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# THE USE OF ICE IN CURING PORK ON THE FARM

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# The Use of Ice in Curing Pork on the Farm

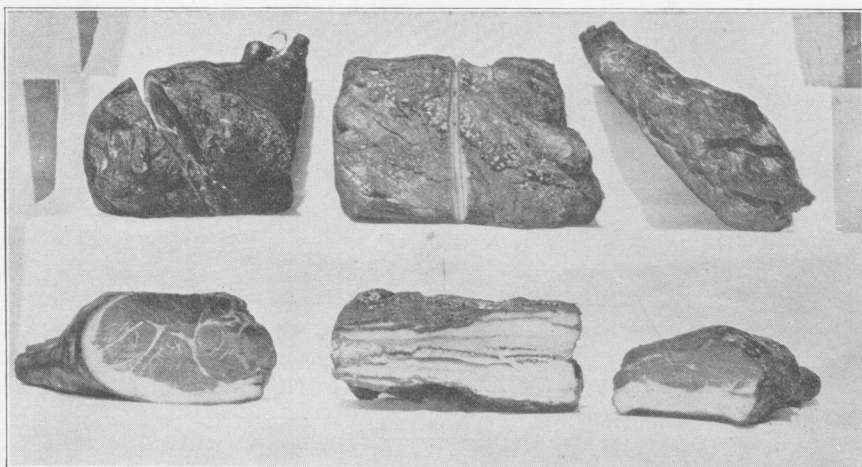
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FARMERS IN Alabama often experience difficulty in curing pork under natural farm conditions because of mild climate and changeable weather. During the average winter it is almost impossible to save meat in some sections of the State without resorting to artificial means of chilling. In a few communities local ice plants have responded to the needs of the farmers and provided refrigerated rooms where meat could be stored upon the payment of a small fee. Such plants serve a useful purpose but are widely scattered and reach a comparatively small number of people.

For several years a few farmers of the State have reported good results from the use of ice in connection with meat-curing operations. As early as 1917 Foot, in Arkansas Extension Circular No. 46, recommended icing meat if the weather turned warm after hogs were killed and there was danger of the meat spoiling.

In order to obtain accurate information on the use of ice for the curing of pork under various conditions and to develop a dependable procedure that would be adapted to farm conditions in the South, an experiment was started at the Alabama



Some of the meat cured by the methods recommended in this circular.

Experiment Station in February 1932. The meat from 13 hogs was iced and cured by different methods and under various conditions of temperature. The investigation is not complete but sufficient data have been obtained so that a safe method can be recommended for using ice in the chilling and curing of pork on the farm even during the summer months. Most farmers, however, will find it more practicable to cure their year's supply of meat in the winter since less ice will be required and since there is less danger of damage by flies, insects, and bacterial growth during the winter season. The purpose of this circular is to describe methods of using ice in curing pork on the farm and to present data upon which the recommendations are based.

## RECOMMENDED METHODS

Successful curing of pork requires that certain points be carefully observed. Throughout this experiment it has been evident that careful observance of the following points is essential: (1) sanitation, (2) thorough chilling during the 24 to 48 hours immediately following slaughter, (3) complete coverage of the meat with the curing mixture, and (4) careful separation of each piece of meat on the floor or shelf. The last two points apply only to the dry cure method.

In curing pork either of two general methods may be used. In one, the meat, curing mixture, and ice are placed in a watertight container; the melting ice and the curing mixture form a brine which preserves the meat. This is called the Brine Cure Method. In the other, the meat is packed in a box which will allow the water from the melting ice to drain off. The meat is then cured in a dry state. This is called the Dry Cure Method. The brine cure is safer than the dry cure when the weather is very warm.

### The Brine Cure Method

**Container.**—Obtain a hardwood barrel such as a molasses or semisolid-buttermilk barrel. If a barrel is not available, one may be purchased through local merchants or from the Alabama-Georgia Syrup Company, Montgomery, Ala. Wash the barrel until it is clean and odorless and scald with boiling water. The sides, hams and shoulders from a hog weighing 300 pounds can be cured in a 50-gallon barrel.

**Curing.**—As soon as the hog is killed and dressed, divide the carcass into the different cuts and rub each cut well with salt, especially around the ends of the bones, and place the meat in the barrel, skin side down. Apply chipped ice, at the rate of 200 pounds of ice for each 100 pounds of meat, using a layer of ice and a layer of meat. When the ice melts a brine will be formed in sufficient quantity to cover the meat. Make a curing mixture of 40 pounds of salt, 10 pounds of sugar, and 9 ounces

of saltpeter for each 100 pounds of meat to be cured. At the end of 24 hours take out the meat, rub each piece thoroughly with the curing mixture, and place back in the iced brine. Pour into the barrel any of the curing mixture which remains after the meat is treated. Weight down the meat with clean bricks or stones. Cover the barrel with clean boards and place in the coolest room available. Leave the meat in the brine for 25 days. If the live weight of the hog is more than 200 pounds, leave in the brine for 30 or 35 days. A scum of mold will probably form on top of the brine but this will not necessarily injure the meat. At the end of the curing period take the meat out of the barrel and wash thoroughly in warm water.

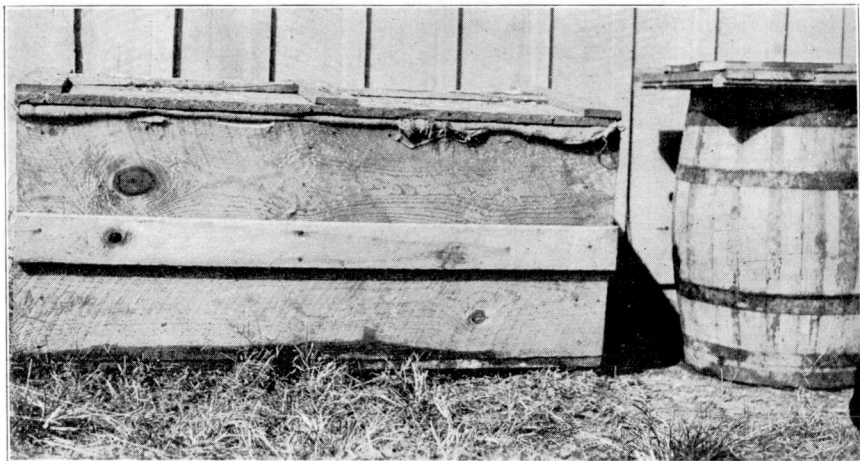
**Smoking.**—Hang the meat eight or ten feet above the floor in a small room and smoke it gently for three or four days. If the meat is not to be used for several months, continue to smoke it for a few hours every other day during the next two or three weeks. This is a drying as well as a smoking process and probably assists in preserving the meat. The room used for smoking the meat should contain a small opening to provide ventilation and to allow the smoke to escape. It should be kept dark to prevent trouble from flies. There will be less danger from fire if the room contains a dirt or concrete floor. For fuel use such woods as green hickory, ash, oak, or apple; corn cobs may also be used. Do not use pine, cedar, or gum as the use of these may blacken the meat and give it a bad flavor. The fire can be controlled better if it is placed in a ten-gallon lard can or a similar container and the top used to regulate the draft. The use of a container will also reduce the fire hazard.

**Storing Smoked Meat.**—If the smoke house is dark so that there will be no danger from flies, leave the meat hanging until used. If there is danger from flies, sew the meat tightly in muslin bags as soon as it cools, wrap in common wrapping paper, place in feed sacks, and hang in the coolest place available. Keep the room as dark as possible.

### The Dry Cure Method

**Containers.**—Obtain a box made of poplar, oak, gum, or some material other than pine or cedar. If the floor of the box is tight, bore two or three small holes in it so the water will drain out as the ice melts. Place a few strips across the bottom of the box to keep the meat from resting on the floor. Place the box in the coolest room available.

**Curing.**—As soon as the hog is killed and dressed divide the carcass into the different cuts and rub each cut well with salt. Be sure to apply plenty of salt where the bones are exposed. Place the meat in the box and cover with chipped ice, using 200 pounds of ice for each 100 pounds of meat. It is important that the meat be packed in ice as soon as possible after the hog is



A box and a barrel used in some of the meat-curing tests reported in this circular.

slaughtered. Make a curing mixture of 12 pounds of salt, 3 pounds of sugar, and 3 ounces of saltpeter for each 100 pounds of meat. At the end of 24 hours take out the meat and give it a thorough rubbing with the curing mixture, especially around the ends of the bones. Remove the ice which has not melted; spread a layer of the curing mixture on the strips where the meat will rest; place the meat back in the box one layer deep (do not stack it), and cover it with the curing mixture which has not already been used.

Construct a temporary shelf of sheet iron or corrugated roofing above the meat. Place the remaining ice on the shelf in such a way that the water will not drain on the meat when the ice melts. Cover the box and do not disturb for at least 25 days. If the live hog weighs more than 200 pounds, leave the meat in the cure for 30 or 35 days, depending on the size of the hog. At the end of the curing period take the meat out of the box, and wash and smoke it as described under the brine cure method.

## REPORT OF EXPERIMENTS

The 20 tests reported below form the basis for the recommendations made in the previous pages of this circular. Except as otherwise noted, one-half of a hog (ham, shoulder and side) was used in each test.

### The Brine Cure Tests

**Test No. 1.**—On February 23, 1932, when the maximum temperature was 61° F. a hog weighing 275 pounds was killed.

The meat was rubbed with salt and packed in a barrel of chipped ice. Two hundred pounds of ice was used for each 100 pounds of meat. The barrel was set in the smoke house. When the ice melted a salt solution was formed in sufficient quantity to cover the meat. A curing mixture composed of 40 pounds of salt, 10 pounds of sugar, and 9 ounces of saltpeter was prepared for each 100 pounds of meat. At the end of 24 hours the meat was taken out, treated with a part of this mixture, and placed back in the brine. The balance of the mixture was poured into the barrel. After 30 days the meat was taken out of the brine, washed in warm water, hung in a dark room, and smoked for four or five days. All of the meat was saved.

**Test No. 2.**—On May 31, when the maximum temperature was 83° F., a hog weighing 182 pounds was killed and Test No. 1 was repeated. All of the meat was saved.

**Test No. 3.**—This test, which was started April 13, was the same as No. 1 except that the barrel containing the meat was buried in the ground. The hog used weighed 200 pounds. The high temperature for the day was 73° F. All of the meat was saved.

**Test No. 4.**—On May 31, Test No. 3 was repeated with similar results. The hog used in this case weighed 165 pounds. The high temperature for the day was 83° F.

### The Dry Cure Tests

**Test No. 5.**—On April 23, when the maximum temperature was 81° F., a hog weighing 195 pounds was killed and the meat was rubbed with salt and packed in a rectangular box 2 x 2 x 2½ feet in size. The meat was covered with chipped ice at the rate of 200 pounds of ice to 100 pounds of meat. After 24 hours the meat was taken up, given a thorough rubbing with a curing mixture composed of 12 pounds of salt, 3 pounds of sugar, and 3 ounces of saltpeter, and was placed back in the box and covered with the curing mixture. The ice was then placed on a temporary shelf above the meat in such a manner that it would not drain on the meat as the ice melted. After 30 days the meat was taken out of the box, washed with warm water, hung in a dark room, and smoked for four or five days. All of the meat was saved.

**Test No. 6.**—This was a repetition of Test No. 5, started May 26, when the temperature was 86° F. The hog weighed 195 pounds. All of the meat was saved.

**Test No. 7.**—On April 23, when the maximum temperature was 81° F., a hog weighing 195 pounds was killed and cured according to the process described under Test No. 5, except that

after 24 hours the meat was repacked **on** the remaining ice. All of the meat was saved.

**Test No. 8.**—This test was a repetition of No. 7 and was started on May 26 when the maximum temperature was 86° F. The hog weighed 195 pounds. All of the meat was saved.

**Test No. 9.**—A hog weighing 187 pounds was killed on April 23, when the maximum temperature was 81° F., and the meat was treated in the same manner as described under Test No. 5 except that the meat was treated with the full amount of curing mixture immediately after slaughter and was packed **in** the ice and left for 30 days. When the box was opened it was found that the curing mixture had been washed off and the meat was spoiled. Apparently the meat spoiled because of the loss of the curing mixture or because the different pieces of meat remained in contact with each other and with the floor of the box at the same point throughout the curing period.

**Test No. 10.**—On April 23, when the temperature was 81° F., a hog weighing 187 pounds was killed and the meat was treated with the curing mixture given in Test No. 5 and packed in a box. Ice was placed on the shelf above the meat. The meat was not repacked at the end of 24 hours but was left in the same position for 30 days. All of the meat spoiled. There are two possible explanations as to why this meat spoiled. One is that it may not have been thoroughly chilled and the other is that it was not repacked.

**Test No. 11.**—On April 20, when the maximum temperature was 78° F., a hog weighing 195 pounds was killed and the meat was rubbed with salt and packed in a specially constructed box having double walls and insulated with four inches of sawdust. The meat was covered with chipped ice at the rate of 200 pounds of ice to 100 pounds of meat. After 24 hours the meat was taken up and given a thorough rubbing with the curing mixture and placed back in the box. The ice which remained in the box was placed on a temporary shelf above the meat in such a manner that it would not drain on the meat as the ice melted. At the end of 30 days the meat was taken out of the box, washed with warm water, hung in a dark room, and smoked for four or five days. All of the meat was saved.

**Test No. 12.**—This test was a repetition of No. 11 and was started on May 27 when the maximum temperature was 87° F. The hog weighed 150 pounds. All of the meat was saved.

**Test No. 13.**—Test No. 11 was again repeated except that after 24 hours the meat was repacked **in** the remaining ice. The test was started April 20, when the maximum temperature was 78° F. and the hog used weighed 195 pounds. At the end of 30 days the box was opened and it was found that the curing mixture had been washed off the meat and that in addition to being

infested with insects the meat was spoiled. Apparently the meat spoiled because the curing mixture was washed off. Insect infestation may also have been a contributing cause.

**Test No. 14.**—This test was also a repetition of No. 11 except that after 24 hours the meat was repacked **on** the ice which remained in the box. The weight of the hog was 150 pounds. The test was started May 27 when the maximum temperature was 87° F. All of the meat was saved.

**Test No. 15.**—This test was a repetition of No. 5 except that 300 pounds of ice was used to each 100 pounds of meat. The test was started on April 20 when the maximum temperature was 78° F. The live weight of the hog was 160 pounds. All of the meat was saved.

**Test No. 16.**—This test was a repetition of No. 15. It was started May 28 when the maximum temperature was 89° F. The live weight of the hog was 173 pounds. All of the meat was saved.

**Test No. 17.**—This test was another repetition of Test No. 15 except that after 24 hours the meat was repacked **in** the remaining ice. The maximum temperature was 78° F. on April 20 when the test was started. At the end of 30 days when the box was opened it was found that the curing mixture had been washed off and the meat was spoiled. Some of the meat was infested with insects. Here again as in Test No. 13 the meat probably spoiled because of the loss of the curing mixture and the work of insects.

**Test No. 18.**—This test was still another repetition of Test No. 15 except that after 24 hours the meat was repacked **on** the remaining ice. The test was started May 28 when the maximum temperature was 89° F. The live weight of the hog was 173 pounds. All of the meat was saved.

**Test No. 19.**—The procedure used in this test was the same as No. 18, except that more meat (one and one-half hogs) was packed in the box. The two hogs, one weighing 161 pounds and the other 163 pounds, were killed May 30 when the maximum temperature was 79° F. All of the meat spoiled except the sides and one shoulder. This was apparently due to the fact that there were too many pieces of meat piled one upon the other.

**Test No. 20.**—On May 30, when the maximum temperature was 79° F., a hog weighing 161 pounds was killed and the meat treated the same as described under Test No. 7, except that 400 pounds of ice was used to 100 pounds of meat. At the end of 30 days it was found that one ham had spoiled. As the ice melted this ham probably settled in a position so the curing mixture was washed off.