

ADJUSTING TO SODIUM REDUCTION

The move to reduce salt levels isn't going away anytime soon. For bakers, that often means experimentation and reformulation.

by Jean Thilmany, contributing editor

Lowered sodium is more than a flash-in-the-pan trend, and bakers are taking note.

Although the U.S. Food and Drug Administration stated that it hasn't yet made the decision to regulate the amount of sodium in foods, other wording in its announcement certainly drew the attention of the processed food industry.

In response to the FDA's reaction to the American Heart Association's (AHA) data that links high-sodium diets and cardiovascular disease, bakers are turning to a number of methods to rein in sodium levels.

The AHA asks food manufacturers to reduce the amount of sodium in foods by 50 percent over a 10-year period. In 2006, the American Medical Association called for the food and restaurant industry to lower the sodium levels of the U.S. food supply by 50 percent.

The FDA's April statement came in reaction to a report from the Institute of Medicine that said national players must work together to reduce the sodium content of foods to reduce Americans risk of hypertension and heart attacks.

"Over the coming weeks, the FDA will more thoroughly review the recommendations of the report and build plans for how the FDA can continue to work with other federal agencies, public health and consumer groups, and the food industry to support the reduction of sodium levels in the food supply," the statement read. "The Department of Health and Human Services will be establishing an interagency working group on sodium at the department that will review options and next steps."

Also in April, General Mills Inc. said it plans to cut sodium levels by 20 percent across many of its product lines over the next five years. Sara Lee, ConAgra Foods, Unilever and Kraft Foods have all announced similar salt reduction targets during the past year or so.

Those statements—taken in conjunction with Americans' continued embrace of healthful eating—prompted wholesale bakers to introduce a range of low- and reduced-sodium products.

But reformulating a product, particularly a baked one, is not usually as easy as simply cutting its salt levels, experts say. Bakers are now at work testing new formulas, trying new ingredients and tinkering with leavening agents in an effort to reduce sodium levels.

Fine tuning

Sodium reduction requires experimentation, says Janice Johnson, applications leader at Cargill, Minneapolis.

"You want to understand what the function of salt is in the product," she says. "It adds flavor, and in yeast-leavened breads, it controls yeast fermentation and also develops gluten within flour to further hold air cells in place."

To lower salt levels while retaining flavor and function, bakers must look to ingredients that have what Johnson calls a "similar personality" to salt.

"Potassium chloride serves the functionality purpose, but it doesn't quite give you the same flavor," Johnson says.

Cargill offers a potassium chloride product, used as a salt replacer, and in conjunction offers SaltWise, a

product aimed at helping re-establish flavor in low-sodium formulas. But bakers will need to look at the big picture when they examine sodium levels, Johnson says.

"You can't rely on any one ingredient to solve this; it's a balancing act. You can try to reduce the salt, but the flavor is hard to bring back. And when you switch from sodium to potassium chloride, it doesn't quite behave in the same way," Johnson says. "For bakery products that rely on chemical leavening like baking soda or powder, those are also a source of sodium. We're trying to get food manufacturers to understand you need to look at all the sodium sources in a product, including the leavening agents."

Adjust leavening

Up to 50 percent of the sodium in a bakery product can come from the baking powder, says Nita Livvix, research and development manager for Clabber Girl, Terre Haute, Ind. "That's not just a little bit of sodium, that's matching the amount of actual salt that goes into the item," she says.

In response, some bakers have looked to cut the sodium levels in their products by reducing the sodium introduced through leavening agents. To help, Clabber Girl introduced InnovaBake, a reduced-sodium baking

powder earlier this year. The product joins InnovaFree, a sodium-free product the company brought out last year.

The sodium in these products is replaced by Cal-Rise, from Cranbury, N.J.-based Innophos, and is what Livvix calls a drop-in replacement. This means bakers can simply substitute the same amount of low or no-salt Innova in place of their usual baking powder. The substitution will not affect the

baking process or product profile and removes the need for bakers to reduce salt levels in their formulas, which can affect flavor, Livvix says.

Reducing sodium via the leavening agents also is an economical choice, says John Brodie, technical service manager, baking, at Innophos. "That's because when you look at the prices of salt replacers, they're significantly more expensive than going the route of using calcium-based leavening," he says.

Cal-Rise, used in Clabber Girl's Innova products among others, is a mixture of calcium acid pyrophosphate and monocalcium phosphate, anhydrous. It is designed as a 1:1 replacement for the leavening agent sodium acid pyrophosphate.

The product boosts calcium content by 18,000 mg per 100 g of the ingredient without adding additional sodium



Leaveners account for up to half the sodium in many baked products.



Breakfast Bites prototype from the Wisconsin Center for Dairy Research at the University of Wisconsin-Madison.

to the formulation. With typical use, bakers that swap Cal-Rise for sodium acid pyrophosphate can make the “good source of calcium” claim on their labels, Brodie says.

The substitution usually reduces sodium levels by about 25 percent.

Labeling usually isn't much of an issue when bakers make these kinds of substitutions, he adds. Bakers would list the calcium acid pyrophosphate and monocalcium phosphate, anhydrous as part of the ingredient list.

Look at replacement

The quest to lower sodium levels has led to the creation of some unusual salt replacements that may be useful in the baking industry.

For instance, autolyzed yeast extract (AYE) can replace a portion of the salt in some formulations, says Kevin McDermott, technical sales, Savoury Systems Inc., a maker of flavor enhancers in Branchburg, N.J. The extract is composed of yeast proteins broken down into simpler compounds and free amino acids that, in combination with potassium chloride, can be used to replace the flavor of salt.

When substituting AYE for salt, food processors can usually reach a 40 percent reduction in sodium levels before tasters begin to miss the flavor, McDermott says. Although the extract isn't widely used in the baking industry, that could soon change.

“We mostly deal with applications outside bakeries, but we did some trials ourselves with some breads, and they tasted very good,” he says.

Ten years ago, the Wisconsin Center for Dairy Research at the University of Wisconsin-Madison began working to find uses for whey permeate, a by-product of whey processing that can be dried and used as a food ad-

ditive. A decade ago, the product was thought to taste too salty. Researchers felt they needed to remove salt from products that contained the permeate.

“At the time, no one cared about sodium, so we didn't think anything of that,” says Kimberlee Burrington, dairy ingredient applications coordinator.

But with the tide turning toward lowered sodium levels, the center took another look at the permeate, this time as a sodium replacer. It's had good luck using the product in muffins, scones and pizza crusts where it's demonstrated a 50 percent sodium reduction in those products with good taste levels, Burrington says. It's also formulated a prototype product, Breakfast Bites, a cheese and dough product.

As far as labeling goes, when using the permeate, bakers would list dairy product solids as part of the ingredient list, she adds.

Bakers get to work

Most ingredient providers, including the Wisconsin Center for Dairy Research and Innophos, will work with customers to perfect their lowered-sodium formulations.

“It's a hot topic,” says Brodie. “I spend 90 percent of my time working with customers to reduce sodium. Most companies realize they have to lower sodium levels and do it fairly soon.”

This year, executives at Grecian Delight Foods, Chicago, launched a line of sodium-reduced flatbreads in response to a trend that Theo Paul, research and development manager, doesn't see abating anytime soon. All the flatbreads in the new line are sodium reduced, and they also include the whole wheat, multigrain and white whole wheat offerings often requested by health-conscious consumers.

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International Food Network Inc.

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“Every time you go to a conference, sodium is obviously a huge issue,” Paul says. “People are talking about it, and thankfully, all the ingredient suppliers have stepped up to the plate.”

The flatbread maker’s strategy for sodium reduction was simple; they just cut 25 percent of the salt. “It isn’t noticeable in our formulation,” Paul says.

Although the bakery has changed its process slightly to adjust for the salt reduction, Mike Pietka, lead technician, admits flatbread may lend itself to this simple salt-reduction strategy more easily than many other baked products

because it contains little leavening and uses slightly less yeast than would a bun or bread loaf.

“With flatbread we’re better off than most because we can adjust proof times more than you can with hamburger buns or loaf bread,” he says. “We use such a small amount of leavening that it doesn’t really contribute to sodium.”

During experimentation on the new product line, Paul and his team learned they could use sea salt rather than iodized salt in their product. Less sea salt is needed to achieve the same salty flavor. The company continues to use iodized salt in its flatbreads but learned an important lesson while testing new product formulations.

“There are so many strategies to use when you’re reducing sodium, and they’re all pretty product specific,” he says. “But sometimes you can take out some of the salt, and it still tastes fine.”

Andy Hart, senior food scientist at product developer International Food Network Inc., Ithaca, N.Y., proposes another method of salt reduction: gradually decreasing sodium levels over a period of time. This method allows consumers to adjust their palate over time, as the product’s sodium levels decrease incrementally. “A lot of our clients are looking to make gradual decreases so they’re not losing consumer acceptability,” he says.

That being said, some bakery products—such as cookies, some cakes and, of course, flatbreads—lend themselves

HEALTHFUL BAKING



6-in. thin whole wheat flatbread, one of the reduced-sodium products from Grecian Delight Foods.

more freely to reduced-sodium levels, Hart adds.

Of course, food labeling also comes into play as bakers seek to market their low-sodium efforts. Hart outlined the following definitions, as mandated by the FDA.

Sodium- or salt-free means the product contains less than 5 mg of sodium per serving. Sodium-free foods cannot contain sodium chloride or sodium unless accompanied by an asterisk that refers to a footnote, such as adds a trivial amount of sodium.

Low sodium means the product contains 140 mg or less per a referenced amount.

Reduced or less sodium means that at least 25 percent less sodium per referenced amount is included per an appropriate reference food.

“So you can’t reference something that’s excessively high in sodium as the reference product. You have to compare like for like,” Hart says. “Sodium has to be reduced based on original formulation and the finished product has to be essentially still the same.”

Light in sodium means the sodium has been reduced by at least 50 percent per the referenced amount. And very low sodium means the sodium content is 35 mg or less per referenced amount.

The use of the term light on sodium-restricted foods is permitted, if the food is low calorie, low fat and sodium is reduced by at least 50 percent per referenced amount, Hart says.

But to achieve this kind of labeling status, bakers will need to make some compromises with formulation and, perhaps, flavor.

“You have to put something back in and formulate correctly to make these low and reduced sodium claims,” Hart says. “Pulling sodium out is one thing, but putting something back in that until it delivers acceptable flavor is the challenge.”

And it is a challenge, considering AHA, AMA and FDA statements, that won’t be going away for volume bakers anytime soon. ■