

The Basics of Brining

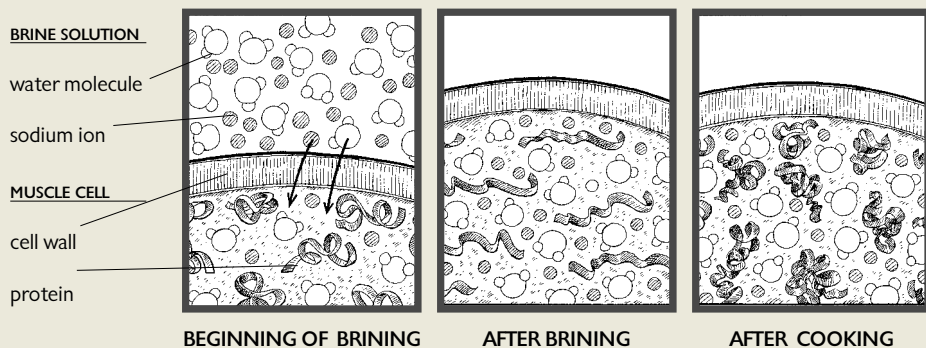
How salt, sugar, and water can improve texture and flavor in lean meats, poultry, and seafood. BY JULIA COLLIN

Why are some roast turkeys dry as sawdust while others boast meat that's firm, juicy, and well seasoned? The answer is brining. Soaking a turkey in a brine—a solution of salt (and often sugar) and a liquid (usually water)—provides it with a plump cushion of seasoned moisture that will sustain it throughout cooking. The turkey will actually gain a bit

of weight—call it, for lack of a better phrase, water retention—that stays with it through the cooking process. This weight gain translates into moist meat; the salt and sugar in the brine translate into seasoned, flavorful meat. And this applies to all likely candidates for brining (see below). For a complete understanding of the process, read on.

HOW IT WORKS

Brining works in accordance with two principles, called diffusion and osmosis, that like things to be kept in equilibrium. When brining a turkey, there is a greater concentration of salt and sugar outside of the turkey (in the brine) than inside the turkey (in the cells that make up its flesh). The law of *diffusion* states that the salt and sugar will naturally flow from the area of greater concentration (the brine) to lesser concentration (the cells). There is also a greater concentration of water, so to speak, outside of the turkey than inside. Here, too, the water will naturally flow from the area of greater concentration (the brine) to lesser concentration (the cells). When water moves in this fashion, the process is called *osmosis*. Once inside the cells, the salt and, to a lesser extent, the sugar cause the cell proteins to unravel, or *denature*. As the individual proteins unravel, they become more likely to interact with one another. This interaction results in the formation of a sticky matrix that captures and holds moisture. Once exposed to heat, the matrix gels and forms a barrier that keeps much of the water from leaking out as the meat cooks. Thus you have a turkey that is both better seasoned and much more moist than when you started.



TWO TYPES OF SALT FOR BRINING

Both table salt and kosher salt can be used to make a brine. We prefer kosher salt because it has a cleaner flavor than table salt (which usually contains iodine and anti-caking agents that can affect flavor) and because it has an airier structure, which gives it a higher propensity to dissolve. Essentially, kosher salt is less salty than table salt. A cup of table salt weighs about 10 ounces, while a cup of kosher salt (depending on the precise crystalline structure of the brand purchased) weighs between 5 and 8 ounces. To simplify the math, we use Diamond Crystal Kosher Salt, which weighs 5 ounces per cup, making it exactly half as strong as table salt. If you buy another brand of kosher salt, you may need to adjust the amount called for in the chart on page 17. For instance, Morton Kosher Salt weighs 7.7 ounces per cup. Use 1½ cups of this kosher salt (not 2 cups) to replace 1 cup of table salt.



KOSHER SALT

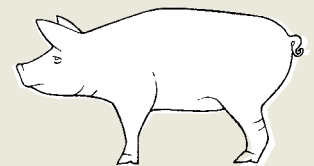
TABLE SALT

THE BEST CANDIDATES FOR BRINING

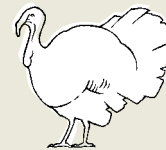
Lean and often mildly flavored meats with a tendency to overcook—such as chicken, turkey, and pork—are perfect candidates for brining, which leaves them plump and seasoned. Many types of seafood also take well to brining, especially when they are subjected to cooking methods that cause extreme moisture loss. For instance, we don't brine salmon fillets before grilling (the fish has plenty of fat and flavor and won't dry out if pulled from the grill when still translucent in the center). However, when grill-roasting a whole side of salmon, brining allows the fish to spend considerable time on the grill, picking up smoke flavor without becoming dry. Shrimp, which is extremely lean and often mushy, is another good choice for brining (the brine actually firms the shrimp).



CORNISH HEN: whole, butterflied
CHICKEN: whole, parts, butterflied



PORK: loin, tenderloin, chops, fresh ham



TURKEY: whole, breast, parts, butterflied



SEAFOOD: whole side of salmon (when grill-roasting or smoking), shrimp

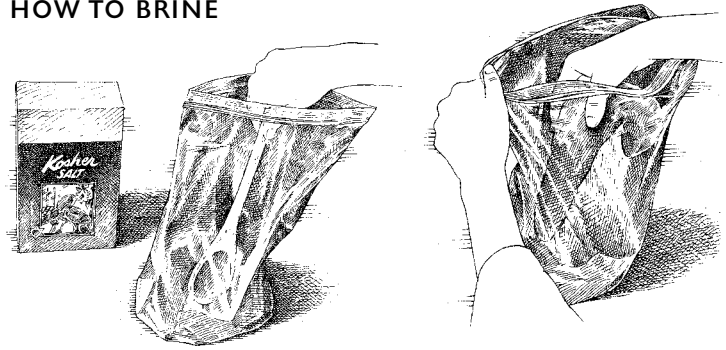
In contrast, beef and lamb do not benefit from brining. Unlike poultry and pork, these meats are generally eaten rare or medium-rare and are therefore cooked to a relatively low internal temperature. As a consequence, they do not lose as much of their natural moisture as poultry or pork, which are generally cooked to higher internal temperatures. Beef and lamb also contain more fat, which makes them more flavorful and helps to keep them moist. For many of the same reasons, gamier, fatter birds, such as duck and squab, don't benefit from brining.

Illustration: John Burgoyne

UNIVERSAL FORMULA FOR BRINING

Since we brined our first turkey several years ago, we have been captivated by the benefits of brining. Brines are featured in many of our recipes, which, given the particular time constraints and the nature of the food being brined, recommend a rather wide variety of formulas. We decided to get scientific and come up with a single, all-purpose formula. To start, we reviewed all of our brining recipes and calculated an average ratio of water to salt to sugar as well as an average brining time per pound of meat. Using this new standard formula, we cooked our way through various cuts of poultry and pork and several types of seafood, and it worked in all but a few situations. High roasting (roasting at 450 to 500 degrees), broiling, and high-heat grilling all require a brine with less sugar to ensure the skin or exterior won't burn. (After brining a turkey or fresh ham, rinse well to remove any remaining sugar.) To keep the flavors of the high-heat brine balanced, we also reduced the amount of salt.

HOW TO BRINE



1. Mix cold water, salt, and sugar in brining vessel and stir to dissolve salt and sugar.

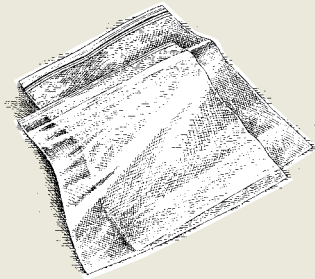
2. Immerse food in brine, seal, and refrigerate. (If not refrigerating, add ice packs before covering.)

TYPE OF BRINE	COLD WATER	SALT *	SUGAR	AMOUNT OF BRINE	TIME **
Basic	1 quart	<ul style="list-style-type: none"> • 1/2 cup Diamond Crystal kosher • 1/4 cup + 2 tablespoons Morton kosher • 1/4 cup table 	1/2 cup	1 quart per pound of food, not to exceed 2 gallons brine	1 hour per pound, but not less than 30 minutes or more than 8 hours
High-Heat Roasting, Broiling, or High-Heat Grilling	1 quart	<ul style="list-style-type: none"> • 1/4 cup Diamond Crystal kosher • 3 tablespoons Morton kosher • 2 tablespoons table 	2 tablespoons	1 quart per pound of food, not to exceed 2 gallons brine	1 hour per pound, but not less than 30 minutes or more than 8 hours

*see page 16 if using kosher salt **when brining multiple items, time based on weight of single item (for example, use weight of 1 of 4 pork chops being brined)

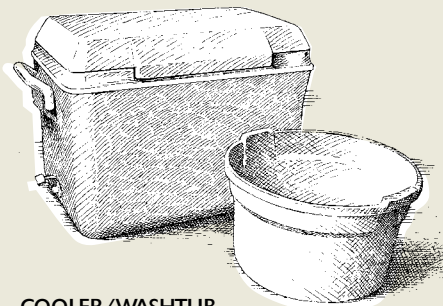
TOOLS OF THE TRADE

From plastic zipper-lock bags that fit on the shelf of the refrigerator to a self-contained cooler chilled with ice packs and stored in a cool garage or cellar, brining vessels come in all shapes and sizes. When brining in coolers or large containers, it may be necessary to weigh the food down with a wide, heavy object such as a dinner plate or soup bowl. This helps keep the food fully immersed in the brine.



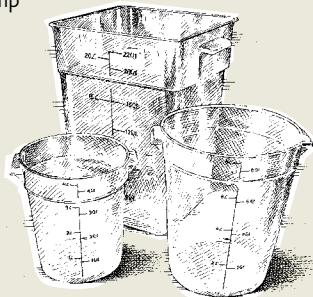
PLASTIC ZIPPER-LOCK BAGS (1- or 2-gallon)

USE FOR: Chicken parts, pork tenderloin and chops, shrimp



COOLER/WASHTUB

USE FOR: Turkey, pork loin, fresh ham, whole side of salmon



CAMBRO* OR TUPPERWARE CONTAINERS

USE FOR: Cornish hen (whole or butterflied), chicken (whole or butterflied)

*see Resources on page 32 for information



ICE PACKS

The refrigerator keeps a brine at the ideal temperature of 40 degrees. Ice packs keep the temperature down when refrigerator space is at a premium or the brining vessel is especially large.

HANGING IT OUT TO DRY

Brining does have one negative effect on chicken and turkey: Adding moisture to the skin as well as the flesh can prevent the skin from crisping when cooked. We found that air-drying, a technique used in many Chinese recipes for roast duck, solves this problem. Letting brined chicken and turkey dry uncovered in the refrigerator allows surface moisture to evaporate, making the skin visibly more dry and taut and therefore promoting crispness when cooked. Although this step is optional, if crisp skin is a goal, it's worth the extra time. For best results, air-dry whole brined birds overnight. Brined chicken parts can be air-dried for several hours.



Transfer the brined bird to a heavy-duty cooling rack set over a rimmed baking sheet, pat the bird dry with paper towels, and refrigerate. The rack lifts the bird off the baking sheet, allowing air to circulate freely under the bird.