
Fishery Leaflet 204

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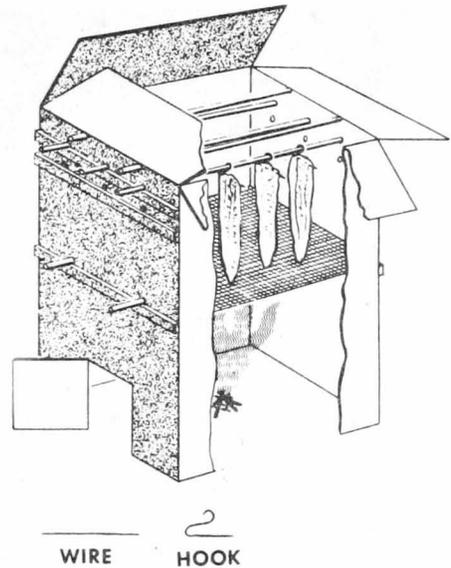
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A CARDBOARD SMOKEHOUSE

By Walter A. Rust*

An inexpensive smokehouse made from a cardboard carton or cartons can be built by any individual who can use a knife, saw, and hammer. It can be set up in the back yard or on a campsite, or it can be folded flat and transported to any locality. It has the advantages of being efficient and easy to operate. The construction and operation of the smoker and the preparation of the fish for smoking are explained in detail in this article.

CONSTRUCTION: A carton which is approximately 30 inches square and 48 inches high is desirable. Although other sizes may be used, the minimum size should be not less than 24 inches in width or depth, nor less than 40 inches in height. One end of the carton should be removed by cutting along the edge folds, and this opening used as the bottom. At the other end, which is to be the top, the flaps should be unfastened so that they can be bent back and folded together again to make a cover.



If the box is weak and there is a tendency toward buckling when pressure is applied at the top, it can be strengthened by tacking a three-quarter inch strip of wood vertically on the outside at each corner. Large-head roofing nails (three-quarter inch) should be driven into the strips from the inside. Four more strips should be nailed horizontally on the outside, on opposite sides, in the same manner as for the corner pieces. Two of these should be nailed 4 inches from the top and the other 2, 20 inches from the bottom. A door 10 inches wide and 12 inches high should be cut in the center of 1 side at the bottom for stoking the fire. It can be made by 2 cuts, 1 vertical and 1 horizontal. The door can then be bent out, the cardboard on the uncut side acting as a hinge.

Old broom or mop handles, bamboo poles, iron rods, or sticks that will not sag can be used for rods. Seven are necessary for the 30-inch size carton. They should be long enough to extend at least 2 inches beyond the outside of the carton. Three of the rods support the fish, 2 hold the tray, and 2 keep the flaps from sagging. Holes should be cut through the cardboard just above the wood strips to enable the rods to rest on the strips. The holes for the rods which support the flaps are just below the fold. The rods should be spaced far enough apart that the fish do not touch when hung. The 2 outside holes are 6 inches from the

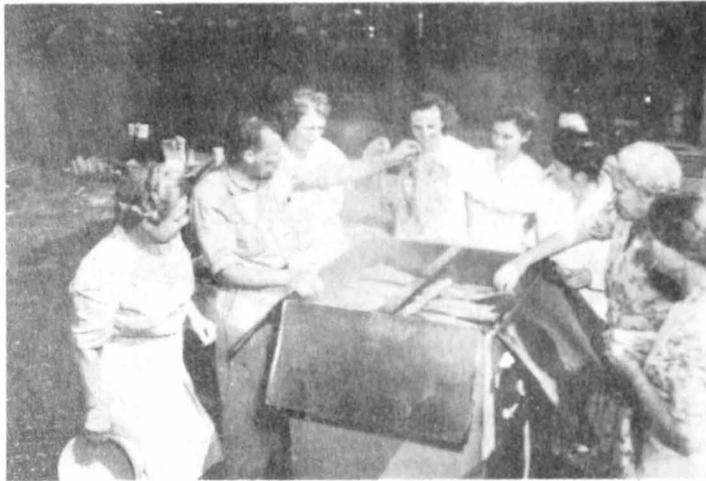
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corner, and the 3rd is in the center, an equal distance from each of the side holes. Smaller cartons require only 2 such rods unless the fish are so small that 3 can be used. If trays are used, additional strips of wood should be tacked 4 inches below the top strips, the holes corresponding with those above. Trays can be made with one-half or one-fourth inch mesh hardware cloth, cut to fit inside the box, the edges bent over and hammered down flat.

Hooks can be made from pieces of 8- or 10-gauge steel wire 14 inches long. Each piece should be bent in the middle around a hammer handle or broom stick, and the hook end bent the same way, to form a goose-neck. The opening of the hook must be large enough to permit it to slip easily over the rod, and the end must be bent so that it will not slip off the rod during the smoking process. Heavy wire coat hangers can be used to make the hooks.

When a single carton of the above dimensions is unavailable, 2 cartons of equal size, at least 24 inches or more in height or width, can be substituted.



On 1, the top and bottom should be completely removed, retaining the sides. The other box bottom should be cut away and the top flaps telescoped over the other until the desired height is obtained. Strips of wood should be tacked on the outside of all the 4 sides of the overlapping space to insure against further telescoping and to make a seal to prevent an undue loss of smoke.

The single carton smoke-house can be flattened and transported to any place desired. Its sole disadvantage is that it cannot be exposed to rain. A 30-inch square house has a capacity of about 60 pounds of "butterflied" or split fish.

From 5 to 6 hours are required to smoke fish ready to eat, the exact period depending upon the size of the fish. The carton will not catch fire if the ventilation is controlled properly by sufficient suffocation of the fire to make smoke instead of a blaze and if too much wood is not placed on the fire at any time. Should too large a blaze develop, it can be smothered with sawdust or reduced by removing a portion of the blazing wood.

OPERATION: A fire should be built on a level plot of ground with the wood appropriate for smoking. The wood pieces should be about 8 inches long and 1 inch in diameter. Semi-dry, non-resinous woods such as oak, hickory, beech, and sweet bay, in combination with 1 or more of the following: river mangrove, Australian pine, palmetto roots, button wood, apple, citrus, and leached drift wood give excellent flavor. Corn cobs, coconut husks, sawdust, and chips of the above woods are also used. Sawdust burns slowly and makes a good smudge. However, too heavy a smoke over-emphasizes the smoke flavor. Any wood containing pitch or similar material should never be used.

While the fire building is in progress, the carton can be brought nearby and made ready. First, the 2 bottom rods should be placed to support the tray that

will catch any fish which drop during the smoking. Then the rods from which the fish are hung should be shoved in place. The prepared, split fish should be woven on the hook by entering the flesh side just below the collar bone, out through the skin on the other side, back again into the flesh and as near to the back bone as possible. This process should be repeated, having the hook come out of the flesh side below the other collar bone. If done properly, the hook will not pull through the flesh during the smoking period. Preparation of fish in this manner holds them flat, increasing the capacity of the smokehouse and shortening the time for smoking. The fish should be hung on the rods and spaced so that they do not touch. If there are a few large fish, too large for the hooks, they should be placed on an oiled or greased tray. After the rods have been hung with fish, the tray containing the large fish should be placed on top of the rods (a tray can always be used to increase the capacity of the smokehouse). The 2 top flap supporting rods should then be inserted and the top of the carton closed by folding the flaps together. After the fire has been started, the smokehouse can be lifted over it so that the fire is in the center of the house and the door is not on the lee side. All holes that do not have rods through them should be filled or covered. If the flaps do not fold together properly, allowing smoke to escape, a piece of cardboard should be laid over the opening and weighted down with a stone or other handy material. The door should be tightly closed. The smokehouse should not be completely airtight, however, but enough air allowed to enter to keep the fire smoldering. Dirt should be pushed up against the side at the bottom to prevent undesirable drafts.

The fire must be stoked about every half hour. For the first 4 or 5 hours, the temperature should be held at about 100° F., or below, then increased to between 180° to 200° F. for about an hour to cook the fish. The progress of the smoking can be observed by lifting the flaps. The first observation should be made 2½ to 3 hours after the house is set over the fire; thereafter, every half hour until the fish are ready to take out. The cooking is completed when the backbone of the fish separates from the meat. Then the smokehouse should be lifted from the fire and the fish either left in the smokehouse to cool and dry or lifted onto a strip of hardware cloth laid on a table in such a manner that air will come in contact with all surfaces of the fish. To keep insects away from the fish while they are cooling and drying, cover with mosquito netting.

This aforementioned method is called the hot smoke process. The cold smoke method, on the other hand, does not require a high temperature. Fish treated by the latter process have to be reheated again before eating. For either method, after the fish are dry, they may be wrapped individually in waxed paper or cellophane and placed 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 as any other fishery product.

The hot smoke method imparts a delicious flavor to the fish and leaves the texture succulent.



Preparation of the Fish for Smoking: Fish which are to be smoked should be scaled and the heads removed, leaving the collar bones attached. The belly should then be cut and the intestinal material removed. A round fiber brush is desirable for removing all blood and other undesirable material from the fish. The fish should be split to the back skin but not through it, washed thoroughly, and placed in a brine composed of one-half cup of salt to 1 gallon of water. The brine container can be either wood, enamelware, or a stoneware crock. It is desirable to keep the fish in the brine until all of them have been cleaned and split. If the fish are cleaned in the afternoon or evening, too late to smoke the same day, they should be drained on a draining board or on a piece of hardware cloth and then salted on both sides and inside. The salt should be of a good grade, containing less than 1 percent impurities, without driers or iodine. A handy salt shaker can be made from a half or 1 pint size salad dressing jar. The fish should be laid flat, flesh side up, in an enameled pan or crock. After they are all salted, they should be covered with waxed paper and put in a refrigerator or other cool place overnight. In the morning they should be placed on the hooks and hung in the smokehouse. If they contain excess moisture, they should be allowed to drip for 15 minutes before the smokehouse is set over the fire.

When the cleaning and smoking of the fish are to be undertaken the same day, the same preliminary cleaning preparations should be completed to the point where the fish are salted. Instead of being salted and held overnight, they should be placed in a brine made of 4 cups of salt and 1 gallon of water. The fish should remain in the brine from one-half to 1 hour, depending on their size and thickness. They should be removed from the brine, rinsed in cold, fresh water, drained for 10 minutes and allowed to hang in a cool, breezy place for about an hour, or until the surface has a shiny appearance. They are then ready for the smokehouse.

