

What Einstein Told His Cook: An excerpt from Fasta Pasta

Why do we have to put salt in the water before boiling pasta in it? Does it make the pasta cook faster? Virtually every cookbook instructs us to salt the water in which we cook pasta or potatoes, and we dutifully comply without asking any questions. There is a very simple reason for adding the salt: It boosts the flavor of the food, just as it does when used in any other kind of cooking. And that's all there is to it.

At this point, every reader who has ever paid the slightest attention in chemistry class will object. "But adding salt to the water raises its boiling point, so the water will boil hotter and cook the food faster." To these readers I award an A in chemistry but a D in Food 101. It's true that dissolving salt—or really anything else, for that matter—in water will indeed make it boil at a higher temperature than 100°C at sea level. But in cooking, the rise is nowhere near enough to make any difference, unless you throw in so much salt that you could use the water to melt ice on your driveway.

As any chemist will be happy to calculate for you, adding a tablespoon (20 grams) of table salt to five quarts of boiling water for cooking a pound of pasta will raise the boiling point by seven hundredths of 1°F. That might shorten the cooking time by half a second or so. Anyone who is in that much of a hurry to get the spaghetti onto the table may also want to consider rollerblading it from the kitchen to the dining room.

In order to boil off (becoming vapor or steam), water molecules must escape from the ties that bind them to their liquid fellows. Wresting themselves loose with the aid of heat is tough enough because water molecules stick together quite strongly, but if there happen to be any alien particles cluttering up the liquid, it's even tougher, because the particles of salt (the sodium and chloride ions) or other dissolved substances simply get in the way. The water molecules therefore require some extra oomph, in the form of a higher temperature, in order to make good their escape to airborne freedom.

Now back to the kitchen. Unfortunately, there is even more mumbo jumbo surrounding the addition of salt to cooking water than the fallacy about boiling temperature. The most frequently cited fables, even in the most respected cookbooks, tell us precisely when we must add the salt to the water. One recent pasta cookbook observes "it is customary to add salt to the boiling water prior to adding the pasta." It goes on to warn that "adding the salt before the water boils may cause an unpleasant aftertaste." Thus, the recommended routine is (1) boil, (2) add salt, (3) add pasta. Meanwhile, another pasta cookbook counsels us to "bring the water to the boil before adding salt or pasta," but leaves open the momentous question of salt-first or pasta-first. The fact is that as long as the pasta cooks in salted water, it makes no difference whether or not the water had already been boiling when the salt was added. Salt dissolves quite easily in water, whether hot or merely lukewarm. And even if it didn't, the roiling of boiling would dissolve it immediately. Once dissolved, the salt has no memory of time or temperature—of precisely when it entered the water or of whether it took the plunge at 100°C or 25°C. It cannot, therefore, affect the pasta differently.

One theory I have heard from a chef is that when salt dissolves in water it releases heat, and that if you add the salt when the pot is already boiling the extra heat can make it boil over. Sorry, Chef, but salt doesn't release heat when it dissolves; it actually absorbs a little bit of heat. What you undoubtedly observed is that when you added the salt, the water suddenly erupted into livelier bubbling. That happened because the salt—or almost any other added solid particles—gives the budding bubbles many new places (nucleation sites) upon which to grow to full size.

Let's just add the salt whenever and for whatever reason we wish. Just make sure we add it or the pasta will taste blah.