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Supplement—The Dietary Intake and Eating Habits of the Mexican Population: Results from the National Health and Nutrition Survey 2012

Discretionary Foods Have a High Contribution and Fruit, Vegetables, and Legumes Have a Low Contribution to the Total Energy Intake of the Mexican Population[1–4]

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Abstract

Background: Overweight and obesity prevalences in Mexico are among the highest in the world, with dietary factors being the third-leading category of risk contributing to the burden of disease. Consequently, studying the compliance of the Mexican population to food-based dietary recommendations is essential for informing nutritional policies.

Objectives: We described the energy contribution of food groups to total dietary energy intake of the Mexican population and by sociodemographic subgroups and compared these results with Mexican dietary recommendations.

Methods: Twenty-four-hour dietary recalls for participants aged ≥5 y (n = 7983) from the 2012 Mexican National Health and Nutrition Survey were used. Foods and beverages were classified into 8 groups (the first 6 were called ''basic foods'' and the last 2 ''discretionary foods''), as follows: *1*) cereals, *2*) legumes, *3*) milk and dairy, *4*) meat and animal products, *5*) fruit and vegetables, *6*) fats and oils, *7*) sugar-sweetened beverages (SSBs), and *8*) products high in saturated fat and/or added sugar (HSFAS). Recommendations were based on the Mexican Dietary Guidelines (MDG). Energy contributions from the food groups by age, sex, region, residence (rural or urban), and socioeconomic status (SES) were estimated.

Results: The highest contribution to total energy intake came from cereals (33%) followed by HSFAS (16%), meat and animal products (14%), and SSBs (9.8%). Fruit and vegetables (5.7%) and legumes (3.8%) had the lowest contribution. Energy contribution of several food groups differed significantly between population subgroups. Overall, discretionary foods contributed more than one-quarter of total energy intake (26%) and were 13 percentage points above the maximum allowed by the recommendations, whereas the intakes of legumes and fruit and vegetables were much lower than recommended.

Conclusions: Our results show the need to generate a food environment conducive to a healthier diet in the Mexican population. *J Nutr* 2016;146(Suppl):1881S–7S.

Keywords: school-aged children, adolescents, adults, food groups, dietary guidelines, discretionary foods, nutrition survey, diet, socioeconomic status, urban and rural areas

Introduction

Mexico has been experiencing a demographic, epidemiologic, and nutritional transition in the past decades (1, 2) due to the aging of its population, the increase in the burden of disease from noncommunicable chronic diseases (NCDs)[7], and a rapid escalation in the intake of foods and beverages with a high content of saturated fat, sugars, and salt (3). In 2012, the prevalence of overweight and obesity (OW/OB) was 9.7% among children <5 y of age (BMI >2 SDs), 34.4% in school-aged children, 35% in adolescents, and 71.3% in adults, placing Mexico among the countries with the highest prevalence of obesity in the world (4, 5). This implies a major challenge for the health sector because nutrition-related NCDs are one of the major health problems that Mexico faces today and in years to come (6, 7).

At the same time, the prevalence of undernutrition declined. The prevalence of wasting decreased to <2.5% in 1999 and has been sustained, and a steady decline of ~50% was observed in the prevalence of stunting between 1988 and 2012 (8). A reduction in anemia among children (9) and women (10) was also observed between 1999 and 2012. However, stunting still affects 1.5 million children <5 y of age and anemia affects 20.4%

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of children between 1 and 4 y of age, 9.7% of children between 5 and 11 y of age, and 11.6% of nonpregnant women of reproductive age (8–11), with iron deficiency affecting 29.4% of women (12). The double burden of malnutrition, with the coexistence of OW/OB and undernutrition, occurs at the population level, at the household level (concurrent OW/OB mothers with stunted or anemic children), and at the individual level (concurrent micronutrient deficiencies or anemia and OW/OB in the same individual) (13, 14).

Given this current situation in the population and the role of dietary intake as a key determinant of these conditions, a thorough assessment is warranted. Energy, macronutrient, and micronutrient intakes of the population are published elsewhere in this supplement issue (15–17). However, the intake pattern of food groups is essential to identify food sources of energy in order to inform the design of food-based dietary guidelines (such as the ones recently published in Mexico) (18) and to recognize the degree to which the intake of food groups differs from national dietary food guidelines.

Although the energy contribution from beverages to the total energy intake of the Mexican population has been published elsewhere (19), information about the contribution of solid foods as well as other food groups has not been reported. Therefore, the aim of this study was to describe the energy contribution of 8 food groups to total dietary energy intake of the Mexican population by sociodemographic characteristics and to compare these results with food-based dietary recommendations.

Methods

The 2012 Mexican National Health and Nutrition Survey [ENSANUT (its acronym in Spanish)] is a probabilistic population-based survey with a multistage, stratified sampling design, which is representative at the national and state levels and for rural and urban areas. The survey was conducted between October 2011 and May 2012. It collected information from 50,528 households, from which 96,031 individuals were selected for participation. A household response rate of 87% was obtained (20). Dietary information was obtained for a subsample of 10,886 participants (~11% of the total ENSANUT sample) by using a 24-h recall automated multiple-pass method (15, 21), collected between Monday and Sunday.

Diet information. For the present analysis, the study population consisted of nonpregnant, nonlactating participants aged ≥5 y (n = 8074). Observations with extreme energy intakes were excluded from the analysis (n = 91). The process used for identifying implausible values is thoroughly described in another article in this supplement (15). Thus, the final sample consisted of 7983 participants.

Subjects could report their intake from the previous day as: *1*) individual foods, *2*) custom recipes (individual ingredients that make up the recipe as reported by participants), and *3*) standard recipes (sets of default ingredients that make up a recipe when the informer was not able to provide one). For the present analysis, food recipes were disaggregated into their ingredients. When a beverage was reported as a custom or standard recipe, it was kept as a single unit. For example, coffee with sugar was maintained as a single beverage and not disaggregated to coffee, water, and sugar.

Foods and beverages were classified into 8 main groups according to their nutritional characteristics: *1*) minimally processed cereals and tubers (excluding processed cereals with >13% of energy from added sugars or saturated fats), *2*) legumes and nuts, *3*) milk and dairy, *4*) meat and animal products, *5*) fruit and vegetables, *6*) fats and oils, *7*) sugar-sweetened beverages (SSBs) and alcoholic beverages, and *8*) high in saturated fat and/or added sugar (HSFAS) products. Food groups 1–6 were considered basic foods, namely foods that substantially contribute to the intake of essential nutrients (22), whereas groups 7 and 8, which we called discretionary foods, consisted of foods that generally provide high energy and low nutrient density.

Fresh-squeezed fruit and vegetable juices without added sugars were included in group 5. The SSB group included industrialized and homemade SSBs such as sodas, *aguas frescas* (traditional Mexican beverages usually prepared with water, fruit, and sugar), energy and sports drinks, and alcoholic beverages for adolescents and adults. The HSFAS group included nonbasic foods [i.e., savory snacks, desserts, confectionery, cookies, cakes, "sweet bread" (traditional baked pastries of a wide variety of shapes, prepared with sugar and fat), and caloric sweeteners] with >13% of total energy from added sugars and/or saturated fat (see **Supplemental Table 1**, which shows the principal food items in each food group).

To document the adequacy of the mean intake of the population we defined a set of recommendations based on the Mexican Dietary Guidelines (MDG) (18). These guidelines suggest a number of portions by food group for different energy requirements. We estimated the average energy percentage contribution of each food group on the basis of healthy dietary plans for 1300–3000 kcal/d proposed by the MDG. We used the following recommendations: 33% from minimally processed cereals, 12% from legumes and nuts, 10% from milk and dairy, 10% from meat and animal products, 12% from fruit and vegetables, and 10% from fats and oils. Although not included in the MDG, we allowed 13% as a maximum for discretionary foods, of which up to 3% from SSBs and up to 10% from HSFAS were considered admissible. Further information on SSB and HSFAS recommendation cutoffs is described in another article in this supplement (23). It must be emphasized that these recommendations are only a guideline to compare actual intake and the recommended intakes by the MDG.

Energy values were calculated from food-composition tables compiled by the Center for Nutrition and Health Research of the National Institute of Public Health (Nutrient Database, Compilation of the National Institute of Public Health, unpublished data, 2012). Once the previously described food groups were defined, the percentage of energy each group contributed to total energy intake was estimated.

Sociodemographic information. Households were categorized by socioeconomic status (SES) tertiles on the basis of a well-being condition index that included household goods and characteristics. Rural areas were identified as residence areas with <2500 inhabitants, and urban areas were defined as those with ≥2500 inhabitants. Geographic regions were classified as North, Central, or South (States by region: North: Baja California, Baja California Sur, Coahuila, Chihuahua, Durango, Nuevo León, Sonora, and Tamaulipas; Central: Aguascalientes, Colima, Estado de México, Guanajuato, Jalisco, Mexico City, Michoacán, Morelos, Nayarit, Querétaro, San Luis Potosí, Sinaloa, and Zacatecas; South:

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[4] Supplemental Table 1 is available from the "Online Supporting Material" link in the online posting of the article and from the same link in the online table of contents at http://jn.nutrition.org.
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[7] Abbreviations used: ENSANUT, National Health and Nutrition Survey; HSFAS, high in saturated fat and/or added sugar; MDG, Mexican Dietary Guidelines; NCD, noncommunicable chronic disease; OW/OB, overweight and obesity; SES, socioeconomic status; SSB, sugar-sweetened beverage; %EC, percentage of energy contribution.

Campeche, Chiapas, Guerrero, Hidalgo, Oaxaca, Puebla, Quintana Roo, Tabasco, Tlaxcala, Veracruz, and Yucatán).

Statistical analysis. All of the analyses were performed by using Stata version 12.1 (StataCorp) with the SVY module for complex surveys. Means and 95% CIs for percentage of energy contribution (%EC) from the 8 food groups were estimated stratified by sociodemographic characteristics (age group, sex, region, rural and urban residence, and SES). Differences in energy contribution were considered significant if the 95% CIs did not overlap.

Multiple linear regression models were used for each food group to identify differences in energy contribution by age group, sex, region, rural and urban residence, and SES. All of the models were also adjusted by day of the week (weekday or weekend). A *P* value of 0.05 was considered significant. The survey was approved by the Research, Biosafety, and Ethics Committees at the National Public Health Institute in Cuernavaca, Mexico.

Results

Descriptive sociodemographic characteristics of the sample are presented in **Table 1**. Most of the individuals were adults (66.9%), lived in urban areas (73.1%), or lived in the Central region of the country (48.7%). Given that the ENSANUT is a nationally representative survey, the sample characteristics reflect those of the Mexican population.

For the overall Mexican population, the highest %EC (95% CI) was from cereals [32.6% (32.0%, 33.3%)], followed by HSFAS products [16.1% (15.5%, 16.6%)], meat and animal products [14.0% (13.5%, 14.5%)], and SSBs [9.8% (9.4%, 10.2%)]. Fats and oils contributed 8.5% of the total energy intake (95% CI: 8.2%, 8.8%). Fruit and vegetables contributed 5.7% (95% CI: 5.4%, 6.0%) and legumes contributed 3.8% (95% CI: 3.4%, 4.1%). Thus, basic foods contributed 74% of the total energy intake of the Mexican population, whereas discretionary foods contributed 26% (SSBs and HSFAS products). Intakes of legumes and fruit and vegetables were the lowest relative to recommendations (8.2 and 6.3 percentage points below recommendations, respectively). Conversely, SSBs and HSFAS products were 6.8 and 6.1 percentage points above recommendations, respectively, and meat and animal products were ~4 percentage points above recommendations. The %EC of cereals and fats and oils was close to recommendations (**Figure 1**A). Significant differences found between stratifications are mentioned below.

TABLE 1 Sociodemographic characteristics of the Mexican population: ENSANUT 2012[1]

	n (%)
Sex	
Male	3805 (49.4)
Female	4178 (50.6)
Age group[2]	
School-aged children	2753 (17.4)
Adolescents	2056 (15.7)
Adults	3174 (66.9)
Residence area[3]	
Urban	5016 (73.1)
Rural	2967 (26.9)
Region[4]	
North	1911 (19.8)
Central	3307 (48.7)
South	2765 (31.5)
Socioeconomic status	
Low	2888 (30.2)
Medium	2760 (31.7)
High	2335 (38.0)

[1] Values are unweighted *n* and weighted percentages; *n* = 7983. Data are from the ENSANUT 2012. ENSANUT, National Health and Nutrition Survey.
[2] School-aged children: ages 5–11 y; adolescents: ages 12–19 y; adults: age ≥20 y.
[3] Rural: <2500 inhabitants; urban: ≥2500 inhabitants.
[4] North: Baja California, Baja California Sur, Coahuila, Chihuahua, Durango, Nuevo León, Sonora, and Tamaulipas; Central: Aguascalientes, Colima, Estado de México, Guanajuato, Jalisco, Mexico City, Michoacán, Morelos, Nayarit, Querétaro, San Luis Potosí, Sinaloa, and Zacatecas; South: Campeche, Chiapas, Guerrero, Hidalgo, Oaxaca, Puebla, Quintana Roo, Tabasco, Tlaxcala, Veracruz, and Yucatán.

The %EC of milk and dairy was higher among school-aged children (11.9%) and adolescents (9.1%) than for adults (7.4%). A similar pattern was found for HSFAS products, with 21.0%, 20.0%, and 13.8% for school-aged children, adolescents, and adults, respectively, whereas for SSBs, school-aged children had a lower %EC (7.0%) than did adolescents and adults (9.5% and 10.6%, respectively). All age groups consumed >24% of total energy from discretionary foods (~11–17 percentage points above recommendations), with higher percentages in school-aged children (28%) and adolescents (30%) (Figure 1A). Males consumed a higher %EC from cereals and SSBs than did females, whereas females consumed a higher %EC of milk and dairy, fruit and vegetables, and HSFAS products than did males (Figure 1B).

Cereals had the highest %EC in the South compared with the North and Central regions (36.5% compared with 30% in the North and 31.2% in the Central region). In the North, meat and animal products (15.1% compared with 13.9% in the Central and 13.5% in the South regions) and SSBs (12.3% compared with 9.2% in the Central region and 9.3% in the South region) had the highest %EC. Fruit and vegetables had the lowest %EC in the North (4.5%) compared with the Central (6.3%) and South (5.5%) regions. Milk and HSFAS products had the lowest %EC in the South relative to other regions (6.6% compared with 8.2% in the North; 9.8% in the Central region for milk, and 14.8% compared with 16% in the North and 17% in the Central region for HSFAS products) (Figure 1C).

Figure 1D shows the percentage contributions of each food group to total energy intake for urban and rural residence areas. Cereals had a higher %EC in rural areas than in urban localities (38.9% compared with 30.3%). This was also observed for legumes (5.9% compared with 3%). Conversely, the %EC in urban localities was higher than in rural areas for milk and dairy (9.2% compared with 6.5%), meat and animal products (14.8% compared with 11.9%), fruit and vegetables (5.8% compared with 5.2%), SSBs (10.3% compared with 8.7%), and HSFAS products (17% compared with 13.4%).

As SES increased, the %EC of cereals and legumes decreased (from 39.8% to 27.4% and from 5.3% to 2.6%, respectively). On the contrary, the %EC of milk and dairy and meat and animal products increased as SES improved (from 5.8% to 10.6% and from 12.5% to 15%, respectively). The %EC of HSFAS products also increased with increasing SES, from 13.2% in low-SES individuals and subjects to 17.7% in high-SES individuals and subjects. The %EC from fruit and vegetables was higher in the high-SES group than in the other 2 tertiles (6.7% in high-SES compared with 5% in low- and medium-SES). There were no differences between SES tertiles in the %EC by SSBs (Figure 1E).

Most of the previously described differences between age groups, sexes, regions, urban and rural residence areas, and SES in a multiple regression model were maintained after adjustment

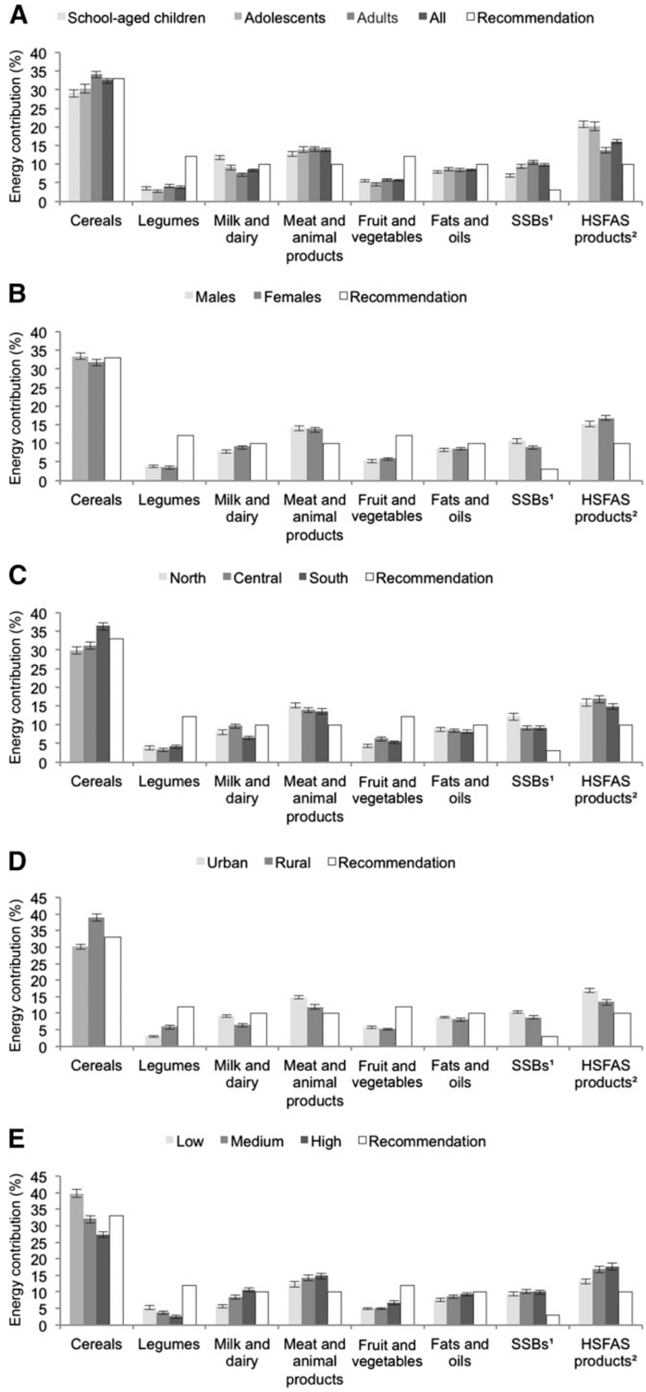

FIGURE 1 Contributions of 8 food groups to total energy intake in the Mexican population by age group (A), sex (B), region (C), rural and urban residence area (D), and socioeconomic status (E). Data are from the Mexican National Health and Nutrition Survey 2012. Values are means and 95% CIs; *n* = 7983. Survey weights were applied for all statistical procedures. [1]SSBs, sugar-sweetened beverages; [2]HSFAS, high in saturated fat and/or added sugar.

(**Table 2**). In the unadjusted means from Figure 1C, the %EC of legumes was similar between the 3 regions, whereas with the adjusted means the North region had a higher %EC than in the Central and South regions. Likewise, the unadjusted %EC of meat and animal products was higher in the North, but this difference was no longer present after adjustment. Differences between unadjusted and adjusted means by region seem to be explained by area and SES adjustment, considering that these conditions differ between regions (i.e., the South region has a higher percentage of rural areas and low-SES households than the other 2 regions).

Discussion

This study described energy intake contribution by 8 food groups in the Mexican population. The highest energy contribution was from cereals, followed by HSFAS products, meat and animal products, and SSBs, whereas fruit and vegetables and legumes had the lowest contribution.

Overall, 74% of energy intake came from basic foods and 26% came from discretionary foods. Food group intake varied by sociodemographic status. For instance, the %EC of cereals and legumes was higher in low-SES households and with rural residence, whereas the %EC of HSFAS products was higher in adolescents and school-aged children, with urban residence, and in medium- and high-SES households. The %ECs for legumes and fruit and vegetables were 8.2 (68%) and 6.3 (53%) percentage points below recommendations, respectively, whereas the %ECs for SSBs and HSFAS products were 6.8 (227%) and 6.1 (61%) percentage points above recommendations, respectively.

Results from this analysis were difficult to compare with those in other populations due to differences in the classification of food groups, although some comparisons were possible with an analysis from the United States that used NHANES data. This study included 41 food and 12 beverage groups, in which the major energy contributors from 1989 to 2010 among children and adolescents were SSBs, pizza, full-fat milk, grain-based desserts, breads, pasta dishes, and savory snacks (24). The mean intake for SSBs was 6.1% for 2010, which is lower than the contribution we found in children (7%) and adolescents (9.5%). The added mean intake of food groups that include foods similar to those in the HSFAS products group (dairy-based and grain-based desserts, ready-to-eat cereals, sweet snacks and candies, and savory snacks) was 19.8%, which is similar to the %EC found in Mexican children (20.9%) and adolescents (20.2%).

We found a very low intake of fruit and vegetables, although this food group has been widely studied and there is substantial evidence of the protective effect of fruit and vegetables in reducing the incidence of type 2 diabetes (25) and some specific cancers (26) and the risk of mortality from cardiovascular diseases (27). The %EC of this food group was significantly lower in the North region of the country than in the other regions and significantly higher in the high-SES group than in medium- and low-SES groups. Similar results were observed 6 y ago in Mexico, in which the intake of fruit and vegetables was far below recommendations, with the North region and low-SES households having the lowest intakes (28). Likewise, the same positive association between fruit and vegetable intake and SES has been observed in other populations (29–31).

On the other hand, we found a very high intake of SSBs, for which the %EC exceeded ≥2 times the admissible percentage in all strata. The highest %EC by SSBs was observed in the North region (12.3%). Remarkably, there was no difference in the contribution of SSBs by SES, contrary to what is observed in the United States and other developed countries in which income has been shown to be negatively associated with SSB intake (32, 33). Although the %EC of SSBs in rural areas was lower than in urban areas, it still was 3 times the upper acceptable percentage of energy intake.

The consumption of foods high in saturated and *trans* fats and added sugars has been associated with the development of obesity and other metabolic disorders. The mechanisms that may partially

TABLE 2 Coefficients of percentage contributions of food groups to total energy intake by sociodemographic characteristics in the Mexican population according to multivariate regression models: ENSANUT 2012[1]

	Cereals	Legumes	Milk and dairy	Meat and animal products	Fruit and vegetables	Fats and oils	SSBs	HSFAS products
Age group								
Adults	0	0	0	0	0	0	0	0
Adolescents	−4.0 (0.7)**	−1.4 (0.3)**	1.7 (0.4)**	−0.4 (0.5)	−1.1 (0.3)**	0.1 (0.3)	−1.1 (0.4)**	6.5 (0.7)**
School-aged children	−5.9 (0.7)**	−0.7 (0.3)*	4.8 (0.4)**	−1.3 (0.5)*	−0.2 (0.3)	−0.5 (0.3)	−3.6 (0.4)**	7.5 (0.6)**
Sex								
Male	0	0	0	0	0	0	0	0
Female	−1.1 (0.7)	−0.2 (0.3)	1.3 (0.3)**	−0.3 (0.5)	0.6 (0.3)	0.0 (0.3)	−1.7 (0.4)**	1.4 (0.6)*
Region								
North	0	0	0	0	0	0	0	0
Central	0.7 (0.7)	−0.8 (0.4)*	1.6 (0.4)**	−1.0 (0.6)	1.8 (0.4)**	−0.4 (0.4)	−3.0 (0.5)**	1.2 (0.7)
South	2.4 (0.8)**	−1.1 (0.4)**	−0.4 (0.4)	−0.4 (0.6)	1.5 (0.3)**	−0.4 (0.4)	−2.5 (0.6)**	0.4 (0.7)
Residence area								
Urban	0	0	0	0	0	0	0	0
Rural	4.6 (0.8)**	2.4 (0.4)**	−1.0 (0.4)**	−2.4 (0.6)**	−0.2 (0.3)	0.1 (0.4)	−1.5 (0.4)**	−2.4 (0.6)**
Socioeconomic status								
Low	0	0	0	0	0	0	0	0
Medium	−6.0 (0.9)**	−1.2 (0.4)**	2.2 (0.4)**	1.3 (0.6)*	−0.1 (0.3)	1.0 (0.4)*	0.2 (0.6)	2.9 (0.7)**
High	−10.0 (1.0)**	−2.0 (0.4)**	4.1 (0.5)**	1.6 (0.7)*	1.6 (0.4)**	1.7 (0.5)**	−0.4 (0.6)	3.7 (0.7)**
Constant	38.2 (1.0)	5.6 (0.5)	4.6 (0.5)	14.1 (0.7)	3.8 (0.4)	7.9 (0.5)	13.7 (0.8)	10.7 (0.8)

[1] Values are β coefficients (SEs) obtained by multivariate linear regression models, n = 7983. One model per food group. Reference groups: adults, male, North region, urban residence area, and low socioeconomic status. All models adjusted by day of the week (weekday or weekend). Survey weights were applied for all statistical procedures. $^{**}P < 0.01$, $^{*}P < 0.05$. ENSANUT, National Health and Nutrition Survey; HSFAS, high in saturated fat and/or added sugar; SSB, sugar-sweetened beverage.

explain this association are that these foods tend to have a high energy density, a low fiber and micronutrient content, poor-quality dietary fat, high glycemic load, and high-intensity flavoring (34). SSBs are also associated with these conditions (35, 36), probably due to the lack of satiety that occurs when they are consumed (37).

Therefore, it is of concern that 26% of daily energy intake in this study came from discretionary foods, and even more so in the case of school-aged children and adolescents, in whom 28% and 30% of their energy intake, respectively, was provided by these foods and beverages. This highlights the importance of taking action to reduce the intake of SSBs and HSFAS products. Thus, the recent tax of 1 peso/L on SSBs (tax of ~10%) and 8% on certain nonbasic and energy-dense foods (>275 kcal/100 g) approved at the beginning of 2014 would be justified on these grounds, given the elastic demand documented in Mexico (38, 39), this meaning that given a price increase by 1%, consumers decrease their purchases by more than 1%. Moreover, the high intake of these products might be displacing basic nutrient-dense foods. Further analyses should explore the association between intakes of certain food groups and the fulfillment of micronutrient requirements by the Mexican population.

A recent analysis showed the coexistence of high prevalences of excess weight (33–82% across age groups) with low to moderate prevalences of anemia (12–23%) in the Mexican population. Specifically, 7.6% of Mexican females aged 12–49 y presented both excess weight and anemia according to ENSANUT 2012 data (14). It is possible that high intakes of energy-dense foods contribute to the obesity epidemic in Mexico, whereas their low nutrient density might sustain the presence of micronutrient deficiencies.

Important changes over time might be occurring in the contribution of food groups to total energy intake in the Mexican population. Analysis from ENSANUT 1999 found that almost 25% of energy intake came from corn tortillas (40). We found that ~20% of energy in the Mexican diet comes from this food (data not shown), revealing a decrease of ~5 percentage points in the contribution of corn tortillas to the Mexican diet over 13 y. The traditional Mexican diet, along with tortillas, includes a high consumption of legumes; yet, we found that legumes had the lowest %EC of the 8 food groups. This might reflect the changes in the traditional diet, especially in populations from urban localities and with high SES, where the %EC of cereals and legumes is lower than in rural areas and low-SES populations. However, the recommendation for legumes was not met in rural areas nor among those of low SES. On the other hand, the intake of fruit and vegetables increased slightly, from 4.6% in 1999 (40) to 6% in 2012 among females, but the intake is still very low. So far, we can only compare food groups that shared the same classification in existing analyses of previous Mexican surveys. Further analysis with the same food group classifications should examine trends in all food groups and changes in previously reported dietary patterns.

It should be noted that in our classification of SSBs we did not include milk and other dairy beverages. We used the same classification methodology of foods for these beverages. That is, the individual ingredients of dairy beverages prepared at home or from standard recipes were classified in the corresponding food group, with sugar and other caloric sweeteners classified in the HSFAS group and plain milk in the milk and dairy group. The exceptions were ready-to-drink flavored milks, which were included as a single food in the milk and dairy group and had a %EC of <0.2%. This approach provides a more accurate estimation of milk and dairy, but due to these differences in beverage classification, our results differ from those of a previous analysis of ENSANUT 2012 (19).

One of the limitations of the present study is that we did not account for over- or underreporting of energy intake. It has been documented that this is present at least in school-aged children of the present survey (41). If over- or underreporting by an individual affects all food groups in the same direction and magnitude, the results would not be influenced. Nevertheless, it is possible that over- or underreporting is selective to certain food groups (e.g., overreporting of food groups that might be perceived as more socially desirable such as fruit and vegetables and underreporting of less socially desirable food groups such as pastries, sweets, and snacks) (42–44). Thus, it is possible that our estimations were subjected to over- or underestimation and that the true population intake is lower for certain healthy foods and higher for unhealthy ones. It is also possible that selective over- or underreporting is more prevalent in specific subpopulations (42, 45); therefore, differences in food group contributions between subpopulations might also be susceptible to error.

Even though we could not compare our analyses with those in other populations, the group classification used in the present analysis was designed to allow comparison with the MDG recommendations. Consequently, the information presented is intended to be comprehensive, especially for policy makers. The present analysis points out the food groups that deviate more from recommendations and that may need special attention for the development of dietary interventions. Likewise, the estimation of food group consumption by energy contribution allowed us to include practically 100% of the population energy intake and not just certain food groups. This allowed the estimation of energy contribution provided by basic and discretionary foods, highlighting the high contribution of the latter. Another strength of this study is the survey's representativeness of subpopulations, which enabled comparisons by age, sex, regions, areas, and SES.

Although the intakes of the cereal, milk and dairy, and fats and oils food groups were close to recommendations, it would be valuable to study subgroups or individual foods from these groups given that these include foods for which intakes are encouraged (e.g., whole grains, low-fat milk and dairy, and healthy oils) and foods for which intakes should be decreased (e.g., refined grains, whole milk and dairy, and *trans* and saturated fats). Analyses for foods that are included in the meat and animal products group—namely, seafood, red meat, and processed meat—are presented in another study in this supplement issue (23).

In summary, our study found that a high percentage of energy comes from discretionary foods (123% above upper acceptable percentages based on our recommendations). The energy intakes for fruit and vegetables and legumes were far below recommendations. Interestingly, the intake of tortillas, the principal whole-grain food in the Mexican diet, has decreased. Evidence from a study in this supplement issue indicates low intakes of fiber (15). These findings are of concern, considering that according to estimates from the 2010 Global Burden of Disease, NCDs account for 71% of the burden of disease in the country (1), with obesity, high fasting plasma glucose, high blood pressure, and unhealthy diet among the 6 main risk factors for disability-adjusted life-years (46). Our results call for the need to generate a food environment conducive to a healthier diet in the Mexican population.

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JAR designed the research; TCA, LSP, and TGS-P analyzed the data and wrote the initial draft of the manuscript; CB provided critical guidance for the analysis; CB and JAR edited the manuscript; and TCA, LSP, TGS-P, and JAR had primary responsibility for final content. All authors read and approved the final manuscript.

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