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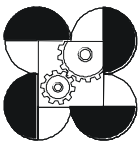
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# **FISH PROCESSING**



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***‘Our Business is Industry...’***

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# **FISH and SHELLFISH FOOD PRODUCTS**

## **INTRODUCTION**

**FISH and SHELLFISH**, of either marine or freshwater origin, easily spoil due to the action of microorganisms and naturally occurring enzymes. This problem becomes particularly evident during peak season when there is a surplus of supply of these commodities.

This glut in the supply results not only to spoilage and wastage of products but also triggers unprofitable low-prices in the market for the fresh produce. Therefore, to maximize the utilization of fish and shellfish catch, processing methods were developed and adapted at the ITDI. These methods can be applied on a micro to small-scale basis to help generate livelihood opportunities, augment family incomes, prevent wastage and insure proper utilization of these resources.

## FERMENTED PRODUCTS

### PATIS and BAGOONG

#### Raw Material

- fresh fish
- salt – coarse or semi-refined

#### Utensils

- |               |                                    |
|---------------|------------------------------------|
| plastic basin | jars – wide mouth ( <i>garapon</i> |
| colander      | – plastic or glass)                |
| wooden ladle  | cheesecloth                        |
|               | rubber bands                       |

#### Procedure

1. Use fresh raw materials such as *dilis*, *galunggong*, *tamban*, *tunsoy*, or small shrimps (*alamang*, *acetes sp.*).
2. Mix thoroughly 1 part salt to 3 parts washed and drained fish (by weight). Transfer into wide mouth jars and cover with cheesecloth bound by rubber band.
3. Allow to ferment for at least six months or longer until it develops the characteristic flavor and aroma of *bagoong*. Stir once a week for the first 2 months, then once a month thereafter.
4. For fish sauce or *patis*, continue fermentation until the solids settle and liquid collects on top of the mixture. (4 - 6 months more)
5. Decant the sauce and filter. Set aside as premium extract.
6. To the fish residue, add an equal amount (by weight) of saturated brine solution (one part salt to two parts water by weight [1:2]) with 0.1% sodium benzoate (1 gram per kilogram brine) then let it age for 2-4 weeks.

7. The resulting sauce is drained and filtered to produce the 2<sup>nd</sup> extract.
8. The residue is again combined with an equal weight of saturated brine solution with 0.1% sodium benzoate and aged 2-4 weeks.
9. The resulting sauce is again filtered to produce the 3<sup>rd</sup> extract and the residue discarded.
10. The extracted *patis* is usually bottled while the *bagoong* may be bottled or canned.

**Note:** A commercial *patis* combination may be blended from the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> extracts. See Table 1 as reference.

**TABLE 1. QUALITY GRADES OF PATIS\***

<b>EXTRACT</b>	<b>CATEGORY</b>	<b>SPECIFICATION</b>
1 <sup>st</sup>	SPECIAL	8% PROTEIN (minimum)
2 <sup>nd</sup>	REGULAR	4% PROTEIN (minimum)
3 <sup>rd</sup>	PATIS FLAVOR	1% PROTEIN (minimum)

*\*Source: Philippine National Standards for Fish Sauce*

## DRIED/SMOKED FISH PRODUCTS

### DRIED FISH

#### DRIED WHOLE SARDINES OR 'TUYO'

##### Procedure

1. Wash fish with clean water to remove adhering dirt and drain.
2. Soak fish in 25% brine (1 part salt in 2 parts water) for about 3 hours or more depending on the size and sub-species of fish. (See Table 2)

**TABLE 2. SOAKING TIME OF FISH IN 25% BRINE**

Scientific Names	Local Name	Common Name	Fish Length	Soaking Time (hour)
<i>Sardinella fimbriata</i>	<i>tunsoy</i>	Fimbriated sardine	15 – 19 cm.	3
<i>Sardinella longiceps</i>	<i>tamban</i>	Indian sardine	15 – 22 cm.	3
<i>Sardinella brachysoma</i>	<i>lapad</i>	Deep-bodied herring	15 – 19 cm.	3
<i>Sardinella tawilis</i>	<i>tawilis</i>	Freshwater sardine	13 – 19 cm.	2 – 3
<i>Sardinella albella</i>	<i>silinyasi</i>	White sardine	5 – 8 cm.	2

3. Drain the fish and rinse with water to remove surface salt. Drain again.
4. Arrange or lay fish on drying trays skin down and dry under the sun or any suitable dryer until the moisture content is reduced to 40-45% (wet basis). This moisture content corresponds to fish that does not retain finger impressions when pressed at the thickest part of its body. The fish is turned over every 5 hours to effect uniform drying.
5. Allow the dried fish to 'sweat' or cool for at least 6 hours at room temperature by bringing the fish-filled trays into a well-ventilated room. Cover with nylon nets or screen mesh to ward off flies and other insects.



- Pack the fish in wooden boxes of 25-kg capacity lined with 0.001-in thick polyethylene film and keep in cool and dry place. For retail packaging, pack the dried product in polyethylene bags of 0.002-inch thickness.
- Packed dried fish maybe stored at room temperature (28°-30°C) for a week and longer at refrigerated temperatures (3°-5°C).

**\*Note: Other species that can be processed into dried whole fish is given in the table in Annex A.**

## DRIED SPLIT FISH OR 'DAING'

### Procedure

- Wash fish (**see Annex A**) with clean water to remove adhering dirt and drain.
- Split fish into butterfly fillets from tip of head to tail and remove the gills and internal organs. Wash thoroughly to remove blood and traces of entrails.
- Soak fish in brine with salt concentration and soaking time given below:

Scientific Names	Local Name	Common Name	Brine Concentration		Soaking Time (hour)
			(%)	Salt:H <sub>2</sub> O	
<i>Sillago sihama</i>	<i>asuhos</i>	Banded whiting	20	1:4	1
<i>Nemipterus taeoniopterus</i>	<i>bisugo</i>	Threadfin bream	20	1:4	1
<i>Caesio chrysozonus</i>	<i>dalagang bukid</i>	Golden caesio	17.5	1:1.42	2
<i>Decapterus macrosoma</i>	<i>galunggong</i>	Shortfin/Round scad	20	1:4	1
<i>Rastrelliger brachysomus</i>	<i>hasa-hasa</i>	Short bodied mackerel	20	1:4	1.5
<i>Sphyræna obtusata</i>	<i>torsillo</i>	Striped baracuda	20	1:4	1.5
<i>Mugil melinopterus</i>	<i>kapak</i>	Black finned mullet	20	1:4	0.5

- After soaking, drain the salted fish and rinse with tap water to remove surface salt. Drain again.

5. Arrange or lay fish on drying trays skin down and dry under the sun or in mechanical dryer at 40 to 45°C for the first 5 hours and at 50-60°C for the succeeding hours (5-10) until the product has a moisture content of 40-45% (wet basis).
6. Allow the dried fish to sweat or cool for at least 6 hours at room temperature.
7. Pack the dried products in bulk in clean wooden boxes and/or clean carton boxes lined with 0.001-in thick PE film. For retail packaging, pack dried fish at 200 or 250 grams/pack in 0.002-inch thick polyethylene (PE) plastic bags.
8. Store the packed dried product in a cool dry place or if possible at refrigerated conditions (3 – 5°C).

## SMOKED FISH

### Raw Material

fresh fish  
coarse salt

### Equipment, Utensils & Supplies

weighing scale  
plastic basin  
chopping boards  
knives  
*katsa* (for filtering salt)  
plastic pail  
wooden ladle  
salinometer  
nylon net, fine-mesh (to ward off flies)  
*bistay* or *titay* (or improvised chicken wire)  
*kawa* or *kaldero*  
*rigadera*  
stove (heavy duty – LPG or firewood)  
charcoal or firewood

smokehouse  
smoking materials – wood shavings or  
*kusot* (from hard woods)  
pot holder, apron, hand towel  
plastic bags (0.004” thickness)  
plastic sealer

## Procedure

1. Clean the fish (see Annex B), eviscerate and wash thoroughly to remove remaining blood. Drain.
2. Soak the fish for 30 minutes in 15% salt solution (1 part salt to 3 parts water, previously dissolved and filtered thru cheesecloth) at the proportion of 1 part fish to 1 part brine. Drain and transfer into cooking trays or baskets.
3. Cook the fish in 15% salt solution (1 part salt to 3 parts water) for 3-5 minutes or until eyes turn white depending on the size of fish. Drain.
4. Arrange or lay cooked fish on smoking trays and sprinkle with water to remove surface salt. Dry for 30 minutes to 1 hour.
5. Hot smoke the fish in a suitable smokehouse at a temperature of 60-90°C until a golden brown color is attained. (30 minutes to 1 hour)
6. Cool the smoked fish at room or ambient temperatures (28°-30°C).
7. Pack the smoked product in plastic bags (polyethylene bags of 0.002-0.004-inch thickness).
8. Store the packed smoked fish at refrigerated condition (3°-5°C) or freezer for longer shelf life.

**\*Note: The table in Annex B shows the fish species commonly used for smoked fish production.**

## THERMALLY PROCESSED FISH PRODUCTS

### SPANISH STYLE SARDINES

#### Ingredients (PER 8-OZ GLASS JAR OR 211 X 300 CAN)

dressed fish ( <i>tamban, tunsoy, silinyasi, tawilis</i> )	170.0	grams
monosodium glutamate or <i>vetsin</i> (optional)	0.2	gram
whole black peppercorns	6	pcs
<i>siling labuyo</i>	3	pcs
bayleaf or laurel leaves	1	pc
carrots, sliced crosswise	2 – 3	pcs
sweet pickles, sliced crosswise	2	pcs

#### Utensils

weighing scale	heavy duty gas stove
chopping board	steamer
knife	All-American brand pressure cooker
colander	or steam retort
plastic trays	All-American manual or electric
salinometer	automatic can sealer (No. 225 or
dial thermometer	No. 225-F) (for cans)

#### Supplies

glass jars, can, metal caps, plastic cap seals, labels

#### Procedure

1. Wash the fish thoroughly. Remove the head, fins, and internal organs. Wash thoroughly to remove blood and traces of entrails.
2. Cut the fish transversely to fit the size of the container.
3. Soak fish in 60° salinometer brine (15 % salt solution) for 30 minutes. Drain and dry for 1-2 hours.
4. Fry the fish for 30 sec–1 min. Drain, cool, cut and trim to fit the container. (The frying process is optional and may be omitted if cans are used.)
5. Fill the cut fish into cans or glass jars. Fill-in weight is 170 ± 10g 211 x 300 can and for 8-oz glass jar.

6. Add other ingredients and pour enough pre-heated vegetable oil into each can leaving  $\frac{1}{6}$ - to  $\frac{1}{4}$ -inch headspace.
7. Exhaust to an internal temperature of 82°C and seal. (Option: The oil may be preheated to 90°C prior to filling and sealing.)
8. Process or sterilize in a pressure cooker or a steam retort. (**see table**)

SCHEDULE OF PROCESS			
Can Size/Jar Size	Temperature (°C)	Pressure (psi)	Processing Time (min)
211 x 300 can	121	15	90
8-oz glass jars	115.6	10	120

9. Cool cans under running water. Allow the glass jars to be air-cooled at room temperature.
10. Wash glass jars and cans to remove grease and grime, and dry.
11. Code, label and store at room temperature.

**Note:** Canned or bottled products should be held in stock for 15 days before distribution to allow equilibration of flavors and detect defects such as bulging in cans and bubbling in bottles.

## SARDINE STYLE IN TOMATO SAUCE

### Ingredients (PER 8-OZ GLASS JAR OR 211 X 300 CAN)

dressed fish (*bangus, tunsoy, galunggong*) 170-180 grams  
 sauce 60 grams

*composed of:*

tomato sauce 37.8 grams  
 tomato paste 12.6 grams  
 corn or vegetable oil 9.0 grams  
 hot pepper extract 0.7 mL  
 salt 1.0-2.0 grams

Mix the sauce ingredients and heat to 85°C with constant stirring then add to the fish.

## Utensils

weighing scale	colander	heavy duty gas stove
chopping board	salinometer	pressure cooker, All
knife	dial thermometer	American brand
plastic trays	steamer	

## Procedure

1. Scale fish and remove the head, fins, tail and internal organs.
2. Wash fish thoroughly to remove blood and other foreign matters.
3. Cut the fish transversely to fit the size of the container. Scrape off remaining blood vessels and black visceral linings.
4. Soak fish in 60° salinometer brine (15 % salt) for 30 minutes. Drain and dry for 1-2 hours.
5. Fry fish for 30 sec to 1 min. Drain, cut and trim. (The frying process may be omitted if cans are used.)
6. Fill the cut fish into cans or glass jars.
7. Fill with the heated sauce to  $\frac{1}{6}$ -inch headspace from the brim of the container.
8. Exhaust by heating the filled cans/glass jars over steam or boiling water to an internal temperature of 85°C (about 30 minutes). Seal the cans/glass jars.
9. Process in a pressure cooker or a retort for one and a half (1½) hours at 121°C (15-psig) or 2 hours at 116°C (10-psig).
10. Cool cans under running water. Allow the glass jars to air-cool down to room temperature.
11. Wash cans and jars, dry, label and store.

### **How to prepare hot pepper extract:**

Prepare by boiling red hot peppers (*siling labuyo*) of known weight in water (1 part pepper to 3 parts water) until soft. Pass the softened hot peppers through a strainer to remove skins and seeds. Restore the water that evaporated.

## **BANGUS, SALMON STYLE**

### **Ingredients (PER 8-OZ GLASS JAR OR 211 X 300 CAN)**

*bangus*, dressed 170-180 grams  
2% brine

### **Utensils**

weighing scale	colander	heavy duty gas stove
chopping board	salinometer	pressure cooker -
knife	dial thermometer	All American
plastic trays	steamer	Standard

### **Procedure**

1. Scale the fish and remove the head, tail and internal organs.
2. Wash the fish thoroughly to remove blood and dirt.
3. Drain and cut transversely to fit the size of the can (scrape off the remaining blood and entrails).
4. Soak in 15% brine for 20 minutes. Drain.
5. Fill into cans/bottles and add 2% brine leaving 1/6 - 1/4-inch headspace.
6. Exhaust by heating the filled cans by steam or over boiling water to an internal temperature of 85°C and seal.
7. Process at 15-psi for 90 minutes in cans, 10-psi for 120 min. in bottles.
8. Cool and, wash cans to remove grease and grime.
9. Dry and label.

## SMOKED *TAHONG* IN OIL

### Raw Material

mussel (*tahong*) meat  
vegetable oil  
refined salt

### Equipment, Utensils & Supplies

weighing scale, 10-kg capacity  
plastic basin  
steamer  
stove  
*bistay* or *titay* (or improvised  
chicken wire)  
charcoal (or firewood)  
smokehouse (½ drum)

### Procedure

1. Thoroughly clean mussels to remove seaweeds, debris and byssus or horny tufts of threads growing out from the base of the foot.
2. Soak in water for 1-2 hours to allow mussels to expel sand and wastes (deuration).
3. Steam for 10-15 minutes to open shells.
4. Cool to temperatures that can allow handling and shucking of mussels. Remove the remaining byssus.
5. Smoke mussel meat for 30 minutes or until golden brown.
6. Pack smoked mussel in UGL cans or glass jars (fill-in weight for 211 x 300 can and 8-oz. glass jar is 170 grams). Add 2.5 grams refined salt and enough vegetable oil into each can or glass jar leaving ¼-inch headspace.
7. Exhaust to an internal temperature of 82°C and seal.
8. Process in a pressure cooker or a retort for one (1) hour at 121°C (15 psi) or 1½ hours at 116°C (10 psi).
9. Cool cans under running water. Allow the glass jars to air-cool.
10. Wash glass jars and cans to remove grease and grime, and dry.
11. Code, label and store at room temperature.



## OTHER FISH FOOD PRODUCTS

### FISH BALLS (PHTD-BFAR\*)

#### Raw Material

Fresh fish – any of the following species: *kalaso, dalagang bukid, labahita*, shark, *bidbid, torsillo* and *bisugo*

#### Ingredients for ½ kg fish meat:

2	tsp	salt
1	cup	all-purpose flour
1	cup	cornstarch
2	tbsp	baking powder
½	cup	iced water
¼	tsp	monosodium glutamate (MSG)

#### Utensils

stove	turner	trays
casserole	colander	food processor/grinder
frying pan ( <i>carajay</i> )	measuring cup	weighing scale
knives	measuring spoon	plastic sealer
chopping board	mixing bowl	

#### Procedure

1. Wash fish, split into butterfly fillet and eviscerate. Wash and drain.
2. Separate fish meat from skin and bones and chop finely.
3. Add salt to fish mince and mix well until pasty. Gradually add sifted mixture of flour, cornstarch, baking powder and MSG and mix well.
4. Add iced water and mix well until a thick homogenous pasty dough is obtained.

\* *Post-Harvest Technology Division – Bureau of Fisheries & Aquatic Resources (PHTD-BFAR)*

5. Form into balls and allow to set in a bowl or basin of tap water for 2 hours or for 30-45 minutes in lukewarm (40-45°C) water.
6. Drop balls in boiling water. When balls float, they are already cooked. Check if center is cooked by cutting into half. If not, extend boiling.
7. Drain fish balls in perforated trays or colander and cool to room temperature.
8. Pack the fish balls in polyethylene bags at ¼ kg to 1 kg per pack.
9. Store the product in a chiller or freezer.

## FISH QUEKIAM

### Ingredients

2	cups	filleted/chopped fish (1 kg)
½ - ¾	tblsp	refined salt (10-15 g)
½	cup	chopped shrimps (250 g)
½	cup	<i>singkamas</i> , chopped finely (250 g)
½	cup	carrots, chopped finely (250 g)
½	cup	finely chopped <i>kintsay</i> (200 g)
1 ½	tsp	white pepper (12 g)
3	tblsp	cornstarch (25 g)
6	tblsp	flour (50 g)
¼	tsp	MSG (5 g)
		<i>taope</i> or <i>panyu-panyoan</i> *

### Procedure

1. Combine all ingredients and blend thoroughly.
2. Wrap the mixture in *taope* or *panyu-panyoan* and form into rolls [approximately 3 cm (1¼ inches) diameter and 14 cm (5½ inches) long].

3. Flash-fry (partial frying) for 1 minute. Drain. Cool and refrigerate.
4. The product is fried in vegetable oil until golden brown before serving.

\* **Edible film wrapper made from soybean protein.**

## **FISH NUGGETS** (NIPSC\*, College of Fisheries)

### **Ingredients**

250 g	minced fish meat
¼ tsp	salt
¼ tsp	white pepper
¼ tsp	powdered onion
¼ tsp	granulated garlic
2 pc	<i>calamansi</i>
2 tsp	soy sauce
¼ tsp	vetsin (optional)
½ cup	flour for dredging
1 cup	breadcrumbs

### **Ingredients for batter**

2 pcs	eggs
3 tbsp	cake flour
2 tbsp	iced water
	a pinch of salt

### **Utensils**

stove	turner	mixing bowl
frying pan ( <i>carajay</i> )	colander	trays
knives	measuring cup	food processor/grinder
chopping board	measuring spoon	weighing scale

### **Procedure**

1. Clean fish and separate the meat from the bones.
2. Chop finely and blend with other ingredients.

\* *Northern Iloilo Polytechnic State College (NIPSC)*

3. Allow to set for 30 minutes.
4. Form into desired shapes/sizes. (Special molds made from cut plastic chopping boards [ $\frac{1}{2}$ -inch thick] or 'polvoron' molders maybe used.) Coat with flour, dip in batter. Roll in breadcrumbs. Flash-fry for 30 seconds.
5. Pack in polyethylene bags and freeze. To consume, deep fry fish nuggets in hot cooking oil until golden brown.

## **FISH HAM (BANGUS) (PHTD-BFAR)**

### **Curing Ingredients**

1	kg	<i>bangus</i>	$\frac{1}{2}$	tsp	black pepper
2	tbsp	brown sugar	$\frac{1}{4}$	tsp	prague powder
1	tsp	vetsin	1– $1\frac{1}{2}$	tsp	gin
1	tbsp	salt	1	tsp	ham spice

### **Utensils**

weighing scale	knife
measuring cups	chopping board
measuring spoons	

### **Procedure**

1. Split the fish at the back from head to tail.
2. Clean *bangus*, remove scales, internal organs, and trim tails and fins.
3. Mix curing ingredients and rub in the *bangus* well and store in a closed container in the refrigerator for 3 days.

4. Prepare a cooking mixture of the following ingredients for every kilogram of *bangus*:
 

$\frac{3}{4}$ cup	beer
1 pc	laurel
1 cup	sugar
1 cup	pineapple juice
$\frac{1}{2}$ cup	water
5. Boil the mixture and cool.
6. Soak cured *bangus* in the cooking mixture for 2 hours or longer.
7. Drain and fry until light brown at medium heat.
8. Serve while hot.

## SQUID BALLS (PHTD-BFAR)

### Ingredients

- |         |   |
|---------|---|
| 1 kg    | minced squid meat                         |
| 2 tbsp  | salt                                      |
| 1 cup   | cornstarch                                |
| 1 cup   | all-purpose flour                         |
| 4 tbsp  | sugar                                     |
| 1½ tbsp | chopped garlic                            |
| 5 tbsp  | chopped onion                             |
| 1 tsp   | monosodium glutamate (MSG)/ <i>vetsin</i> |
| 3 tbsp  | iced water                                |

### Utensils

- |                               |                 |                        |
|-------------------------------|-----------------|------------------------|
| stove                         | turner          | trays                  |
| casserole                     | colander        | food processor/grinder |
| frying pan ( <i>carajay</i> ) | measuring cup   | weighing scale         |
| knives                        | measuring spoon | plastic sealer         |
| chopping board                | mixing bowl     |                        |

## Procedure

1. Wash squid, remove internal organs and heads.
2. Wash well and peel off dark skins manually after soaking in lukewarm water for 5 minutes then in cold water for another 5 minutes.
3. Grind the minced squid meat in a food grinder or processor for 10 minutes or until a smooth consistency is achieved.
4. Mix in the salt until the mixture becomes a sticky paste, slowly add other ingredients such as cornstarch, flour, sugar, garlic, onion, MSG and cold water.
5. Continue mixing and kneading for another 20 minutes to obtain a homogenous mixture.
6. Form into uniform sized balls and drop into 40°C water and allow to set for 20 minutes.
7. Drop the balls in boiling water until the balls float. Check if fully cooked up to the center.
8. Drain and allow to cool. Pack in PE bags.
9. Store in a freezer until use.
10. For consumption: deep fry for 2-3 minutes. Drain. Serve with sweet and sour sauce.

## SQUID RINGS (PHTD-BFAR)

### Ingredients

- |       |  |
|-------|--|
| 1 cup | sliced squid   |
| 1 tsp | refined salt   |
| ¼ tsp | baking power<br><i>vetsin</i> or monosodium glutamate (optional) |
| ¼ kg  | cornstarch   |

## Utensils

weighing scale	measuring cup & spoon	<i>carajay</i>
knife	mixing bowl	ladle
chopping board	colander	stove

## Procedure

1. Wash fresh squid, remove internal organs and heads.
2. Wash well and peel off dark skins manually after soaking in lukewarm water (40°-50°C) for 5 minutes then in cold ice water for another 5 minutes.
3. Slice squid cross-sectionally into rings and add salt, baking powder and *vetsin*. Mix thoroughly.
4. Roll in cornstarch until well coated.
5. Deep fry in pre-heated cooking oil until light golden brown.
6. Cool to room temperature and pack in polypropylene (PP) bags of at least 0.002-inch thickness.

## SPICY AND CRISPY DILIS (PHTD-BFAR)

### Ingredients

¼ kg	dried <i>dilis</i>
1 pc	chicken egg
7 tbsp	cornstarch
¼ cup	brown sugar
½ tbsp	salt
½ - 1 tsp	<i>sili labuyo</i>
	cooking oil

## Utensils

mixing bowls	measuring cup	turner
fork	skillet	colander
measuring spoons	stove	trays
		weighing scale

## Procedure

1. Select clean dried *dilis* and place in a mixing bowl.
2. In another bowl, beat egg thoroughly and blend in all the seasoning.
3. Add cornstarch and mix well until all lumps are gone. (It is best if the batter is chilled prior to use.)
4. Pour mixture over dried *dilis* and stir until each fish is completely coated. (Do not allow mixture to stand very long or else the fish will stick together when fried.)
5. Deep fat fry until golden brown.
6. Place in a colander to remove excess fat.
7. Allow to cool at room temperature.
8. Pack in polypropylene (PP)/polyethylene (PE) bags of at least 0.002-inch thickness.



**Table A. Species of Finfishes Commonly Utilized in the Production of Dried Fish**

Local Name	Common Name	Scientific Name	Forms	
			Whole	Split/Filleted
<b>A. Marine Species</b>				
1. <i>Alumahan</i>	Striped mackerel	<i>Rastrelliger chrysozonus</i>		√
2. <i>Balila/Espada</i>	Hairtail	<i>Trichiurus haumela</i>	√	
3. <i>Banak</i>	Long-finned mullet	<i>Mugil vaigiensis</i>		√
4. <i>Bisugo</i>	Threadfin bream	<i>Nemipterus taeniopterus</i>		√
5. <i>Bonito/Katchorita</i>	Eastern little tuna	<i>Euthunnus yaito</i>		√
6. <i>Dalagang bukid</i>	Golden caesio	<i>Caesio chrysozonus</i>		√
7. <i>Danggit/Samaral</i>	Siganid	<i>Theuthis javus</i>		√
8. <i>Dilis</i>	Anchovies	<i>Stolephorus comersonii</i>	√	
9. <i>Galunggong</i>	Round scad	<i>Decapterus macrosoma</i>	√	√
10. <i>Hasa-hasa</i>	Short-bodied	<i>Rastrelliger brachysomus</i>		√
11. <i>Kabasi</i>	Short finned gizzard	<i>Anodontostoma chacunda</i>		√
12. <i>Kalaso</i>	Lizard fish	<i>Saurida tumbil</i>		√
13. <i>Kanduli</i>	Manila sea catfish	<i>Arius manillensis</i>		√
14. <i>Kapak</i>	Black-finned mullet	<i>Mugil melinopterus</i>		√
15. <i>Lapad</i>	Deep-bodied sardines	<i>Sardinella brachysoma</i>	√	
16. <i>Labahita</i>	Surgeon fish	<i>Acanthurus bleekeri</i>		√
17. <i>Lapu-lapu</i>	Spotted grouper	<i>Epinephelus corallicola</i>		√
18. <i>Mamaleng bato</i>	Small mouthed threadfin	<i>Polynemus microstoma</i>		√
19. <i>Matang baka</i>	Big-eyed scad	<i>Caranx crumenophthalmus</i>		√
20. <i>Salay-salay</i>	Crevalle	<i>Caranx leptolepsis</i>		√
21. <i>Silinyasi</i>	White sardines	<i>Sardinella albella</i>	√	
22. <i>Sapsap</i>	Common slipmouth	<i>Leiognathus equulus</i>	√	
23. <i>Tamban</i>	Indian oil sardines	<i>Sardinella longiceps</i>	√	
24. <i>Tangigue</i>	Spanish mackerel	<i>Caranx sexfasciatus</i>		√
25. <i>Torsillo</i>	Barracuda	<i>Sphyræna obstusata</i>		√
26. <i>Tunsoy</i>	Fimbriated sardines	<i>Sardinella fimbriata</i>	√	
27. <i>Tawilis</i>	Fresh water sardines	<i>Sardinella tawilis</i>	√	
<b>B. Fresh Water Species</b>				
28. <i>Bangus</i>	Milkfish	<i>Chanos chanos</i>		√
29. <i>Dalag/Bulig</i>	Murrel/Mud fish	<i>Opicephalus striatus</i>		√
30. <i>Gourami</i>	Gourami	<i>Osphronemus goramy</i>	√	
31. <i>Hito</i>	Catfish	<i>Clarias batrachus</i>		√
32. <i>Tilapia or St. Peter's Fish</i>	Tilapia	<i>Tilapia mossambica</i>		√

## ANNEX B

**Table B. Some Fishes That Can Be Processed into Different Types of Smoked Fish**

Common Name	Local Name	Scientific Name	Whole*	Filleted
1. Milkfish	<i>Bangus</i>	<i>Chanos chanos</i>	x	X
2. Short-bodied mackerel	<i>Hasa-hasa</i>	<i>Rastrelliger brachysomus</i>	x	
3. Striped mackerel	<i>Alumahan</i>	<i>Rastrelliber chrysozonus</i>	x	
4. Scad	<i>Galunggong*</i>	<i>Decapterus macrosoma</i>	x	
5. Fimbriated sardine	<i>Tunsoy*</i>	<i>Sardinella fimbriata</i>	x	
6. Indian sardine	<i>Tamban*</i>	<i>Sardinella longiceps</i>	x	
7. Tilapia or St. Peter's fish	<i>Tilapia*</i>	<i>Tilapia mosambica</i>	x	
8. Spanish mackerel	<i>Tangigue</i>	<i>Cybium commerson</i>		X

**\*Small fishes (10-15 cm long) need not be eviscerated**

## LIST OF SUPPLIERS OF INGREDIENTS AND EQUIPMENT

<p>1. SIN KIAN HENG 196 Palanca St., Manila Tel. nos.: 733-2131; 733-6381; 733-2129; 733-6376 Fax: 733-6371 (for pressure cooker, can sealer and utensils)</p>
<p>2. KILLION MERCHANDISING 40 Orozco St., Manila Tel. no. : 733-8221; 733-7033; 733-2093 (for ingredients)</p>
<p>3. MGM FOOD &amp; COMMODITIES CORPORATION 61 Mariveles St., Mandaluyong City Tel. nos.: 532-2044; 532-3633; 533-3057 (for flexible packages and ingredients)</p>
<p>4. SAINTS &amp; BRANCH 545 Franciscan St., Sta. Ana Village, Sunvalley, Parañaque Tel. nos.: 821-5325; 821-5328 (for glass jars and caps)</p>
<p>6. SPICES AND FOODMIX Nutrition Foundation of the Philippines Ultima Entrepinoy Forum Center 107 E. Rodriguez Sr. Ave., QC Tel. nos.: 411-1349; 742-0826 (for curing ingredients)</p>
<p>7. TAIWAN MACHINERIES DISPLAY AND TRADE CENTER 27 Guava Road, Malabon Tel. nos.: 361-71-02, 363-01-66, 363-01-67, 363-01-88 (for equipment)</p>

8.	<p>WILSHINE ENTERPRISE COMPANY          6 McDonough St., Paranaque City          Tel. nos.: 852-1179; 852-1184          (for vacuum gauge, dial thermometer, can seam micrometer, can sealers)</p>
9.	<p>SAN MIGUEL GLASS PLANT          45 Muelle dela Industria, Del Pan, Binondo, Manila          Tel. nos.: 242-8641 to 60          Fax: 632-3093          (for glass jars and metal caps)</p>
10.	<p>ASIA Brewery, Inc.          6<sup>th</sup> Flr. Allied Bank Center, Ayala Ave., Makati City          Tel. nos.: 816-3421 to 25          Fax: 810-2711          (for glass jars and metal caps)</p>
11.	<p>Oriental Tin Can &amp; Metal Sheet Mfg.          64 Gen. Luis St., Sitio Kapre Brgy. Nagkaisang Nayon Area IX, Dist II, Quezon City          Tel. nos.: 936-5339          Fax: 936-8507          (for cans)</p>
12.	<p>Metro Container Corp.          1196 Sto. Rosario St., Mapulang Lupa, Malinta, Valenzuela City          Tel. nos.: 645-8304; 983-9551          Telefax: 983-9558          (for cans)</p>
13.	<p>General Metal Container Corp. of the Phils.          60 Gen. Luis St., Bo. Capri, Novaliches, Quezon City          Tel. nos.: 936-1495          Telefax: 938-0945 to 46          (for cans)</p>
14.	<p>Philippine Aerosol Container          Cor. Reliance &amp; Broxtom Sts., Pasig City          Tel. nos.: 631-1775 to 84          (for cans)</p>