USDA Updates Sodium Values for Selected Processed Foods

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Abstract

Sodium is a nutrient of major public health concern because of the association between sodium intake and cardiac health. Processed and restaurant foods account for 77 percent of U.S. sodium intake. Under the USDA Nutrient Data Laboratory's sodium monitoring program, three different brands of pasta sauce, condensed tomato soup, and two types of pizzas were collected in 12 locations in 1998-99 and again during 2008-09. Sample units of these foods were prepared for analysis using USDA National Food and Nutrient Analysis Program protocols. Analytical samples and quality control materials were analyzed by USDA-qualified laboratories using the ICP method. Sodium values in the same three brands of pasta sauce were compared between 1999 and 2009: Brand A pasta sauce declined 38% (from 635mg to 395mg/100g); Brand B remained constant (493mg/100g and 505mg/100g); and Brand C decreased 21% (from 451mg to 357mg/100g). Sodium levels in a popular brand of condensed tomato soup declined significantly from 551mg/100g (1998) to 380mg/100g (2009). The sodium levels of both types of pizzas (same brand) increased slightly from 1999 to 2008. Rising crust cheese pizza increased from 606mg/100g (1999) to 696mg/100g (2008); rising crust supreme pizza increased from 682mg to 712mg/100g. A suggested serving for pizzas ranged from 187-227g. These analyses suggest a trend in decreasing sodium levels by product type and provide current, accurate data for important contributors of dietary sodium for USDA databases and are included in the current USDA Nutrient Database (SR 23) permitting tracking of the sodium content of specific foods to estimate impact of changes in the food supply on population intakes. Funding: ARS/USDA and NIH

Introduction

Sodium consumed in excess is a major public health concern. The 2010 Dietary Guidelines recommends individuals consume less than 2,300 mg of sodium a day and for salt-sensitive populations, who now account for 68% of the American population, to not exceed more than 1,500 mg of sodium per day. With processed and restaurant foods accounting for approximately 77 percent of sodium intake in the American diet, a reduction in sodium levels in these foods is imperative. Numerous health organizations and government agencies have recommended a substantial reduction in sodium levels in processed foods extended over the coming decade. This will allow for manufacturers to reformulate foods and for consumers to adapt their tastes to lower sodium. Salt works in tandem with sugar and fat to enhance flavor; therefore reducing salt may affect the sugar and fat content. Under the USDA Nutrient Data Laboratory's (NDL) sodium monitoring program, select processed foods that are high sodium contributors in the American diet were sampled and analyzed in 1998-99 and collected again for analysis in 2008-09.

Methods

Sampling: In 1998 and 1999, sample units were collected in 12 statistically selected locations in the 48 coterminous states using a multistage, stratified sampling plan developed for the National Food and Nutrient Analysis Program (NFNAP)[1]. Sample units (in each selected location) included three different brand names of pasta sauce (3 cans per brand), one brand of condensed tomato soup (4 cans), and two types of frozen pizza from the same brand (1 box per type). These sample units were again collected in 2008-2009 using the NFNAP sampling plan to evaluate the extent of change in sodium levels[2]. Selected foods consisted of popular brands that contributed to the majority of the market share.

Analyses: The sample units were randomly grouped into 6 subgroups of 2 each and composited according to previously developed protocols for NFNAP. Values for nutrients and proximates were determined by a USDA-approved commercial laboratory using ICP methodology for sodium, HPLC for total sugars and acid hydrolysis for total fat. Label claim values were calculated on 100g basis for ease of comparison.

Quality Control: Analytical quality assurance was monitored through the use of appropriate standard reference materials (SRM) and in-house control materials.

Figure 1.

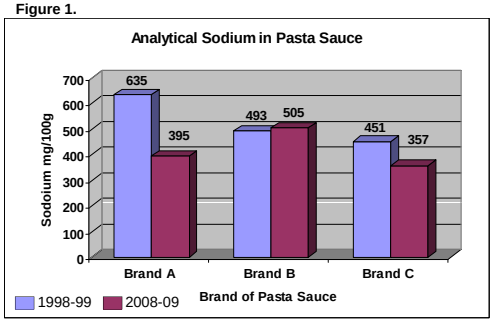

Figure 2.

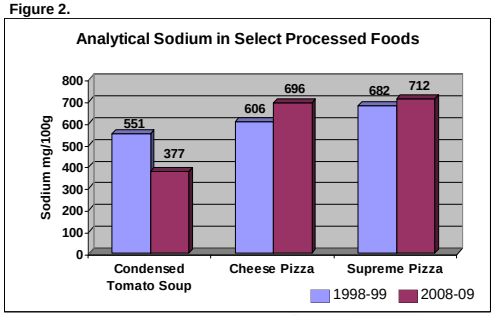

Table 1. Sodium, Sugar and Fat Comparisons per 100g

Select Foods	Changes in Analytical Values from 1998-99 to 2008-09[1]	Difference in Analytical Values and Label Claim (2008-09)[1]
Pasta Sauce:		
Brand A		
Sodium	- 240 mg	-9 mg
Total Sugar	0	0
Total Fat	0	0
Brand B		
Sodium	+ 12 mg	-45 mg
Total Sugar	0	0
Total Fat	0	0
Brand C		
Sodium	- 94 mg	+30 mg
Total Sugar	0	+1 g
Total Fat	- 2 g	0
Condensed Tomato Soup:		
Sodium	-174 mg	+10 mg
Total Sugar	0	+2 g
Total Fat	0	0
Rising Crust Frozen Pizza:		
Cheese Pizza		
Sodium	+ 90 mg	n/a *
Total Sugar	+ 1 g	n/a *
Total Fat	0	n/a *
Supreme Pizza		
Sodium	+ 30 mg	n/a *
Total Sugar	- 2 g	n/a *
Total Fat	- 1 g	n/a *

[1] Numbers were rounded to whole integers.

* Label claim values for pizza are based on frozen pizza and not comparable to cooked analytical values.

Results (Nutrient Values Based on 100g)

Sodium, total sugar, and total fat values for pasta sauce varied across three national brands (see Figure 1).

Sodium

- Variability between brands and across foods did not range widely; SE ranged from 3.2 to 11.1.
- For pasta sauce, Brands A and C reduced the sodium levels (38% and 21%) while Brand B remained unchanged (see figure 1). Some label claim values differed from the analytical values: for Brand B, label claims stated sodium reductions of 23% (137 mg).
- For condensed tomato soup, sodium decreased 31% from 551 ± 5.5 mg in 1998 to 380 ± 3.5 mg in 2009 (see Figure 1 and Table).
- Two types of rising crust frozen pizza from the same brand had increased sodium values from 1998 to 2009: cheese pizza by 13% and supreme pizza by 4% (see Figure 2 and Table). Label claim values are based on a frozen pizza and are not comparable to the analytical values for a cooked pizza.

Total sugar

- For pasta sauce, total sugar values remained the same (4.7 to 6.8 g) across the 3 brands and were comparable to label claim values (see Table).
- For condensed tomato soup, total sugar content based on analytical values remained the same, but the label claim value showed an increase of 1.6g (8.1 to 9.7g).
- Total sugar content increased 16% for the frozen rising crust cheese pizza (from 4.3 to 5.0 g) but decreased 32% in the supreme pizza (from 6.9 to 4.7 g) between 1998 and 2009.

Total fat

- For pasta sauce, total fat values remained the same (0.8 g and 2.1 g) for Brands A and B, while decreasing by 1.8g for Brand C; analytical were comparable to label claim values (see Table).
- For condensed tomato soup, total fat decreased slightly (0.1g) and remained as 0g on the label.
- Total fat did not change for the frozen rising crust cheese pizza (8.6 g) from 1998 to 2009, but for the supreme pizza, total fat decreased by 5% to 10.7g.

Conclusion

These observations provide sodium values for tracking the sodium content in select processed foods that are high sodium contributors in the American diet, and evaluate whether other flavor enhancing nutrients, sugar and fat, changed as a result of alterations in sodium content. Sodium values in this study for selected foods decreased, remained unchanged, or even increased; this indicates that efforts by the food industry to reduce sodium will require continued monitoring to determine effects on overall sodium content of the U.S. food supply. Based on these few data points, it does not appear that decreases in sodium tracked with increases in total sugars or total fat. These data also provide current, accurate data on select processed foods for USDA databases and will be available in the USDA National Nutrient Database for Standard Reference (SR24)[3].

References

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2. Perry CR, Pehrsson PR, Holden J. A Revised Sampling Plan for Obtaining Food Products for Nutrient Analysis for the USDA National Nutrient Database. 2003. Proceedings of the American Statistical Association, Section on Survey Research Methods [CD-ROM], Alexandria, VA: American Statistical Association, San Francisco, CA.
3. Nutrient Data Laboratory (NDL), Agricultural Research Service, US Department of Agriculture. 2011. USDA National Nutrient Database for Standard Reference, Release No.24. NDL Web site: http://www.ars.usda.gov/nutrientdata.