

## Salty

We taste foods as salty through a relatively simple biological mechanism: sodium ions from salt activate salty-taste-specific receptors by way of *ion channels*—essentially a gated passageway into a cell—which then complete an electrical circuit that sends the brain the message “salty!”

Of all the primary taste sensations, our mechanism for sensing salty tastes is unique in its detection of a specific compound, sodium. Almost nothing else triggers the taste of saltiness; ion channels are very selective about what they bind with. Sodium is a biological necessity regulated by the kidneys and used to control blood pressure, enable cellular communication, balance water levels, and manage a whole lot of other things. Our lives

depend on us eating enough of it. Given its biological importance, our ability to specifically taste salt and crave it makes sense. As with sweetness, our cravings for salty tastes are related to what our bodies need at any given moment.

The word *salty* describes the taste, while *salt* defines a chemical compound. *Table salt* refers to sodium chloride specifically; and unless you’re talking chemistry, this is the type of salt meant when the word *salt* is used. From a chemistry perspective, there are other types of salts besides

sodium chloride. One salt, potassium chloride, does taste salty but also has a bitter taste. If you look at the ingredient labels for salt substitutes, you’ll see other compounds added to moderate that bitterness. Other salts you might know of, such as Epsom salt (magnesium sulfate), also taste bitter. Salts that contain lithium instead of sodium taste salty because lithium ions ( $\text{Li}^+$ ) can permeate the salty taste cells’ ion channels. I feel sorry for the chemist who discovered this, though—lithium is toxic in large doses! (For culinary uses of these other types of salts, see page 382.) In almost all cases, salty tastes are brought about by sodium ions from table salt, so you can assume if you’re tasting salt, it’s because of sodium chloride.

It’s the sodium ion ( $\text{Na}^+$ ) in sodium chloride that tastes salty; the chloride ion ( $\text{Cl}^-$ ) merely stabilizes the sodium in solid form. For the taste of salty to register, the sodium ion has to complete the ion channel’s circuit. This is a subtle but important point for eaters needing to regulate their salt intake: how salty a food tastes cannot be used to detect how much salt is present! Sodium ions, being extremely small, easily permeate into the foods they’re cooked

with, and once constrained, won’t come into contact with the salty taste receptors. A large amount of salt added early on in the cooking process can be absorbed into a food’s interior, meaning you won’t taste it *but* you will still digest it, leading to an increased sodium intake. Be aware of this if you’re cooking for people on low-sodium diets!

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Iodized salt has the element iodine added as a nutritional fortification against diseases like goiter, which is why it’s no longer an issue in countries like the United States. Controlled experiments show no taste difference between iodized and noniodized salt when used in foods at normal concentrations.

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Very, very weak solutions of salt will taste sweet! Sodium ions appear to activate the sweet receptor, but the exact mechanism isn’t yet known.

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Adding salt can change the way other tastes register and alter the way we sense smells. Taste receptors aren't perfect, one-to-one detectors for the various compounds. Salty and sour tastes can mask each other because sodium can slightly interfere with our sour taste receptors. Adding a pinch of salt to baked goods doesn't necessarily make the food taste salty, but it will reduce sourness, which in turn increases the perception of sweetness! The addition of a small quantity of salt (not too much!) enhances other foods, bringing a "fullness" to foods that might otherwise have what is described as a "flat" taste. This is why so many sweet dishes—cookies, chocolate cake, even hot chocolate—call for a pinch of salt. How much salt is in a pinch? Enough that it amps up the food's flavor, but not so much that it becomes a distinct flavor in itself.

In larger quantities, salt acts as an ingredient as much as a taste enhancer. Mussels liberally seasoned with salt, bagels topped with coarse salt, salty lassi (an Indian yogurt drink), and even chocolate ice cream or brownies sprinkled with sea salt all taste inherently different without the salt. When using salt as a topping, use a coarse, flaky variety (look for sea salt), not rock/kosher salt or table salt—you'll need less salt for the same salty sensation this way.

### DIY Sea Salt

Making your own salt is easy—if you live near the sea and don't mind slopping some buckets of water home. Fill a few 2-quart (2-liter) containers with pleasant-smelling seawater and return home. Pour the water into a large pan, straining it through a clean cloth or coffee filter to remove any sand and particulates. Boil the water down to about a fifth or sixth of its original volume, pour it into a shallow glass pan, and allow it to dry as it evaporates over a day or two. Expect to get about ¼ cup (65g) salt per 2-quart container.

Making salt via evaporation removes the water instead of extracting the salt. This means anything else in the water, from subtle flavorings and trace minerals (good) to toxic mercury (bad), will be present in the salt. Using it once isn't an issue, but I'd avoid a life-long habit of using DIY sea salt.



- Tips**
- Avoid "hidden salt" by using only the amount needed in the early stages of cooking to trigger chemical and physical changes, and then adjust salt levels for taste at the very end of cooking.
  - A pinch of salt isn't an exact measurement. Traditionally, it's the amount of salt you can pinch between your thumb and index finger, but if you need to start somewhere, try using ¼ teaspoon (~1g).
  - Because of genetic differences in the way people taste some bitter compounds, different eaters will desire different amounts of salt to mask bitterness in foods like broccoli, Brussels sprouts, and kale. Leave a salt shaker on the table to allow eaters to balance tastes!
  - The amount of salt you prefer is in part based on your last few months of eating patterns—your body will learn to prefer less or more salt over time.

### To make something taste saltier

- Add salt (duh) or add savory-based ingredients (increasing the savory/umami sensation amplifies salt perception; for savory ingredient suggestions, see page 63).

### If a dish is too salty

- If it's only slightly oversalted, increase the sweetness or sourness to mask.
- Dilute the salt by adding more ingredients to the dish. (The old trick of adding a potato to oversalted soup does little to decrease the sensation of saltiness but does dilute the concentration of salt.)