



A Comparison of Concentrations of Sodium and Related Nutrients (Potassium, Total Dietary Fiber, Total and Saturated Fat, and Total Sugar) in Private-Label and National Brands of Popular, Sodium-Contributing, Commercially Packaged Foods in the United States



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ABSTRACT

Background Private-label brands account for about one in four foods sold in US supermarkets. They provide value to consumers due to their low cost. We know of no US studies comparing the nutrition content of private-label products with corresponding national brand products.

Objective The objective was to compare concentrations of sodium and related nutrients (potassium, total dietary fiber, total and saturated fat, and total sugar) in popular sodium-contributing, commercially packaged foods by brand type (national or private-label brand).

Design During 2010 to 2014, the Nutrient Data Laboratory of the US Department of Agriculture obtained 1,706 samples of private-label and national brand products from up to 12 locations nationwide and chemically analyzed 937 composites for sodium and related nutrients. The samples came from 61 sodium-contributing, commercially packaged food products for which both private-label and national brands were among the top 75% to 80% of brands for US unit sales. In this post hoc comparative analysis, the authors assigned a variable brand type (national or private label) to each composite and determined mean nutrient contents by brand type overall and by food product and type.

Statistical analyses performed The authors tested for significant differences ($P < 0.05$) by brand type using independent sample *t* tests or Mann-Whitney *U* tests when appropriate.

Results Overall for all foods sampled, differences between brand types were not statistically significant for any of the nutrients studied. However, differences in both directions exist for a few individual food products and food categories.

Conclusions Concentrations of sodium and related nutrients (potassium, total dietary fiber, total and saturated fat, and total sugar) do not differ systematically between private-label and national brands, suggesting that brand type is not a consideration for nutritional quality of foods in the United States. The study data provide public health officials with baseline nutrient content by brand type to help focus US sodium-reduction efforts.

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A PRIVATE-LABEL BRAND, ALSO KNOWN AS A STORE brand, is a “brand owned or sponsored by a retailer or supplier.”¹ Two examples of US private-label brands are Great Value sold at Walmart, and Kirkland sold at Costco. In 2014, private-label brands accounted for almost a quarter of product units sold in US supermarkets.² Sales of private-label brand products have grown steadily, outpacing the increase in sales of national-brand products.

Private-label brands provide value to consumers. These brands cost about three-fourths the price of national brand products.³ Because food prices are an important factor in food

choices,⁴ private-label brands can influence purchase decisions and, in turn, nutrient intakes.

The authors know of no published US studies comparing nutrient content by brand type. Selected foods in other countries have undergone limited comparisons,⁵⁻¹² and most researchers reported no differences by brand type but did observe differences for individual foods and food categories. However, these results cannot be generalized to the US food supply.

US public health officials have recently started working with food manufacturers to reduce sodium levels in

commercially processed and restaurant foods¹³⁻¹⁶ and monitor these efforts.^{17,18} As part of the monitoring program led by the US Department of Agriculture (USDA), the Nutrient Data Laboratory (NDL) of USDA is monitoring levels of sodium in popular, sodium-contributing foods through periodic nationwide sampling and chemical analyses. USDA then uses these data to update its food composition databases used for national nutrition monitoring in the United States; that is, the National Nutrient Database for Standard Reference and Food and Nutrient Database for Dietary Studies.¹⁹ In addition to sodium, NDL monitors levels of related nutrients, including potassium, total dietary fiber (fiber), total and saturated fat, and total sugar, that may change when manufacturers and restaurants reformulate their products to reduce sodium content. The 2015-2020 Dietary Guidelines for Americans recommends decreased consumption of total and saturated fat and total sugar and increased consumption of potassium and fiber.²⁰ As part of the nationwide sampling of these foods, NDL selected top national and private brands for each food based on their market share for units sold.¹⁷

The primary aim of this study was to compare sodium and related nutrient content by brand-type for popular sodium-contributing foods where both private-label and national brands were among the top brands in the United States. A secondary aim was to provide information on the need to monitor private-label products to help streamline procedures for the federal sodium monitoring program.

METHODS

Between 2010 and 2014, NDL sampled and chemically analyzed 125 popular, sodium-contributing, commercially processed and restaurant sentinel foods containing sodium that had been added during processing or preparation. About three-fourths (92 of 125) these foods were commercially packaged foods from stores, representing several food types, including potato chips, bread, canned tomato soup and corn, frozen pizza, and chicken nuggets. Specifics on the definition of sentinel foods and on the selection, sampling, processing, and chemical analyses are detailed elsewhere.¹⁷ Institutional review board approval was not obtained because human subjects were not involved.

NDL developed a three-stage sampling plan for each sentinel food using the most recent US Census and Nielsen sales data to ensure a nationally representative, geographically dispersed sample. Using a probability-proportional-to-size sampling plan, in stage 1, NDL selected 12 counties based on most recent US Census data available. In stage 2, NDL selected retail outlets in these counties based on Nielsen and Trade Dimensions sales data. In stage 3, NDL identified the top brands for each food product representing up to 70% to 80% of total units sold in supermarkets using Nielsen point-of-sales data. Nielsen data provide unit sales for packaged foods sold in major supermarkets throughout the United States, including private-label-brand foods, but do not identify the retail stores that sell private-label brands. The sampling plan is detailed elsewhere.^{21,22}

NDL sampled both private-label and national-brand products for 61 of the 92 packaged sentinel foods because they comprised the top brands for these foods. No private brands were sampled for sentinel foods such as soy sauce or Cheerios (General Mills), hence they are not included in the study.

Professional buyers purchased 1,706 samples of these 61 food products from up to 12 locations. Not all national brands were available at the selected retail outlets, and not all retail outlets sold private-label brands. For example, NDL purchased 27 samples for American cheese: two top national brands, Brand A (nine samples) and Brand B (10 samples), and eight private-label brands, including Great Value (three samples) and Kroger (two samples). The samples for national and private-label brands for each product had similar ingredients and nutrition-related attributes, such as similar fat content or sodium types. For example, for beef frankfurters, frankfurters containing any meats other than beef were excluded, as were low-fat or low-sodium products. The samples were shipped to laboratories at Virginia Tech or Texas Tech, where they were composited to conserve laboratory analysis costs. The composites generally included two randomly selected city samples of the same national or private-label-brand product or products of two different private or regional brands (brands available only in certain US regions that are not associated with a specific retail outlet). Nine hundred thirty-seven composites were shipped to commercial laboratories for chemical analysis using official methods of the Association of Analytical Chemists (documented elsewhere).²³ Blind samples of matrix-matched reference materials were included for analysis to help compare and validate the chemical analysis results of composite samples.²⁴ NDL analyzed sodium, total fat, and potassium content in most composites, but it measured total sugar in only one-third and fiber in only one-quarter of the foods because many foods were low in these nutrients and to save analytical costs.

For this post hoc analysis, NDL assigned a brand type—national or private—to each of the 937 composites. Regional brands were treated as national brands, and composites of samples of both national and private-label-brand products were not included in the study. Sample sizes were sodium: 876 composites for 61 foods; potassium: 886 for 61 foods; fiber: 232 for 29 foods; total sugar: 269 for 39 foods; total fat: 865 for 60 foods; and saturated fat: 448 for 44 foods. NDL grouped the food products by food categories (adapted from What We Eat in America food categories²⁵) to present the data.

Statistical Analyses

NDL determined the mean, standard deviation, coefficient of variability (CV) (to represent variability among samples), and percent difference ($[(\text{private-label-brand value} - \text{national brand value}) / \text{national brand value}] \times 100$) for the mean nutrient estimates for individual food products and food categories and overall by brand type using SAS version 9.3.²⁶ (SAS Institute, Cary, NC). To mitigate the effects of heterogeneity of nutrient contents of different brands for individual food products and different foods within each category on variance estimates, reciprocal weights were incorporated. These weights were based on the reciprocal of the number of times a brand or food item appeared within a category, where weights were calculated as $1/n$, with n being the number of occurrences within a category. All descriptive estimates for individual food products, food categories, and overall by brand type incorporated these weights.

NDL tested for significance of difference ($P < 0.05$) using independent samples t test or Mann-Whitney U tests.

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