CURED AND SMOKING POULTRY

James H. Denton*

Cured and smoked poultry is a taste-tempting treat. In addition to having a distinctive aroma and flavor, it also has eye appeal unmatched by any other meat product. Once cured and smoked, the meat is easily and quickly prepared for serving and can be stored in the home refrigerator for as long as 2 weeks. Meats that are only smoked and not cured can be stored no longer than other cooked meats.

The curing and smoking process produces a product that is distinctly different from meat which has only been smoked. Curing results from the combined actions of salt, sugar and nitrite (sodium nitrite or salt-peter) on the meat. The salt and sugar flavor the meat and help preserve it. Salting, a common method of meat preservation before refrigeration was available, reduces water activity of the muscle tissue and inhibits certain bacteria.

Nitrite is the ingredient that gives cured meat its characteristic flavor and reddish-pink color. Nitrite also extends the shelf life of cured meats by preventing the growth of both spoilage bacteria and anaerobic bacteria (bacteria that grow only in the absence of oxygen) such as Clostridium botulinum, which causes botulism poisoning. This property allows cured and smoked meats to be marketed in the vacuum packages commonly used in supermarket sandwich and deli meat sections.

Several procedures can be used for curing and smoking poultry. The following method was developed by poultry specialists at Texas A&M University.

Step 1. Selecting poultry

Poultry selected for smoking should be of good quality. Grade A poultry obtained from the local market is highly acceptable for this purpose. If turkey, chicken or other home-grown poultry is used, it should be well fleshted, well finished and properly processed. Freshly slaughtered birds must be chilled before curing procedures can begin. All poultry should be chilled to below 40 degrees F as soon as possible (within 30 minutes) after killing; see B-1383, Processing Poultry At Home. Beginning with a high quality bird will result in a high quality product.

Step 2. Preparing the brine

The curing brine can be prepared in either of two ways:
1) The water and each curing brine ingredient can be measured and added individually. This method allows the most flexibility in modifying the salt and sugar content slightly to suit individual preferences. However, this method requires the use of an accurate scale for weighing ingredients. It also may

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be inconvenient to purchase each ingredient separately and perhaps in larger quantities than required. Nitrite (sulfur) is usually available at drugstores. Formulations for preparing 10-, 5- and 1-gallon quantities are given in the table below. Part of the water should be added in the form of ice to chill the brine to 34 to 36 degrees F. For example, with a 10-gallon mixture use 9 gallons of water and 1 gallon of ice.

### Brine Mixture For Curing

These mixtures will give a reading of 45 to 50 degrees F when measured with a sodium chloride salometer. Mixtures must be stirred thoroughly so that all ingredients are completely dissolved.

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>10 gal.</th>
<th>5 gal.</th>
<th>1 gal.</th>
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</thead>
<tbody>
<tr>
<td>Gallons of water</td>
<td>10</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Ounces of salt peter</td>
<td>16</td>
<td>8</td>
<td>1.6</td>
</tr>
<tr>
<td>Pounds of salt (non-iodized)</td>
<td>9</td>
<td>4.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Ounces of sugar (brown or white)</td>
<td>24</td>
<td>12</td>
<td>2.4</td>
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2) Another method of preparing the brine is to purchase commercially prepared cure in which the salt, sugar and nitrite are already mixed in the appropriate ratio. These commercially prepared cures (or curing salts) usually are available in either the white sugar or brown sugar formulation. Prepared cures can be found in some grocery stores but are more often found in co-ops, locker plants, specialty meat markets and other establishments which may cure and smoke their own meat products. The brown sugar cure gives meat a distinctive flavor which many people prefer. To prepare curing brine from commercial cures, dissolve 1 pound of cure in each gallon of water required to make the quantity of brine desired. Using commercial cures eliminates the need for buying ingredients separately and makes brine preparation much faster.

Brine prepared by either method can be used for both the injection and soaking phases of the curing process.

### Step 3. Injecting the curing brine

Poultry, with the exception of small broilers and quail, are cured by pumping or injecting them with brine mixture in an amount equivalent to 10 percent of the bird's weight (for example, a 10-pound turkey should receive 1 pound of brine). Pumping the bird is necessary to uniformly distribute the brine solution through all muscles. Those who routinely cure a large number of birds (as in a commercial operation) use a pressure pump with small or medium-sized needles. For a small number of birds, a 50-cc syringe (or larger) will work very well. These syringes can be obtained from a producer's co-op, veterinary supply store or veterinarian. The needle should be 14 gauge or larger in order to make injection easier.

For each pound of poultry inject 45 cc of brine. Inject three sites in each breast half, two in each thigh and one in each drumstick for broilers, capons, pheasants and other birds weighing 3 to 9 pounds. Turkeys and other birds weighing 10 pounds or more will require additional injections, one in each wing and one in each half of the back. Quail and small broilers less than 3 pounds can be cured without injection by soaking them in the brine solution. Injected brine should be distributed throughout the bird in the same percentage as the meat is distributed on the bird. The following guide should be used in the injection process.

#### Birds 3 to 9 pounds:
- 60 percent of the brine injected in the breast
- 30 percent of the brine injected in the thighs
- 10 percent of the brine injected in the drumsticks

#### Birds 10 pounds or more:
- 50 percent of the brine injected in the breast
- 25 percent of the brine injected in the thighs
- 10 percent of the brine injected in the drumsticks
- 10 percent of the brine injected in the wings
- 5 percent of the brine injected in the back

After all the brine has been injected, the muscles should be worked lightly with the fingers to ensure uniform distribution of the brine throughout the tissues.

### Step 4. Soaking the poultry

After the poultry has been pumped, place it in a stainless steel or plastic container manufactured for use with food. Cover it with the remaining brine. The 1-gallon brine mixture is sufficient for one turkey or up to three chickens. This amount can be
put in containers that fit in the household refrigerator, so that it is unnecessary to add ice to maintain the required 34- to 36-degree F temperature. Curing two or more turkeys or more than three chickens will require the 5-gallon or 10-gallon brine mixture. This amount of poultry usually must be placed in an insulated ice chest with ice added in sufficient quantity to maintain the 34- to 36-degree F temperature. It is important to remember that the addition of ice decreases the amount of water necessary in the brine solution. The proper concentrations of salt, sugar and nitrite in the brine must be maintained.

The poultry must be completely covered with the brine solution throughout the soaking phase. It may be necessary to check the temperature of the brine once or twice during the soaking time if the outside temperature is 80 degrees F or higher. If the temperature of the brine goes above 40 degrees F, a small amount of ice should be added to the ice chest to lower the brine temperature. Adding small amounts of ice will not alter the concentrations of the ingredients enough to affect the curing process. The poultry should remain in the chilled brine for the length of time specified in the following table.

<table>
<thead>
<tr>
<th>Recommended Curing Times</th>
<th>24 to 36 hours</th>
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<tbody>
<tr>
<td>Broilers, Pheasants, Capons</td>
<td>48 to 72 hours</td>
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<tr>
<td>Turkeys (more than 10 pounds)</td>
<td>48 hours</td>
</tr>
<tr>
<td>Small broilers (no injection)</td>
<td>4 to 6 hours</td>
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<tr>
<td>Quail (no injection)</td>
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Step 5. Draining and netting the carcass

After the required curing time, the birds are removed from the solution and thoroughly drained for at least 15 minutes. It is important that none of the brine is left in the pockets of the body cavities. If a conventional smokehouse is to be used, place birds in stockinettes and hang them breast down. Stockinettes usually are available where commercial curing salt is sold. If a backyard barbecue cooker is to be used the stockinettes is not necessary, although it is desirable to tie the legs together with a small string and tuck the wings to the breast to ensure a neat, attractive final product. The poultry will retain the shape in which it is cooked.

Step 6. Smoking the poultry

When the birds are almost dry, place them in the smokehouse or backyard barbecue cooker at a temperature of approximately 170 degrees F. When the birds are completely dry, smoke can be applied. Drying before smoking prevents a streaked appearance. If only a few birds are to be smoked, a closed backyard barbecue pit will work well. It is important to cook the carcasses very slowly and generate plenty of smoke. Use a small fire and place the meat as far from the fire as possible. Green hickory is the best wood for the smoke source, although other types (pecan, fruit woods, mesquite, oak, etc.) work very well.

Smoke the meat (with low heat) until a light, lustrous, pecan brown color is obtained. Length of smoking time depends upon the size of the carcass. Turkeys usually require 8 to 14 hours and chickens 6 to 8 hours. Quail require 4 to 6 hours to complete the smoking and cooking process. Smoking meat too long results in excessive dryness.

Step 7. Completing the cooking

When the desired color is obtained, increase the temperature in the smokehouse (or backyard cooker) to 200 to 225 degrees F in order to finish cooking. Cook the bird until the inside temperature at the thickest breast muscle area is 162 to 165 degrees F (determined with a meat thermometer). Birds smoked in a barbecue pit usually are fully cooked after the recommended smoking period. If a meat thermometer is not available, the doneness can be estimated by twisting the leg quarter slightly. If it moves freely cooking should be complete. Approximately 20 percent shrinkage can be expected during cooking.

Step 8. Storing cured and smoked poultry

Poultry prepared by this process can be eaten without further cooking, and will keep at ordinary refrigerator temperatures as long as cured meats. If the birds are to be stored longer than 2 weeks, they should be packaged and kept in a freezer at 0 degrees F. Cured and smoked poultry can be safely stored in a freezer for as long as a year without adversely affecting the quality.
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