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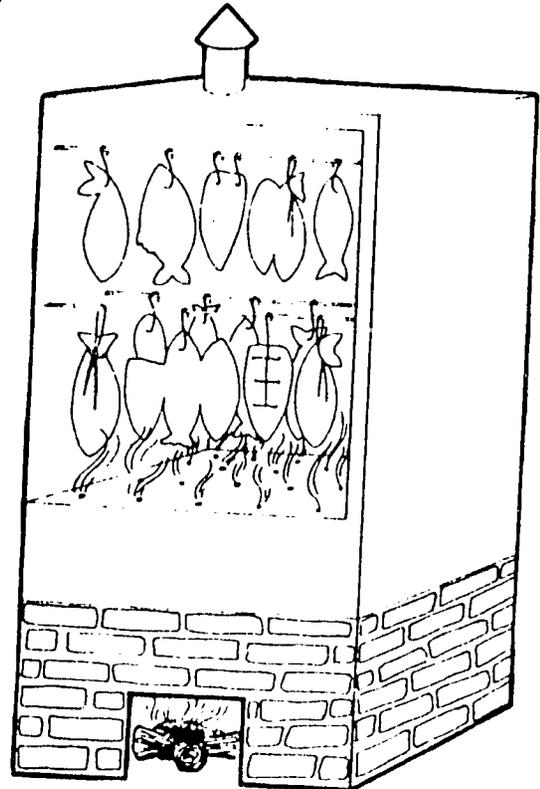
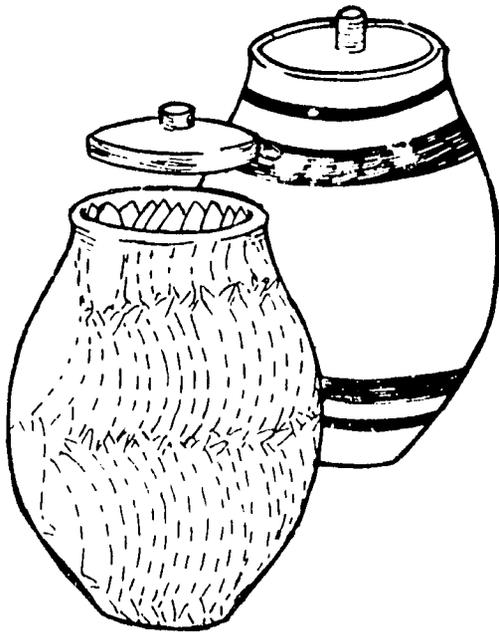
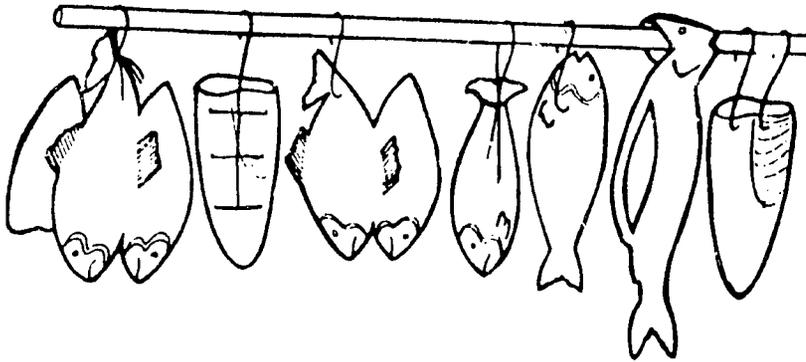
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Home projects

2. Fish Preservation



F I S H - P R E S E R V A T I O N

INTRODUCTION

This booklet is one of a series on Home Projects researched and produced by the World Scout Bureau. They in turn are part of a series of booklets on Community Development and Scouting.

It is written for Scout leaders. It is also hoped that it will be adapted, translated and republished by National Associations for use by Scouts in their own communities.

It is an essentially practical booklet and is intended to inspire Scout leaders to organize training activities for the Scouts. In this way, the Scouts will be able to help their own families improve their living conditions and encourage others to do the same.

This booklet may also be used as resource material for a training workshop on Home Projects for Scout leaders.

Titles in the "Home Projects" series so far include :

No. 1 - Water

No. 2 - Fish Preservation

No. 3 - Laundry

C O N T E N T S

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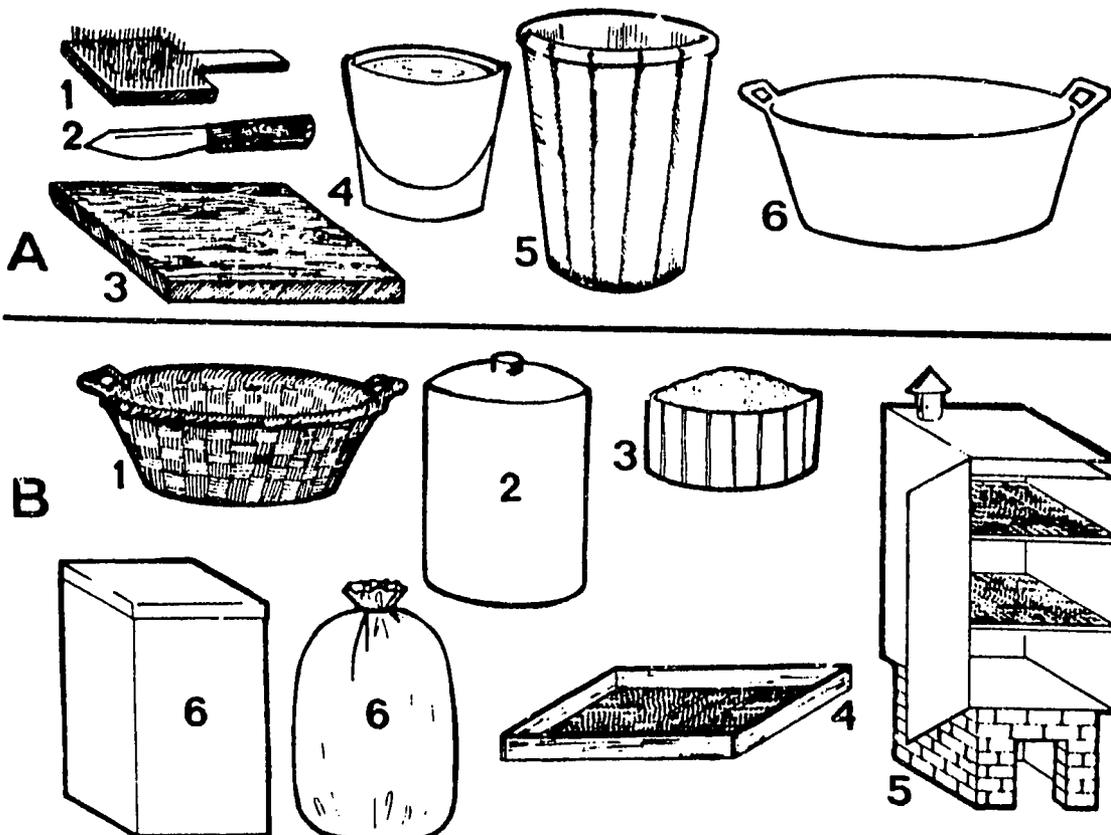
CHAPTER 1.UTENSILSA. CLEANING

1. Scraper for removing scales. Scales can be removed with a knife, but when large numbers of fish are to be cleaned, a scraper makes the work easier.
2. Clean, sharp knife to cut and clean fish.
3. Clean, wooden board (not plywood) on which to lay fish when cutting and cleaning.
4. Potable cold water for washing fish.
5. Container for fish waste.
6. Clean pan, kettle, tub or pail for washing fish.

B. CURING

1. Box, basket mat or tray that will permit brine to drain off for dry salting.
2. Clean container that does not leak to pack fish in for wet salting.
3. Coarse, edible-grade salt.*
4. Rack, mat or screen-wire frame for smoking or drying.
5. Oven for smoking or smoke-drying fish.
6. Airtight boxes or plastic bags for storing dried fish.

* Coarse salt often contains impurities which can be easily removed by washing the salt with potable fresh water, or clean seawater.

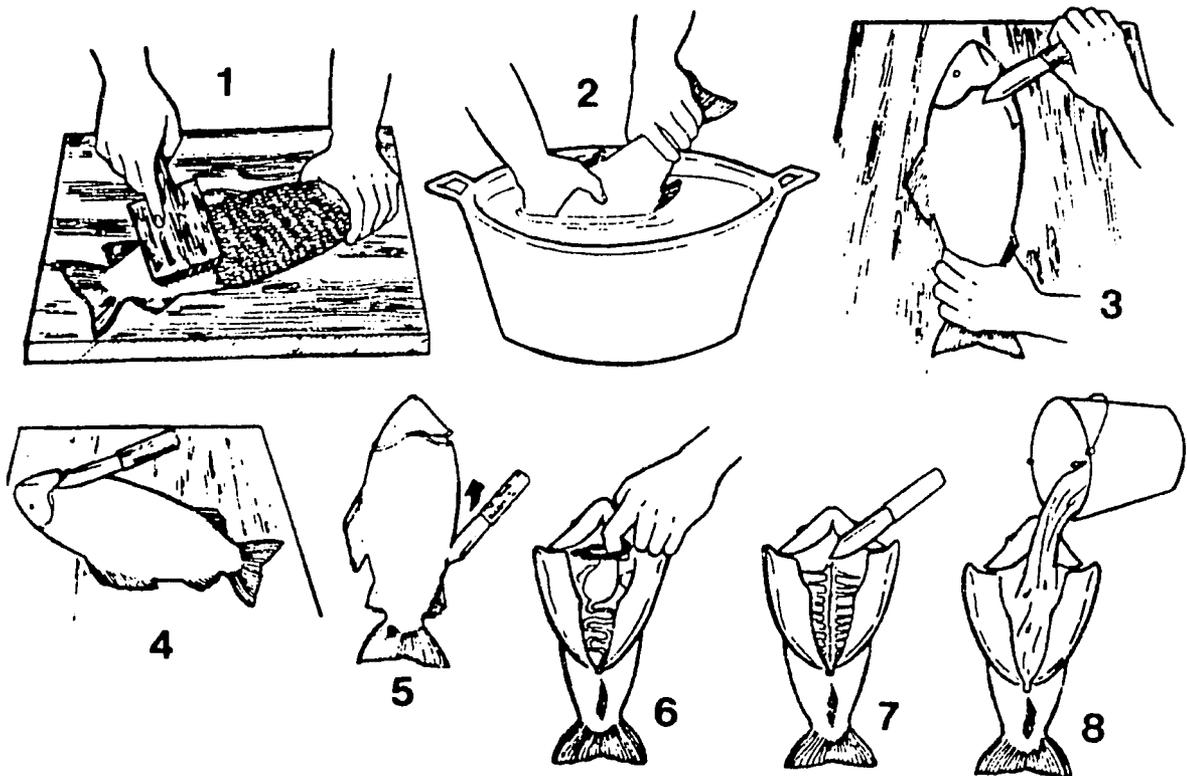
ILLUSTRATIONS

CHAPTER 2.CLEANING

TO KILL THE FISH : - GIVE IT A SHARP BLOW ON THE HEAD

GUTTING AND SCALING

1. Place the fish on a clean, wooden board (not plywood). Hold the fish by the head and, using the scraper, scrape the scales from the body of the fish. Scrape from the tail toward the head, taking care not to break the skin under the scales.
2. Wash the fish in potable, running, cold water or, if this is not available, place it in a tub filled with clean, cold water. Hold the fish in one hand and clean away all dirt and remaining scales with the other hand.
3. Place the fish on its side on a clean wooden board. Using a clean, sharp knife, make a cut that follows the line of the gill covers. Turn the fish over and do the same on the other side. Do not cut off the head.
4. Loosen the gills by placing the point of the knife under them and cutting them away from the body and head of the fish. Do not cut off the head.
5. Starting at the anal opening, cut open the belly of the fish. The cut must be made from the anal opening toward the head. Do not cut the fish in half but make sure that the cut is deep enough to allow you to open the fish easily.
6. When you have opened the fish and exposed to view the organs, viscera and gills, place your fingers under the gills and remove them. The organs and viscera are attached to the gills and will follow when the gills are removed.
7. Scrape out all of the blood along the spine with your knife.
8. Clean out the belly cavity with potable, running, cold water.

ILLUSTRATIONS

CHAPTER 3.FILLETINGA. LARGE FISH

1. Place the fish on a clean, wooden board (not plywood) with its belly up. The head should be at the right if you are right-handed. Cut along the contours of the gill covers.
2. Remove the head and the viscera.
3. Turn the fish on its side. To separate the first fillet from the bone, begin at the head end of the fish and cut toward the tail. Keeping the knife as close as possible to the bone (it should be resting on the back-bone), cut away the flesh from the side nearest you. The tip of the knife should reach the spine.
4. Cut loose the rib cage from the spine, then you will be able to cut the remainder of the fillet away from the bone.
5. Turn the fish so that the tail is at the right and the fleshy side is up.
6. Cut again to detach the remaining fillet from the bones. If necessary remove the fins from the fillet. Wash the fillets with potable cold water.

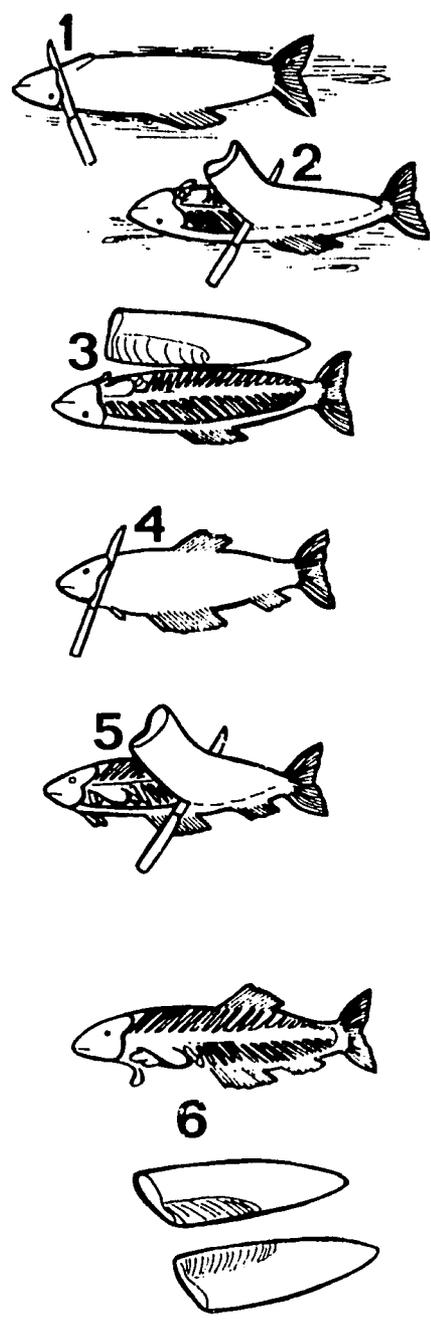
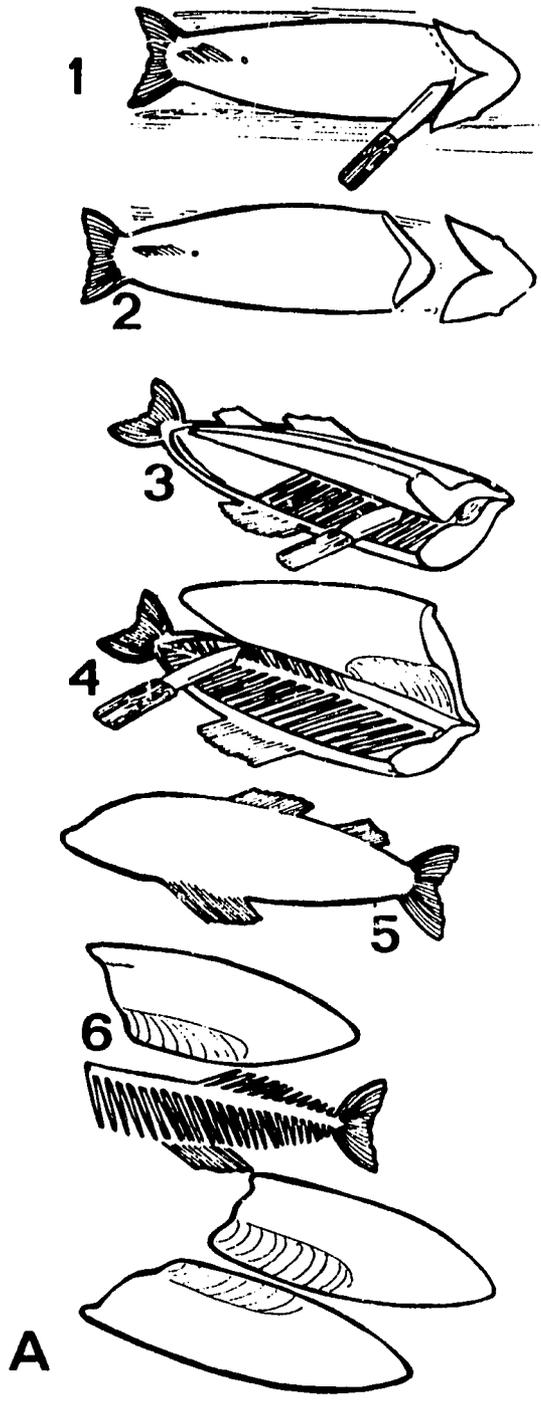
B. SMALL FISH

An ungutted fish may be used.

1. Place the fish on a clean, wooden board (not plywood) with its back toward you. The head should be toward the left if you are right-handed. Make a cut along the contours of the gill covers into the fish flesh until you reach the spine.
2. Tilt the knife until it is at a right angle to the spine. Cut the fillet loose from the head toward the tail, as close to the spine as possible. The rib cage around the belly should be cut loose and should follow the fillet.
3. When the fillet is detached you will be able to see the viscera, organs and bones of the fish.
4. Turn the fish over. The belly will now be facing you.
5. Repeat steps 1,2 and 3.
6. Clean away viscera that may still be attached to the fillet. If necessary remove the fins from the fillet. Wash the fillets with potable, running cold water, if possible.

ILLUSTRATIONS

3. FILLETING



CHAPTER 4.SPLITTING

FOR SUBSEQUENT CURING

A. SMALL AND MEDIUM-SIZED FISH

1. Place the fish on a clean, wooden board (not plywood), its back toward you. The head should be at your right if you are right-handed. Split the head and continue the cut along one side of the spine, cutting into the belly cavity from the back of the fish, but not cutting into the underbelly.
2. Open the fish, remove viscera and gills. Wash the fish thoroughly with potable, running, cold water.

B. LARGE FISH

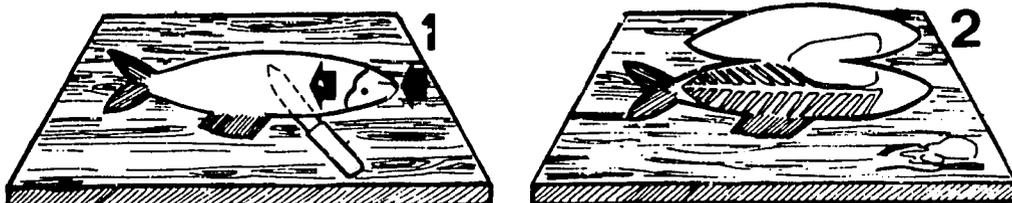
Here a double cut is made in order to reduce the thickness of the resulting slices, thus facilitating the subsequent processing of the fish.

1. Place the fish on a clean, wooden board (not plywood), underbelly toward you, the head to the right if you are right handed. Make a shallow cut along the gill covers, then cut from the head toward the tail in order to obtain a flap of fish flesh.
2. The flap should be attached to the fish on the dorsal side, and the cut should be shallow enough so as not to cut into the belly cavity.
3. Turn the fish over, head to the right, dorsal side toward you. Split the head (it might be necessary with large fish to use an axe or a knife with hammer to achieve this splitting). Continue to cut from the head to the tail so as to obtain a second flap of fish flesh of equal thickness to the first.
4. This cut should go into the belly cavity but should not penetrate the underbelly. Open the fish, remove viscera and gills and wash with potable, running, cold water.

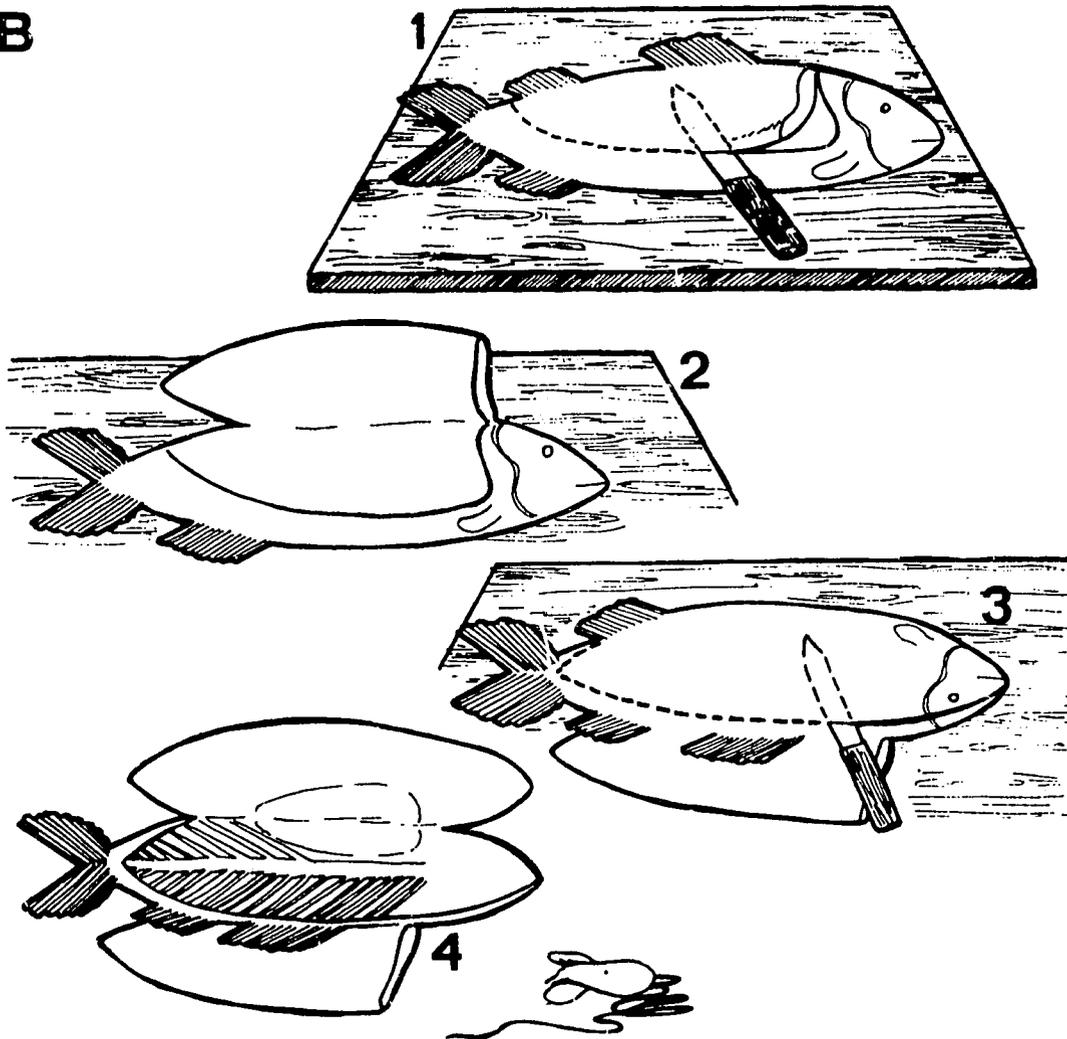
ILLUSTRATIONS

4. SPLITTING

A



B



CHAPTER 5.SMOKE-DRYINGA. YOU WILL NEED :

1. Small whole fish, small split fish, large split fish or fillets.
2. Five to six parts of water to one part of salt for the brine solution, if pre-salting or brining is to be used.

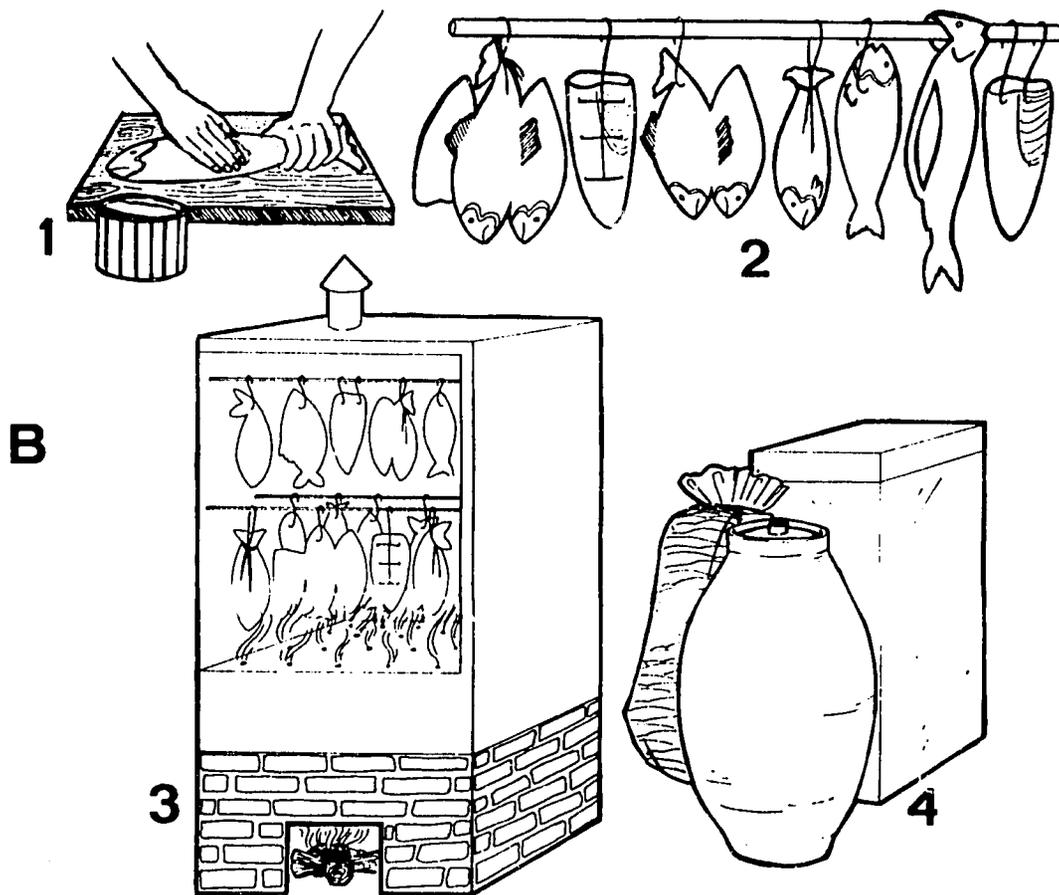
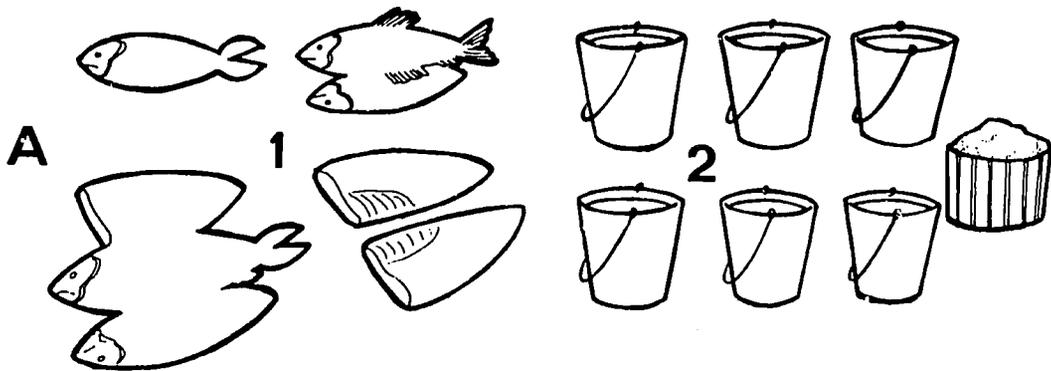
B. INSTRUCTIONS

When smoking is done for preservation, the main objective is to cook and dry the fish. The name of the process is smoke-drying. The drying can be partially or fully accomplished inside the smoker. When it is only partially accomplished within the smoker, it is continued outside the smoker, normally as sun-drying. When fish are prepared for smoke-drying they are not usually pre-salted or brined because salting depends upon local taste preferences and local conditions, and may be omitted if desired. Dependent upon climatic conditions, salt is advantageous for the ultimate keeping quality of the fish. Fish for smoking can be prepared as whole fish (either gutted or ungutted) or split, filleted, in chunks or slices, etc. Here again, local tradition and preference will decide.

1. If required, pre-salt the fish for at least 10 to a maximum of 90 minutes in a brine of six parts water to one part salt. The time required will depend upon the size of the fish, its preparation (whether split, filleted or whole) and its degree of fatness (a fatter fish needs longer brining) and can be determined more exactly by experimentation. If the fish are not pre-salted they should be washed.
2. Hang the fish from a stick or lay them on a mesh tray taking care that they do not touch each other. If the fish are placed on a mesh tray they may be turned during the process for more even smoking. The fish can be hung in different ways. Whole fish can be hung on a stick threaded through the gill covers, or by a string tied around the tail. Split fish can be hung with a string around the tail or with a S-shaped hook through either the head end or through the tail. If split fish are suspended through the head end, it is an advantage to have the gill bone left in place, as fish flesh can tear under its own weight.
3. Build a fire in the firebox. At the beginning the fire should be smouldering, to dry the surface of the fish. The temperature should then be increased, by allowing in more air. This phase should last about two hours and will cook the fish. If the initial drying is not carried out properly the flesh will cook too rapidly and the fish will fall from the sticks or break up on the trays. After cooking, drying should be continued for several hours at a lower temperature. This would be in the sun, if climatic conditions are favourable, but the fish must be covered with mosquito netting or gauze to prevent infestation by flies and beetles. The finished product should have the consistency of rough wood and should be thoroughly dry. Mould growth will rapidly result if any parts of the fish are not properly dried.
4. This product, if protected from insect infestation, will keep for several months. Under humid conditions it can be packed in airtight containers or heavy-gauge polyethylene. Otherwise, if this is too expensive, it can be redried from time to time.

ILLUSTRATIONS

5. SMOKE-DRYING

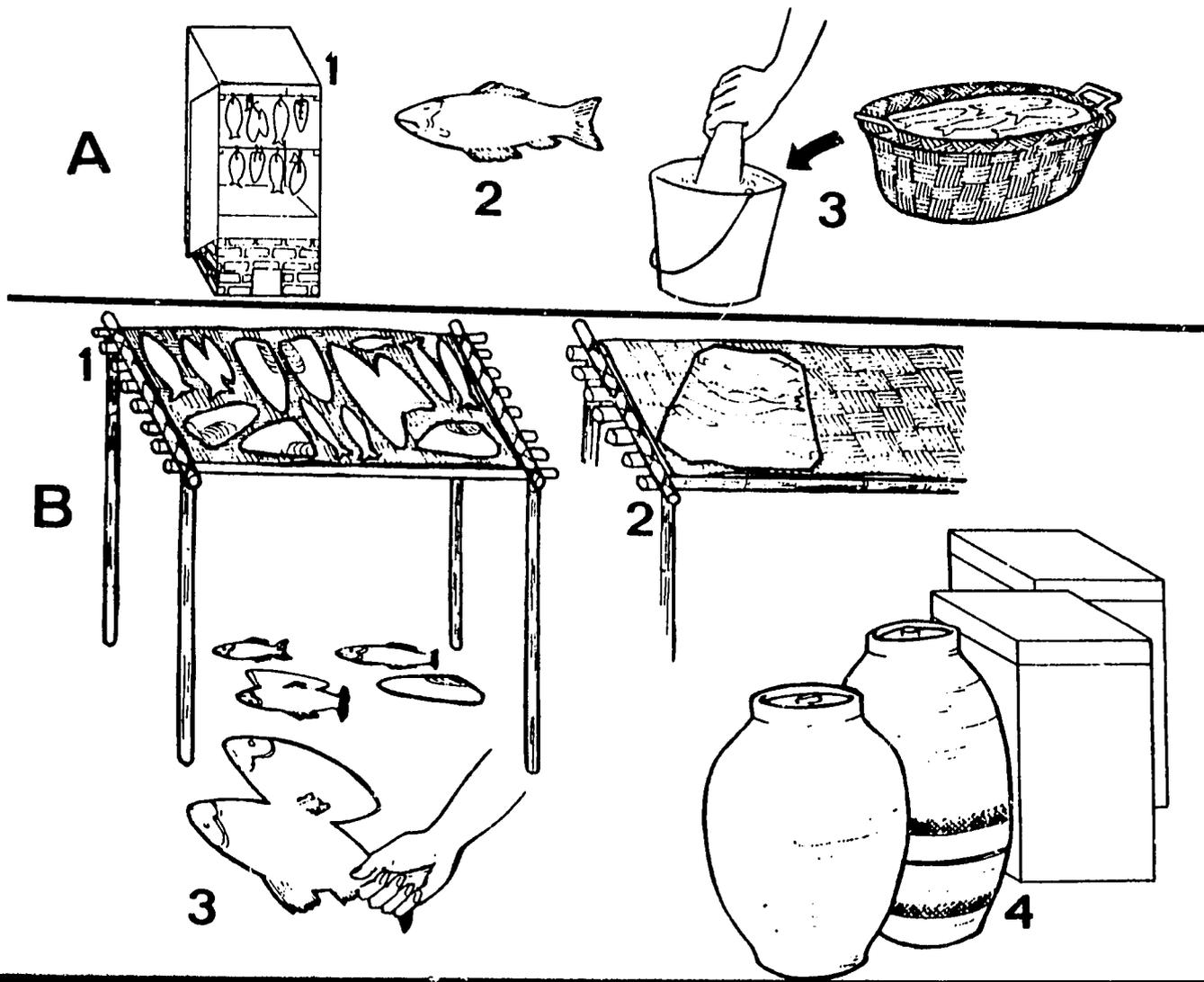


CHAPTER 6.SUN-DRYINGA. YOU WILL NEED :

1. Smoked fish
2. Non salted fish or
3. Salted fish (rinse in potable cold water).

B. FOR BEST RESULTS, SPLIT MEDIUM OR LARGE-SIZED FISH SHOULD BE USED, BUT A SALTED, GUTTED WHOLE FISH CAN ALSO BE DRIED.

1. Place the fish on mesh, bamboo or other trays that will permit free air circulation. Make sure they are protected to prevent contamination by flies and insects. Keep the trays of fish in the shade for the first day or two, depending on the humidity. If the fish is put directly in the sun a crust will form that will hamper good drying. When the surface on the fish begins to appear dry, place the trays in the sun to dry completely.
2. During the night or in time of rain the fish should be stacked and covered with a heavy-gauge plastic or other material to prevent moisture return.
3. When the fish is ready it will not bend easily. If salted fish is used the surface will be covered with fine salt crystals.
4. Non-salted dried and salt-dried fish will keep for long periods of time, especially when stored in airtight ceramic pots or metal containers.

ILLUSTRATIONS

CHAPTER 7.DRY SALTINGA. YOU WILL NEED :

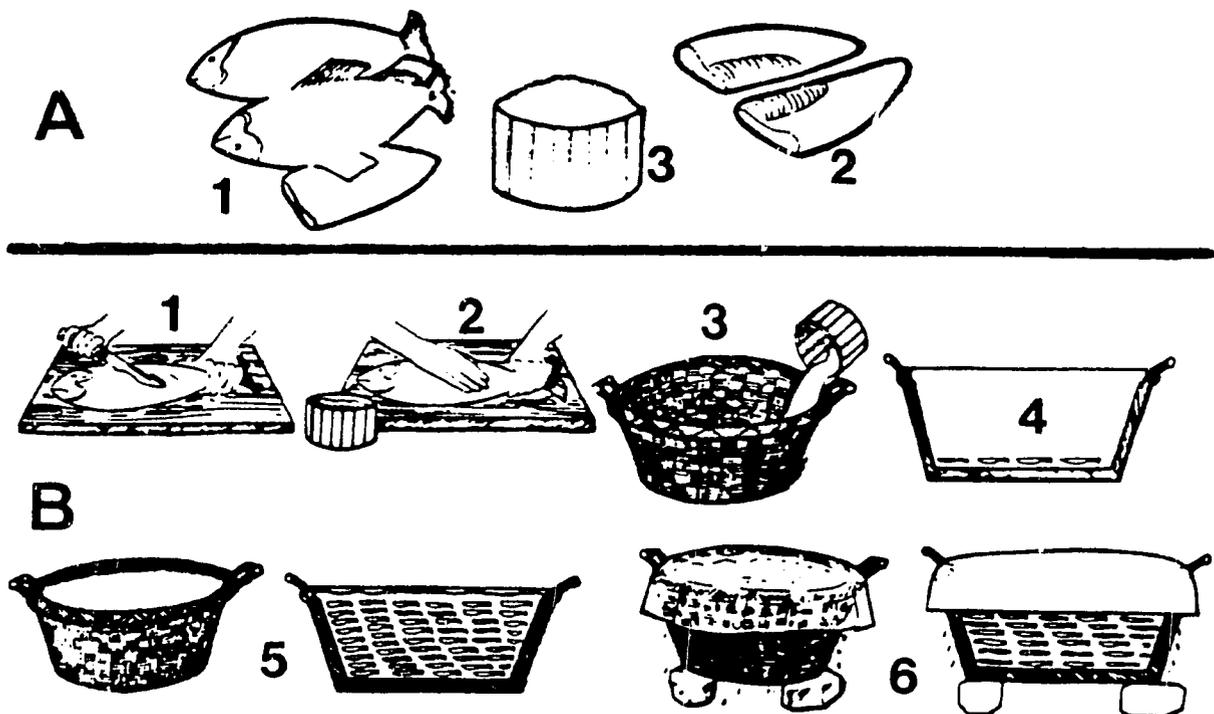
1. Split fish or
2. Fillets
3. Coarse, edible-grade salt

B. IN DRY SALTING A BASKET OR PERFORATED TRAY, OR SOME OTHER CONTAINER WHICH WILL ALLOW LIQUID TO DRAIN OFF, SHOULD BE USED.

1. Place the fish on a clean, wooden board (not plywood). Using a clean, sharp knife, score the flesh for better salt penetration into thick areas.
2. Rub coarse salt into the fish flesh.
3. Place a thick layer of salt on the bottom of the container.
4. Place a layer of fish (one fish deep) skin side up over the salt. The fish should be split to allow for good salt penetration. The fish must not overlap.
5. Continue: a layer of salt and a layer of fish, skin side up, in this manner until the container is full.
6. Cover with heavy-gauge plastic, but do not weigh down with stones.

NOTE :

Be sure to elevate the basket on stones or bricks so that the liquid drains off and the fish dry. Heavily salted fish, when covered, will keep for a long period of time.

ILLUSTRATIONS

CHAPTER 8.WET SALTINGA. YOU WILL NEED :

1. A perfectly clean vat with a cover of slightly smaller diameter than the inside of the vat.
2. Several well cleaned and washed stones to use as weights.
3. Coarse, edible-grade salt.
4. A container for preparing brine.

B. SMALL FISH (Sardine type)

Leave the viscera in. They ferment the fish and help to preserve it.

LARGE FISH

Remove the viscera. The salt alone will preserve the fish. Large and medium-sized fish must be split open to provide for good salt penetration.

1. Use three parts fish to one part salt.
2. Cover the bottom of the vat with a thick layer of coarse salt. Place fish in one layer (one fish deep) over the salt. Sprinkle the fish, until thoroughly covered, with additional salt. Continue to add fish and salt on top.

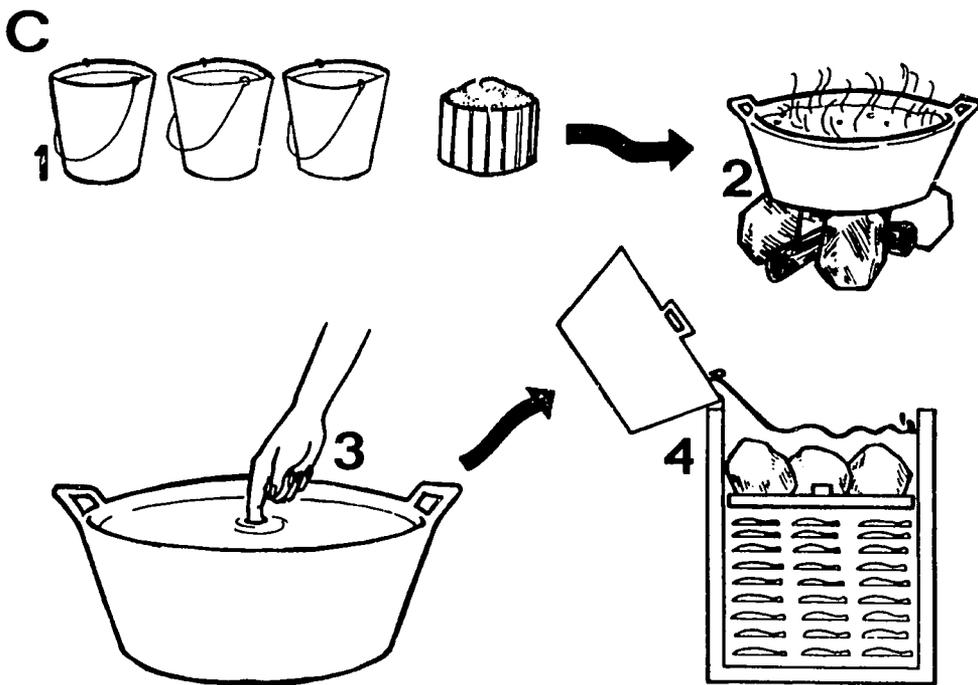
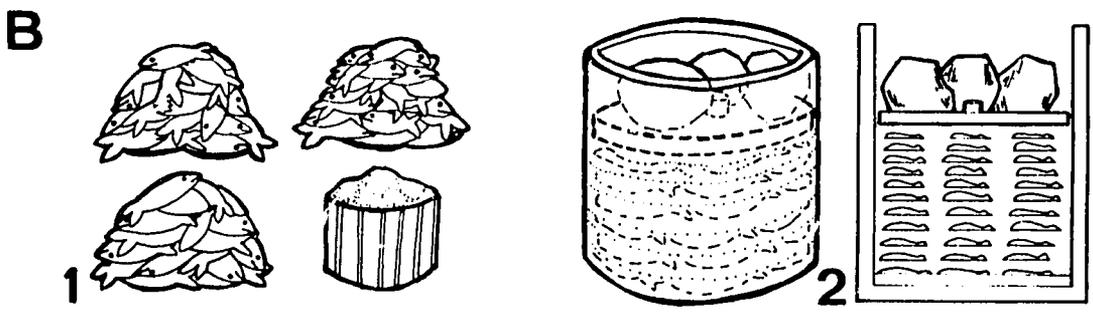
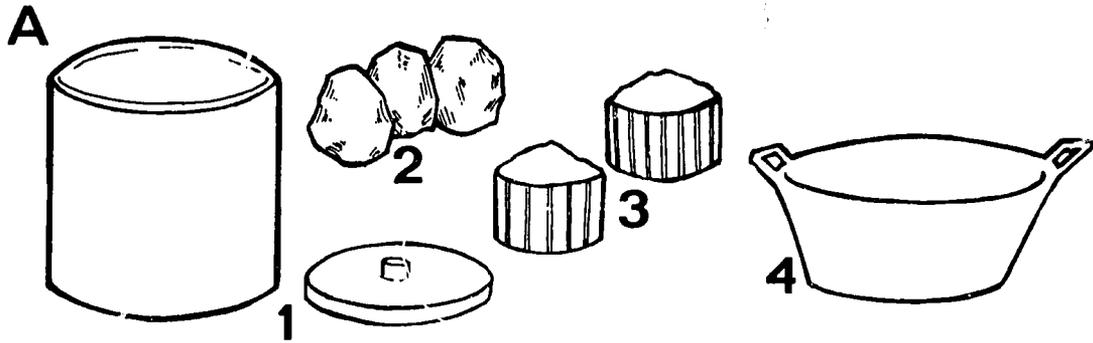
Place the cover on the container and weigh it down with stones. Brine will form, rising 2 to 3cm above the cover. If sufficient brine should not form, add a saturated salt solution.

C. PREPARATION OF SATURATED SALT BRINE SOLUTION

1. Use three parts of potable water to one part salt.
2. Place solution in a container and heat over a fire. Bring to a boil and then let cool.
3. When you are able to place your finger in the brine and feel no discomfort, the brine is ready to be used.
4. Add the additional brine solution required.

ILLUSTRATIONS

8. WET SALTING



CHAPTER 9.UTILIZATIONA. DESALTING THE FISH

Before cured fish can be used, it must be desalted by soaking in potable, cold water overnight or up to 48 hours. In warm climates, the fish should not be soaked more than overnight. Change the water several times. Fish may also be broken into large flakes, placed in potable, cold water and heated slowly (simmered) for 30 minutes to 1 hour. Very dry, very salty fish may need to be soaked in cold water and then simmered in fresh cold water.

NOTE:

All cured fish must be cooked before eating.

B. FISH STEW

Cook cured fish, after desalting by soaking, in water with different kinds of vegetables. Vegetables commonly used for stew are: yams, tomatoes, onions and potatoes. Also used are : okra, peppers, spinach, or other green leaves, rice, groundnuts and pimento. Seasonings should also be used.

C. BOILED FISH

After the fish is desalted, place it in a deep pan or skillet. Cover it with cold water and heat very slowly until it is almost boiling. This may take an hour or more. Skim off the scum which has risen to the top. Lift the fish out of the water onto a warmed plate. Serve with oil, or melted butter, and pepper.

D. BROILED FISH

After the fish has been desalted, drain and dry it. Sprinkle it with cooking fat or oil. Place the fish, flesh side up, on a metal rack over a fire. Cook the fish for 3 to 4 minutes, then turn it over and cook it about 4 minutes longer. The length of time the fish will have to cook depends on its thickness. Thicker pieces of fish take longer to cook.

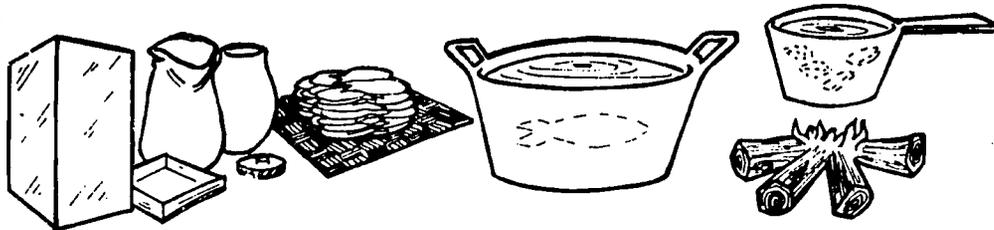
NOTE:

For detailed recipes see any reliable cook book.

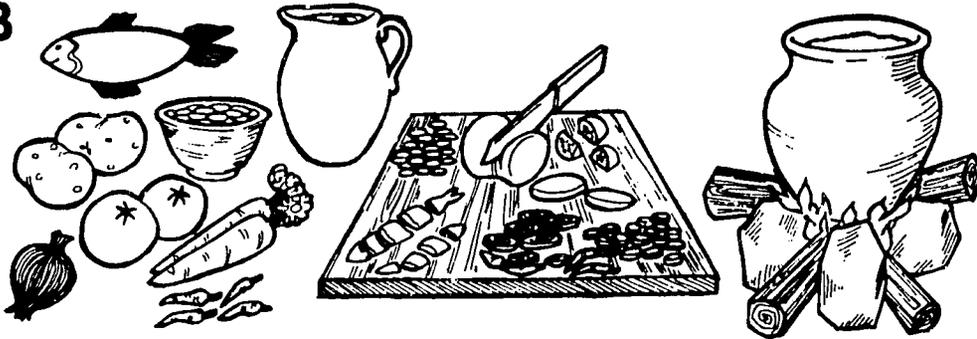
ILLUSTRATIONS

9. UTILIZATION

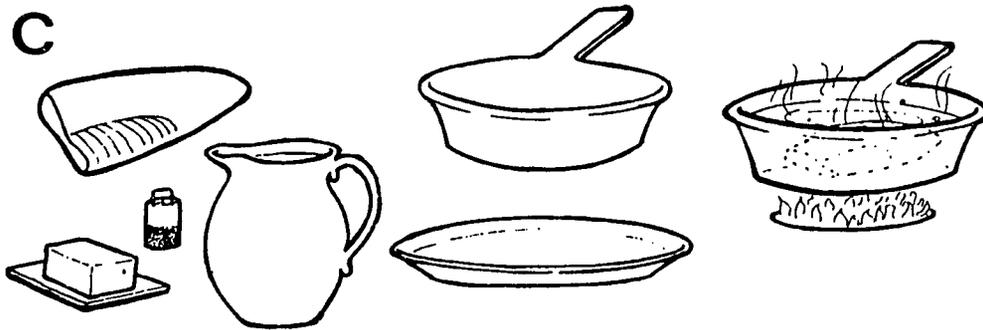
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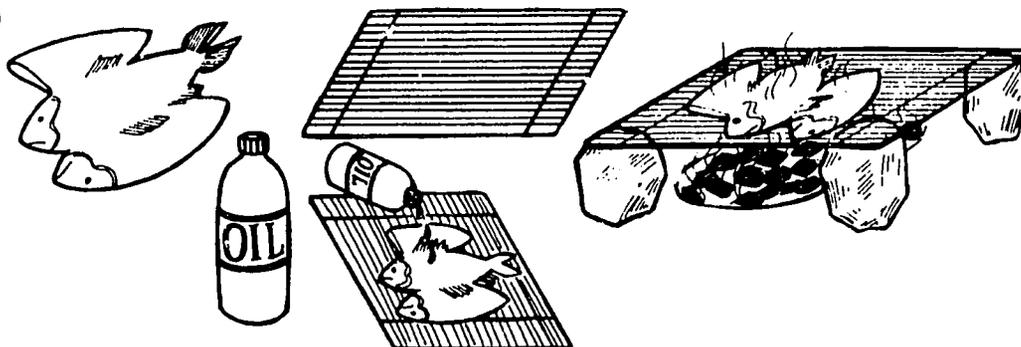
B



C



D



CHAPTER 10.STORAGECURED FISH CAN BE STORED IN DIFFERENT WAYSA. USING WOVEN MATS

1. Use smoked or sun dried fish.
2. Place several layers of dried fish on a woven mat.
3. Fold the mat, rightly, around the fish.
4. Sew the mat together to form a tight container around the fish.
5. Place the sewn mat containing the fish into a plastic bag and store the package in a wooden crate to avoid breakage of fish.

B. USING CONTAINERS

1. Stack the fish in an airtight metal container, or
2. Stack the fish in airtight ceramic or terracotta containers.

ILLUSTRATIONS