



Perspective: CDR

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Time to tinker with salt levels in cheese?

Salt plays many roles in cheese; it can alter the effectiveness of starter culture, influence the growth of pathogens and have a major impact on flavor. So it really shouldn't surprise us that reducing the sodium chloride content of cheese presents a challenge.

The degree of saltiness observed in any food is a learned or conditioned behavior, and we are accustomed to the idea that certain foods have salty flavor notes. In fact, there is a line item on the USDA cheese grading scorecard for the cheese grader to assess the salt contribution to the overall flavor of a cheese — is it too high or too low?

There are no federal standards of identity for salt content of any cheese (other than specifics when labeling cheese reduced or low sodium). Instead the saltiness attribute is at the discretion of the grader, a judge who has extensive experience and knows what a great cheese should taste like. The

cheesemaker adds no more or no less salt than needed to produce a quality cheese.

Cheesemakers take advantage of the variability in salt sensitivity among bacteria when choosing a starter strain. In fact, the salt sensitivity of the acid-producing cultures, or starters, necessary to produce a particular cheese dictates the amount of salt used. The extent of acid development, or the lowest pH the cheese reaches, is due to several factors: activity of acid-producing cultures, the amount of sugar in the milk and cheese and the rate of acid development (especially the amount of acid developed prior to whey removal). The rate and extent of acid development controls the amount of colloidal calcium phosphate in the cheese, which in turn is the main buffering agent in cheese and acts to modulate the final or lowest pH of the cheese. For Cheddar, the pH could be

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4.9 or less without the influence of sodium chloride on starter cultures. Why does this matter? Because a pH of 4.9 can cause defects in appearance, body and texture.

The Code of Federal Regulations Chapter 21, part 101.12, lists 30 grams as the serving size for most cheeses with the following exceptions, cottage (110 grams), hard grating cheese such as Parmesan and Romano (5 grams), dry cottage cheese curd and Ricotta (55 grams). However, the nutritional labeling requirements for low-sodium foods indicate that foods with a serving size of 30 grams or less must not contain more than 140 milligrams sodium per 50 grams of that food. For most cheeses, including hard grating cheese, the amount of salt could not exceed 0.71 percent to meet that requirement. In the case of cottage cheese it would be 0.33 percent. Can you meet the requirements of a low sodium cheese — less than 0.71 percent salt — without compromising the expected flavor of the cheese? Probably not. Exceptions may be Swiss cheese or Fresh Mozzarella, cheeses already low in sodium.

Is the cheese quality always compromised when reducing sodium chloride by 33 percent or more? For a professional cheese grader the answer might be yes. However, for the consumer who is looking for a cheese with less salt, the answer may be no — at least the cheese may be acceptable even if it is not preferred. The top complaint about reduced-salt cheeses is that they lack desired flavor and flavor intensity. This is an issue difficult to avoid since flavor changes are the result of adjustments that cheesemakers make to avoid excessive acidity and bitterness when they reduce the salt in cheese.

Cheesemakers have two options

for adjusting the amount of sodium in cheese; they can use less sodium chloride or they can use salt substitutes (which introduce their own issues).

To meet the requirement for reduced-sodium cheese, the sodium content of the cheese must be at least 25 percent less per serving than the reference cheese. The cheese company is free to set the reference amount in their cheese; it is implied that they establish a typical level or salt content and avoid artificially stating an absurdly high level. However, sodium content of cheese varieties is not uniform throughout the cheese industry. This presents a problem. For example, many blue-veined cheeses are high salt cheeses, with typical salt contents of more than 3 percent. A 25 percent reduction in salt would put the salt level at 2.25 percent, a level that award-winning manufacturers of blue-veined cheeses already achieve. Do we need to set sodium standards for each variety of cheese?

At a 2008 seminar, sponsored by the Food Research Institute, Kathy Glass addressed the role of sodium salts in the safety of ready-to-eat foods. Although salt is added to cheese to control and enhance flavor and is not the sole method to control pathogen growth, it is still a factor in the multiple hurdle approach to food safety. Glass notes, "For every effort made to reduce salt levels in foods, a replacement for its antimicrobial activity needs to be considered."

What do consumers want from us? We know they expect some saltiness in cheese but we think they also want a larger selection of lower sodium cheeses. Plan to attend the International Cheese Technology Expo in Madison, Wis., where many of the questions raised here will be answered at a morning session sponsored by the Innovation Center for U.S. Dairy on Wednesday, April 21, and a second session sponsored by the Wisconsin Center for Dairy Research on Thursday, April 22, 2010. CMN

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