

Comparison of corresponding commercially processed foods from store and restaurant for sodium, fat, sugar and potassium content in a nationwide sample

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Objective:

The objective of this study is to compare nutrient profiles for corresponding commercially processed food items from restaurants and stores.

Background:

Similar food items from the two varied sources – restaurant and store may have different nutrient profiles. There are concerns that the restaurant industry has lagged behind in reformulating foods for a healthier nutrient profile, in general, and in sodium reduction efforts, in particular.

About 125 commercially processed foods from stores and restaurants, termed Sentinel Foods are being sampled nationwide and analyzed, under the USDA's National Food and Nutrient Analysis Program (NFNAP), as part of an inter-agency effort to monitor sodium and related nutrients in the US food supply. Eleven of the Sentinel Foods have corresponding foods from both sources. These foods are - chili with meat and beans; cheese pizza, thin crust; macaroni and cheese; biscuit; Spanish rice; refried beans; lasagna with meat; chicken tenders; chicken nuggets; fried chicken thigh; and French fries. Results from four of these corresponding pairs are presented.

NFNAP employs statistically valid nationwide sampling plans, selection of brands using consumer sales data, analysis of foods using valid, approved methods by qualified laboratories, comprehensive quality control, and oversight by USDA scientists to generate new and updated analytical data¹.

Methods:

Sampling: A specific sampling plan was developed for each item. Top national and store brands representing 70-80% of retail sales, based on Nielsen 2009 point-of-sales data, were sampled for each food item from up to 12 grocery stores nationwide. Similarly 2-4 family-style restaurants were sampled for each restaurant item from up to 12 locations nationwide.

Analysis: Foods were analyzed using valid, approved analytical methods: sodium - AOAC 985.01 (3.2.06) + 984.27 (50.1.15), AOAC 968.08 (4.8.02) + 985.35 (50.1.14) + 965.05 (2.6.01); potassium - AOAC 985.01 (3.2.06) + 984.27 (50.1.15), AOAC 968.08 (4.8.02) + 985.35 (50.1.14) + 965.05 (2.6.01); fiber - AOAC 985.29 (45.4.07), AOAC 991.43 (32.1.17); sugars - AOAC 982.14 (32.2.07); fat - AOAC 996.06 (41.1.28A), AOAC 996.06 (41.1.28A); saturated fat - AOAC 996.06 (41.1.28A), AOAC 996.06 (41.1.28A). In-house control materials and Standard Reference Materials was employed to monitor accuracy of analyses. Samples were weighed to obtain serving size information. Nutrient and serving size values were weighted by the market share of the selected brands to generate nationally representative values.

Statistical Analyses: Descriptive statistics were calculated for selected nutrients (total fat, saturated fat, dietary fiber, sodium, potassium, total sugar) on per 100 gram (g) basis and serving size basis of the food item. Samples with family size serving sizes, for e.g. Chicken nuggets, 20 pieces were not used for the latter analysis. The means were compared between corresponding foods from store and restaurant using two sample T-tests and Mann-Whitney U-tests at p<0.05.

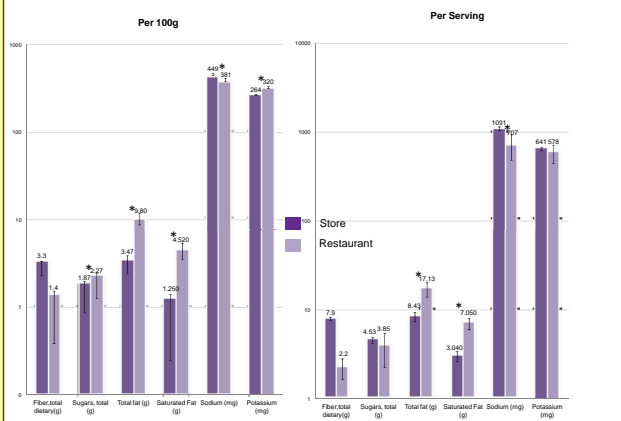
References and Acknowledgements:

1. Haytowitz, D.B., Pehrsson, P.R., and Holden, J.M. (2008) The National Food and Nutrient Analysis Program: A Decade of Progress. *Journal of Food Composition and Analysis* 21(Suppl. 1):S94-S102. Acknowledgements to Marion Daniel for providing the statistical analysis on the presentation.

Results:

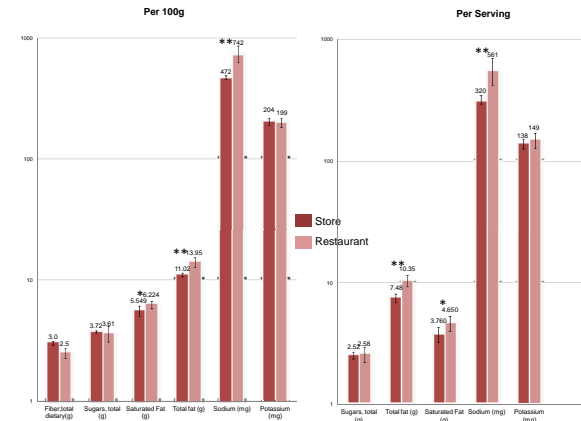
Comparison of corresponding commercially processed foods from store and restaurant on per 100 g and per serving basis

Chili with meat and beans



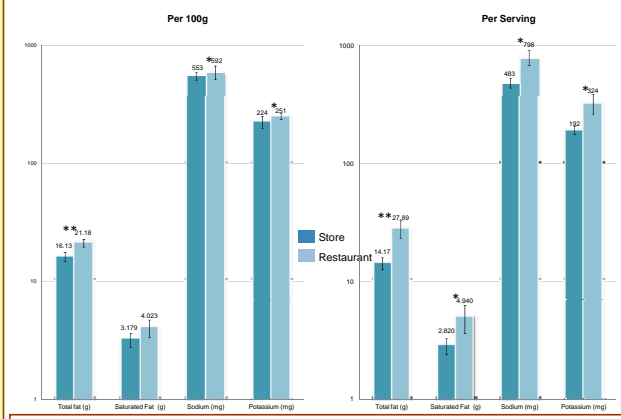
Chili with meat and beans from store were higher in sodium (449±20.1 vs. 381±36; difference +68 mg/100 g, 15%), but lower in total fat (3.47±0.4 vs. 3.8±0.2; difference -0.33 g/100 g, -18.2%) and saturated fat (1.25±0.16 vs. 1.52±0.89; difference -0.27 g/100 g, 26.1%) than those obtained from restaurant. Due to larger serving size for store, the differences in sodium were more marked (difference +384 mg/100 g, 35%), but the differences in total fat (difference -8.7, 103%) and saturated fat (-4.01, 132%) became less proportionally.

Cheese pizza, thin crust



Cheese pizzas, thin crust from store were lower in sodium and total fat vs. restaurant. The differences in nutrient content of cheese pizza between store and restaurant when examined per serving did not differ from the results per 100 g because serving sizes were similar from both sources.

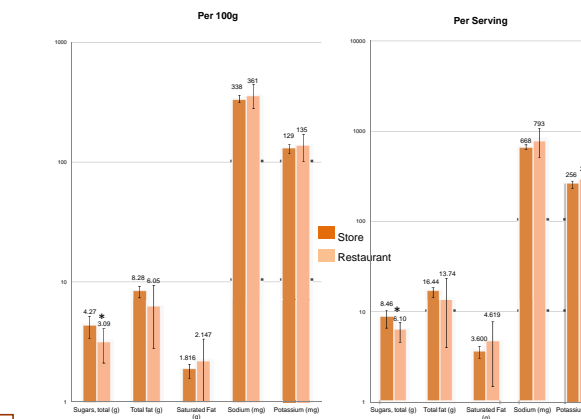
Chicken nuggets



Chicken nuggets from store were ~25% lower in fat vs. restaurant on 100 g basis. Significant differences were observed for sodium, potassium, total and saturated fat, when compared on serving size basis. The serving sizes for chicken nuggets at restaurant were over 30% higher than at store, even after family size packages of 20 nuggets were discarded for analysis.

* = p<0.05; ** = p<0.0001

Macaroni and cheese



Macaroni and cheese from store and restaurants were not significantly different for all the nutrients compared, except for total sugar.

Conclusion:

- Significant differences were observed in nutrient content between the two sources; however, differences were not consistent across the four foods sampled. Data from the additional seven pairs of corresponding restaurant and packaged foods may increase our understanding of differences in the nutrient profiles.
- These studies will help our understanding of the food environment, strengthen national nutrition monitoring, and update the USDA National Nutrient Database for Standard Reference (SR), the most authoritative food composition database in the US.
- For these and nutrient data for over 8,500 foods, please visit <http://www.ars.usda.gov/nutrientdata>.