

Macronutrient Composition of Menu Offerings in Fast Food Restaurants in the U.S.



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Introduction: A high intake of fast food is associated with increased obesity risk. This study assessed recent changes in caloric content and macronutrient composition in large U.S. fast food restaurants.

Methods: Data from the MenuStat project included 11,737 menu items in 37 fast food restaurants from 2012 to 2014. Generalized linear models were used to examine changes in the caloric content and corresponding changes in the macronutrient composition (non-sugar carbohydrates, sugar, unsaturated fat, saturated fat, and protein) of menu items over time. Additionally, macronutrient composition was compared in menu items newly introduced in 2013 and 2014, relative to 2012. Analyses, conducted in January 2016, controlled for restaurant and were stratified by menu categories.

Results: Overall, there was a 22-calorie reduction in food items from 2012 to 2014. Beverages had a 46-calorie increase, explained by an increase in calories from sugar (12 calories) and saturated fat (16 calories). Newly introduced main courses in 2014 had 59 calories fewer than those on 2012 menus, explained by a 54-calorie reduction in unsaturated fat, while other macronutrient content remained fairly constant. Newly introduced dessert items in 2014 had 90 calories more than those on 2012 menus, explained primarily by an increase of 57 calories of sugar.

Conclusions: Overall, there were relatively minor changes in menu items' caloric and macronutrient composition. Although declines in caloric content among newly introduced fast food main courses may improve the public's caloric intake, it appears that the macronutrient composition of newly introduced items did not shift to a healthier profile.

(Am J Prev Med 2016;51(4):e91–e97) © 2016 American Journal of Preventive Medicine. Published by Elsevier Inc. All rights reserved.

Introduction

On a typical day in the U.S., 36% of adults eat at fast food restaurants, with a mean caloric intake among consumers of 877 calories.¹ There is robust evidence linking consumption of fast food to obesity risk.^{2,3,4} Requiring restaurants to list menu items' calories on menu boards is one strategy that has been proposed to encourage healthier eating patterns, and the

menu-labeling provision of the Affordable Care Act mandates that calorie information be posted on menus and menu boards in chain restaurants and similar retail food establishments with 20 or more locations.⁵ Although menu labeling of calories has had little or no impact on consumers' purchases,^{6,7,8,9} recent research suggests that it may encourage chain restaurants to develop products with fewer calories,^{10,11} particularly among chains that have begun to voluntarily post calories on their menus.¹²

Two recent studies examined 66 of the largest U.S. chain restaurants and observed voluntary reductions to the calories in newly introduced menu items by 60 calories (a 12% decline) from 2012 to 2013,¹⁰ which persisted in 2014.¹¹ A third study compared differences in calorie counts of items in restaurants that voluntarily implemented national menu labeling with those that did not and found that the mean calorie content of menu

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0749-3797/\$36.00

<http://dx.doi.org/10.1016/j.amepre.2016.03.023>

items was lower for restaurants that voluntarily posted calories.¹² A key question is how macronutrient composition might explain changes in caloric content of menu items. Although overall caloric consumption is often considered to be the most important factor associated with obesity, prior studies suggest that macronutrient content of consumed foods and drinks, rather than caloric content only, differentially influences weight gain. For instance, consumption of unhealthy fats has been associated with weight gain, whereas an intake of healthy (i.e., unsaturated) fats has not.^{13,14} A high intake of sugar or refined carbohydrates is associated with greater weight gain, relative to consumption of healthier carbohydrates, such as whole grains or fruits and vegetables.¹⁵ The consumption of more protein relative to carbohydrates may reduce metabolic risk.¹⁶ Therefore, a better understanding of the potential impact of changes in the caloric content of menu items in fast food restaurants on population health requires knowledge of corresponding changes in macronutrient composition.

The present study investigated the caloric content and macronutrient composition of menu items offered by fast food restaurants in a large database containing information about all menu items offered by 37 large U.S. restaurant chains. Study objectives were to describe recent trends in caloric content in terms of macronutrient composition of menu offerings in large fast food chains in the U.S. from 2012 to 2014, and to determine whether changes in caloric content of menu items were explained by changes in non-sugar carbohydrates, sugar, unsaturated fat, saturated fat, or protein. Given the U.S. public's high fast food consumption, results may inform efforts to improve healthy eating habits.

Methods

Data

Data were from the MenuStat project (<http://menustat.org/>), which contains a census of menu items in most of the 200 largest U.S. restaurant chains, as defined by U.S. sales volume. Data collection methods are published elsewhere.¹⁷ Briefly, data collection began in 2012 with 66 of the 100 largest U.S. restaurants and has expanded annually. The data include caloric content and other information about menu items from restaurant websites. The present study included menu items offered by fast food restaurants. Menu items offered in fast food restaurants are typically not prepared onsite, but rather prepared en masse and then shipped to restaurant sites to be heated and assembled via highly formulaic and mechanized processes. Therefore, measurement in macronutrient composition across time and menu categories should not be subject to error or variation because of site- or time-specific differences in human cooking habits. Because of uniform recipes and portions, caloric content of items at fast food restaurants are far more accurate and reliable than are measures of caloric content

in sit-down restaurants where food is prepared onsite and menus vary more frequently.¹⁸ Data were included for the 37 fast food restaurants where data were collected in all 3 years (2012–2014). Because of the relatively small numbers of children's menu items (i.e., those items appearing on the children's menu only), it was not feasible to stratify children's menu items by menu category and therefore children's menu items were excluded. The final analytic data set included 11,737 menu items in 37 large, U.S. fast food chain restaurants ([Appendix Table 1](#), available online, lists each restaurant and a definition of fast food).

Measures

The outcome measures were per-item mean calories and calories from macronutrients (non-sugar carbohydrates, sugar, unsaturated fat, saturated fat, or protein). Analyses were conducted overall, including all menu items available in each year. Additionally, analyses examined caloric and macronutrient content among newly introduced menu items in 2013 and 2014 compared with items on the menu in 2012 and subsequently discontinued. Per-item measures of calories are presented overall and by menu category. Each menu item within combination meals was considered individually, and all menu items were included regardless of serving size. New menu items in 2013 were defined as those that had no item name, description, or calories recorded in 2012, but did have an item name, description, and calories recorded in 2013. Similarly, new menu items in 2014 were defined as those that only had this information available in 2014 and not in 2012 or 2013. MenuStat data include total calories, as well as the grams of carbohydrates, sugar, total fat (saturated and unsaturated), and protein, for each menu item. Following U.S. Department of Agriculture definitions, each menu item's caloric content was calculated from data about each item's macronutrient composition.¹⁹ Specifically, caloric content was calculated as the sum of the corresponding calories per each gram of non-sugar carbohydrates, sugar, unsaturated fat, saturated fat, and protein.¹⁹ Items with macronutrient information missing in all 3 years ($n=76$) were excluded. Then, the difference between the macronutrient-derived calories and the total calories reported in the MenuStat data were calculated for each item in each year. A small number of items ($n=260$, or $<2\%$) were excluded because the macronutrient-derived calories values were >50 calories greater or <50 calories fewer than the MenuStat-reported calories. The trends in calories over time and the patterns in calories between menu categories were consistent using the calories reported in the MenuStat data or the total calories calculated from nutritional composition ([Appendix Table 2](#), available online).

The main independent variable was an indicator of time. In the overall analysis, the independent variable of interest was year (2012, 2013, or 2014). In the analysis of newly introduced items, the independent variable of interest was whether a menu item was newly introduced in 2013 or 2014, compared with the reference value of being on the menu in 2012 only. Results were conducted among all items and stratified by mutually exclusive menu categories (food or beverage). Within the food category, items were stratified further by three mutually exclusive categories: appetizers and sides (including appetizers and side dishes but excluding toppings and ingredients), main courses (burgers, entrees, pizza, sandwiches, and salads and soups), and desserts. All analyses were adjusted to account for the restaurant in which

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