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# KEEPING MEAT ON THE MENU

BY DONNA BERRY | [MEATPOULTRY@SOSLAND.COM](mailto:MEATPOULTRY@SOSLAND.COM)

Processors should keep sodium in check in order to keep meat on consumers' plates

The 2015 Dietary Guidelines Advisory Committee (DGAC) report submitted on Feb. 19 stated that sodium continues to be overconsumed by the US population. But surprisingly to some in the food and nutrition communities, the committee did not suggest lowering the recommended daily intake for the general population. It remains at 2,300 mg. a day.

Because intake for many grossly exceeds this daily goal, the committee suggests that consumers change their eating habits. In other words, they should seek out foods that have appropriate sodium contents.

According to the report, sodium, along with other over-consumed nutrients, is not intended to be reduced in isolation, but should be a part of a healthy dietary pattern balanced in calories. Instead of focusing purely on reduction, emphasis should be placed on replacement and shifts in food intake and eating patterns.

This recommendation, coupled with highly controversial recommendations to reduce intake of all meat, should concern processors. But as of now, these recommendations are just that, recommendations. The report is not the *Dietary Guidelines for Americans* policy or a draft of the policy. The federal

government will use the report to develop the guidelines scheduled to be released later in the year. These guidelines form the basis of federal nutrition policy, education, outreach and food-assistance programs used by consumers, industry, nutrition educators and health professionals.

There's no certainty to what degree the federal government will heed the reduced-meat recommendations; however, it is a good time for processors to commit to reducing sodium content in order to keep their products on the menu...at home, in schools and other institutions. You don't want consumers' sodium reduction efforts to include swapping a ham and turkey hoagie for a veggie wrap.

## ANIMAL PROTEINS RELY ON SODIUM

The fact is, most types of meat, from a simple chicken breast to deli-sliced luncheon meat to an all-American hot dog, are noteworthy sources of sodium, as sodium-containing ingredients are not just necessary for ensuring taste, but also quality and safety.

"When thinking of sodium reduction, meat processors often start down the path of simple sodium chloride reduction; in other words, reducing the amount of salt added and seeing if

a consumer notices a difference in the sensory attributes,” says Julie Schuette, technical food applications manager, Cargill, Minneapolis.

“Stepwise reductions in salt over time can be a good overall strategy, as there is a belief by many food manufacturers that when salt is removed in small increments, the decrease in salty flavor is small enough to go unnoticed by consumers.” However, eventually, too large of a reduction can drastically alter the flavor, as well as the texture, and render it unacceptable by the consumer.

Taste is paramount, but texture cannot be ignored. The good news is that potassium chloride, either specially processed, or with assistance from flavoring agents, can provide full-salt textures in low-sodium formulations.

“In addition to flavor modifications, water-holding capacity [WHC] of meat products is very sensitive and directly related to changes in salt content,” Schuette says. “As salt content decreases, WHC decreases, and this can impact the textural sensory aspect and yield of meat products.”

Research suggests that it’s the negatively charged chloride ion in salt that affects WHC, not the sodium ion; therefore, an ingredient such as potassium chloride should have an impact on WHC similar to sodium chloride, sans the sodium.

“Negatively charged chloride ions are attracted like a magnet to the positively charged surface of the myofibril protein surface,” Schuette says. “As the number of negative chloride ions increases, they neutralize the positive charges, causing the isoelectric point of the myofibril proteins to shift. This weakens the attraction between myofibrils and allows more water to move into the space between myofibrils, resulting in filament swelling and increasing WHC.

“We have been able to successfully reduce the sodium contents of many types of meat products through the use of our proprietary potassium chloride,” she says. “There are no detectable changes to texture and yields remain high.”

With potassium being a nutrient of concern, use of potassium chloride provides two benefits. It allows for

a reduction in sodium while increasing potassium content.

Starting with naturally sourced potassium chloride from North American salt mines, NuTek Food Science, Omaha, Neb., applies its patented single-crystal technology to produce a potassium chloride salt that functions as a one-to-one direct replacement for regular sodium chloride salt. “In collaboration with our customers, we commonly see successful sodium reduction levels of 30 percent to 50 percent, oftentimes, in excess of 50 percent, across a variety of foods, particularly proteins,” says Brian Boor, president and COO.

The ingredient is listed as potassium chloride, with or without a carrier. “Depending on the ingredient used, one of three carriers – rice flour, wheat flour or maltodextrin – will need to be listed on the ingredient statement, along with potassium chloride. Many times these ingredients are already present in the formula, so no extra declaration is necessary,” Boor says. “In many instances, the use of this ingredient simplifies ingredient statements, as flavors or masking agents can be eliminated, resulting in a cleaner label and in some cases a cost-neutral end product.”

Innophos Inc., Cranbury, NJ, offers a salt replacement system based on magnesal, which is a patented technology that yields a single crystal of magnesium, potassium and

*The sodium content of bacon and pepperoni can be cut in half, while deli-style ham and turkey can be reduced by about one-third.*



*Lean meat should be included in a healthy, balanced diet. Although many processors are working hard to reduce sodium in their meat products, great care must be taken not to reduce too much because this could damage the flavor.*

*“When thinking of sodium reduction, meat processors often...reduce the amount of salt added and seeing if a consumer notices a difference in the sensory attributes.”*

– Julie Schuette, Cargill



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ammonium chloride. It can be used as a partial replacement for salt in various meat applications, according to Barbara Bufe Heidolph, director of commercial and applications development.

“As noted in the patent, it is the composition of this triple mineral chloride salt that enables the formulator to deliver a balanced flavor profile, delivering saltiness and minimizing bitterness,” Heidolph says. “It is capable not only of delivering target flavor, but also providing functional interaction with the protein as well as microbial inhibition.” Applications range from burgers and meatballs to hot dogs and salami.

Certain sea salts have proven to be an option for reducing sodium content in meat. For example, A&B Ingredients Inc., Fairfield, NJ, offers a low-sodium sea salt based on a blend of salts harvested from the Mediterranean and Dead Seas.

“The proprietary manufacturing process and the combination of these salts are the key reasons for its clean taste,” says Gil Bakal, managing director. “It contains half the sodium of traditional salt, and is an excellent source of potassium. It is labeled as sea salt or sea salt and natural flavor.”

Jungbunzlauer Inc., Newton Center, Mass., offers a salt replacer based on sodium chloride, potassium chloride and sodium gluconate. “It gives the same salty flavor profile, functionality and ease of use as salt, but with a 35 percent sodium reduction when directly replaced,” says John Reidy,

*It is a good time for processors to commit to reducing sodium content in order to keep their products on the menu.*

market development manager-health and nutrition.

“We have also combined sodium nitrite with our salt replacer to offer a reduced-sodium curing salt,” Reidy says. “The product is used similar to regular curing salt and is designed to replace both the added salt and curing salt in the formula. This allows for only one ingredient to be added, achieving both the taste and safety/color factor of the product.”

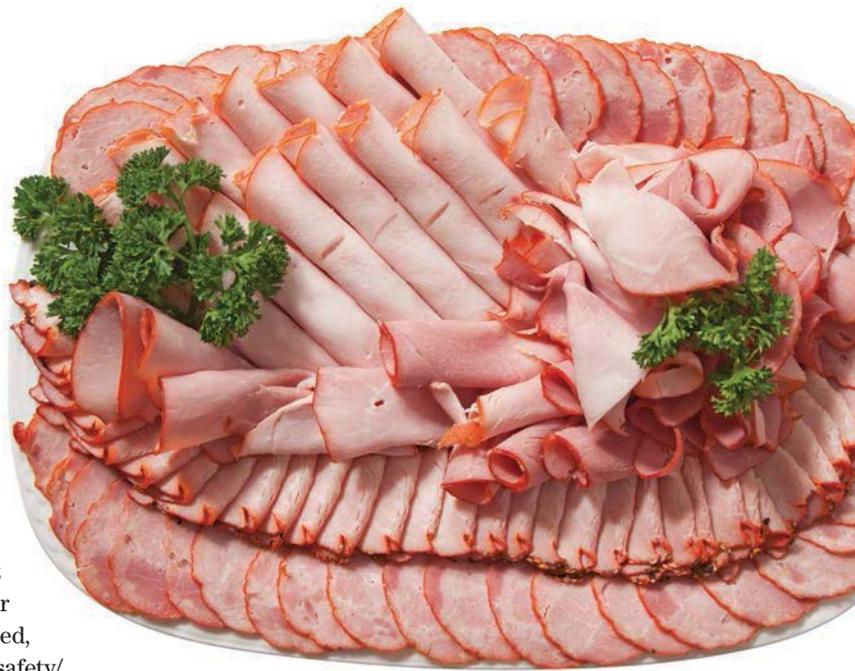
**OTHER SODIUM SOURCES**

Suppliers also offer replacements for other sodium-containing ingredients, many of which are based on potassium.

“To ensure quality and safety, the best strategy is for processors to first reduce as much sodium as possible from sources other than salt in order to meet their sodium targets,” says Jim Anderson, business development manager-Americas, ICL Food Specialties, St. Louis. “Keeping salt levels preserves the desired effect of protein modification while keeping costs at bay, as nothing is less expensive than salt.”

Therefore processors need to look at other sources of sodium in their meat products. For example, replacing sodium phosphates with potassium phosphates is fairly easy to do. “The downside is that the bitter potassium taste can occur and must be addressed, but again, this can be easy to do in meat applications,” Anderson says. “The upside is that potassium phosphates can have better solubility, which can make processing easier and more effective. With proper formulation, there is no reason a processor cannot significantly lower sodium while maintaining and in some cases improving flavor and texture by ingredient management.”

Peng Yuan, manager-applications and product development at Innophos, adds, “Potassium-based phosphates are more hygroscopic than sodium-based phosphates, so the manufacturer may need to take this into consideration during production, distribution, storage and use.”



In addition to sodium’s impact on taste and texture, salt’s role in inhibiting the growth of pathogenic bacteria and spoilage microorganisms cannot be ignored. Thus, when reducing salt, steps must be made to ensure food safety.

Corbion Purac, Lenexa, Kan., offers several sodium-reduction solutions to the processed meat industry. “Made via natural fermentation, these ingredients impart salty and savory flavors while inhibiting a wide range of pathogens, including *Listeria monocytogenes*,” says Tom Rourke, senior business development manager. “This allows processors to reduce sodium in cured and uncured meat and poultry products without compromising food safety or shelf-life.”

Labeled cultured corn sugar or dextrose and vinegar, these fermentation-based solutions can be added dry directly to meat or via the brine. “These ingredients behave in a similar way to sodium chloride,” Rourke says. “For example, a 30 percent reduced-salt ham will obviously have a less salty flavor when compared to a full-salt product. By adding 3 percent of this fermented ingredient, salty flavor is significantly increased in the reduced-salt ham.”

In conclusion, even though sodium reduction in the US is not regulated for the general population, there are guidelines and requirements for foods sold or served in restaurants, vending machines and school meals. “These should serve as final product sodium content targets,” Heidolph says. “In general, a standard reduction process should be followed. This is reduction followed by further reduction and then replacement.” 