Journal of Food Composition and Analysis xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Journal of Food Composition and Analysis

journal homepage: www.elsevier.com/locate/jfca

Original research article

Beware of Greeks bearing gifts: The potential impact of yogurt innovation on dietary intakes☆

Christopher Alan Taylor[a,*], Colleen K. Spees[a], Rosanna P. Watowicz[b], Stephen Martinez[c], Neal H. Hooker[a]

[a] The Ohio State University, USA
[b] Case Western Reserve University, USA
[c] USDA Economic Research Service, USA

ARTICLE INFO

Keywords:
Food analysis
Food composition
NHANES
Yogurt
Sugar
Fat
Dietary intakes
Dietary patterns
Food supply
Food innovation

ABSTRACT

The food supply is dynamic making dietary surveillance challenging. As one example, the recent growth of Greek-style yogurts has the potential to alter the nutritional contribution of this important dairy category. An approach to integrate market supply information into national nutrition surveillance data is proposed to better reflect such trends. This study uses product-level nutrition data from 575 new spoonable yogurts reported in 2005–12 Global New Product Database (GNPD); 92 of these products were Greek-style. Sub-category level nutrient variability is integrated with nationally representative consumption patterns from the National Health and Nutrition Examination Survey (NHANES 2005–12) and used to simulate the potential impact of yogurt innovation; 2-year cycles were used to characterize the dynamic process. The GNPD simulation suggests total fat may be higher than previously estimated but that total sugars may be over-stated. While protein levels on average appear similar in both approaches there is pronounced variability in the food innovation data, which could dramatically change the simulation results. The opportunity for product innovation to influence national consumption estimates is demonstrated and will be pronounced when these products comprise a critical mass of the US food supply.

1. Introduction

While per capita milk consumption in the US has been declining over the last 4 decades, there has been an offsetting increase in cheese and yogurt sales (ERS, 2015). Industry reports suggest a growing proportion of yogurts formulated with a nutrition-marketing goal in mind (Mintel, 2015). But what defines a "better-for-you" yogurt should be changes in nutrient-density rather than marketing claims alone. Regardless, whether these innovations in the yogurt market are substantial enough to influence national-level dietary intakes remains a question. The speed of innovation by manufacturers, adoption by consumers, and nutritional composition of these processed dairy products vary considerably (Desai et al., 2013). This suggests the truism that ultimate diet quality for a consumer depends upon the items actually eaten, which may not be captured at a national level. The traditional approach to estimating the diet contribution of a particular set of products, such as yogurt, relies on a database of point estimates of the "typical" nutrient contents of standardized foods linked to individual self-reports of products they consumed, which may or may not look like these standardized foods. National-level dietary surveillance efforts may be improved by enhanced funding to support incorporating food innovation trends and a richer description of the nutritional quality variability seen within a food product category.

Current national nutrition surveillance efforts, including those of What We Eat In America (WWEIA), the dietary survey component of the National Health and Nutrition Examination Survey, utilize a validated reference database to quantify intakes of self-report dietary intake assessments (CDC, 2017). The Food and Nutrient Database for Dietary Surveys (FNDDS, ARS, 2015) and Food Patterns Equivalents Database (FPED, Bowman et al., 2014) are challenged with estimating an accurate nutritional composition given a constantly-evolving food supply. Product categories are particularly dynamic, and the impact on nutrient changes contributed by certain innovative products may be considerable. As an example of this, the yogurt category was used to explore the potential impact on national diet estimates in light of a dynamic set of new Greek-style products.

☆ This paper was originally presented as a poster at the 39th National Nutrient Databank Conference (NNDC) held May 16–18, 2016 in Alexandria, VA (USA).

* Corresponding author at: The Ohio State University, 306A Atwell Hall 453, 10th Ave., Columbus, OH 43210 – 1234, USA.
E-mail address: taylor.1043@osu.edu (C.A. Taylor).

http://dx.doi.org/10.1016/j.jfca.2017.06.011
Received 2 August 2016; Received in revised form 30 April 2017; Accepted 30 June 2017
0889-1575/ © 2017 Elsevier Inc. All rights reserved.

The recent interest in Greek-style yogurts has been characterized as a "boom", with rapid expansion of products and market share (Boynton et al., 2013; Boynton and Novakovic, 2013; Dharmasena et al., 2014). Boynton and Novakovic (2013) compiled aggregate market statistics, which suggest that Greek-style yogurt sales rose from 2% of the market volume in 2009 to 22.5% in 2012. This paper simulated the potential effect on national nutrient intake estimates using the dynamic innovation in spoonable yogurts as a case study, which integrates food innovation trends with nationally representative consumption patterns. These analyses were performed using product-level food innovation information from a private database (Mintel's Global New Products Database, GNPD) integrated with the rich dietary intake records contained within the 2005–2012 National Health and Nutrition Examination Survey (NHANES).

2. Methods

The analyses in this study were conducted to assess the potential transition of the nutritional composition of product-level innovation in spoonable yogurts in the US between 2005 and 2012, corresponding with the last complete dietary intake data from NHANES. An overview of the data management and analysis are presented in Fig. 1. Linkages between a private database of product innovation (GNPD) and national nutrition monitoring data (NHANES) were performed to assess the potential impacts of yogurt product innovations on national consumption estimates in the US population. Spoonable yogurt products that were new, repackaged, or reformulated from the Global New Products Database (GNPD) during 2005–2012 were matched to the consumption instances of spoonable yogurts reported in dietary recalls from NHANES. This work creates an opportunity to compare traditional national surveillance estimates of the nutrition contribution of yogurt consumed compared to estimates based on evolving food industry (re) formulations.

2.1. Preparing product-level innovation data

Product description and nutrition composition data were downloaded for the 575 spoonable yogurts in GNPD that were new, reformulated, or repacked and released in the US between January 1, 2005 and December 31, 2012. Nutritional content data were provided as the composition per serving and per 100 g of product. When the nutrition data was incomplete or not entered, information from the Nutrition Facts panel was used to fill in the missing data elements. Data cleaning was needed to correct typographic errors and complete missing fields. Missing and outlier values for nutritional content were confirmed from product packaging images provided by Mintel (Mintel, 2015), the database publisher, when available. Multipack products were disaggregated manually into discreet lines of nutritional content data for each individual product. For standardization across differing package and serving sizes, the nutritional content per 100 g of products was used.

To overlay the product innovation data from GNPD to the dietary intake data in NHANES 2005–2012, a research dietitian linked the 575 individual yogurt products to the 22 unique yogurt food codes from the FNDDS. For a more parsimonious analysis, the FNDDS food codes were collapsed into 12 discrete yogurt categories based on fat content, flavors, and reduced-calorie varieties (Table 1). A review of the ingredients and product images was conducted to identify specific product categorizations when GNPD data was not sufficient for classification into a discrete yogurt group.

To determine the variability in the nutritional composition based on product innovation, the energy and nutrients contents per 100 g were aggregated and reported as mean, minimum and maximum nutritional content per discrete yogurt group. The mean, minimum and maximum estimates were computed across 2-year groupings to correspond with the NHANES cycles of data (2005–06, 2007–08, 2009–10, and 2011–12) to allow for an analysis of temporal changes in the marketplace based on the date of introduction. These data were overlaid with the consumption data from the corresponding NHANES cycle to simulate the potential impact of food product innovation on the national yogurt consumption estimates. Note this process does not alter the NHANES consumption data in any way, merely adding the variability in nutritional composition over the 12 product sub-categories that is seen in new product launches and comparing if this dynamic food innovation data changes any of the nationally-representative estimates compared to the traditional nutrition surveillance methods.

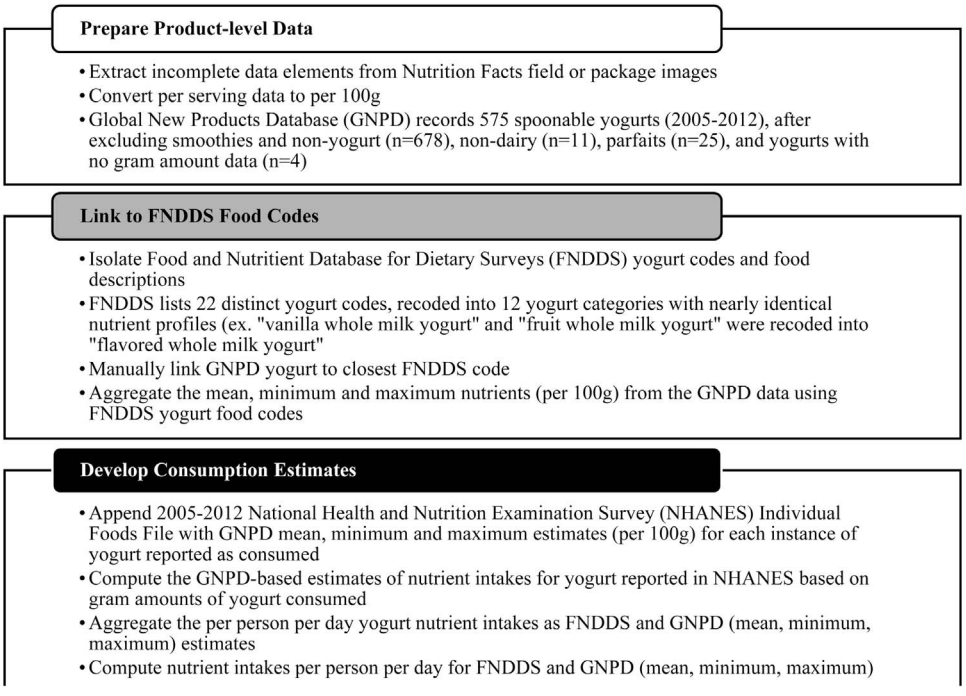

Fig. 1. The Study Design of Data Collection and Tabulation.

Download English Version:

https://daneshyari.com/en/article/7620071

Download Persian Version:

https://daneshyari.com/article/7620071

Daneshyari.com