

Reduction of sodium in baked products over the last decade

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Introduction

- The Nutrient Data Laboratory (NDL) is responsible for the dissemination of 140 nutrients for over 7500 foods through the USDA National Nutrient Database for Standard Reference (SR)¹. Included in these nutrients and foods are sodium and baked products.
- Approximately 77% of sodium in the U.S. diet comes from processed, prepared, and restaurant foods. Of the top 5 contributors to sodium intake, grain products contribute 11%, with baked products comprising 40% of that amount².
- Because of high consumption, white bread is considered a major contributor of sodium in the diet. Several other baked products such as hot dog rolls and flour tortillas are also major contributors.
- In an effort to combat rising levels of sodium intake in the U.S. diet, companies are beginning to lower levels of sodium in their products.
- NDL has initiated a process to monitor sodium levels in foods, including baked products. Foods that contribute highly to sodium will continue to be monitored over the next few years.
- As sodium levels are lowered through means such as replacement of leavening agents, other nutrient levels, such as calcium, may be affected.

Objectives

- To identify changes in sodium values of selected baked products over the last decade;
- To analyze impact of sodium formulation changes on other nutrients in baked products.

Methods

Sampling

- Sampling done through the National Food and Nutrient Analysis Program (NFNAP)³.
- Sample units obtained from 12 retail outlets nationwide based on NFNAP's probability-proportional-to-size (PPS) sampling plan;
- 2-3 brand-name products sampled as well as multiple store-brand products.
- Four types of baked products selected based on key contributors to total sodium intake: white bread, wheat bread, hotdog rolls, and flour tortillas.

Analytical methodology

- Both sodium and calcium analyzed using ICP (AOAC 985.01 + 984.27).

Quality control

- Analytical quality control performed through the use of duplicate sampling with in-house control and certified reference materials;
- Sodium and calcium values generated by NDL in 1999 compared to new values generated in 2011.

Table 1. Sodium values in selected baked products

Food Item	Sodium Nutrient values						RACC* sodium (mg/50 g) 1999	RACC sodium (mg/50 g) 2011	Change 1999 to 2011 mg/100 g	RACC change 1999 to 2011 mg/100 g
	Sodium (mg/100 g) 1999 ¹	n	SE	Sodium (mg/100 g) 2011	n	SE				
White bread	688	8	8.6	491	19	10.4	344	246	-197	-98
Hotdog rolls	479	6	6.3	500	12	10.4	240	250	+21	+10
Flour tortillas	636	6	18.6	686	13	18.2	318	343	+50	+25
Wheat bread	521	3	16.6	527	13	14.2	261	264	+6	+3

¹SR database release date

*Reference Amounts Customarily Consumed⁴

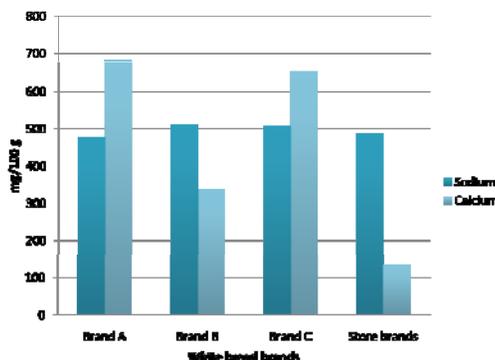
Table 2. Calcium values in selected baked products

Food Item	Calcium Nutrient values						RACC* calcium (mg/50 g) 1999	RACC calcium (mg/50 g) 2011	Change 1999 to 2011 mg/100 g	RACC change 1999 to 2011 mg/100 g
	Calcium (mg/100 g) 1999 ¹	n	SE	Calcium (mg/100 g) 2011	n	SE				
White bread	151	8	2.7	261	19	7.8	76	131	+110	+55
Hotdog rolls	138	4	0.5	173	12	1.2	69	87	+35	+18
Flour tortillas	129	6	9.3	106	13	1.6	65	53	-23	-12
Wheat bread	142	3	4.4	141	13	6.3	71	71	-1	+0

¹SR database release date

*Reference Amounts Customarily Consumed⁴

Figure 1. Sodium and calcium levels of white bread brands (2011)



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Results and Discussion

Sodium

- Changes in the sodium content over time are most obvious in white bread compared to the other three products evaluated.
- Sodium values in white bread decreased by an average of 190 mg/100 g or about 28%.
- The new values were consistent among brands, ranging from 478 to 512 mg/100 g or 239 to 256 mg/50 g serving.
- Sodium values in hotdog rolls showed a small increase from 479 to 500 mg/100 g (4% increase).
- Sodium values in flour tortillas increased from 636 to 686 mg/100 g (8% increase).
- Levels of sodium in wheat bread remained virtually unchanged.

Calcium

- A difference in calcium was noted at brand level in some white breads.
- On average, calcium increased from 151 to 261 mg/100 g, ≈ 73%;

Conclusion

- Our data indicate that white bread, a major contributor of sodium from processed foods in the diet², is declining in sodium content.
- The industry is aware of the high contribution white bread and other baked products make to sodium intake due to high rate of consumption and has initiated sodium reduction strategies for some of their products.
- Literature reviews show that the industry is incorporating alternate leavening agents to decrease sodium, which in turn is increasing calcium⁴.
- Values discussed in this poster will be released in USDA's SR-24 in summer of 2011.

References

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