 year at room temperature.

Category	Country	Product	Material	Method	Packaging
Canned	PHI	Canned milkfish in tomato sauce. *Bangus* Product is defined as a prepared fish product which has been sealed hermitically and subjected to high temperature to kill spoilage microorganisms. It is sauteed with garlic, onion with the addition of vegetables.	Milkfish 28-35 pesos/kg (US$1.25-1.56) Tomato sauce, salt, corn oil. Problems raised: low fish supply and high cost of tin cans.	1 Clean/gut. 2 Pack into can. 3 Exhaust. 4 Fill up ingredients. 5 Seal using electric can sealer. 6 Process. 7 Cool. 8 Label. 9 Store.	Canned product is packed in fiberboard/carton box and store, in a cool, dry place at room temperature. Shelf-life is 12 months or more.
Canned	THA	Canned shrimp *Gung krapong* Product is defined as canned shrimp meat in brine.	Shrimp *Metapenaeus* spp. *Metapenaeopsis* spp. *Trachypenaeus* spp. *Parapenaeopsis* spp Salt.	1 Shrimp meat. 2 Wash. 3 Size 4 Wash. 5 Pack in can. 6 Fill with brine. 7 Close can by vacuum seamer. 8 Retort (sterilise) by boiler. 9 Cool. 10 Pack in carton.	Pack in carton (48 x 6.5 oz) and store in a dry place at below 45°C. Shelf-life is 1 year.
Canned	THA	Canned babyclam *Hoy lai krapong'* Product is defined as canned babyclam in brine.	Babyclam *Paphia undulata* Salt.	1 Babyclam meat. 2 Wash. 3 Size. 4 Wash. 5 Pack in can. 6 Close can by vacuum seamer. 7 Retort (sterilise) by boiler & retort. 8 Cool. 9 Pack in carton.	Pack in carton (24 x 10 oz or 24 x 15 oz) and store in a dry place at below 45°C. Shelf-life is 1 year.
Canned	THA	Canned crab meat P*oo krapong* Product is defined as canned crab meat in brine.	Crab *Cancer* spp. Salt.	1 Crab meat. 2 Clean. 3 Wash. 4 Pack in can. 5 Fill with brine. 6 Close can by vacuum seamer. 7 Retort (sterilise) by boiler & retort. 8 Cool. 9 Pack in carton.	Pack in carton (48 x 6.5 oz) and store in dry place at below 45°C. Shelf-life is 1 year.
Canned	THA	Fish in tomato sauce 5-10 baht/can (US$0.2-0.4) *Pla krapong*	Fish .Sardine *.Dussumieria* spp.	1 Fish. 2 Dehead, degut, tail off. 3 Wash.	Pack in carton (48 x 6.5 oz or 100 x 140g) and store in a dry place at below 45°C. Shelf-life is 1 year.

Category	Country	Product	Material	Method	Packaging
		Product is defined as canned sardine or mackerel in tomato sauce. It is eaten with rice.	.Horse mackerel .Mackerel Tomato sauce, salt, sugar.	4 Pack in can. 5 Exhaust. 6 Fill with tomato sauce. 7 Close can by vacuum seamer. 8 Retort (sterilise) by boiler & retort. 9 Cool. 10 Pack in carton.	
Canned	THA	Canned tuna 15-30 baht/can (US$0.59-1.18) Pla *tuna krapong* Product is defined as canned tuna in oil or canned tuna in brine. It is mixed with spices and eaten as a snack.	Fish .*Thunnus tonggol* .*Euthynnus affinis* .*Katsuwonus pelamis* .*Thunnus alalunga* Oil, salt, vegetable broth.	1 Fish. 2 Degut. 3 Wash. 4 Pre-cook 5 Dehead, debone, remove skin, blood and dark meat. 6 Pack in can. 7 Fill with oil or brine. 8 Close can by vacuum seamer. 9 Retort (sterilise) by boiler. 10 Cool. 11 Pack in carton.	Pack in carton (48 x 6.5 oz or 24 x 13 oz or 6 x 66.5 oz) and store in a dry place at below 45°C. Shelf-life is 1 year.
Canned	PHI	Canned milkfish, *Salmon* style. *Bangus* Product is defined as a prepared fish product which has been sealed hermitically and subjected to high temperature to kill spoilage microorganisms. It is sauteed with garlic, onion with the addition of vegetables, used as a salad or sandwich spread.	Milkfish 28-35 pesos/kg (US$1.25-1.56) Salt.	1 Clean/cut. 2 Pack into can. 3 Exhaust. 4 Fill up ingredients. 5 Seal using electric can sealer. 6 Process. 7 Cool. 8 Label. 9 Store.	Canned product is packed in fiberboard/carton box and store in a cool, dry place at room temperature. Shelf-life is 12 months or more.
Canned	PHI	Canned milkfish in oil *Bangus* Product is defined as a prepared fish product which has been sealed hermitically and subjected to high temperature to kill spoilage microorganisms. It is sauteed with garlic, onion with the addition of vegetables, used as a salad or sandwich spread.	Milkfish 28-35 pesos/kg (US$1.25-1.56) Salt, oil.	1 Clean/Cut. 2 Pack into can. 3 Exhaust. 4 Fill up ingredients. 5 Seal using electric can sealer. 6 Process. 7 Cool. 8 Label. 9 Store.	Canned product is packed in fiberboard/carton box and store in a cool, dry place at room temperature. Shelf-life is 12 months or more.
Canned	PHI	Canned tuna in oil *Tambacol*	Tuna 20-25 pesos/kg (US$0.89-1.12) Salt, oil	1 Inspect/grade. 2 Dehead. 3 Pre-cook.	Canned product is packed in fiberboard/carton box and store in a cool, dry place at room temperature. Shelf-life is 12 months or more.

Category	Country	Product	Material	Method	Packaging
		Product is defined as a prepared fish product which has been sealed hermitically and subjected to high temperature to kill spoilage microorganisms. It is used as a sandwich spread, sauteed in garlic and vegetables.		4 Cool. 5 Cut/Slice. 6 Pack. 7 Fill ingredients. 8 Seal using electric can sealer. 9 Process. 10 Cool and label. 11 Store.	
Canned	PHI	Canned sardine in tomato sauce *Tamban* Product is defined as a prepared fish product which has been sealed hermitically and subjected in high temperature to kill spoilage microorganisms. It is sauteed with garlic, onion with the addition of ingredients, and as sandwich filling.	Sardine 23-25 pesos/kg (US$1.03-1.12) Salt, oil.	1 Clean/Cut. 2 Pack into can. 3 Exhaust. 4 Fill ingredients. 5 Seal with electric can sealer. 6 Process. 7 Cool. 8 Label. 9 Store.	Canned product is packed in fiberboard/carton box and store in a cool, dry place at room temperature. Shelf-life is 12 months or more.
Canned	PHI	Canned mackerel in tomato sauce *Galonggong* Product is defined as a prepared fish product which has been sealed hermitically and subjected to high temperature to kill spoilage microorganisms. It is sauteed with garlic, onion with the addition of ingredients, and as sandwich filling.	Mackerel 20-25 pesos/kg (US$0.89-1.12) Salt, oil, tomato sauce.	1 Clean/Cut. 2 Pack into can. 3 Exhaust 4 Fill ingredients. 5 Seal with electric can sealer. 6 Process. 7 Cool. 8 Label. 9 Store.	Canned product is packed in fiberboard/carton box and store in a cool, dry place at room temperature. Shelf-life is 12 months or more.
Comminuted	MAL	Cuttlefish ball M$6.00/kg (US$2.23) *Bebola sotong* Product is made from fresh cuttlefish and surimi paste. It is deep dried and cook with vegetable.	Fresh cuttlefish Surimi Flavour enhancer, salt, tadioca starch.	1 Cuttlefish and surimi. 2 Mince and mix with ingredients. 3 Form into ball. 4 Set. 5 Boil. 6 Chill. 7 Pack. 8 Freeze and store.	Pack in plastic bag of 1 kg or 400gm/pack. Shelf life is 6 months at -20°C.
Comminuted	MAL	Fresh prawn wantan M$0.22/kg (US$0.08) Product is made from surimi paste with fresh prawn meat wrap with *wantan* skin. It is deep fried, cooked with soup or fried with mee.	Surimi paste Fresh prawn meat. Carrot, turnip, spring onion, sugar, salt, flavour.	1 Surimi paste. 2 Mix with prawn meat. 3 Mix with ingredients. 4 Wrap into wantan shape. 5 Pack in tray. 6 Freeze. 7 Store.	Pack in polyfoam tray wrapped with plastic (15 pieces each tray.) Shelf-life is 3 months at -20°C

Category	Country	Product	Material	Method	Packaging
Comminuted	MAL	Fresh prawn *wantan* M$0.22/kg Product is made from surimi paste with fresh prawn meat wrap with wantan skin. It is deep fried, cooked with soup or fried with mee.	Surimi paste Fresh prawn meat Carrot, turnip, spring onion, sugar, salt, flavour.	1 Surimi paste. 2 Mix with prawn meat. 3 Mix with carrot, turnip, spring onion, sugar, salt & flavour 4 Wrap into wantan shape. 5 Pack in tray. 6 Freeze. 7 Store.	Pack in polyfoam tray wrapped with plastic (15 pieces each tray.) Shelf life is 3 months at -20°C.
Comminuted	MAL	Prawn burger M$12.00/kg (US$4.46) *Burger udang* Product is made from surimi paste with prawn meat formed into burger. It is fried and placed in between bread as prawn burger.	Minced fresh prawn meat Surimi paste Flavour enhancer, salt, tapioca starch, breadcrumb.	1 Surimi. 2 Surimi paste. 3 Mix with minced prawn meat and colour. 4 Form into burger shape. 5 Pack. 6 Freeze. 7 Store.	Pack in plastic bag of 10 pieces each. Shelf life is 6 months at -20°C.
Comminuted	MAL	Fresh prawn dumpling M$3.00/plate (US$1.12) Product is made from surimi paste with fresh prawn meat wrapped with dumpling. It is deep fried and cooked with soup.	Surimi paste Fresh prawn meat Carrot, turnip, spring onion, sugar, salt, flavour.	1 Surimi paste. 2 Mix with fresh prawn meat and ingredients. 3 Wrap into dumpling shape. 4 Pack in tray. 5 Freeze. 6 Store.	Pack in polyfoam tray with plastic of 10 pieces each. Shelf life is 3 months at -20°C.
Comminuted	MAL	Scallop flavour fishcake M$0.25/plate (US$0.09) Scallop cake Product is made from surimi paste formed into small scallop shape cake. It is deep fried.	Surimi Flavour enhancer, scallop extract, salt, tapioca starch, breadcrumb.	1 Surimi. 2 Mince. 3 Mix all ingredients. 4 Form into small scallop shape. 5 Set. 6 Boil. 7 Chill. 8 Pack. 9 Freeze. 10 Store.	Pack in tray of 10 pieces each. Shelf life is 6 months at -20°C.
Comminuted	BRU	Fishball B$7.00/kg (US$3.72) *Bebola ikan* White and round rubbery product made from fish. Product is used in soups, fried noodles or rice.	Fish .*Caesio* spp. B$4.95/kg (US$2.63) .Frozen surimi, threadfin bream B$4.50 (US$2.40) Salt, tapioca flour, msg, water.	1 Fish. 2 Fillet. 3 Scrape the flesh with spoon and mince with mincer. 4 Add ingredients to minced meat or surimi using mixer. 5 Form with fishball forming machine. 6 Set at room temperature for 4 hrs. 7 Pack. 8 Chill/Freeze. 9 Distribution.	Pack in PE bag or on styrofoam try covered with wrapping film. Store in refrigerator for 1-2 weeks. Problem raised: short storage life. Suggestion raised: need to improve packaging.

Category	Country	Product	Material	Method	Packaging
Comminuted	BRU	Fish cake B$6.50/kg (US$3.46) *Kek ikan* Brownish and oval shaped fish product. Product is used in soups, fried noodles and rice.	Frozen surimi .Threadfin bream B$4.50/kg (US$2.40) .Coral fish B$4.95/kg (US$2.63) Salt, tapioca flour, msg, water	1 Surimi or minced meat. 2 Mix with ingredients. 3 Form manually. 4 Setting at room temp. for 4 hrs. 5 Fry, 30 mins. 6 Pack.	Pack in PE bag or styrofoam tray covered with wrapping film. Shelf life is 1-2 weeks in refrigerator. Problems raised: short storage life. Suggestion raised: need to improve packaging.
Comminuted	IND	Fishball *Bakso ikan* A type of fish jelly product which is eaten in soup or as snack.	Fish .Spanish mackerel S$0.70/kg (US$0.37) .Yellowtail fusilier .Seaperch. .Shark Salt, spices, corn flour, wheat flour, pepper.	1 Fish. 2 Wash and dress. 3 Mince. 4 Mix with ingredients. 5 Form by fishball forming machine. 6 Boil. 7 Cool. 8 Pack.	Pack in plastic bag. Shelf life is 3 weeks at cool dry place.
Comminuted	MAL	Fish sausage M$9.00/kg (US$3.35) *Sosej ikan* Product is fish meat paste packed in artificial casing eg collagen. It is deep fried or cut into pieces and cook with vegetable. It can also be served with bun as sandwich.	Fresh minced meat M$1.00/kg (US$0.37) Surimi Flavour enhancer, salt, tapioca starch.	1 Fish. 2 Wash. 3 Heat and gut. 4 Debone with meat bone separator. 5 Blend by machine. 6 Mix with colour. 7 Stuff with casing by stuffing machine. 8 Boil and steam. 9 Reboil. 10 Chill. 11 Remove casing. 12 Pack by machine. 13 Freeze in contact freezer and store in cold room.	Pack in plastic of 400 gm/pack. Shelf life is 6 months at -20°C.
Comminuted	MAL	Prawn sausage M$10.50/kg *Sosej udang* Product is fresh prawn and surimi paste packed in artificial casing. It is deep fried and cut into pieces to cook with vegetable. It can also be served as a sandwich.	Fresh minced prawn. Surimi. Flavour enhancer, salt, tapioca starch.	1 Prawn and surimi. 2 Mix with colour by silent cutter. 3 Stuff into casing. 4 Boil/steam. 5 Reboil. 6 Chill. 7 Remove casing. 8 Pack. 9 Freeze and store.	Pack in plastic bag of 1kg or 400 gm/pack. Shelf life is 6 months at -20°C.
Comminuted	MAL	Cuttlefish sausage and cocktail M$9.50/kg (US$3.53) *Sosej sotong*	Fresh minced cuttlefish. Surimi	1 Minced cuttlefish and surimi. 2 Mix with fixed colour. 3 Stuff into casing.	Pack in plastic bag of 400g or 1 kg. Shelf life is 6 months at -20°C.

Category	Country	Product	Material	Method	Packaging
			Flavour enhancer, salt, tapioca starch.	4 Boil/steam. 5 Reboil. 6 Chill. 7 Remove casing. 8 Pack. 9 Freeze. 10 Store.	
		Product is made from cuttlefish and surimi paste packed in artificial casing. It is deep fried and cut into pieces to cook with vegetables or pan fried and placed between bread and eaten like "hot dog".			
Comminuted	MAL	Fish burger M$9.00/kg (US$3.35) *Burger ikan*	Fresh minced fish meat Surimi	1 Fresh fish meat or surimi. 2 Mix with fixed colour. 3 Form into burger shape. 4 Freeze. 5 Store.	Pack in plastic bag of 10 pieces each. Shelf life is 6 months at -20°C.
		Product is made from fish meat paste formed into burger shape. It is pan fried and placed between bread as burger.	Flavour enhancer, slat, tapioca starch, breadcrumb.		
Comminuted	MAL	Fishball *Bebola ikan*	Fish	1 Fish. 2 Remove head, scale and viscera. 3 Debone. 4 Mince to fine structure. 5 Add ingredients. 6 Mix thoroughly. 7 Form into ball. 8 Set (2-3 hrs). 9 Boil. 10 Air cool.	Pack in plastic pack.
		Product is defined as white and round shape. rubbery texture and Shiny in outlook. It is used in soups, fried mee and fried vegetables.	Salt, pepper, onion, celery, chilli, flavour enhancer, tapioca starch, sodium borate, polyhosphate.		
Comminuted	MAL	Fishcake. *Tauhu ikan*	Fish	1 Fish. 2 Remove head, scale and viscera. 3 Debone. 4 Mince to fine structure. 5 Add ingredients. 6 Mix thoroughly. 7 Press into tray. 8 Set (2-3 hours). 9 Cut into desired portions. 10 Deep fry.	Pack in plastic pack.
		Product is defined as brownish and cut into portions. It is used in soups, fried mee and fried vegetables.	Salt, pepper, onion, celery, chilli, flavour enhancer, tapioca starch, soduim borate, polyphosphate.		
Comminuted	MAL	Otak-otak *Otak-otak*	Meat of conger eel	1 Fish meat. 2 Mince. 3 Mix with all other ingredients. 4 Blend 3-4 times. 5 Pack in and freeze. 6 Pack in palm leaves and roast. 7 Store.	Pack in plastic or palm leaf.
		It is roasted and eaten as dish for meal.	Flour, coconut juice, fish curry powder, coriander powder, chilli, onion, sugar, salt, msg, caraway seed.		

Category	Country	Product	Material	Method	Packaging
Comminuted	PHI	Native sausage *Longanisa* Product is defined as fish meat paste packed in animal casing. It is fried till cooked or mixed with other recipes.	Tuna 20-25 pesos/kg (US$0.89-1.12) *.Neothunnus macroterus* Brine.	1 Dress. 2 Fillet. 3 Separate meat. 4 Crush. 5 Blanch. 6 Drain. 7 Fix color. 8 Stuff. 9 Boil or steam. 10 Reboil. 11 Wrap. 12 Store.	Pack in plastic/vacuum pack or styrofoam plates covered with plastic and stored at 5°C. Shelf life is 1-6 days.
Comminuted	PHI	Fishball *Bola-bola* Product is defined as ground white meat fish. It is deep fried, cooked with vegetables, boiled with soup for taste and flavour and used in various conditions.	*Caesio cunning* 25-28 pesos/kg (US$1.12-1.25)	1 Chop. 2 Salt. 3 Dissolve into corn starch and baking powder. 4 Mix using meat grinder, silent cutter, agitator. 5 Form ball. 6 Cook. 7 Drain. 8 Dry.	Pack in plastic/vacuum pack or styrofoam plates covered with plastic and stored at 5°C. Shelf life is 1-6 days.
Comminuted	PHI	Fish burger Product is defined as fried patties made from chopped fish meat. It is fried till golden brown, used for making sandwich or used as a main dish.	Tuna 20-25 pesos/kg (US$0.80-1.12) Hamburger seasoning, egg, onion (chopped), salt, evaporated milk, white pepper, msg.	1 Chop using meat chopper, food cutter. 2 Mix. 3 Mold into patties. 4 Fry.	Pack in plastic and store at 2-3°C or -10°C. Shelf life is 1-3 months.
Comminuted	SIN	Fishball/fishcake S$2.80-5.00/kg (US$1.49-2.66) *Hi-ei / Hi-kwei* Product is defined as fish jelly product and is used as an ingredient in noodle, soup and eaten as snacks.	Headed/gutted fish is imported from Thailand and Malaysia by road in frozen or chilled forms. Frozen surimi is mainly from Thailand. Surimi S$2-3/kg (US$1.06-1.60) Fish .Bigeye snapper (*Priancanthus* spp.) .Threadfin bream .Goat fish (*upeneus* spp.) Salt, sugar, msg, polyphoshates, starch, water.	1 Fish. 2 Mince from meat-bone separator. 3 Wash meat in water for 10 min. in paddle washer. 4 Press water out of washed meat by hydraulic press. 5 Strain by strainer. 6 Grind for 5 min. with ingredients using homogeniser. 7 Form by fishball/fishcake forming machine. 8 Set in warm water (40°C) for 30 mins. 9 Boil in hot water for 10 min. or deep fry.	Product is sold fresh for local consumption. Storage is 2-3 days at chilled condition. For export it is frozen and vacuum packed with a shelf life of 3-6 months.
Comminuted	SIN	Cuttlefish/squid ball S$7-11/kg (US$3.72-5.85)	Cuttlefish, squid S$4-5 (US$2.13-2.66)	1 Squid/cuttlefish. 2 Wash, clean, gut.	Pack in PE bag, polystyrene tray and shrink wrapped.

Category	Country	Product	Material	Method	Packaging
		A type of fish jelly product which is consumed after light frying.	Salt, sugar, msg, polyphosphates, oil, starch.	3 Grind. 5 Mix with ingredients. 6 Form by forming machine. 7 Set. 8 Boil, cool, pack, freeze.	Shelf life is 3-6 months at -18°C or below.
Comminuted	SIN	Imitation crabmeat sticks S$12-20 (US$6.38-10.64) A type of fish jelly product. Product is ready-to-use as snack or use as ingredient in salads, pilaff, soups.	Surimi S$3-4 (US$1.6-2.13) Salt, sugar, egg white, starch, crab flavour.	1 Surimi. 2 Grind/mix with ingredients by silent cutter. 3 Form by crab stick forming machine. 4 Vacuum pack. 5 Cook at 85°C for 30 mins. 6 Cool. 7 Freeze at -40°C for 40 mins.	Product is frozen and vacuum packed. Shelf life is 6-12 months at below -18°C.
Comminuted	THA	Fishball 30-90 baht/kg (US$1.18-3.54) depending on quality *Luk-Chin pla* Product is defined as minced fish product. It is used in various kinds or soups eg. noodle soup.	Minced fish 5-10 baht/kg (US$0.2-0.4) Fillet 13-25 baht/kg (US$0.51-0.98) *.Stegostoma fasciatom* *.Chiloscyllium* spp. *.Chirocentrus nudus* *.sphyraena* spp. *.Bigeye snapper* *.Scomberomorus* spp. and other fishes Salt 2.5-3%, crushed ice 5%	1 Minced fish meat by meat-bone separator & mincer. 2 Grind (add salt & crushed ice) by kneading machine. 3 Form into ball shape by fishball forming machine. 4 Set in warm water (40-45)°C for 20 minutes using water-bath. 5 Boil in hot water (90°C) for 5 minutes using water-bath. 6 Cool. 7 Store.	Pack in plastic bag and store in ice or refrigerator. Shelf life is 3 days. Problem raised: short storage life.
Comminuted	THA	Fish noodle *Ba mee pla* Product is used in noodle soup.	Minced fish (whole fish) 5-10 baht/kg (US$0.2-0.4) Fillet 13-25 baht/kg (US$0.51-0.98) Wheat flour, potassium pyrophosphate, msg, sodium bicarbonate, salt.	1 Minced fish meat by meat-bone separator & mincer. 2 Grind fish meat for 3 minutes (add all ingredients) by kneading machine. 3 Pass through roller-noodle machine to make noodle shape. 4 Weigh each lot of noodle (40g). 5 Steam for 5 minutes.	Pack in plastic bag and store in refrigerator or at room temperature. Shelf life is 3 days at room temperature and 7 days in the refrigerator. Problem raised: short storage life.
Comminuted	THA	Surimi 35-50 bahts/kg (US$1.38-1.97) Product is defined as minced fish which has been washed with water, added with additives and frozen. It is used as raw material for minced fish product eg. Japanese style minced fish products, fishball, sausage, etc.	Fish 7-15 bahts/kg (US$0.28-0.59) .Threadfin bream *.Priacanthus* spp. *.Sciaena* spp. *.Saurida* spp. Polyphosphate, sugar.	1 Fish. 2 Mince by meat-bone separator. 3 Wash with 2-5 times iced water using fish washing tank. 4 Remove excess water by screw press. 5 Strain. 6 Mix well with polyphosphate & sugar using silent cutter.	Pack in plastic bag and stored frozen.

Category	Country	Product	Material	Method	Packaging
		Problems raised: poor gel quality and whiteness.		7 Freeze. 8 Keep frozen in block form.	
Communited	THA	Imitation crab meat 150-350 bahts/kg (US$5.9-13.76) *Pu Tiun* Product is made from surimi, added with ingredients and flavours, then formed like crab meat. It is used for Japanese dishes and as salad. Problem raised: poor gel quality.	Surimi 35-50 baht/kg (US$1.38-1.97) Salt, crushed ice, flour, extract and flavour, egg white, colouring.	1 Surimi. 2 Grind (add ingredients) by kneading machine or silent cutter. 3 Form into crabmeat shape using baking-forming-wrapping machine. 4 Add colouring. 5 Wrapping. 6 Steam (using steam box) & cool. 7 Pack. 8 Freeze. 9 Store.	Pack in plastic bag and stored frozen.
Cured	PHI	*Kench* style cured fish. *Balbacua* It is a heavily salted, moist fish product. Product is broiled, sauted with garlic, onions, tomatoes and vegetables for noodles.	Fish .Skipjack .Herring .Roundscad .Fimbriated sardine .Deep bodied sardine .Striped mackerel .Short bodied mackerel	1 Fish. 2 Saturate with salt. 3 Wash with 2% salt. 4 Drain away water. 5 Pack in wooden box in layers of fish/salt.	Product has a shelf life of 90 days at room temperature.
Dried	BRU	Salted fish *Ikan masin* Fish sun dried as whole or split.	Fish .Short-bodied mackerel B$1.65 (US$0.51) (*Rastrelliger brachysoma*) .Spanish mackerel B$2.50 (US$1.33) (*Scomberomorus commersoni*) .Catfish B$1.50 (US$0.80) (*Ariidae*) Salt	1 Fish. 2 Wash. 3 Remove gills, entrails and scales. 4 Mix with salt. 5 Keep overnight. 6 Sun dry (1-2 days). 7 Salted fish. Suggestion raised: need to improve processing method.	Polyethylene (PE) bags, hard cardboard boxes in cool dry place for 6-12 months. Suggestion raised: need to improve packaging.
Dried	BRU	Dried prawn B$17.00 *Udang kering* Salted, boiled and sun dried prawn.	Prawn .*Penaeidae* spp. Salt.	1 Prawn. 2 Wash with sea water and mix with salt. 3 Cook by gas stove. 4 Remove skin. 5 Spread out to sun dry (4 days).	PE bags in cool dry place for 6 months. Suggestion raised: need to improve packaging.
Dried	BRU	Chilled sour slated fish B$6.70 (US$3.56) *Liking* Semi-dried fish. Served in fried form.	Fish .*Clupeidae* B$0.90 (US$0.48) Salt, chilli, tarmarind.	1 Fish. 2 Wash, remove gills, entrails and scales. 3 Add tamarind, chilli, salt. 4 Keep overnight in refrigerator.	PE bag in refrigerator for 2-3 weeks. Suggestion raised: need to improve storage and packaging.

Category	Country	Product	Material	Method	Packaging
Dried	BRU	Dried fish B$8.30 (US$4.42) *Lalap* Sun dried fish. Served in fried form.	Fish .Short-bodied mackerel B$1.65 (US$0.88) .*Gynnurus* spp. B$0.85 (US$0.45) .Sardine B$0.85 (US$ 0.45) Salt, sugar.	1 Fish. 2 Wash, remove gills, entrails, scales, bones. 3 Wash. 4 Mix with salt and sugar. 5 Sun dry for 2 days. 6 Dried fish.	PE bags or hard cardboard boxes for 1 month. Suggestion raised: need to improve packaging.
Dried	IND	Dried/salted fish S$1-6 (US$.53-3.19) I*kan kering/asin* Product is sun dried fish. It is fried and eaten as snack or used as flavouring material in soup and dish.	Fish S$0.50-1.50 (US$0.27-0.8) .Anchovy (Stolephorus spp.) .Ray .Mackerel .Sardine .Peperek .Catfish .Shark Squid .*Loligo* spp. Salt.	1 Fish. 2 Gut and wash. 3 Add salt. 4 Wash and drain. 5 Dry. Problems raised: low hygiene requirement as a result of traditional processing method.	Pack in plastic bag in weight of 0.5-1 kg or in wooden box of 100kg. Shelf life is 3 months at room temperature.
Dried	MAL	Dried anchovy *Ikan bilis/bilis kering* Salted, boiled and sun dried small fish made from anchovy. Product is deep fried till crispy or boiled in soup for taste and flavour. It is also widely use in various ways.	Anchovy Brine 10%	1 Fish. 2 Boil in bamboo basket in 10% brine for 15 mins. 3 Remove basket, drain. 4 Spread out/sun dry for 2-4 days depend on weather. 5 Pack.	Pack in hard cardboard boxes in 10kg/box and braided bamboo basket of 60 kg. Shelf life is 1-6 months at cool dry place.
Dried	MAL	Dried/salted fish *Ikan kering/masin.* It is salted and sun dried fish. To serve, product is deep fry till crispy; cook with vegetables; steam with ginger and oil to be taken with porridge and widely use in preparation of food.	Fish .*Rastrelliger kanagurta* .*Sciaena* spp. .*Scomberomorus* spp. .*Lutianus* spp. .*Fomionger* .*Nemipterus* spp. .Any fish which cannot be distributed as fresh fish.	1 Fish. 2 Wash with sea water. 3 Remove gill/entrail. 4 Remove scale, optional. 5 Place dressed fish in wooden tub. 6 Add 10% salt, to weight of fish. 7 Salting for 2 days. 8 Spread out to sun dry using wooden platform and mat for 10-30 hrs. 9 Pack. Problems raised: lack of quality control. Turnover of product based on dryness.	Pack in braided rattan/bamboo baskets in 50-60 kg. each. Shelf life is 6 months at cool dry place.

Category	Country	Product	Material	Method	Packaging
Dried	MAL	Dried prawn *Udang kering* Product is salted, boiled and sun dried prawn. It is widely used, eg to cook with vegetables and meat or in soup.	*Solenocera sub-nuda* Salt.	1 Shrimp. 2 Wash with sea water and mix with salt (salt/shrimp = 4:100). 3 Cook by using gas/kerosene stove. 4 Remove skin. 5 spread out to sun dry (1-4 days)	Pack in basket, plastic or paper bag. Shelf life is 3-6 months at cool dry place.
Dried	MAL	Dried cockles *Kerang kering*	Blood cockle	NA	NA
Dried	MAL	Dried cuttlefish *Sotong kering* Product is sun dried cuttlefish. It is served in local dishes.	Cuttlefish	1 Cuttlefish. 2 Cut open and wash. 3 Spread out on tray. 4 Sun dry. Suggestion raised: need to improve quality by drying.	NA
Dried	MAL	Dried shellfish *Siput kering* Product is sun dried shellfish.	Shellfish	NA	NA
Dried	MAL	Dried jelly fish *Ubur-ubur* It is a rubbery textured product.	Jelly fish Alum, sodium metabisulphite.	1 Jelly fish. 2 Clean. 3 Put in alternate layers of salt (jelly fish/salt:4:1) for 2-3 weeks. 4 Add sodium metabisulphite to decolourise the product. 5 Arrange and dry in shade for 2-10 days.	NA
Dried	PHI	Anchovy 50.00 pesos/kg (US$2.23) *Dilis* Product is defined as fish with salty taste and fishy odour. Used in chinese dishes. Fried and eaten as snack.	Anchovy 20.00 pesos/kg (US$0.89)	1 Anchovy. 2 Clean. 3 Dry under the sun. 4 Store.	Pack in wooden, plastic and carton boxes and store in a clean, dry, cool place. Shelf life is few months if properly stored.
Dried	PHI	Dried shrimp 60.00 pesos/kg (US$2.68) *Hibe*	Shrimp 30-35 pesos/kg (US$1.34-1.56)	1 Shrimp. 2 Wash. 3 Boil using stove.	Pack in sack or plastic and store in a clean, dry, cool place. Shelf life is a number of months if properly stored.

Category	Country	Product	Material	Method	Packaging
		Product is defined as dried whole shrimp without shell. It is used for cooking with vegetables.		4 Dry. 5 Pound. 6 Store.	
Dried	PHI	Dried squid 180 pesos/kg (US$8.02) *Pusit* Product is defined as *bicol* style, reddish brown and about the consistency of a leather. It is fried, broiled or soaked in sugar, salt, soy sauce, spices and then fried or broiled.	Squid 50-60 pesos/kg	1 Squid. 2 Wash with salt water. 3 Arrange in split bamboo rack. 4 Dry, turn once or twice a day. 5 Bind in bales. 6 Store in cool place.	Pack in plastic or wooden boxes and store in a clean, dry, cool place. Shelf life is a number of months if properly stored. Problems raised: packaging, mold occurs during storage. Poor hygiene and sanitation.
Dried	PHI	Dried milkfish 45-50 pesos/kg (US$2.01-2.23) *Daeng na bangus* Product is defined as salted and dried split fish with salty taste and fishy odour. It is fried and served with tomatoes.	Milkfish 35-38 pesos/kg (US$1.56) Coarse salt.	1 Fresh milkfish. 2 Wash. 3 Split. 4 Soak in brine. 5 Dry for 2 days. 6 Store.	Pack in plastic, carton and wooden boxes and store at room temperature or under refrigeration. Shelf-life is 42 days at room temperature or 49 days under refrigeration. Problem raised: packaging.
Dried	PHI	Lizardfish 35.00 pesos/kg (US$1.56) *Kalaso* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Lizard fish 23.00 pesos/kg (US$1.03) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in clean, dry, cool place. Shelf life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Hairtail 35.00 pesos/kg (US$1.56) *Balila* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Hairtail 25.00 pesos/kg (US$1.12) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Striped mackerel 50.00 pesos/kg (US$2.23) *Alumahan* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Striped mackerel 35.00 pesos/kg (US$1.56) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Big-eye scad 35.00 pesos/kg (US$1.56) *Matambaka* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Big-eye scad 25.00 pesos/kg (US$1.12) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.

Category	Country	Product	Material	Method	Packaging
Dried	PHI	Soft-bodied mackerel 50.00 pesos/kg (US$2.23) *Hasa-hasa* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Soft-bodied mackerel 30.00 pesos/kg (US$1.56) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Long tailed nemipterid 45.00 pesos/kg (US$2.01) *Bisugo* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Long tailed nemipterid 30.00 pesos/kg (US$1.56) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Barracuda 40.00 pesos/kg ((US$1.78) *Torcillo* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Barracuda 25.00 pesos/kg (US$1.12) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Roundscad 35.00 pesos/kg (US$1.56) *Galonggong* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Barracuda 25.00 pesos/kg (US$1.12) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Crevalle 35.00 pesos/kg (US$1.56) *Salay-salay* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Crevalle 23.00 pesos/kg (US$1.03) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Slipmouth 40.00 pesos/kg (US$1.78) *Sap-sap* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Slipmouth 25.00 pesos/kg (US$1.12) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Deep-bodied herring 40.00 pesos/kg (US$1.78) *Lapad*	Deep-bodied herring 25.00 pesos/kg (US$1.12) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored.

Category	Country	Product	Material	Method	Packaging
		Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.		4 Dry. 5 Store.	Problem raised: packaging.
Dried	PHI	Fimbriated herring 40.00 pesos/kg (US$1.78) *Tonsoy* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Fimbriated herring 25.00 pesos/kg (US$1.12) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Indian sardines 45.00 pesos/kg (US$2.01) *Tamban* Product is defined as fish with salty taste and fishy odour. It is cooked with vegetables, fried or broiled.	Indian sardines 30.00 pesos/kg (US$1.56) Salt.	1 Fresh fish. 2 Prepare raw material. 3 Soak in brine. 4 Dry. 5 Store.	Pack in plastic, carton and wooden boxes and store in a clean, dry, cool place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Dried shark fin 120-130 pesos/kg (US$5.35-5.80) *Pinatuyong palikpik ng pating* Product is defined as tasty and nutritious fins. It is used for soup or gelatin content and Chinese delicacies.	Shark fin 10-15 pesos/kg (US$0.45-0.67) Salt Problem raised: high cost of raw material.	1 Fins. 2 Dust with salt (1:10). 3 Stand for 24 hours. 4 Wash. 5 Hang or spread out on wire. 6 Dry for over a month. 7 Pack in sack or barrel.	Pack in sack or barrel and store in a clean, cool and dry place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	PHI	Dried abalone *Sopas* Product is defined as flesh hard but delicious product. It is used in chinese dishes, noodles and *chopsuey*.	Abalone Problem raised: high cost of raw material.	1 Shuck. 2 Soak. 3 Clean. 4 Drain. 5 Pre-cook. 6 Dry. 7 Pack.	Pack in carton boxes and store in a clean, cool and dry place. Shelf-life is a number of months if properly stored.
Dried	PHI	Dried sea cucumber *Trepang* Product is defined as elastic and rubbery, boiled dried product. It is deep fried with msg, salt, vinegar, garlic as sauce.	Sea cucumber	1 Soak. 2 Clean. 3 Boil. 4 Slice with knife. 5 Fry using gas stove.	Pack in cargon boxes and store in a clean, cool and dry place. Shelf-life is a number of months if properly stored. Problem raised: packaging.
Dried	SIN	Sea cucumber S$8.15/kg (YS$4.26-7.98) *Hai-sim*	Sea cucumber S$15-50 (US$7.98-26.60) *Microthele nobilis*	1 Sea cucumber. 2 Boil in sea water until they swell.	Pack in gunny sack with 60 kg product. Keep in cool dry place at room temperature indefinitely if

Category	Country	Product	Material	Method	Packaging
			.Holothuria scabra	3 Drain and cool. 4 Slit body wall along back. 5 Second boiling until rubber-like hardness. 6 Drain and cool. 7 Remove guts. 8 Dry over fire for 1-2 days until hard and dry. 9 Sun dry for 4-5 days.	product is properly stored and not attacked by insects and molds.
		It is a gutted, boiled and dried. Product is soaked in water before use. It is cooked by boiling for 5 min and use in soups, fried with meat or vegetables.			
Dried	SIN	Shark fin S$20-300/kg (US$10.64-159.60) *Hu-chi* Boiled dried product. It is used in soup. Shark fin soup is a chinese delicacy.	.Dorsal fin .Pectoral fin .Tail fin The fins, S$100-200 (US$53.19-106.38) are imported as dried fins.	1 Dried fins. 2 Soak overnight in hot water of 80-90°C. 3 Scrap off skin. 4 Separate fin needles from cartilage. 5 Boil until fin needles expand and curl. 6 Cool by soaking overnight in water. 7 Arrange fin needles into desired shape on trays. 8 Dry in drier at 45°C for about 6 hrs. 9 Pack.	Pack in cellophane of about 50 gm. Product can be kept indefinitely in cool dry place at room temperature if stored properly.
Dried	THA	Dried salted fish 30-80 baht (US$1.18-3.15) *Pla chom* Sun dried product which is deep fried in oil before serve.	Marine fishes .Short-bodied mackerel .Indian mackerel *.Deayadis* spp. *.Aetobatus* spp. *.Darahathinus* spp. Cost of fish depends on the species and size. Price ranges from 5-35 bahts. (US$0.2-1.38) Salt.	1 Marine fish. 2 Head/gut. 3 Soak with salt for about 1-2 days. 4 Wash and drain. 5 Sun dry for 1-2 days.	Pack in plastic bag and keep in well ventilated storage room. Shelf life is 3-6 months without insect infestation. Suggestion raised: need to improve packaging and processing method.
Dried	THA	Dried shrimp 40-250 habt (US$1.57-9.83) *Khong hang* Sun dried boiled shrimp. Product is deep fried in oil before serve.	Shrimp 12-50 baht (US$0.47-1.97) *.Penaeus* spp. *.Metapenaus* spp.	1 Shrimp. 2 Boil in sea water using gas stove. 3 Sun dry for 8 hrs in dryer machine for 4 hrs. 4 Remove shell by shell removing machine. 5 Pack.	Pack in plastic bag or glass container. Shelf life is 3-6 months in well ventilated storage room. Suggestion raised: need to improve packaging and processing method.
Dried	THA	Dried squid 80-200 baht (US$3.15-7.86) *Pla muk hang* Sun dried squid made from squids, octopuses. Product is deep fried before serve.	Material *.Loligo* spp. *.Sepia* spp. *.Octopus* spp.	1 Squid. 2 Split, clean in brine or sea water. 3 Flat dry in sun for 2-3 days.	Pack in plastic bag. Shelf life is 3-6 months in well ventilated room. Suggestion raised: need to improve packaging and prevent mold growth during storage.
Dried	THA	Dried shellfish 0-75 baht. *Hoi hang*	*Mytilus smaragdinus*, etc. Cost of meat is 20-30 baht.	1 Clean meat. 2 Sun dry.	Pack in plastic bag. Shelf life is 3-6 months in well ventilated room.

Category	Country	Product	Material	Method	Packaging
		Sun dried boiled shellfish made from green mussel and other shellfish. Product is deep fried in oil before serve.			Suggestion raised: need to improve packaging and prevent mold growth during storage.
Dried	THA	Dried salted freshwater fish 70-90 baht/kg (US$2.75-3.54) *Pla cham* Sun dried salted fish made from freshwater fishes. Products is deep fried before serve.	Freshwater fishes 10-30 baht/kg (US$0.39-1.18) .Snake head .Cat fish *(Pla duk, Pla swai)* .Climbing perch .Swam eel .Local carp .Common carp .*Sepat siam* .Others	1 Scale, dehead and gut. 2 Clean and soak in brine (10%) for 1 day or 3 Mix with salt (fish:salt = 16:1) for 1 day or soak in brine (30%) for 15-30 mins. 4 Wash and drain. 5 Dry under sun for 2-3 days. 6 Pack.	Pack in plastic bag. Shelf life is 3-6 months in ventillated room. Suggestion raised: need to improve packaging and processing method.
Dried	THA	Dried jelly fish *Mang ka proon hang* Sun dried jelly fish which is soaked in soft, then steamed or boiled. It is served in soup with noodle.	Use only the carp of *Rhopilema* spp. Salt potash-alum mixture 30%.	1 Soak in iced water for 8-10 hrs to remove mucus. 2 Drain. 3 Mix with 30% salt potash-alum mixture for 2-3 days. 4 Wash and drain. 5 Mix with 20% jelly fish to weight of salt potash-alum for 2-3 days. 6 Wash, leave on wire mesh. Place in shady area for 3-4 days.	Pack in plastic bag. Shelf life is 3-6 months in ventillated place. Suggestion raised: need to improve processing and packaging method.
Fermented	BRU	Pickled shrimps B$2.00/bottle (US$1.07) *Cincaluk* A suspension of acetes in sauce. Product is eaten with rice.	Prawn .*Acetes* spp. B$1.70 (US$0.91) Salt, sugar.	1 Acetes. 2 Wash and drain. 3 Mix with ingredients. 4 Ferment for 1 week. 5 Pickled shrimp.	Packed in glass bottles. Last for 1 month in refrigerator. Suggestion raised: need to improve storage and packaging method.
Fermented	BRU	Fermented fish B$2.00/bottle (US$1.07) *Budu ikan* Fermentation of small fish. Product is served with rice.	Fish .Anchovy Salt, rice powder (fried & pounded).	1 Fish. 2 Wash and drain. 3 Add fried rice powder, salt. 4 Ferment for at least 3 days. 5 Fermented product.	Keep in glass bottle for 3-4 weeks. Suggestion raised: need to improve storage and packaging methods.
Fermented	BRU	Fermented fish stomach B$2.00/bottle (US$1.07) *Budu perut ikan* Fermentation of stomach of fish. Product is served with rice.	Fish .Anchovy Salt, rice powder (fried & pounded).	1 Fish stomach. 2 Wash and drain. 3 Add fried rice powder, salt. 4 Ferment for at least 3 days. 5 Fermented product.	Pack in glass bottle. Shelf life is 3-4 weeks. Suggestion raised: need to improve storage and packaging method.
Fermented	BRU	Fermented mussel B$2.00/bottle (US$1.07) *Budu kupang*	Mussels	1 Mussel. 2 Wash and drain.	Keep in glass bottle for 3-4 weeks.

Category	Country	Product	Material	Method	Packaging
				3 Add fried rice powder, salt.	Suggestion raised: need to improve storage and packaging methods.
		Fermentation of mussel. Product is served with rice.	Salt, rice powder (fried & pounded).	4 Ferment for at least 3 days. 5 Fermented product.	
Fermented	BRU	Shrimp paste B$12.00/kg (US$6.38) *Belacan* Thick viscous brown concentrate of fermented shrimp. Product is used as a condiment in local dishes. It can be cooked with chilli, tamarind, sugar and eaten with rice.	Prawn *Acetes* spp. B$1.70/kg (US$0.91) Salt.	1 Wash & drain acetes. 2 Mix well with salt in plastic sacks. 3 Ferment overnight. 4 Partially sun dry for 1 day. 5 Pound in wooden mortar and mince in mincer. 6 Sun dry. 7 Pound. 8 Shrimp paste.	Pack in PE plastic bag or glazed earthe nware pots. Shelf life is 1-2 years. Suggestion raised: need to improve packaging.
Fermented	IND	Fermented fish paste S$0.9/kg (US$0.48) *Terasi/belachan* Product is sun dried fermented fish paste, used as a flavouring material.	Trash fish or small shrimp S$5.50/kg (US$2.93) Salt. Problem raised: inconsistency in the supply of raw materials.	1 Raw material. 2 Mix by mixer. 3 Sun dry. 4 Mix. 5 Add salt. 6 Pack.	Pack in plastic bag of 50-100 gm. Shelf life is 3 months at cool dry place or room temperature.
Fermented	IND	Fermented fish S$1.40/kg (US$0.75) *Ikan peda* Product is boiled fermented fish. It is eaten with rice.	Fish *Kembong* S$1.10/kg (US$0.59) Salt.	1 Raw material. 2 Add salt. 3 Boil in water. 4 Cool dry. 5 Pack.	Pack in bamboo basket. Shelf life is 2 weeks at room temperature.
Fermented	IND	Fish sauce S$1.10/kg (US$0.59) *Kecap ikan* Product is fermented fish sauce. It is used as a flavouring material.	Anchovy S$1.30/kg (US$0.69) Salt.	1 Raw material. 2 Add salt. 3 Ferment. 4 Filter. 5 Pack.	Pack in bottle. Shelf life is 1 year at room temperature.
Fermented	MAL	Prawn paste *Otak udang* This is a thick viscous dark brown is used as a condiment.	*Acetes nysiol* Salt.	1 Shrimp 2 Wash and mix with salt in bamboo baskets or wooden tubs. 3 Spread out to sun dry for 5-8 hrs. 4 Mince and left to ferment for 7 days.	Pack in tins.
Fermented	MAL	Shrimp paste *Belacan* It is a salty paste with a greyish pink to deep purple colour. Product is used as an ingredient for local dishes.	Acetes Arabic salt.	NA	Pack in plastic bag.

Category	Country	Product	Material	Method	Packaging
Fermented	MAL	Fermented anchovy *Budu* Product is the liquefaction of anchovy in salt. The clear liquid changes from amber to dark brown with some form of sedimentation. It is used as a condiment in dishes.	Anchovy Salt.	1 Anchovy. 2 Rinse with salt water repeatedly. 3 Add salt to anchovy (1:2-3). 4 Transfer to vats or pots. 5 Add salt again on top. 6 Leave to ferment for $^1/_2$ - 2 years. Problems raised: irregular supply of raw material. Suggestion raised: need to consider alternative raw materials, eg. by-catch. The introduction of enzyme to hasten the maturation period of the product is useful. The processing premises lack sanitation. Problem raised: poor sanitation at processing premises.	Pack in bottle.
Fermented	MAL	Pickled prawn *Cincaluk* It is a suspension of tiny, pink acetes shrimp in sauce and is normally eaten with rice.	Acetes shrimp Salt.	1 Shrimp. 2 Wash. 3 Mix with 20% coarse salt, 6% cold rice. 4 Pack in jars. 5 Ferment for 20-30 days.	Pack in bottle. Consumption is limited to the state of Malacca.
Fermented	PHI	Shrimp paste 20.00 pesos/kg (US$0.89) *Bagoong Alamang* Product is defined as a mixture of shrimp and salt that has been allowed to fermented. It is sauteed in garlic, pork fat and used as dips for mangoes and other foods.	Small shrimp 10.00 pesos/kg (US$0.45) *Acetes* spp. Salt.	1 Clean. 2 Wash. 3 Drain. 4 Salt. 5 Ferment in fermenting tanks, mixing vats. 6 Pack.	Pack in glass jars, bottles and cans and store in a clean, dry place. Shelf-life is 3 weeks to 6 months. Problems raised: long fermentation period and rust on bottle caps.
Fermented	PHI	Fish sauce 10.00 pesos/kg (US$0.45) *Patis* Product is defined as a liquid that can be drained off from the mixture of fish and salt that has been allowed to ferment. It is added to vegetables as seasonings and flavouring, and as dips for foods.	Fresh fish 20-25 pesos/kg (US$0.89-1.12) Salt.	1 Clean. 2 Wash. 3 Drain. 4 Salt. (1:3). 5 Ferment in fermenting vats, earthenware, jar. 6 Filter. 7 Pack.	Pack in bottles and cans and store in a clean, dry place. Shelf-life is 6 to 12 months. Problem raised: long fermentation period and rust on bottle caps.
Fermented	PHI	Fish paste 10.00 pesos/kg (US$0.45) *Bagoong Isda* Product is defined as a mixture of fish and salt that has been allowed to ferment. It is added to foods as seasoning and flavouring.	Fresh fish 20-25 pesos/kg (US$0.89-1.12) Anchovy Salt.	1 Wash. 2 Salt (1:3) 3 Ferment in earthen jar, concrete tank, wooden vat, plastic drum, oil drum, oil can. 4 Pack.	Pack in glass jar and bottle and store in a clean, dry place. Shelf-life is 6 to 12 months. Problem raised: long fermentation period and rust on bottle caps.

Category	Country	Product	Material	Method	Packaging
Fermented	THA	Fermented fish *Pla-ra* Cost of product depends on fish species and quality, ranging from 20-60 bahts/kg US$0.89-2.68). Product is served in various ways by directly together with some vegetables. It can be consumed after cooking ie. wrap in banana leaves and roast or fry. It is also used as condiment for curries.	Fresh water fish .Snake head .Climbing perch .Local carp .Gourami Marine fish .Lizard fish Cost of fish ranges from 5-20 bahts/kg (US$0.2-0.79). Solar salt, ground roasted or rice bran.	1 Fish. 2 Head, gut, scale and wash in water. 3 Drain and mix wtih salt (25% by wt.) and pack in closed jar for about 30 days. 4 Take the fish out and mix with ground roasted rice (10% by weight). 5 Pack in closed jar for 2-6 months. Problems raised: spoilage caused by mold growth and insect/fly infestationn during fermentation process and marketing phase. A good quality product must have slightly pinkish meat and goodaromatic flavour.	Pack in earthern jar with salt on top. Shelf life is 1-3 years at 29-33°C.
Fermented	THA	Fermented fish sauce 5-25 baht/bottle/750ml (US$0.2-0.98) *Nam pla* Fish sauce made from fermented fish and used as a condiment.	Fish 2-4 baht/kg (US$0.08-0.16) .Anchovy .Sardine .Mackerel Solar salt.	1 Fish. 2 Mix with salt (fish:salt = 3:1) using mixer. 3 Pack in jar or concrete tank for 8-12 months. 4 Filter and electric pump to open tank to improve the flavour. 5 Pack in glass bottle. Problem raised: blackening of the colour of fish sauce which made the product unattractive to the consumer. A good quality fish sauce must have clear red-brownish liquid, meaty salty taste and sweet aromatic flavour.	Pack in glass bottle, PE container, earthern jar. Shelf life is more than 1 year at cool dry place.
Fermented	THA	Fermented fish .*Pla som* 25-50 baht/kg (US$0.98-1.97) .*Pla jom* 15-20 baht/kg (US$0.59-0.79) .*Pla chao* 25-30 baht/kg (US$0.98-1.18) A type of fermented fish mixed with salt, ground roasted rice and pounded garlic. Product is served in various ways eg. directly, with vegetables and onion, cooked with coconut milk, chilli and lemon grass.	Fish .Freshwater fish .Marine fish Solar salt, boiled rice, pounded garlic.	1 Fish. 2 Dress. 3 Wash and drain. 4 Mix with ingredients. 5 Pack tightly in banan leaf or plastic bag. 6 Leave at room temperature for 2-3 days.	Pack in plastic bag, banana leaf, glass jar. Shelf life is 2-3 weeks at cool dry place.
Fermented	THA	Shrimp paste 15-100 baht/kg (US$0.59-3.93) *Kapi* A fermented product made from ground crustacean and small shrimp with salt.	Crustacean .Small shrimp 4-8 baht/kg (US$0.16-0.32) Solar salt.	1 Shrimp. 2 Wash and drain. 3 Mix with salt (16%). 4 Sun dry for 4-5 hrs till 40-45% moisture. 5 Grind 2-3 times.	Pack in plastic box, plastic bag or jar. Shelf life is 1-2 years at cool dry place.

Category	Country	Product	Material	Method	Packaging
		Used as a condiment for making sauce and and curry soup.		6 Pack tightly in jar or wooden barrel for 1-6 months. Problems raised: darkening of the product and insect infestation. A good quality product must have a purple brown color, smooth texture and salty krill flavour.	
Fermented	THA	Fish sauce 10-20 baht/bottle (US$0.39-0.79) *Budu* A thick fish sauce made from small fish. Product is consumed with chilli, onion, sugar and lemon grass. It can be mixed with boiled rice and vegetable which is called kao-yum.	Fish .Anchovy .Scad Sardine Solar salt, brown sugar.	1 Fish. 2 Wash and drain. 3 Mix with salt (25%). 4 Pack in earthen jar for 3-12 months. 5 Add brown sugar (10%). 6 Boil. 7 Pack in glass bottle. Problems raised: insect infestation during fermentation. A good quality product must have a thick liquid consistency, brown color, slightly sweet and salty taste.	Pack in glass bottle. Shelf life is 1-3 years at cool dry place.
Fish Meal	SIN	Animal feed S$0.80-1.00 (US$0.43-0.53) Product is dried, ground (after cook and press) fish and fish offal which is used as a high protein feed supplement to animal and fish. It is not for human consumption.	Trash fish from Thai trawlers S$0.14 (US$0.08) Supply of raw material is stable with competitive price.	1 Trash fish pass through screw conveyer. 2 Steam and pass through screw conveyer. 3 Remove water by screw press, pass to screw conveyer. 4 Dry in a series of 8 steam jacketed driers at 190°C. 5 Mill. 6 Pack. The whole process takes 45 mins.	Pack in 81 kg gunny sack or 50 kg kraft bag which made up of 4 layers of kraft paper which is similar to cement bag. Shelf life of product at room temperature is 4-5 months at 4% moisture content.
Fish Meal	THA	Animal feed 13-17 baht/kg (US$0.51-0.67) *Pla pon* Product is defined as fish powder made from trash fish (by-catch) or Sardinella and used as animal feed. Problem raised: price and protein content.	Fish 2-3 baht/kg (US$0.08-0.12) .Trash fish .Sardine Problem raised: freshness of raw material.	1 Fish. 2 Wash. 3 Cook with coagulator. 4 Screw press. 5 Dry in rotary dryer. 6 Mill.	Pack in jute bag and plastic bag and store in well ventilated storage room.
Fish meal	IND	Animal feed S$0.90/kg (US$0.48) *Tepung ikan*	Sardine and by-product of processing plant. S$0.2/kg (US$0.11)	1 Fish/waste. 2 Boil for 30 minutes. 3 Press by presser.	Pack in plastic bag of 100 kg. Shelf life is more than 1 year at room temperature.

Category	Country	Product	Material	Method	Packaging
		Product is dried fish powder which is used as a feed.		4 Crush by crusher. 5 Dry by dryer. 6 Mince by grinder. 7 Pack.	
Fish meal	MAL	Animal feed *Tepong ikan* Product is defined as feed ingredients used in swine and poultry formulation. It is used as animal feed. Problems raised: shortage of raw material and competition from imported fish meal.	Trawl by-catch	1 Cook by dry or wet method. 2 Press cooked fish to remove moisture. 3 Dry. 4 Grind. 5 Pack.	Pack in multilayer paper bag.
Fish meal	MAL	Fish manure *Ikan baja*	Trawl by-catch	NA	NA
Fish meal	PHI	Animal feed Product is defined as dried ground product derived from fish. It is used mainly for feeding fish, poultry and hogs.	Fish	1 Preparation of raw materials. 2 Cook using steam cooker. 3 Press. 4 Grind. 5 Pack. 6 Store.	Pack in black-lined sack and store in a cool, dry place. Shelf-life is 6 months.
Frozen	IND	Frozen product S$ 5.00/kg fish (US$2.66) S$5.50/kg shrimp (US$2.92) S$15.00/kg squid (US$7.98) *Product beku* Product is processed by quick frozen. It can be boiled, fried or cooked in various ways before serving.	Fish S$1.10/kg (US$0.59) Shrimp S$17/kg (US$9.04) Squid S$4/kg (US$2.13)	1 Raw material. 2 Prepare. 3 Freeze by air blast or contact plate freezer.	Pack in plastic bag. Shelf life is 1 year at cold storage of -18°C.
Frozen	MAL	Frozen cuttlefish *Sotong beku* Frozen product	Cuttle fish	1 Cuttle fish. 2 Clean. 3 Pack into tins. 4 Store in cold room.	NA
Frozen	MAL	Frozen prawn *Udang beku* Frozen product.	*Penaeus* spp.	NA	NA

Category	Country	Product	Material	Method	Packaging
Frozen	MAL	Frozen fish *Ikan beku* Product is preserved by freezing.	NA	NA	NA
Frozen	PHI	Shrimp *Suahe* Product is defined as frozen product arranged in blocks. It is pickled, cooked with vegetables, steamed or use for other speciality preparations.	Shrimp 60.00 pesos/kg (US$2.68)	1 Weigh. 2 Sort/grade. 3 Head. 4 Weigh. 5 Arrange in aluminium tray. 6 Glaze. 7 Blast/contact freeze. 8 Pack.	Pack in PE bag and carton box and store at -18°C. Shelf-life is 6 months.
Frozen	PHI	Prawn *Suapo* Product is defined as frozen product arranged in blocks. It is pickled, cooked with vegetables, steamed or use for other speciality preparations.	Prawn	1 Weigh. 2 Sort/grade. 3 Head. 4 Weigh. 5 Arrange in aluminium tray. 6 Glaze. 7 Blast/contact freeze. 8 Pack.	Pack in PE bag and carton box and store at -18°C. Shelf-life is 6 months.
Frozen	PHI	Milkfish *Tambakol* Product is defined as individually quick frozen.	Milkfish 45-50 pesos/kg (US$2.01/2.23)	1 Wash. 2 Sort/grade. 3 Weigh. 4 Pack. 5 Freezing using blast/contact freezer. 6 Pack.	Pack in PE bag and carton box and store at -18°C to -12°C. Shelf-life is 6 months.
Frozen	PHI	Tuna *Bangus* Product is deifned as individually quick frozen. It is eaten as sashimi, canned, cooked with vegetables, pickled or steamed.	Tuna	1 Wash. 2 Split/gut. 3 Bleed. 4 Wash. 5 Glaze. 6 Blast/contact freeze. 7 Pack.	Pack in carton box and store at -18°C.
Frozen	SIN	Fish (including fillet, steak and loin) Product is defined as whole fish, gutted fish, fillet, steak and lion. It is prepared and served by all forms of cooking.	Fish .Dory .Shark .Sword fish .Tuna .Red snapper	1 Frozen fish, thaw. 2 Chill. 3 Wash. 4 Cut. 5 Fillet. 6 Freeze by blast, plate or nitrogen freezer.	Pack in cardboard boxes. Size of pack varies according to buyer specification. Institutional packs are 6, 8, 10 and 20 kg. Product can be kept frozen at -18°C for 6-12 months.

Category	Country	Product	Material	Method	Packaging
			.Red mullet .Grouper .Mackerel .Pomfret .Seabream	Suggestion raised: need to upgrade processing premises and facilities to meet more stringent import/health requirements imposed by many countries especially etc.	
Frozen	SIN	Prawn/shrimp S$10-35 (US$5.32-18.62) *Sia* Whole, beheaded, peeled, deveined, cooked in block and IQF. Product is served in all forms of cooking.	Penaeid prawn, chilled or frozen S$4.00-25.00 (US$2.13-13.30)	1 Frozen prawn, thaw. 2 Chill. 3 Sort and wash. 4 Dehead, peel, devein. 5 Cook. 6 Cool. 7 Freeze.	Pack in crdboard boxes usually 1-2 kg packs. Shelf life is 6-12 months at -18°C.
Frozen	SIN	Cuttlefish/squid S$10-15.00 (US$5.32-7.98) Frozen whole, tube or fillet form.	Cuttle fish S$3-5 (US$1.6-2.66) .*Sepia* spp. .*Sepiola* spp. Squid .*Loligo* spp.	1 Cuttle fish/squid. 2 Thaw. 3 Sort. 4 Remove head, gut, skin. 5 Wash. 6 Tubes or fillet. 7 Pack. 8 Freeze.	Pack in cardboard boxes. Size of pack varies according to buyer specification varying from 2-20 kg blocks. Shelf life of product is 6-12 months at -18°C.
Frozen	THA	Frozen fish *Pla chae kang* Product is defined as frozen whole fish or frozen fish fillet (skin-on or skinless). It is for fresh consumption and as raw material for food industry.	Marine fish .Red snapper .Painted sweetlip .Malabar snapper .Freshwater fish .Tilapia .Catfish	1 Fish. 2 Fillet. 3 Freeze by air-blast/contact freezer.	pack in plastic bag or small plastic tray. Shelf-life is 12 months at cold storage of -18°C.
Frozen	THA	Frozen raw shrimp *Kung sod chae kang* Product is defined as 1) frozen head-on, shell-on shrimp 2) frozen headless, shell-on shrimp 3) frozen shrimp meat (peeled & deveined or peeled & undeveined). It is consumed fresh and as raw material for food industry.	Shrimp .White shrimp 140-150baht/kg (US$5.51-5.9) .Pink shrimp 140-150 baht/kg (US$5.51-5.9) .Black tiger shrimp 130-180 baht.kg (US$5.11-7.08)	1 Shrimp 2 Dehead or head-on. 3 Shell-on or peeled. 4 Freeze by air-blast, contact freezer or IQF freezer.	Pack in plastic bag or small plastic tray and store at -18°C. Shelf-life is 12 months.
Frozen	THA	Frozen cooked shrimp *Kung tom chae kang*	Shrimp .Sand shrimp	1 Shrimp. 2 Boil.	Pack in plastic bag or small plastic tray and store at -18°C. Shelf-life is 12 months.

Category	Country	Product	Material	Method	Packaging
			.Black tiger shrimp	3 Peel. 4 Freeze by air-blast freezer, contact freezer or IQF freezer.	
		Product is defined as frozen peeled deveined, peeled and undeveined. It is consumed fresh and as raw material for food industry.			
Frozen	THA	Frozen cuttlefish *Muek kra dong chae kang* Product is defined as 1) frozen whole cuttlefish 2) frozen whole cleaned cuttlefish 3) frozen cuttlefish fillet 4) frozen cuttlefish head. It is used for fresh consumption and as raw material for food industry.	Cuttlefish 55 baht/kg (US$2.16)	1 Cuttlefish. 2 Clean. 3 Cut. 4 Freeze by air-blast freezer, contact freezer IQF freezer.	Pack in plastic bag or small plastic tray and store at -18°C. Shelf-life is 12 months.
Frozen	THA	Frozen squid *Muek kuay chae kang* Product is defined as 1) frozen whole squid, 2) frozen whole cleaned squid, 3) frozen squid tube, 4) frozen squid ring, 5) frozen squid head, It is used for fresh consumption and as raw material for food industry.	Squid 35 baht/kg (US$1.38)	1 Squid. 2 Clean. 3 Cut. 4 Freeze by air-blast freezer, contact freezer or IQF freezer.	Pack in plastic bag or small plastic tray and store at -18°C. Shelf-life is 12 months.
Frozen	THA	Frozen octopus *Huek sai chae kang* Product is defined as 1) frozen whole octopus. 2) frozen octopus, (ink-on), 3) frozen octopus (ink-off), 4) frozen gutted octopus. It is used for fresh consumption and as raw material for food industry.	Octopus	1 Octopus. 2 Clean. 3 Freeze by air-blast freezer, contact freezer or IQF freezer.	Pack in plastic bag or small plastic tray and store at -18°C. Shelf-life is 12 months.
Frozen	THA	Frozen shellfish *Hoy chae kang* Product is defined as 1) frozen baby clam meat,	Shellfish .Baby clam .Ark shell	1 Shellfish. 2 Boil. 3 Shell off. 4 Freeze by air-blast freezer, contact freezer or IQF freezer.	Pack in plastic bag or small plastic tray and store at -18°C. Shelf-life is 12 months.

Category	Country	Product	Material	Method	Packaging
		2) frozen ark shell. It is used for fresh consumption and as raw material for food industry.			
Powdered	MAL	Prawn dust *Tepong/kulit udang* Product is made from by-product of dried prawn.	Dried shell of prawn.	Shells is manually removed fromm dried prawn by trashing process.	NA
Powdered	THA	Fish floss 120-150 baht/kg (US$4.72-5.90) *Pla yong* Product is fish mince from shark, ray, snapper and threadfin bream mixed with ingredients. It is served with bread or used in rice soup.	Fish: 8-15 baht/kg (US$0.32-0.59) .*Scoliodon* .*Caseharhinus* .*Dasyatis* spp. .*Lutianus* spp. .Threadfin bream Soy sauce, salt, sugar, water.	1 Fish, dress. 2 Cut into desired pieces. 3 Soak in 2% brine for 10-15 mins, twice. 4 Separate into small pieces from bones and skin. 5 Wash twice in order to remove fat. 6 Press out excess water using screw press. 7 Heat all ingredients in pan, add meat. 8 Mix thoroughly until liquid drys up. 9 Dry in oven, separate into small fibres. 10 Dry again.	Pack in glass bottle and PE bag. Shelf life is 6-12 months at room temperature or refrigerator. Problems raised: packaging and mold growth during storage.
Smoked	BRU	Smoked semi-dried fish B$5-6/kg (US$2.66-3.19) *Ikan salai* Smoked fish made from marine fish. Product is eaten with rice.	Fish .*Selar* spp. B$4.00/kg (US$2.13) .*Abalister* spp. B$4.00/kg (US$2.13) .*Euthuynnus* spp. B$5.00/kg (US$2.66)	1 Degut fish and drain. 2 Smoked with charcoal. 3 Smoked fish.	Wrap with paper. Shelf life is 1-2 days. Suggestion raised: need to improve packaging and prevent mould growth during storage.
Smoked	BRU	Smoked dried fish *Tahai* Smoked and sun dried fish. Product is served by boiling with chilli, tamarind and salt; and in local dishes.	Sardine	1 Fish. 2 Wash and arrange on wire grill mesh. 3 Smoke. 4 Sun dry. 5 Dry smoked fish.	Pack in PE bag. Shelf life is 2 months. Suggestion raised: need to improve handling and packaging of product.
Smoked	IND	Smoked fish *Asap* A type of smoked product which is eaten as a snack.	Milk fish .*Chanus-chanus* S$1.10/kg (US$0.59) .*Katsuonus pelamis* S$0.90/kg (US$0.48) Salt.	1 Fish. 2 Dress. 3 Wash. 4 Add salt. 5 Drain. 6 Smoke by machine.	Pack in plastic bag of 1 kg/pack using vacuum sealer. Shelf life is 1 month at cool dry place.
Smoked	MAL	Smoked tuna *Ikan aya asap*	Tuna	NA	NA

Category	Country	Product	Material	Method	Packaging
		Product is fish which is smoked into hardened pieces.			
Smoked	PHI	Smoked boneless milkfish 45-50 pesos/kg (US$2.01-2.23) *Bangus* Product is defined as smoked fish made from milkfish (*Chanos-chanos*). It is fried before eaten.	Milkfish 28-35 pesos/kg (US$1.25-1.56) Brine 60 degree salinity.	1 Split/fillet 2 Clean. 3 Wash. 4 Debone. 5 Brine. 6 Dry. 7 Smoke in smoek house. 8 Pack. 9 Distribute.	Pack in plastic bags (0.03mm PE). Shelf-life is 3-6 months frozen or 15 days refreigerated. Problem on mold and bacterial spoilage.
Smoked	PHI	Smoked sardine 40-45 pesos/kg (US$1.78-2.01) *Law-law* Product is defined as smoked fish made from sardines. It is eaten either fried, with tomatoes, flaked or with noodles.	Sardine 25-30 pesos/kg (US$1.12-1.34) Brine 60°S.	1 Weigh. 2 Clean. 3 Wash. 4 Brine in brining tank. 5 Pre-cooked in charcoal stove. 6 Dry in bamboo tray. 7 Smoke in smoke house. 8 Cool. 9 Pack.	Pack in basket with banana leaves, shallow basket (*bilao*) with newspaper/banana leaves, plastic bag. Shelf-life is 3 days at room temperature or 6 days refrigerated. Problems raised: mold and bacterial spoilage.
Smoked	PHI	Smoked roundscad 30-35 pesos/kg (US$1.34-1.56) *Galonggong* Product is defined as smoked fish made from roundscad (*Decapterus macrosoma*). It is eaten either fried, with tomatoes, flaked or with noodles.	Roundscad 20-25 pesos/kg (US$0.89-1.12) Brine 60°S.	1 Weigh. 2 Clean. 3 Wash. 4 Brine in brining tank. 5 Pre-cooked in charcoal stove. 6 Dry in bamboo tray. 7 Smoke in smoke house. 8 Cool. 9 Pack.	Pack in basket with banana leaves, shallow basket (*bilao*) with newspaper/banana leaves, plastic bag. Shelf-life is 3 days at room temperature or 6 days refrigerated. Problems raised: mold and bacterial spoilage.
Smoked	PHI	Smoked herring 35-40 pesos/kg (US$1.56-1.78) *Tamban* Product is defined as smoked fish made from herring (*Sardinella longiceps*). It is eaten fried.	Herring 23-25 pesos/kg (US$1.03-1.12) Salt.	1 Weigh. 2 Clean. 3 Wash. 4 Brine in brining tank. 5 Pre-cooked in charcoal stove. 6 Dry in bamboo tray. 7 Smoke in smoke house. 8 Cool. 9 Pack.	Pack in basket with banana leaves, shallow basket (*bilao*) with newspaper/banana leaves, plastic bag. Shelf-life is 3 days at room temperature or 6 days refrigerated. Problems raised: mold and bacterial spoilage.
Smoked	PHI	Smoked sardine 35-40 pesos/kg (US$1.56-1.78) *Tunsoy*	Sardine 23-25 pesos/kg (US$1.03-1.12)	1 Weigh. 2 Clean.	Pack in basket with banana leaves, shallow basket (*bilao*) with newspaper/banana leaves, plastic bag.

Category	Country	Product	Material	Method	Packaging
		Product is defined as smoked fish made from sardine. It is eaten fried.	Salt.	3 Wash. 4 Brine in brining tank. 5 Pre-cooked in charcoal stove. 6 Dry in bamboo tray. 7 Smoke in smoke house. 8 Cool. 9 Pack.	Shelf-life is 3 days at room temperature or 6 days refrigerated. Problems raised: mold and bacterial spoilage.
Smoked	PHI	Smoked milkfish 40-45 pesos/kg (US$1.78-2.01) *Bangus* Product is defined as smoked fish made from milkfish. It is eaten fried.	Milkfish 28-35 pesos/kg (US$1/25-1.56) Salt.	1 Weigh. 2 Clean. 3 Wash. 4 Brine in brining tank. 5 Pre-cooked in charcoal stove. 6 Dry in bamboo tray. 7 Smoke in smoke house. 8 Cool. 9 Pack.	Pack in basket with banana leaves, shallow basket (*bilao*) with newspaper/banana leaves, plastic bag. Shelf-life is 3 days at room temperature or 6 days refrigerated. Problems raised: mold and bacterial spoilage.
Smoked	THA	Dried smoked fish 15-150 baht/kg *Pla rom quan or Pla krob* Smoked dried fish made from marine fishes. Product is used in Thai soup (*tom-yum*) and chilli paste (grated before use)	Marine fish .*Dasyodis* spp. .*Aetobatus* spp. .Others Freshwater fish. .*Ophicoephalus* spp. .*Clarias* spp. .*Anabas tastudineves* .*Fluta alba* .*Pontius gonionotis* .*Cyrinus curpio* .*Pangasium* spp. Cost of fish ranges from 8-60 baht/kg.	1 Fish. 2 Gut, clean. 3 Split fish from back (big fish). 4 Sun dry or grill on fire for 4-12 hrs. 5 Smoke for 4-24 hrs in smoke house. 6 Dry in sun again for 1-2 days. 7 Store.	Pack on demand and should always be sun dried every 1-2 weeks to prevent mold growth. Problem raised: packaging. Suggestion raised: beware of insects during sun drying.
Other	BRU	Prawn cracker B$4.00/kg (US$2.13) *Keropok uadang* Round or longitudinal shaped dried chips. Product is deep fried and eaten as snacks.	Prawn .*Penaeidae* spp. B$3.00/kg (US$1.60) Tapioca flour, pepper, salt, baking powder, msg, water.	1 Prawn, mince. 2 Mix with ingredients. 3 Form by machine or manually. 4 Steam for about 1.5 hrs in steamer. 5 Cool. 6 Coloured and keep overnight. 7 Slice by machine or manually. 8 Sun dry for 1 day. 9 Pack.	Pack in thick PE bag. Shelf life is 1 year at room temperature Suggestion raised: need to improve packaging.

Category	Country	Product	Material	Method	Packaging
Other	BRU	Squid cracker B$11.70/kg (US$6.22) *Keropok sotong* Round or longitudinal shaped dried chips. Product is deep fried and eaten as snacks.	Squid .*Loligoidae* spp. B$4.00/kg (US$2.13) Tapioca flour, msg, salt, water.	1 Squid. 2 Mince and mix with ingredients. 3 Form by machine or manually. 4 Steam for about $1\frac{1}{2}$ hrs. 5 Cool. 6 Coloured and keep overnight. 7 Slice by machine or manually. 8 Sun dry for 1 day. 9 Pack.	Pack in thick PE bag. Shelf life is 1 year at room temperature. Suggestion raised: need to improve packaging.
Other	BRU	Fish cracker B$8.40/kg (US$4.47) *Keropok ikan* Round shaped dried chips. Product is deep fried and eaten as snacks.	Fish .*Lutjanidae* spp. B$4.00/kg (US$2.13) .Tapioca flour Salt, msg, water.	1 Fish. 2 Minced meat from meat-bone separator. 3 Mix with ingredients by using mixer. 4 Form manually. 5 Steam for 4 hrs. 6 Cool. 7 Colour and keep chill overnight. 8 Slice by using the slicer. 9 Sun dry for 1 day. 10 Pack.	Pack in thick PE bag. Shelf life is 1 year at room temperature. Suggestion raised: need to improve packaging.
Other	IND	Cracker *Kerupuk* A comminuted dried product which when deep fried will expand and become crispy.	Shrimp S$10/kg (US$5.32) Fish S$1.50/kg (US$0.80) Flour, spices, etc.	1 Raw material. 2 Add ingredients. 3 Mix by mixer. 4 Shape. 5 Steam. 6 Cool. 7 Cut by cutter. 8 Dry. 9 Pack.	Pack in plastic bag. Shelf life about 1 year at room temperature.
Other	MAL	Fish cracker *Keropok ikan* Product is defined as round or oblique or stick shaped dried chips. It is a snack item. Problem raised: shortage of raw material.	Fish Starch, salt, sugar, flavour enhancer.	1 Fish. 2 Remove head, tail and viscera. 3 Debone. 4 Mince. 5 Add ingredients. 6 Mix. 7 Form. 8 Cook. 9 Cool. 10 Slice. 11 Dry. 12 Cool. 13 Pack.	Pack in plastic pack.

Category	Country	Product	Material	Method	Packaging
Other	MAL	Prawn cracker *Keropok udang* Product is defined as round or oblique or stick shaped dried chips. It is a snack item.	Prawn Starch, salt, sugar, flavour enhancer.	1 Fish. 2 Remove head, tail and viscera. 3 Debone. 4 Mince. 5 Add ingredients. 6 Mix. 7 Form. 8 Cook. 9 Cool. 10 Slice. 11 Dry. 12 Cool. 13 Pack.	NA
Other	MAL	Fish satay *Sate ikan* It is a snack item.	Fish Sugar, chilli powder, soy sauce, ginger, salt. Problem raised: shortage of raw material.	1 Fish. 2 Dress. 3 Sun dry. 4 Cool. 5 Roll. 6 Dip in viscous sauce. 7 Oven. 8 Cool. 9 Pack.	Pack in plastic pack.
Other	PHI	Shrimp kropeck *Sitsarong hipon* Product is defined as brittle square chips. It is deep fried as a snack food item. Problem raised: competition from manufacturers of similar snack food items.	Shirmp Rice, salt, msg.	1 Weigh. 2 Wash. 3 Clean. 4 Pre-cook. 5 Grind. 6 Mix. 7 Steam using steamer. 8 Cut. 9 Dry using dryer. 10 Pack.	Pack in air-tight PE and store in a cool, dry place (28°C-33°C). Shelf-life is 12 months or more.
Other	PHI	Seaweed *Gulamang degat* Product is defined as brittle square chips. It is for cook dried gulaman bars in the preparation of gelatin products, and in the manufacture of pharmaceutical, dental and cosmetic products.	Seaweed	1 Sort. 2 Preparation of solution. 3 Bleach. 4 Wash. 5 Dry using drying trays. 6 Boil. 7 Freeze. 8 Thaw. 9 Cut.	Pack in sack and store in a cool, dry, shady place. Shelf-life is 12 months or more.

Category	Country	Product	Material	Method	Packaging
				10 Dry. 11 Pack.	
Other	SIN	Prawn cracker Describe as toasted seasoned prawn chips. Eaten as titbits and snacks.	Prawn chips imported from Malaysia.	1 Prawn chip, 2cm long each. 2 Dry in drier at 40°-45°C for about 8 hrs. 3 Toast in toasting machine at 250°C. 4 Mix with seasoning liquid. 5 Dry. 6 Pack by packaging machine.	Pack in plastic retail packet of 25 gm. Shelf life is 1 year at room temperature.
Other	SIN	Prepared cuttlefish Roasted cuttlefish seasoned with spices and chilli. It is a ready-to-eat snack.	Semi-dried whole cuttlefish Sugar, salt, seasoning, colouring.	1 Semi-dried whole cuttlefish. 2 Sort and separate tentacles from body. 3 Soak in seasoning for about 8 hrs. 4 Toast on toasting machine. 5 Crimp by crimp machine. 6 Pack by packaging machine.	Pack in plastic retail packet of 25-50 gm. Shelf life is 1 year at room temperature.
Other	THA	Shrimp or fish cracker 80-100 baht/kg (US$3.15-3.93) *Khau kriab pla* Product is made from any kind of fish mixed with other ingredients mainly tapioca flour. It is deep fried in oil before eaten.	MInced meat of shrimp or fish Tapioca flour, salt, pepper, garlic, hot water, sugar.	1 Mix all ingredients and knead using kneading machine. 2 Form into desired shape eg. roll, etc. 3 Steam for about 1.5 hours in steam pot. 4 Cool overnight. 5 Cut into thin slices using slicer. 6 Sun-dry for 1-2 days on drying tray. 7 Keep in containers. Problem raised: quality control in processing methods.	Keep in air-tight containers and store at room temperature. Packed products should be placed in shed to prevent discoloration. Shelf-life is 1 year.
Other	THA	Fish satay 80-100 baht/kg (US$3.15-3.93) *Pla satay* Product is defined as dried minced fish product which is seasoned with sugar, soya sauce, sesame seed and deep fried. It is consumed directly.	Lizard fish 6-8 bahts/kg (US$0.24-0.32) Flour, soya sauce, sugar, salt, sesame seed.	1 Fish. 2 Mince fish by meat-bone separator. 3 Mix with ingredients. 4 Form to round sheet. 5 Sun-dry for half-day. 6 Deep fry. 7 Pack. Problem raised: quality control in processing methods.	Pack in plastic bag or aluminium bag and store at room temperature. Shelf-life is 3-5 months.

ANNEX 2: (i) PRODUCTION/EXPORT VOLUME/DESTINATION OF EXPORT

Category	Product	Country	Production				Export				Destination
			1984	1985	1986	1987	1984	1985	1986	1987	
Boiled	Fish	IND	96,396	97,619	92,487	NA	NA	NA	NA	NA	NIL
Boiled	Fish	MAL	6,472	5,297	743	1,922	NA	NA	NA	NA	NA
Boiled	Fish, cooked	SIN	154	159	283	385	0	0	0	0	NIL
Boiled	Fish, steamed	THA	NA	9,285	7,801	NA	NA	NA	NA	NA	NIL
Canned	Baby clam	THA	50,507	83,726	101,232	NA	6,710	8,462	8,808	NA	CAN AUS GER ITA JAP NET UK USA
Canned	Crab meat	THA	22356	22,233	30,432	NA	6,988	6,378	8,173	NA	AUS BEL CAN DEN FRA ITA JAP NET SWE UK USA
Canned	Fish in tomato sauce	THA	324,109	28,9511	303,041	NA	2,412	3,012	8,782	NA	AUS MAL FRA FIN NZ SIN SA USA
Canned	Mackerel in tomato sauce	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Canned	Mackerel, tuna, sardine	IND	9,567	4,621	3,541	NA	NA	NA	NA	NA	NIL
Canned	Milkfish in oil	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NZ
Canned	Milkfish in tomato sauce	PHI	NA	NA	NA	NA	NA	47	37	74	CAN USA NOR UK G SWI KUW SA SIN AUS GUA HAW AUT
Canned	Milkfish, salmon style	PHI	NA	NA	NA	NA	NA	NA	NA	NA	GUA APE BAH
Canned	Sardine in tomato sauce	PHI	NA	NA	NA	NA	NA	6	48	198	USA NET WG SWI SA SAB GUA TTP HAW CAN NOR DEN UK AUT APE BAH TAI AUS NZ
Canned	Shrimp	THA	137,336	127,643	141,174	NA	11,631	12,231	14,444	NA	CAN FRA USA UK AUS SWE NET ITA
Canned	Tuna	THA	76,838	86,881	93,772	NA	39,862	87,134	141,759	NA	AUS BEL CAN DEN FIN FRA GER ITA JAP MAL NET SWI SA SIN UK USA
Canned	Tuna in oil	PHI	NA	NA	NA	NA	22,598	25,467	26,401	26,061	CAN USA PUE SWE NOR FIN DEN UK NET BEL FRA G AUT SWI GOZ ITA GRE ISR KUW SIN GUA MOZ BAR IRE CYP LEB SA BAH THA NZ AUS
Comminuted	Cuttlefish ball	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Cuttlefish sausage & cocktail	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Cuttlefish/squie ball	SIN	188	193	181	75	30	12	3	0	JAP AUS
Comminuted	Fish burger	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Fish burger	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Fish noodle	THA	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Fish sausage & cocktail	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Fishball	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Fishball	IND	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Fishball	MAL	1,966	1,264	976	1,705	NA	NA	NA	NA	NIL
Comminuted	Fishball	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Fishball	THA	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Fishball/fishcake	SIN	412	599	395	435	0	11	4	23	BRU MAL AUS G JAP
Comminuted	Fishcake	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Fishcake	MAL	10	25	19	21	NA	NA	NA	NA	NIL
Comminuted	Fishcake, scallop flavour	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Imitation crab meat	THA	NA	NA	NA	NA	NA	NA	NA	NA	EC
Comminuted	Native sausage	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Otak-otak	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Prawn burger	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Prawn dumpling, fresh	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Comminuted	Prawn sausage & cocktail	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL

NA: not available NIL: no export

Category	Product	Country	Production				Export				Destination
			1984	1985	1986	1987	1984	1985	1986	1987	
Comminuted	Surimi	THA	NA	NA	NA	NA	NA	NA	NA	NA	SIN JAP MAL EC AUS
Dried	Abalone	PHI	NA	NA	NA	NA	NA	NA	NA	NA	HK JAP AUS HAW
Dried	Anchovy	MAL	6,962	4,682	6,046	11,054	NA	NA	NA	NA	NIL
Dried	Anchovy	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Cockle	MAL	735	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Cuttlefish	MAL	409	302	238	233	NA	NA	NA	NA	NIL
Dried	Fish	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Fish, chilled sour salted	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Fish, dried	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Fish, freshwater, salted	THA	20,762	11,240	25,767	NA	NA	NA	NA	NA	NIL
Dried	Fish, salted	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Fish, salted	IND	337,746	349,391	362,395	NA	NA	NA	NA	NA	NIL
Dried	Fish, salted	MAL	11,629	7,416	5,338	6,548	2,763	2,581	1,123	1,003	NIL
Dried	Fish, salted	THA	67,280	61,342	61,782	NA	2,826	4,812	6,007	NA	HK USA FRA MAL JAP AUS
Dried	Jelly fish	MAL	2,541	602	255	464	NA	NA	NA	NA	NIL
Dried	Jelly fish	THA	10,992	29,018	76,090	NA	NA	NA	NA	NA	NIL
Dried	Mildfish	PHI	28,030	39,992	8,076	3,403	700	404	358	472	CAN USA NET KUW SA BAH AUS GUA TTP NOR UK G ITA OMA HK TAI LEB NZ PNG SIN JAP
Dried	Prawn	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Prawn	MAL	667	883	638	702	224	188	332	226	NIL
Dried	Sea cucumber	PHI	NA	NA	NA	NA	NA	NA	NA	NA	CAN USA SWI SIN HK TAI JAP
Dried	Sea cucumber	SIN	NA	NA	NA	NA	NA	NA	NA	NA	HK MAL TAI
Dried	Shark fin	PHI	NA	NA	NA	NA	10	NA	11	NA	FRA HK TAI
Dried	Shark fin	SIN	20	19	14	21	20	10	20	0	HK MAL
Dried	Shellfish	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Shellfish	THA	9,641	6,240	3,214	NA	125	115	131	NA	HK
Dried	Shrimp	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Shrimp	THA	42,809	37,765	36,124	NA	6,234	5,925	6,749	NA	HK MAL NET UK FRA USA AUS G BEL
Dried	Squid	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Dried	Squid	THA	38,764	46,414	45,871	NA	4,078	4,386	4,877	NA	JAP HK MAL SIN USA
Fermented	Anchovy	MAL	115	90	237	87	NA	NA	NA	NA	NIL
Fermented	Fish	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Fermented	Fish	IND	7,146	6,928	6,738	NA	NA	NA	NA	NA	NIL
Fermented	Fish paste	IND	16,018	13,911	12,874	NA	NA	NA	NA	NA	NIL
Fermented	Fish paste	PHI	NA	NA	NA	NA	22	NA	167	194	CAN USA NOR UK NET FRA G AUT SWI SPA ITA JOR KUW SA GUA SAP QAT BAH HUN AUS PNG NZ
Fermented	Fish sauce	IND	91	664	566	NA	NA	NA	NA	NA	NIL
Fermented	Fish sauce	PHI	NA	NA	NA	NA	12	NA	NA	NA	NIL
Fermented	Fish sauce, *budu*	THA	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Fermented	Fish sauce, *nam pla*	THA	80,671	68,939	74,531	NA	8,754	9,109	10,711	NA	HK SA FRA USA AUS
Fermented	Fish stomach	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Fermented	Fish, *pla chao*	THA	NA	NA	NA	NA	NA	NA	NA	NA	NIL

Category	Product	Country	Production				Export				Destination
			1984	1985	1986	1987	1984	1985	1986	1987	
Fermented	Fish, *pla jom*	THA	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Fermented	Fish, *pla ra*	THA	12,832	7,962	10,274	NA	NA	NA	NA	NA	NIL
Fermented	Fish, *pla som*	THA	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Fermented	Mussel	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Fermented	Prawn paste	MAL	363	317	156	103	NA	NA	NA	NA	NIL
Fermented	Prawn, pickled	MAL	67	94	45	55	NA	NA	NA	NA	NIL
Fermented	Shrimp paste	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Fermented	Shrimp paste	MAL	2,818	3,146	3,283	3,883	NA	NA	NA	NA	NIL
Fermented	Shrimp paste	PHI	NA	NA	NA	NA	NA	NA	315	443	CAN USA NOR HAW UK FRA G AUT GUA SWI KUW SAP BAH KOR SPA HK JAP ITA PNG NZ
Fermented	Shrimp paste	THA	21,153	18,818	19,359	NA	247	80	152	NA	CAN SA USA
Fermented	Shrimp, pickled	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Fish meal	Animal feed	IND	2,943	1,773	928	NA	NA	NA	NA	NA	NIL
Fish meal	Animal feed	MAL	27,097	21,867	22,877	43,621	2,249	3,099	2,397	3,945	NIL
Fish meal	Animal feed	PHI	489	NA	67	606	<1	714	733	NA	NIL
Fish meal	Animal feed	SIN	3,158	2,647	1,926	1,602	NA	NA	NA	NA	NIL
Fish meal	Animal feed	THA	209,885	214,210	207,150	NA	85,487	74,791	68,114	NA	HK TAI MAL SIN IND
Fish meal	Fish manure	MAL	4,396	2,095	2,655	6,174	NA	NA	NA	NA	NIL
Frozen	Cuttlefish	MAL	319	129	102	522	NA	NA	NA	NA	NIL
Frozen	Cuttlefish	THA	56,352	42,814	51,625	NA	1,599	470	3,834	NA	ITA JAP FRA
Frozen	Cuttlefish/squid	SIN	3,000	3,551	451	324	729	3,394	314	184	HK JAP SPA KOR THA
Frozen	Fish	MAL	NA	2,348	2,060	2,426	NA	NA	NA	NA	NIL
Frozen	Fish	SIN	1,271	3,756	4,766	5,645	356	2,713	3,242	4,992	USA JAP FRA SA AUS KOR GER ITA MAL
Frozen	Fish	THA	1,664,265	1,722,797	1,974,195	NA	75,254	96,444	118,911	NA	AUS JAP USA
Frozen	Fish, shrimp, squid	IND	41,626	53,996	56,623	NA	NA	NA	NA	NA	NIL
Frozen	Mildfish	PHI	2,223	NA	1,813	747	1,155	1,522	1,810	1,689	NIL
Frozen	Octopus	THA	6,549	9,225	11,946	NA	NA	NA	NA	NA	ITA JAP FRA
Frozen	Prawn	MAL	NA	3,134	4,676	3,884	NA	NA	NA	NA	NIL
Frozen	Prawn	PHI	NA	NA	NA	NA	NA	NA	NA	NA	CAN USA UK NET KUW SA BAH SIN JAP AUS GUA TTP HAW SWI NAU HK NZ
Frozen	Prawn/shrimp	SIN	509	665	488	2,358	198	509	354	2,110	NIL
Frozen	Shellfish	THA	153,595	183,523	160,691	NA	11,156	12,732	22,395	NA	JAP USA
Frozen	Shrimp	PHI	1,839	NA	1,546	1,390	6,228	8,105	11,211	14,935	CAN USA UK NET FRA G ITA APE THA SIN HK TAI JAP OKI AUS TTP HAW CYP NZ
Frozen	Shrimp	THA	142,073	134,801	147,579	NA	19,428	24,041	28,729	NA	AUS HK JAP USA UK
Frozen	Squid	THA	66,340	63,996	71,344	NA	NA	NA	NA	NA	ITA JAP FRA
Frozen	Tuna	PHI	3,333	NA	13,528	38,340	13,387	11,899	9,168	11,250	CAN USA DEN ITA ISR THA SIN KOR HK JAP OKI GUA HAW TTP
Powdered	Fish floss	THA	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Powdered	Prawn dust	MAL	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Smoked	Fish	IND	28,930	29,587	36,957	NA	NA	NA	NA	NA	NIL
Smoked	Fish, dried	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Smoked	Fish, dried	THA	2,925	46,870	2,833	NA	NA	NA	NA	NA	MAL SIN USA HK JAP FRA UK AUS CAN
Smoked	Fish, semi-dried	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Smoked	Herring	PHI	NA	NA	NA	NA	NA	NA	NA	NA	CAN USA SA AUS GUA HAW KUW
Smoked	Lizard fish	THA	648	507	464	NA	NA	NA	NA	NA	NIL

Category	Product	Country	Production				Export				Destination
			1984	1985	1986	1987	1984	1985	1986	1987	
Smoked	Milkfish	PHI	NA	NA	NA	NA	NA	NA	NA	NA	CAN USA KUW SIN GUA HAW UK SA NZ NAU
Smoked	Milkfish, boneless	PHI	310	48	96	14	NA	108	NA	190	CAN USA SA GUA HAW KUW SIN UK NZ
Smoked	Other food fishes	THA	1,503	50	95	NA	NA	NA	NA	NA	NIL
Smoked	Roundscad	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Smoked	Sardine, *law-law*	PHI	NA	NA	NA	NA	NA	NA	NA	NA	CAN USA KUW AUT GUA NZ HAW
Smoked	Sardine, *tunsoy*	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Smoked	Tuna	MAL	NA	NA	NA	NA	NA	NA	NA	NA	JAP
Other	Cracker, fish & shrimp	IND	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Other	Fish cracker	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Other	Fish cracker	MAL	6,126	5,429	1,475	10,611	NA	NA	NA	NA	NIL
Other	Fish or shrimp cracker	THA	NA	NA	NA	NA	NA	NA	NA	NA	USA HK
Other	Fish satay	MAL	NA	121	104	191	NA	NA	NA	NA	NIL
Other	Fish satay	THA	NA	NA	NA	NA	NA	NA	NA	NA	MAL
Other	Prawn cracker	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Other	Prawn cracker	MAL	38	55	41	30	NA	NA	NA	NA	NIL
Other	Prawn cracker	SIN	53	47	40	85	0	0	0	0	NIL
Other	Prepared cuttlefish	SIN	105	199	160	131	32	90	43	29	JAP FRA MAL
Other	Seaweed	PHI	NA	NA	NA	NA	NA	23,749	29,426	26,563	AUS NZ SWE ARG SA OKI CAN USA CHI DEN UK IRE NET FRA G SPA POR THA KOR HK TAI JAP MOZ KUW
Other	Shrimp kropoeck	PHI	NA	NA	NA	NA	NA	NA	NA	NA	NIL
Other	Squid cracker	BRU	NA	NA	NA	NA	NA	NA	NA	NA	NIL

Annex 2: (ii) Destination Code For Export

CODE	DESTINATION	CODE	DESTINATION
APE	ARABIAN PENINSULA STATES	KUW	KUWAIT
ARG	ARGENTINA	LEB	LEBANON
AUS	AUSTRALIA	MAL	MALAYSIA
AUT	AUSTRIA	MOZ	MOZAMBIQUE
BAH	BAHRAIN	NAU	NAURU
BAR	BARBADOS	NET	NETHERLANDS
BEL	BELGIUM	NOR	NORWAY
BRU	BRUNEI	NZ	NEW ZEALAND
CAN	CANADA	OKI	OKINAWA, JAPAN
CHI	CHILE	OMA	OMAN
CYP	CYPRUS	PHI	PHILIPPINES
DEN	DENMARK	PNG	PAPUA NEW GUINEA
EC	EUROPEAN COMMUNITY	POR	PORTUGAL
FIN	FINLAND	PUE	PUERTO RICO
FRA	FRANCE	QAT	QATAR
GER	GERMANY	SA	SAUDI ARABIA
GOZ	GOZO (MALTA)	SAB	SABAH, MALAYSIA
GRE	GREECE	SIN	SINGAPORE
GUA	GUAM	SPA	SPAIN
HAQ	HAWAII	SWE	SWEDEN
HK	HONG KONG	SWI	SWITZERLAND
HUN	HUNGARY	TAI	TAIWAN
IND	INDONESIA	THA	THAILAND
IRE	IRELAND	TTP	TRUST TERRITORY OF THE PACIFIC ISLANDS
ISR	ISRAEL		
ITA	ITALY	UK	UNITED KINGDOM
JAP	JAPAN	USA	UNITED STATES OF AMERICA
JOR	JORDAN		
KOR	REPUBLIC OF KOREA (SOUTH KOREA)		

ANNEX 3: LIST OF CO-ORDINATORS AND RESPONDENTS

Brunei Darussalam

Mr Matdanan bin Haji Ja'afar (co-ordinator)
Director of Fisheries
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Tel: 42068

Respondents:
Ms Marilou V. Alcasid
Ms Hamidah Hj Ladia
Ms Mariani Hj Sabtu
Ms Ranimah Hj A. Wahab

Indonesia

Ms Enni Soetopo (co-ordinator)
Chief, Sub-directorate Program & Project Aid
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Respondent:
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Malaysia

Ms Rabihah Mahmood (co-ordinator)
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Ministry of Agriculture Malaysia
Jalan Sultan Salahuddin
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Respondents:
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Mr Ahmad Hazizi Abd. Aziz
Mr Hafiz b. Ahmad

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Ms Gloria Guevara (co-ordinator)
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880 Quezon Avenue, Quezon City
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Respondents:
Ms Marcaria D. Andrade
Ms Consuelo C. Camu
Ms Adoracion R. Evangelista

Singapore

Mr Chin Yew Neng (co-ordinator)
Primary Production Department
3rd Storey, National Development Building
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Tel: 3226616

Respondent:
Mr Yeap Soon Eong

Thailand

Ms Sirilak Suwanrangsi (co-ordinator)
Fishery Technological Development Division
Department of Fisheries
New Road, Yanawa
Bangkok 10120
Tel: 2124552

Respondents:
Dr Poonsap Virulhakul
Ms Preeda Methathip
Ms Orawan Kongpun

ANNEX 4. QUESTIONNAIRE FORMS

INVENTORY OF FISH PRODUCTS IN SOUTHEAST ASIA

Please answer all items. If information is not available, please indicate by "N.A.".

General statements may be given if estimated figures are not available; please indicate this by abbreviation "Gen.".

When exact statistical figures are not available, estimated figures may be used; please indicate by abbreviation "Est." if figures are estimated.

Part 1: Country Contacts

a) **Name/address of co-ordinator:** _____

_____

_____

Telephone: Cable: Telex: Fax:

b) **Name/address of respondent [please indicate section(s) involved]**

(1) _____

_____

Telephone: Cable: Telex:

(2) _____

_____

Telephone: Cable: Telex:

(1) _____

_____

Telephone: Cable: Telex:

PART II: DETAILS OF PRODUCTS

a) Dried products (including salted dried, semi-dried, etc.)

Name of Product		Description of product	References	Materials Used			Outline of processing method
English name	Local name			Main materials	Cost per kg	Sub ingredients	

List of machines used	Final Product				
	Packaging conditions	Storage conditions (state method/temp.)	Shelf life	Ways of consumption	Retail price per kg

Production Volume (MT)								Countries of destination (export)	Remarks on present/current problems in marketing & quality control
Production				Export					
1984	1985	1986	1987	1984	1985	1986	1987		

REFERENCES

REFERENCES

Category	Product	Country	Reference
Boiled	Fish	IND	Fisheries Statistics of Indonesia 1985.
Boiled	Fish	MAL	1. FAO Fisheries Rep. No. 4 Quezon City - 1961. 2. FAO Workshop on Development of Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29/6-1/7/85).
Boiled	Steamed Fish	THA	1. Fisheries Record of Thailand 1981 by Fisheries Statistics Section. 2. Statistics of Fisheries Factory 1982 by Fisheries Statistics Section. 3. Fisheries Processing Method by FTDD.
Canned	Baby clam	THA	Fisheries Record of Thailand 1986.
Canned	Crab meat	THA	Fisheries Record of Thailand 1986.
Canned	Fish in tomato sauce	THA	Fisheries Record of Thailand 1986.
Canned	Mackerel in tomato sauce	PHI	1. Philippine Handbook on Fish Processing Technology. NSDB. 1980. 2. Fish Curing & Processing. MIR Publishers, Moscow.
Canned	Mackerel, tuna, sardine	IND	Fisheries Statistics of Indonesia 1985.
Canned	Milkfish in oil	PHI	1. Philippine Handbook on Fish Processing Technology. NSDB. 1980. 2. Fish Curing & Processing. MIR Publisheres, Moscow.
Canned	Milkfish in tomato sauce	PHI	1. Philippine Handbook on Fish Processing Technology. NSDB. 1980. 2. Fish Curing & Processing. MIR Publisheres, Moscow.
Canned	Milkfish, salmon style	PHI	1. Philippine Handbook on Fish Processing Technology. NSDB. 1980. 2. Fish Curing & Processing. MIR Publisheres, Moscow.
Canned	Sardine in tomato sauce	PHI	1. Philippine Handbook on Fish Processing Technology. NSDB. 1980. 2. Fish Curing & Processing. MIR Publishers, Moscow.
Canned	Shrimp	THA	Fisheries Record of Thailand 1986.
Canned	Tuna	THA	Fisheries Record of Thailand 1986.
Canned	Tuna in oil	PHI	1. Philippine Handbook on Fish Processing Technology. NSDB. 1980. 2. Fish Curing & Processing. MIR Publishers, Moscow.
Comminuted	Fish burger	PHI	PDS fish recipe.

Category	Product	Country	Reference
Comminuted	Fishball	IND	Fisheries Statistical of Indonesia 1985.
Comminuted	Fishball	MAL	1. *Berita Nelayan Bil. 31.* (Fishermen News) 2. *Risalah MARDI No. 14 (Panduan Usahawan).* (MARDI Pamphlet)
Comminuted	Fishball	PHI	PDS fish recipe.
Comminuted	Fishball	THA	Some Thai Traditional and Developed Fish Products by FIDD.
Comminuted	Fishcake	MAL	FAO Workshop on Development of Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29/6-1/7/85).
Communited	Native sausage	PHI	The Chemistry and Technology of Marine Products Processing.
Cured	*Kench*-style cured fish	PHI	Philippine Handbook on Processing Technology. NSDB.
Dried	Abalone	PHI	Philippine Handbook on Processing Technology. NSDB.
Dried	Anchovy	MAL	1. Annual Fisheries Statistics 1980, 1981, 1982, 1983 & 1984. 2. *Berita Nelayan* (Fishermen News) Vol. 21, No. 13 (1978), 29.
Dried	Anchovy	PHI	Philippine Handbook on Processing Technology. NSDB.
Dried	Cuttlefish	MAL	FAO Workshop on Development of Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29/6-1/7/85).
Dried	Fish	MAL	1. *Teknologi Makanan* (Food Technology), Vol. 4, No. 1 (1985). 2. Infofish Marketing Digest 2/83. 3. Report on FAO/EPIP Regional Training Center on Fish Processing Technology 1961.
Dried	Fish	PHI	Philippine Handbook on Processing Technology. NSDB.
Dried	Fish, freshwater, salted	THA	1. Fisheries Record of Thailand 1981 by Fisheries Statistics Section. 2. Statistics of Fisheries Factory 1982 by Fisheries Statistics Section. 3. Fisheries Processing Products by FTDD.
Dried	Fish, salted	IND	Fisheries Statistics of Indonesia 1985.
Dried	Fish, salted	MAL	1. *Teknologi Makanan* (Food Technology), Vol. 4, No. 1 (April 1985). 2. Infofish Marketing Digest 2/83. 3. Report on FAO/EPTP Regional Training Center on Fish Processing Technology 1961.
Dried	Fish, salted	THA	1. Fisheries Record of Thailand 1981 by Fisheries Statistics Section. 2. Statistics of Fisheries Factory 1982 by Fisheries Statistics Section. 3. Fisheries Processing Products by FTDD.

Category	Product	Country	Reference
Dried	Jelly fish	MAL	1. *Berita Nelayan* (Fishermen News), No. 26. 2. FAO Workshop on Development of Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29/6-1/7/85).
Dried	Jelly fish	THA	1. Fisheries Record of Thailand 1981 by Fisheries Statistics Section. 2. Statistics of Fisheries Factory 1982 by Fisheries Statistics Section. 3. Some Thai Traditional and Developed Fish Products.
Dried	Milkfish	PHI	Milkfish (*bangus*) As Food. NSDB.
Dried	Prawn	MAL	1. Report on FAO/KATA Regional Training Center on Fish Processing Technology 1961.
Dried	Sea cucumber	PHI	Fish Processing Handbook for the Phil. A. Avery.
Dried	Sea cucumber	SIN	Infofish Marketing Digest 6/83 p 19-21.
Dried	Shark fin	PHI	Fish Processing Handbook for the Phil. A. Avery.
Dried	Shellfish	THA	1. Fisheries Record of Thailand 1981 by Fisheries Statistics Section. 2. Statistics of Fisheries Factory 1982 by Fisheries Statistics Section. 3. Fisheries Processing Method by FTDD.
Dried	Shrimp	PHI	Philippine Handbook on Processing Technology. NSDB.
Dried	Shrimp	THA	1. Fisheries Record of Thailand 1981 by Fisheries Statistics Section. 2. Statistics of Fisheries Factory 1982 by Fisheries Statistics Section. 3. Fisheries Processing Method by FTDD.
Dried	Squid	PHI	1. Philippine Handbook on Processing Technology. NSDB. 2. Fish Processing Handbook for the Phil. A. Avery.
Dried	Squid	THA	1. Fisheries Record of Thailand 1981 by Fisheries Statistics Section. 2. Statistics of Fisheries Factory 1982 by Fisheries Statistics Section. 3. Fisheries Processing Method by FTDD.
Fermented	Anchovy	MAL	1. *Berita Nelayan* (Fishermen News), No. 17, 32. 2. *Teknologi Makanan* (Food Technology), Vol. 3, No. 2 (Oct 1984). 3. FAO Workshop on Development of Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29/6-1/7/85).
Fermented	Fish	IND	Fisheries Statistics of Indonesia 1985.
Fermented	Fish paste	IND	Fisheries Statistics of Indonesia 1985.
Fermented	Fish paste	PHI	Philippine Handbook on Fish Processing Technology. NSDB. 1980.

Category	Product	Country	Reference
Fermented	Fish sauce	IND	Fisheries Statistics of Indonesia 1985.
Fermented	Fish sauce	PHI	1. Philippine Handbook on Fish Processing Technology. NSDB. 1980 p. 15 2. Fish Curing & Processing. MIR Publishers, Moscow.
Fermented	Fish sauce, *budu*	THA	National Research Council 1982. Report on Thai Traditional Fermented Food Research Project Phase I: 37-39.
Fermented	Fish sauce, *nam pla*	THA	National Research Council of Thailand (1982). Report on Thai Traditional Fermented Food, Research Project Phase I: 41-43. Rattagool, P and Methalip, P. Improving production of fish sauce. IPFC Working Party on Fish. Technology and Marketing in Melbourne, Australia, 23-26 October 1984.
Fermented	Fish, *pla chao*	THA	Rattagool, P. 1984. Fermented Fish products in Thailand. This paper was prepared for Regional Training Course for Fishery Extension Officers in Marine Capture Fisheries on Fish Handling and Processing at SEAFDEC, Thailand.
Fermented	Fish, *pla ra*	THA	National Research Council of Thailand (1982). Report on Thai Traditional Fermented Food, Research Project Phase I: 5-11.
Fermented	Fish, *pla som*	THA	Rattagool, P. 1984. Fermented Fish products in Thailand. This paper was prepared for Regional Training Course for Fishery Extension Officers in Marine Capture Fisheries on Fish Handling and Processing at SEAFDEC, Thailand.
Fermented	Prawn paste	MAL	FAO Workshop on Development of Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29/6-1/7/85).
Fermented	Prawn, pickled	MAL	1. *Berita Nelayan Bil.* 23. (Fishermen News) 2. *Teknology Makanan* (Ford Technology) Jil. 4, Bil. 1 (April 1985). 3. FAO Workshop on Development of Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29/6-1/7/85).
Fermented	Shrimp paste	MAL	1. *Berita Nelayan* (Fishermen News), No. 10. 2. *Teknologi Makanan* (Food Technology), Vol. 3, No. 1 (April 1984). 3. Report on FAO/BOTA Regional Training Center on Fish Processing Technology 1961.
Fermented	Shrimp paste	PHI	1. Philippine Handbook on Fish Processing Technology. NSDB. 1980 p.15 2. Fish Curing & Processing. MIR Publishers, Moscow.
Fermented	Shrimp paste	THA	Saisithi, p. 1982. 'Fishery Products' Institute of Food Research and Product Development. Kasetsart University, Bangkok, Thailand.
Fish meal	Animal feed	IND	Fisheries Statistics of Indonesia 1985.
Fish meal	Animal feed	MAL	FAO Workshop on Development on Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29.6-1/7/85).
Fish meal	Animal feed	PHI	1. Fish Curing & Processing by A.D. Merindol. MIR Publishers, Moscow. 1969. 2. Philippine of Fisheries on Fish Processing Technology. NSDB. Bicutan, Taguig Metro Manila. 1980.

Category	Product	Country	Reference
Fish meal	Animal feed	THA	1. Fisheries Record of Thailand 1986 by Fisheries Statistics Section. 2. Statistics of Fisheries Factory 1986 by Fisheries Statistics Section.
Powdered	Fish floss	THA	Some Thai Traditional and Developed Fish Products by Mrs Perngrudee Pruthiarenum, FTDD.
Frozen	Cuttlefish	MAL	*Berita Nelayan* (Fishermen News), 24 March 1981.
Frozen	Fish, shrimp, squid	IND	Fisheries Statistics of Indonesia 1985.
Frozen	Prawn	PHI	Prawn presentation and Processing. Australian Fisheries Newsletter. January 1988 : 7-11.
Frozen	Shrimp	PHI	Prawn presentation and Processing. Australian Fisheries Newsletter. January 1988 : 7-11.
Frozen	Tuna	PHI	Fisheries Extension Series. BFAR 1986, p 23.
Other	Cracker, fish & shrimp	IND	Fisheries Statistics of Indonesia 1985.
Other	Fish cracker	MAL	1. *Berita Nelayan* (Fishermen News), No. 13, 25, 29. 2. *Risalah* MARDI No. 8 (MARDI Pamphlet).
Other	Fish or shrimp cracker	THA	Some Thai Traditional and Developed Fish Products by FTDD.
Other	Fish satay	MAL	FAO Workshop on Development of Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29/6-1/7/85).
Other	Prawn cracker	MAL	1. *Berita Nelayan* (Fishermen News), No. 13, 25, 29. 2. *Risalah* MARDI No. 8 (MARDI Pamphlet).
Other	Seaweed	PHI	Philippine Handbook on Fish Processing Technology. NSDB. Bicutan, Taguig Metro Manila, Philippines. 1980
Other	Shrimp kropoeck	PHI	Philippine Handbook on Fish Processing Technology. NSDB. Bicutan, Taguig Metro Manila, Philippines. 1980
Other	Fish	IND	Fisheries Statistics of Indonesia 1985.
Smoked	Fish, dried	THA	1. Fisheries Record of Thailand 1981 by Fisheries Statistics Section. 2. Statistics of Fisheries Factory 1982 by Fisheries Statistics Section. 3. Some Thai Traditional and Developed Fish Products by FTDD.
Smoked	Herring	PHI	Philippine Handbook on Fish Processing Technology.
Smoked	Lizard fish	THA	Statistics of Fisheries Factory.
Smoked	Milkfish, boneless	PHI	1. Philippine Handbook on Fish Processing Technology. 2. Fish Curing & Processing. MIR Publishers, Moscow.

Category	Product	Country	Reference
Smoked	Other food fishes	THA	Statistics of Fisheries Factory.
Smoked	Round scad	PHI	1. Philippine Handbook on Fish Processing Technology. 2. Fish Curing & Processing. MIR Publishers, Moscow.
Smoked	Round scad	PHI	1. Philippine Handbook on Fish Processing Technology. 2. Fish Curing & Processing. MIR Publishers, Moscow.
Smoked	Sardine, *law-law*	PHI	1. Philippine Handbook on Fish Processing Technology. 2. Fish Curing & Processing. MIR Publishers, Moscow.
Smoked	Sardine, *tunsoy*	PHI	Philippine Handbook on Fishing Processing Technology.
Smoked	Tuna	MAL	FAO Workshop on Development of Small Scale Processing Industry in Fishing Villages, Penang, Malaysia (29/6-1/7/85).

INDEX

INDEX

Southeast Asian Fish Products

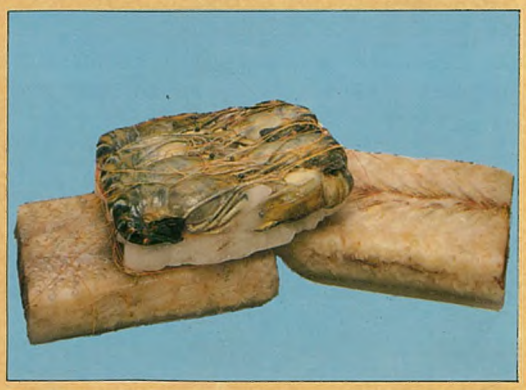
Second Edition, 1991

This book is based on an Asean wide survey of fish products processed and consumed in the region.

The results of the products surveyed are organised according to 11 main categories shown on this cover.

Marine Fisheries Research Department **ISBN 9971-88-283-3**

Fish meal



Frozen

Boiled

Cured

Powdered

Canned

Dried

Smoked

Comminuted

Fermented

Others