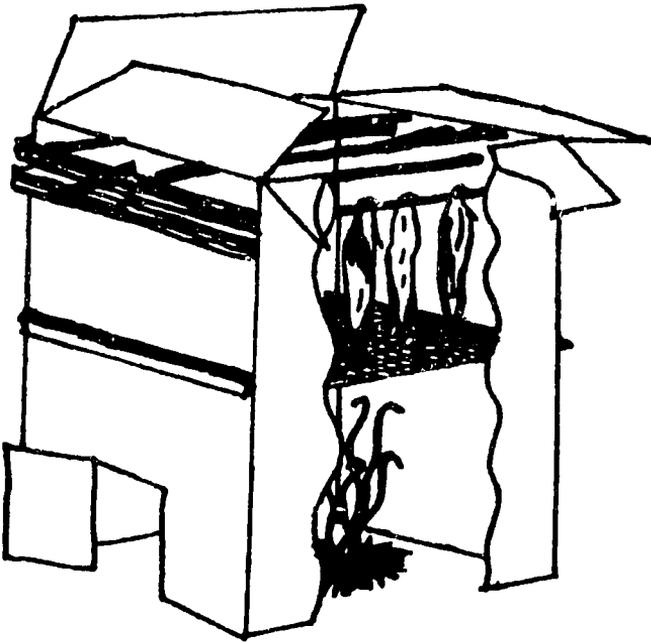


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Smoking Fish in a Cardboard Smokehouse



a **VITA** publication

INTRODUCTION

Easy to Make

Anyone who can use a knife, saw and hammer can make a low-cost smokehouse from a cardboard carton (See Figure 1). It can be folded flat and moved easily. It is efficient and easy to operate. Its only disadvantage is that it cannot be exposed to rain. A 30-inch square (75-centimeter square) smokehouse holds about 60 pounds (27 kilograms) of split fish.

Storing the Fish

Smoked fish can spoil, even when it is produced under the most sanitary handling conditions. Therefore, it must be refrigerated, frozen or canned if it is to be stored.

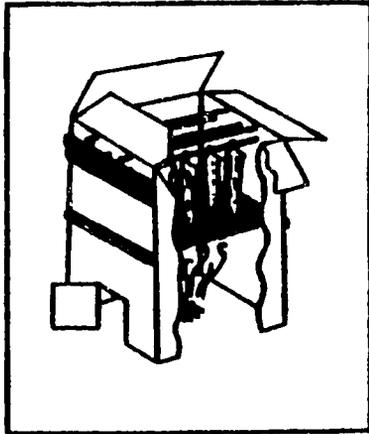


Figure 1 - Cardboard Smokehouse

CONSTRUCTION

Tools and Materials

Knife
Hammer
Saw

Smokehouse - to be made from the following materials:

Cardboard carton: Approximately 30 inches (75 centimeters) wide, 30 inches deep and 48 inches (120 centimeters) high.

Three-quarter-inch (2 centimeters) wood strips.

Three-quarter-inch (2 centimeters) roofing nails.

Sticks or rods (broom handles, iron rods, anything that will not sag).

14-inch (35 centimeters) pieces of 8 or 10 gauge steel wire (or heavy wire coat hangers).

Half or quarter-inch (0.5 or 1 centimeter) wire mesh.

Building the Smokehouse

Use a cardboard carton which is about 30 inches (75 centimeters) square and 48 inches (120 centimeters) high. Other sizes may be used, but they should be at least 24 inches (60 centimeters) wide and deep and 40 inches (100 centimeters) high.

1. Remove one end by cutting along the edge folds. The open end is used as the bottom.
2. Unfasten the flaps at the other end so that they can be bent back and folded together again to make a cover.
3. If the box is weak and tends to buckle when pressure is applied at the top, strengthen it by tacking a three-quarter inch (2 centimeters) strip of wood vertically on the outside at each corner; attach the strip by driving large-head roofing nails (three-quarter inch or 2 centimeters) into them from the inside. Nail four more strips horizontally on the outside on opposite sides; nail two of them 4 inches (10 centimeters) from the top and the other two 20 inches (50 centimeters) from the bottom, driving large-headed roofing nails into them from the inside.
4. Cut a door 10 inches (25 centimeters) wide and 12 inches (30 centimeters) high in the center of one side at the bottom. Make two cuts, one vertical and one horizontal.

The door can then be bent out, with the cardboard on the uncut side acting as a hinge.

5. Cut holes for the rods (which should extend at least two inches (5 centimeters) beyond the outside of the carton). Seven rods are used with a 30-inch (75 centimeter) size carton:

Two rods: just below the fold at the top, to keep the flaps from sagging.

Three rods: just above the upper horizontal wood strips, to support the fish. The two outside holes are 6 inches (15 centimeters) in from the corners, the third is in the center. (Smaller cartons may need only two rods here.)

Two rods: just above the lower horizontal wood strips, to support a tray to catch any fish that falls.

6. Make a tray by cutting half-inch or quarter-inch (0.5 or 1-centimeter) wire mesh to fit inside the box. Bend the edges over and hammer them down flat.
7. Make hooks from pieces of 8- or 10-gauge steel wire 14 inches (35 centimeters) long (or heavy wire coat hangers). Bend each piece in the middle around a hammer handle or a broom stick. Then, bend the hook end the same way to form a goose neck (see Figure 2.) The opening of the hook must be big enough to slip

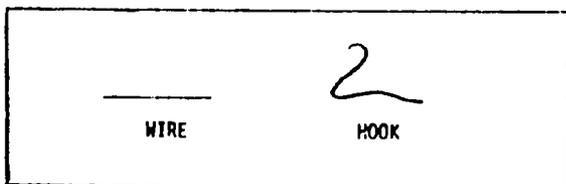


Figure 2 - Making Hooks from Pieces of Steel Wire

easily over the rod; the end must be bent so it will not slip off the rod during the smoking process.

8. When the right size carton is not available, use two cartons of equal size, at least 24 inches (60 centimeters) high and 24 inches (60 centimeters) wide:
 - a. Remove the top and bottom from one.
 - b. Cut away the bottom of the other.
 - c. Telescope the second over the first to get the desired height.

- d. Tack strips of wood on the outside of all four sides of the overlapping space to prevent further telescoping and to seal the smokehouse.

SMOKING

It takes five to six hours to smoke fish ready to eat. The exact period depends on the size of the fish. The carton will not catch fire if:

1. The ventilation is controlled to make the fire smoke rather than blaze.
2. Not too much wood is placed on the fire. If too large a blaze develops, it can be smothered with sawdust or reduced by removing some of the blazing wood.

Preparing the Fish

1. Scale and behead the fish, leaving the collarbones intact.
2. Cut the belly and remove the guts. A round fiber brush is helpful for removing blood and other undesirable material from the fish.
3. Split the fish to the back skin but not through it.
4. Wash it thoroughly in pure, unpolluted water.
5. Place it in a brine (made by mixing 4 cups [64 tablespoons] of salt to a gallon [3.8 liters] of water) for a half hour to an hour, depending on size and thickness.
6. Remove the fish from the brine, rinse it in cold pure water, drain it for 10 minutes and then let it hang in a cool breezy place for about an hour or until its surface is shiny.

[If the fish is to be held overnight and smoked the next day, follow steps 1 through 4 above and then:]

5. Place it in a brine (made by mixing a half cup [8 tablespoons] of salt to a gallon [3.8 liters] of water), keeping the fish in the brine until all the fish has been cleaned and split.
6. Drain the fish on a draining board or a piece of wire mesh.
7. Salt the fish on both sides and inside. The salt should be of good grade, without driers or iodine, and containing less than one percent impurities.
8. Lay the fish flat in an enameled pan or crock.

9. Cover the fish with waxed paper and keep it overnight in a refrigerator or other cool place.
10. In the morning, place them on the hooks and hang them in the smokehouse. If they are too moist, they should be allowed to drip for 15 minutes before the smokehouse is set over the fire.

Preparing the Fire

Build a fire on a level plot of ground.

Use pieces of wood about 8 inches (20 centimeters) long and one inch (2.5 centimeters) in diameter: semi-dry, non-resinous woods such as oak, hickory, beech and sweet bay, in combination with one or more of the following: river mangrove, Australian pine, palmetto root, buttonwood, apple, citrus, or leached driftwood. Corn cobs, coconut husks, sawdust and chips of the above woods are also used. Sawdust burns slowly and makes a good smudge. But if the smoke is too heavy, the smoke flavor will be too strong.

Smoking - Hot Smoke Method

1. Bring the carton nearby while the fire is being built.
2. Put the tray on the two bottom rods in the smokehouse.
3. Put in the smokehouse the rods for hanging the fish.
4. Weave the straight end of the hooks into the prepared split fish, going in the flesh side just below the collarbone, out through the skin, back into the flesh as near the backbone as possible. Repeat the process on the other side of the backbone, having the hook come out of the flesh side below the other collarbone. If this is done properly, the hook will not pull through the fish while it is being smoked. The hook will hold the fish flat, shortening the time needed for smoking and making room for more fish in the smokehouse.
5. Hang the fish on the rods, spaced so that they do not touch.
6. If there are a few fish too large for the hooks, place them on an oiled or greased tray.
7. After the rods have been hung with the fish, the tray with the large fish can be placed on top of the rods. (A tray can also be used simply to increase the capacity of the smokehouse.)
8. Insert the two flap-supporting rods and close the top of the carton by folding the flaps together.

9. Lift the smokehouse over the fire so that the fire is in the center of the house and the door is facing the wind.
10. Fill or cover all holes that do not have rods through them.
11. If the flaps do not fold together well enough to keep smoke from escaping, lay a piece of cardboard over the opening and weight it down with a stone or any other handy object.
12. Close the door tightly.

NOTE: THE SMOKEHOUSE SHOULD BE COMPLETELY AIRTIGHT. LET ENOUGH AIR ENTER TO KEEP THE FIRE SMOLDERING.

13. Push dirt up against the sides at the bottom to prevent undesirable drafts.
14. Stoke the fire every half hour.
15. For the first 4 or 5 hours, hold the temperature at 100 degrees F. (37.8 degrees C.) or less. Then increase it to between 180 and 200 degrees F. (between 82.2 and 93.3 degrees C.) for about an hour to cook the fish.
16. Check the progress of the smoking by lifting the flaps about 2-1/2 to 3 hours after the house is placed over the fire. Then check it every half hour until the fish is ready to take out. The fish is cooked when the backbone separates from the flesh.
17. When the fish is cooked, lift the smokehouse from the fire and let the fish cool and dry either by letting it hang in the smokehouse or by laying it on a strip of wire mesh in a way that air will contact all the surfaces of the fish. To keep insects away from the fish while it is cooling and drying, cover it with mosquito netting.

Smoking - Cold Smoke Method

The cold smoke method does not require a high temperature, but fish treated this way has to be reheated before eating.

STORING AND PROCESSING

When the fish are dry, wrap them individually in waxed paper or cellophane and put them in a refrigerator or other cool place, or they may be frozen or processed in tin cans or glass jars. When processed or frozen, they can be stored like any other fishery products.

SOURCE: Walter A. Rust, "A Cardboard Smokehouse", U. S. Department of Interior, Fish and Wildlife Service, Fishery Leaflet 204, Reissued December 1957.