

# Food Facts Highlights:

## Brine Meats before Grilling for Moistness and Flavor

*It seems that brining of meat is all the rage. But how does it work? A food scientist explains how a soak in a salt solution makes lean meat juicier and more flavorful. But note, while brining will improve quality - especially of grilled meat, it may not be appropriate for those who need to restrict sodium in their diet. From an article by Shirley O. Corriher- FineCooking <http://www.taunton.com/finecooking/pages/c00169.asp>*



Roasted turkey breast, sautéed pork chops, and stir-fried shrimp all tend to suffer a common fate when they're cooked even a few minutes longer than necessary: they get dry and tough. Actually, any kind of meat or fish will taste like shoe leather if it's severely overcooked, but turkey, pork, and shrimp are particularly vulnerable because they're so lean. Luckily, there's a simple solution (literally) for this problem. Soaking these types of leaner meats in a brine -- a solution of salt and water -- will help ensure moister, juicier results.

### How Brining Works

**Moisture loss is inevitable** when you cook any type of muscle fiber. Heat causes raw individual coiled proteins in the fibers to unwind -- the technical term is denature -- and then join together with one another, resulting in some shrinkage and moisture loss. Normally, meat loses about 30% of its weight during cooking. But if you soak the meat in a brine first, you can **reduce this moisture loss during cooking** to as little as 15% according to Dr. Estes Reynolds, a brining expert at the University of Georgia.

**Brining enhances juiciness** in several ways. First of all, muscle fibers simply absorb liquid during the brining period. Some of this liquid gets lost during cooking, but since brined meat is in a sense more juicy at the start of cooking, it ends up juicier. Brined meats typically weigh six to eight percent more than they did before brining -- clear proof of the water uptake. Some meat available in the grocery store is brined, or pumped, to increase juiciness, especially frozen turkeys or frozen skinless, boneless chicken breasts. Another way that brining increases juiciness is by dissolving some proteins. A mild salt solution can actually dissolve some of the proteins in muscle fibers, turning them from solid to liquid.

Of all the **processes at work during brining**, the most significant is salt's ability to denature proteins. The dissolved salt causes some of the proteins in muscle fibers to unwind and swell. As they unwind, the bonds that had held the protein unit together as a bundle break. Water from the brine binds directly to these proteins, but even more important, water gets trapped between these proteins when the meat cooks and the proteins bind together. Some of this would happen anyway just during cooking, but the brine unwinds more proteins and exposes more bonding sites. As long as you don't overcook the meat, which would cause protein bonds to tighten and squeeze out a lot of the trapped liquid, these **natural juices will be retained**.

### Brining Basics

How long to brine depends on the size and type of meat you've got. Larger meats like a whole turkey require much more time for the brine to work. Small pieces of seafood like shrimp shouldn't sit in a brine for more than half an hour. In fact, any meat that's brined

for too long will dry out and start to taste salty as the salt ends up pulling liquid out of the muscle fibers. (Be sure not to brine meats that have already been brined before you buy them, such as "extra-tender" pork, which has been treated with sodium phosphate and water to make it juicier.)

It's vital to have a brine with the correct salt concentration, especially for lengthy brining times. Any food-safe nonreactive food-grade container is fine for brining. Plastic food storage bags or oven cooking bags work well - place the filled bag in a large bowl or pan to catch any drips and refrigerate. Discard the brine after use; for safety reasons, it should never be reused. Whatever you're brining, remember to rinse the meat or fish well afterward to remove any surface salt. Properly brined meat shouldn't taste salty, just very juicy with good flavor. Sugar can also be added to the brine solution for a nice, golden color to the skin of grilled poultry (or use apple juice as the brining liquid), but salt is the key ingredient for meat juiciness.

<b>Meat or fish item</b>	<b>Brine concentration (Diamond kosher salt) *</b>	<b>Brining time</b>
Whole turkey	2 cups salt to 1 gallon water	12 to 24 hours
Turkey breast	1/2 cup salt to 1 quart water	4 to 6 hours
Pork chops	1/2 cup salt to 1 quart water	4 hours
Large whole chicken	1 cup salt to 2 quarts water	3 to 4 hours
Chicken pieces	1/2 cup salt to 1 quart water	2 hours (or 1 hour in a concentrated brine with 1 cup salt)
Cornish hens	1 cup salt to 2 quarts water	1 hour
Shrimp (1/2 pound extra- large shrimp, shells on)	1/2 cup salt to 1 pint ice water	30 minutes
Thin fish fillets	1/2 cup salt to 1 pint ice water	10 minutes

\*Note: Measurements are specific for Diamond-brand kosher salt. If using table salt, decrease salt by half (kosher salt has larger flakes, so you need to measure out more). If using Morton-brand kosher salt, decrease salt by ¼.

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