

Food companies sign up for war on salt

Efforts to reduce Americans' sodium intake are long overdue in the eyes of most health experts.



For decades, people have been ignoring advice to eat less salt, in large part because it's hard to avoid in processed and restaurant foods. (Kirk McKoy / Los Angeles Times)

By Emily Sohn, Special to the Los Angeles Times

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For decades, people have been ignoring advice to eat less salt — in large part because it's hard to avoid. Processed and restaurant foods are simply loaded with sodium.

Now, under growing pressure from doctors, consumers, states, advocacy groups and even national-level advisors, big-name food companies are slashing sodium from soups, potato chips, sauces, condiments and other products.

Last month, the Food and Drug Administration announced its intent to reduce salt in the American diet, beginning with a call for voluntary cutbacks from the food industry. New York City has spearheaded a [National Salt Reduction Initiative](#), and, as part of it, 16 companies (including Starbucks, Subway, Boar's Head and Mars) so far have signed on to voluntarily reduce sodium levels in their foods by 25% over the next five years.

Kraft announced in March plans to cut 10% of the sodium from its North American product line in the next two years. ConAgra Foods Inc. (makers of Chef Boyardee and Orville Redenbacher's brands) aims to cut 20% by 2015. Heinz is cutting 15% of the sodium in its ketchup. Similar pledges have come from General Mills, Unilever, Sara Lee, Campbell's and PepsiCo, which is even attacking its Lay's potato chips.

For manufacturers, cutting salt requires more than just laying off the shaker. Salt balances flavors and textures in products like bread, cheese, cereal and yogurt-based drinks that don't necessarily taste salty. It acts as a preservative, fighting the growth of bacteria. Perhaps the biggest hurdle of all is that, to our salt-saturated tongues, without sodium food can taste bland.

To lower salt levels while still pleasing the palates of a salt-obsessed nation, companies are turning to new strategies — from the low-tech end, simply subbing in other spices, to, on the higher-tech end, developing molecules that can replace or enhance salt.

These efforts are long overdue in the eyes of most health experts. In a report released in April, the Institute of Medicine (the U.S. government's official health advisor) urged the U.S. Food and Drug Administration to adopt new standards for salt and to put limits on sodium levels in restaurant meals and prepared foods.

The report repeated evidence that reducing sodium in American diets — from today's average of more than 3,400 milligrams to the 2,300 mg (about a teaspoon) a day recommended for most healthy people — could

prevent 100,000 deaths each year. (African Americans, people middle-aged and older, and those with high blood pressure are advised to consume no more than 1,500 mg.) The report also noted that, though such recommendations have been around for a long time, sodium consumption has generally risen since the 1970s.

"We've had 40 years of history with this and not much success," says Jane Henney, professor of medicine at the University of Cincinnati and editor of the Institute of Medicine report. "If over time we can get down to a reasonable level of sodium intake, it's going to make a real difference in terms of health outcomes, and we will see the impact in real dollars in healthcare savings."

Sodium's function

Sodium, along with chlorine, forms the bulk of ordinary table salt, in the form of sodium chloride, or NaCl. In the body, sodium regulates muscle contractions, nerve impulses, water levels and more. Every cell in the body needs it, and the tongue has receptors that tell the brain when salt has entered the mouth.

"The whole system is tuned so that you like salt to make sure that you take in enough sodium to survive," says biologist David Linemeyer, vice president of Senomyx, a flavor research and development company in San Diego.

But if you take in more sodium than the kidneys can handle, the blood retains water, forcing the heart to work harder — raising the risk of high blood pressure, heart attacks, strokes and avoidable deaths.

Even when people try to eat less salt, the mineral is almost impossible to avoid. More than 75% of the sodium we consume comes in packaged and processed foods. A typical portion of American cheese contains 450 mg of sodium. An average bowl of chicken noodle soup has nearly 1,000 mg. A serving of cornflakes has the same amount of sodium as a bagel: about 270 mg. Seven Triscuits add 650 mg.

Then there are the surprising levels in frozen and restaurant meals: nearly 2,000 mg in a Hungry-Man prepared steak meal, 3,300 mg in Olive Garden's Chicken Parmesan and 6,290 mg in Chili's Buffalo Chicken Fajitas with tortillas and condiments.

The Institute of Medicine report suggested that manufacturers and restaurants gradually reduce sodium content over time, with the hope that our tastes will gradually change without any suffering. Some companies, including Campbell's and Kellogg's, had already started to do that, without much fanfare.

"There are trends now in the industry with food companies not advertising the fact that their products are less salty," says flavor chemist Harshad Patel, technical director at Kerry Ingredients and Flavors, a Wisconsin-based food technology company. That's probably because people tend to reject foods that are labeled low-sodium, he says. "They're just reducing sodium slowly and gradually by 10% or 20%, so consumers are not put off by the perception that this product is going to be less tasty."

Gradually decreasing salt doesn't solve all the problems food companies face, though, because salt does more than just make pretzels and nachos satisfying. It balances sweetness in cookies and cakes. It gives smoothness to bread. It makes meat juicier. Without salt, cereal tastes like cardboard, cheese tastes less cheesy, soup seems thinner and lunchmeat goes bad more quickly.

Whenever a company tries to remove salt from a recipe, it has to find a way to save both taste and texture.

"It's an amazing ingredient in many ways," Patel says. "That's why we struggle with trying to replace it."

Replacement strategies

One standard strategy is to replace some or all of the salt in a recipe with potassium chloride, which offers a salty flavor but also comes with a bitter, metallic edge that lingers on the teeth for several minutes and makes you feel like you just chewed on a nail. Some people are particularly sensitive to it.

Many low-sodium soups, salt-alternative seasonings and other products offer a mixture of sodium chloride and potassium chloride, along with sugar, spices, MSG and other flavorings added to mask the "off" flavors.

Sea salt, another trendy replacement for table salt, contains a mixture of minerals and thus has less sodium than table salt does — the exact amount depends on the type of sea salt. Sea salt already appears in some conventional soups and can shave 50% or more off the sodium content.

Companies have also experimented with lime juice, vinegar, yeast extract and proportions of ingredients to produce products with a satisfying complexity.

"This is really an art and a science in how you fine-tune things," Patel says. "Most of the time, if you balance flavors, you cannot distinguish one product from another," even if one has more sodium, he says.

On the more technical side, manufacturers sometimes redistribute salt so that more crystals sit on the surface of a product and less lie inside. That provides a quick zing of salty flavor in the mouth. They may use smaller salt crystals, which has a similar effect because it increases the amount of salt that actually dissolves on the tongue. Some companies are working to formulate salt crystals that don't dissolve easily so that they provide flavor but then pass through the body without having ill health effects. Many of these developments are confidential.

PepsiCo is also working on changing the shape of salt crystals so they tickle the tongue more effectively.

"I can't say a whole lot about it," says Dave DeCecco, a spokesman for PepsiCo in Purchase, N.Y. "The R&D people are hypersensitive that we don't start giving away secrets. It's probably a couple years away before that becomes available."

Elsewhere, scientists are trying to understand, once and for all, how the tongue knows that something is salty. Once they know that, they may be able to trick the brain into thinking it's tasting more salt than it is.

They already know that salt receptors are more complicated than sugar receptors, which work like a simple lock-and-key system. They also know that salt receptors take the form of pore-like channels in cell membranes through which only sodium can sneak to send the pure, clean taste of salt to the brain. A lot of different receptors and other molecules appear to be involved, and much is still unknown.

For that reason, "it's unlikely there will be a salt substitute the same way there's an aspartame or sucralose," says Gary Beauchamp, director of the Monell Chemical Senses Center in Philadelphia. More likely, scientists will develop salt-enhancing molecules that might, say, hold salt channels open longer or prevent them from closing. That would allow a salty sensation to hang around for longer — so that less salt tastes just as salty.

Recent developments support the concept. Scientists have discovered amino acids, for example, that don't taste salty on their own but when combined with salt make salt taste saltier. And at Senomyx, researchers have identified a protein that appears to be a central part of the sodium receptor and are busy searching through a library of more than 500,000 natural and artificial flavor candidates to find ones that might interact with that protein (called SNMX-29) and produce saltier sensations. Already, the company says it has found more than 250 candidates.

"We can't give you a timeline," says Gwen Rosenberg, a communications officer at Senomyx. "But we absolutely believe it's realistic."

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