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.


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
that is, the National Nutrient Database for Standard Reference

odic nationwide sampling and chemical analyses. USDA then

levels of sodium in popular, sodium-contributing foods through peri-

NDL of USDA is monitoring levels of

in addition to sodium, NDL monitors levels of related nutrients,

including potassium, total dietary fiber (fiber), total and

and saturated fat, and total sugar, that may change when manu-

facturers 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.21

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, geographi-

cally 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 pack-

aged 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 prod-

ucts 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 pur-

chased 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 in-

gredients 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 labo-

ratory 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 (docu-

mented elsewhere).23 Blind samples of matrix-matched

reference materials were included for analysis to help

compare and validate the chemical analysis results of com-

posite samples.24 NDL analyzed sodium, total fat, and potas-

sium 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 ([private-label-brand value—national

brand value/national brand value]×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 heteroge-

neity 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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