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H Smokehouse FOR THE *Sportsman AND Hobbyist*

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OPERATIVE EXTENSION SERVICE , OREGON STATE UNIVERSITY , CORVALLIS

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A Smokehouse for the *Sportsman and Hobbyist*

The general methods employed in smoking are so broad and the process so simple that anyone can produce a palatable product with a minimum of experience.

The smoker illustrated here is easy and inexpensive to construct and operate, and has the added advantage of being completely portable and easy to move or to store when not in use.

How to Build the Smoker

The smokehouse is constructed from two pieces of 4- x 8-foot plywood, either $\frac{3}{8}$ or $\frac{1}{2}$ inch in thickness. The lower half is lined with sheet metal as a fire hazard protection, and the bottom should be of metal, asbestos board, or other fire resistant material. (See plan, pp. 4-5.)

The trays are made of $\frac{1}{4}$ -inch galvanized hardware cloth screen fastened to wood frames. Construct the frames to allow a 2-inch clearance around the sides to facilitate air circulation. Provide a metal pan or tray to catch any drippings resulting from the smoking process and to prevent them from falling on the hotplate and burning. Drip pans may be lined with foil for easier cleaning. Vents insure proper circulation of smoke and fresh air. Make vents by drilling holes near the top and bottom of the sides and covering them with adjustable caps.

An old ice box or electric refrigerator may be modified and used as a smoker in place of the cabinet described above. Use caution in any smoker cabinet to prevent children from locking themselves in.

How the smoker works

A two-burner hotplate, preferably with a three-level heat regulator or

thermostat, is a good source of heat. Place a gallon can or deep pan partially filled with hardwood sawdust or chips over one of the burners. Place sawdust or chips in the container so that part of the bottom is exposed. Air is required for combustion. A limb or stock of wood may be placed over the burner, but always use a piece of sheet metal or an iron fry pan between the burner and the piece of wood to reduce the danger of the element burning out. Ashes surrounding the element cause overheating at that point.

Close vents enough to prevent the chips from bursting into open flame. Line the bottom compartment with metal or asbestos, as shown in the plan. If a small portion of the inside bottom of the can is left uncovered, better combustion will occur.

When necessary, the second burner plate may be used to provide additional heat for hot smoking or kipping.

Precautions to take

Since the smoker is largely constructed of wood, take precautions not to overheat. Use a thermometer to maintain proper temperatures. This may be inserted in a cork and sus-

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pended through a hole near the top. Control ventilation carefully so that the wood smoulders and smokes, but does not flame. Should the wood flame, reduce the heat or partly cover the top of the can with a piece of sheet metal.

Since the smoker is continuously heated for considerable periods of time, the possibility of the occurrence of a short in the electrical circuit exists. To be safe, the hotplate should

be grounded. This may be accomplished by running a wire from the hotplate metal to a rod driven in the ground, or to a nearby water pipe.

Observe care both in the operation and location of the smoker—do not put it next to another building while in use. Careful regulation of the fresh air inlet and the heat control on the burner will regulate temperature and minimize danger of wood flaming.

Smoking and Kippering

The process of smoking has much to offer the sportsman and hobbyist as a method of preserving fish and domestic and game meats. Smoking eliminates the necessity of refrigeration during the preserving process, and enhances flavors at the same time.

Hot-smoked or kippered meats are both flavored and completely cooked with smoke. Since kippered meats are not entirely dried out and frequently may be moist and juicy, their keeping qualities are limited. Unless refrigerated, frozen, or canned, hot-smoked meats should be consumed within a few days after processing. Smoked meats may be kept for a short time in the freezer. They should be thawed in the refrigerator to prevent the loss of moisture.

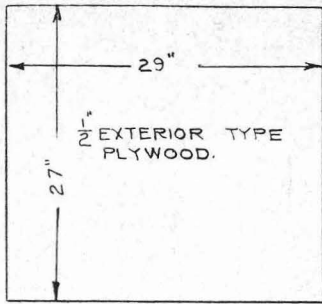
Conversely, cool-smoked meats are quite completely dried out while smoking, but *are not cooked*. Although both kippered and cool-smoked meats and fish are brined prior to processing, cool smoked meats are generally given a heavier brine. The salt cures the meat and the smoking dries it, improves its flavor, and tends to preserve it by inhibiting bacterial action. Cool-smoked meats will keep indefinitely if kept dry, although they may become rancid in time.

Fish and game meats may be preserved by frozen storage and thawed later for smoking when desired. Air must be excluded from the product during frozen storage, however, or dehydration and oxidation (“locker burn”) will result and flavor will be impaired.

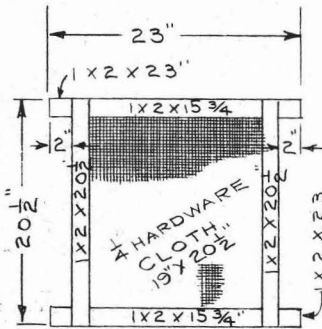
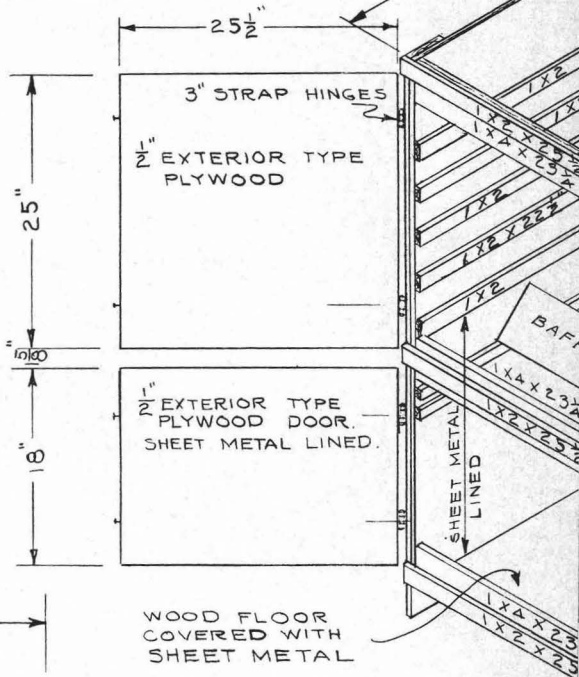
Nearly all game meats may be improved by smoking. A partial list includes big game, such as deer, elk, bear, etc.; waterfowl and larger upland game birds; and certain fur bearers such as muskrat, raccoon, and beaver. The tougher cuts of big game, such as the neck and lower leg muscles, make excellent smoked jerky. Domestic animals and fowl are handled in the same manner as game.

Fish most suitable for smoking or kippering have a high oil content. These fish are considered most suitable: salmon, sturgeon, smelt, catfish, whitefish, herring, shad, and trout (including steelhead).

To prepare small fish for smoking, clean them, remove heads, brine (as explained in following paragraphs), dry thoroughly, and then smoke on trays. Another good method for small fish is to clean the body cavity but leave the heads attached. Then string the fish through the heads on sharpened



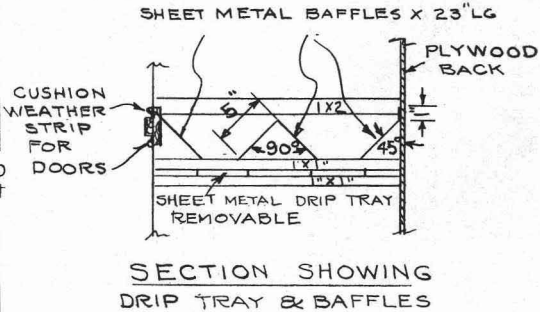
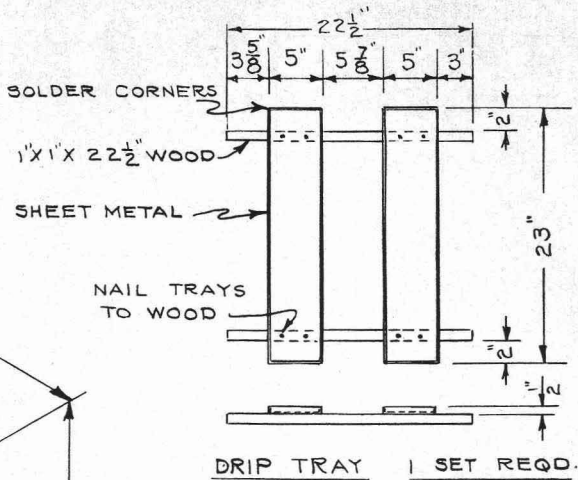
TOP FOR SMOKE HOUSE



TRAYS 5-REQD.

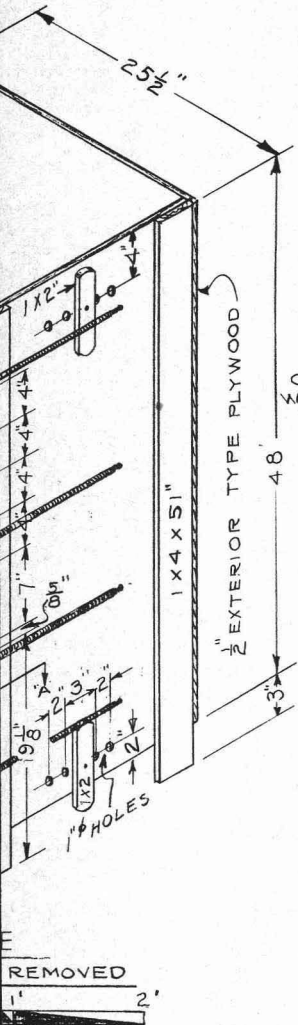
SCREEN DOOR SPRINGS TO HOLD DOORS TIGHT. 4-REQD.

SMOKE WITH ROOF & SCALE 0'



CUSHION WEATHER STRIP AROUND FRAMES TO SEAL BOTH DOORS. APPROX. 16 FT. REQD.

SECTION A-A



Construction Details For Home-Built Smokehouse

stiff wires or small-diameter welding rods. Wires or rods 23 inches long will hang crosswise in the smoker shown in this bulletin. Bacon or other meats may also be supported in the same manner for smoking.

Larger fish should be filleted and placed on the trays skin side down. Fish having many bones, such as shad, carp, suckers, etc., may be hot smoked and then canned in a pressure cooker. Pressure cooking softens the bones and the finished product will keep indefinitely. When canning smoked fish use the same pressures and time schedules as for fresh fish.

Woods to be used in smoking should be nonresinous, such as apple, cherry, alder, vine, maple, oak, and ash. Hickory may be available in some areas. Preferably remove all bark from the wood, as bark may impart a bitter flavor to the smoked food.

Smoking meats and fish

Although individual tastes vary as to strength of brine, curing and smoking time, and desired dryness or flavor of the finished product, the following may give the beginner some suggestions as to general procedures.

Kippering (hot smoking). Cut meat or fish into convenient sized pieces. Immerse in brine (8 to 16 ounces of salt per gallon of water) for 12 to 24 hours. For the first time try about 11 ounces of salt and 12 hours brining time. Remove to fresh water (not running) and freshen for 2 to 4 hours. Drain well and dry with cloth or paper towels. Allow surface of meat to dry (this is very important), oil trays with vegetable oil to prevent sticking, place meat on trays, and put trays into the smoker. A thick, milky secretion may appear on the surface of fish during heating. This is a good pro-

tein food substance and need not be removed. Process with warm smoke (around 100° F. for 4 to 6 hours) to add flavor, then finish with hot smoke, or oven heat (up to 150° F.) to thoroughly cook through. To keep ovens from overheating, the oven door may need to be left ajar. Meat or fish is then ready to eat.

Cool smoking. Brine (8 to 16 ounces of salt per gallon of water) but do not wash in fresh water. For a sweeter product add 1 pound of brown sugar to the brine, with not less than 12 ounces of salt. Drain and dry thoroughly, and place in smoker. Dry out and flavor with warm smoke at temperatures not exceeding 90° F. for 1 to 5 days until sufficiently dried. Smoking need not be a continuous day and night process but should be completed as rapidly as possible. When completely dry, meat is ready to use, and will keep without refrigeration. Meat may be cooked before eating, if desired. The smoker illustrated here is ideally suited for hot smoking. If a completely dry product, such as jerky, is desired, the meat may be left in the smoker under heat without smoking, or it may be removed from the smoke and placed in the ventilated or open oven of a range for further drying. Oven drying temperatures should be low (not over 150° F.) to prevent cooking.

Flavoring

Tabasco, onions, garlic, etc. may be added to the brine or freshening water. If desired, pepper may be sprinkled on the meat before it is placed in the smoker. Low-oil content fish, such as flounder and other bottom fish, may be improved in texture and flavor by basting with cooking oil during the smoking process. The use of curing salts may provide special flavoring.

Sour cream fish dip

To $\frac{1}{2}$ pint thick sour cream add $1\frac{1}{2}$ to 2 cups crumbled smoked or kippered salmon or steelhead. Add garlic salt to taste and blend well. Serve with assorted crackers or potato chips.

Smoked or kippered jerky

Smoked or kippered jerky may be prepared from many wild and domestic animal meats. Remove all fat from the meat. Cut into strips not over $\frac{1}{2}$ inch thick. Place the meat in layers in a suitable container, liberally salting each layer. Pepper, garlic powder, tobasco, brown sugar, or other flavoring may be added at this time. If tough cuts are used, sprinkle powdered meat tenderizer on each layer.

Place the container in the refrigerator, or other cool area, and leave for at least 18 hours. Remove, thoroughly drain the meat, and place it in smoker.

Follow processing directions as listed under kippering or cool smoking—depending on whether you want a moist or a completely dry product.

Blanched and smoked jerky

A quick and easy way to make smoked jerky from deer or elk is to blanch or parboil strips of lean meat. Cut the strips about $\frac{3}{4}$ inch in diameter and 6 inches long. Avoid making strips thicker than 1 inch. Cut lengthwise of the muscles, not across the grain.

Blanch or parboil in a solution of about 2 cups of salt per gallon of water and enough pepper to suit your taste. Drop strips of meat into the boiling mixture for about a minute—not any longer, preferably a little less. Stir enough to keep all pieces separate. Remove and drain; then place the strips of jerky meat in the smokehouse.

Smoke the meat for from 3 to 5 hours, depending upon your preference for the amount of smoke flavor. The

longer the meat is smoked the better it will keep. If you like a peppery taste, lightly pepper the strips of meat just before smoking.

If the strips of jerky are not completely dry following the smoking period, place them in an open oven with low heat or spread on trays near furnaces or other sources of artificial heat. Dry jerky will keep under refrigeration for several months. If it is not completely dry, it should be eaten within a week or frozen for future use.

Smoking turkeys or chickens

Kill, pick, and draw the birds in the usual manner. Pack birds close together in a crock, odorless hardwood barrel, or other suitable container. Cover the birds with a curing solution made of 6 pounds of salt, 3 pounds of sugar, and 3 ounces of salt-peter dissolved in $4\frac{1}{2}$ gallons water. Weight the birds to prevent floating. It is important to hold the temperature as near 38° F. as possible. It is desirable to remove turkeys or chickens once each week and repack to remix the solution and to make sure that it comes in contact with all parts of the birds.

Depending on the weight of the birds, the meat should be sufficiently cured in 2 to 4 weeks to be removed from the brine and prepared for smoking. It is suggested that the individual turkey remain in the brine from $1\frac{1}{2}$ to $1\frac{1}{2}$ days per pound of dressed weight.

The cured turkey or chicken should be washed, hung to dry, then smoked, using hardwood, at a suggested smokehouse temperature of 100° to 110° F. Several hours in hardwood smoke may be enough to give sufficient flavor, although you may prefer to smoke the meat longer, even to the extent of having a fire under it 8 to 10 hours each day for several days.



This bulletin was prepared by M. G. Huber, Extension agricultural engineering specialist; A. S. Landforce, Extension wildlife management specialist; and Jay B. Long, associate professor of fish and game management, Oregon State University. OSU nutrition and food technology specialists checked the manuscript and made valuable suggestions.

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