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Adherence to the Food Guide Pyramid Recommendations Among African Americans and Latinos: Results from the Multiethnic Cohort

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ABSTRACT

The objective of the study was to determine the degree of adherence to the Food Guide Pyramid recommendations among African Americans, Latinos born in the United States, and Latinos born in Mexico. Subjects were from the Multiethnic Cohort Study in Hawaii and Los Angeles, and completed a self-administered quantitative food frequency questionnaire at baseline in 1993-1996. Dairy recommendations were the least likely of all the food group recommendations to be followed, with 61% to 99% of individuals in the three ethnic groups not consuming the recommended number of servings. African Americans were less likely to adhere to all of the food group recommendations compared to the two Latino groups. A greater percentage of Latinos born in the United States did not adhere to the food group recommendations compared to Latinos born in Mexico. All three groups would benefit from interventions designed to promote healthy food choices.

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Examining differences in dietary patterns among ethnic groups may provide insight about causes of differing rates of chronic disease and guide development of dietary recommendations and interventions. Data from the Third National Health and Nutrition Examination Survey (NHANES III), conducted from 1988 to 1994, show that rates of diabetes for African Americans and Mexican Americans were 1.6 and 1.9 times, respectively, the rate of whites (1). Age-adjusted prevalence of overweight for African Americans was 31% in men and 49% in women, for Mexican Americans was 39% in men and 47% in women, and for whites was 32% in both men and women (2). Mortality rates due to cardiovascular disease (CVD) and cancer vary substantially among different ethnic groups. Age-adjusted rates of death due to heart disease were 210 per 100,000 for African Americans, 73 for Latinos, and 263 for whites (3). Age-adjusted cancer mortality rates in 2000 for men and women, respectively, were 343 and 194 for African Americans, 245 and 166 for whites, and 175 and 112 for Latinos (4).

Although the Food Guide Pyramid is a general guide to help Americans make healthful food choices (5,6), there is little information about adherence to these recommendations by ethnic minorities in the United States. The Continuing Survey of Food Intakes by Individuals (CSFII) 1994 to 1996 data compared 1 or 2 days of dietary intake data from 16,103 individuals with the Food Guide Pyramid recommendations (7). Considering that African Americans and Latinos together comprised approximately 70 million people in the year 2000 US census, data for these groups were relatively few: 1,105 non-Hispanic blacks and 405 Mexican Americans (aged 20 years and over) in CSFII. Other national surveys such as the 1988 to 1994 NHANES and the 1982 to 1984 Latino NHANES oversampled noninstitutionalized African Americans and Mexican Americans and collected dietary intake data using 24-hour recalls and/or food frequency questionnaires (FFQs) but did not compare intakes with those recommended in the Food Guide Pyramid.

This article presents data about adherence to the Food Guide Pyramid among African Americans and Latinos from the Multiethnic Cohort. The Multiethnic Cohort collected dietary data for 215,000 Japanese Americans, Native Hawaiians, and whites (mostly in Hawaii), and African Americans and Latinos (mostly in Los Angeles). We have shown that food consumption patterns differ substantially between Latinos born in Mexico or Central and South America and Latinos born in the United States (8).

In a previous article (9), we presented data for Japanese Americans and Native Hawaiians because data for these ethnic groups are not reported separately in the national surveys (7). Here we extend those findings to African Americans and Latinos in the Multiethnic Cohort. Our findings

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are separated for Latinos born in the United States and those born in Mexico or Central and South America to examine whether place of birth is a predictor of food-group consumption among these Latinos. Seventy-four percent of the non–US-born group were born in Mexico.

METHODS

The Multiethnic Cohort and dietary assessment methods have been detailed elsewhere (10). Briefly, the Multiethnic Cohort included representative population samples of five ethnic groups—African Americans, Latinos, Japanese Americans, Native Hawaiians, and whites—age 45 to 75 years, who completed a mailed self-administered quantitative FFQ (10), which was developed specifically for the study population, between 1993 and 1996. Ethnicity was self-defined. The cohort reflects a range of educational levels, although cohort members are more educated than the general population. Acceptable correspondence between the questionnaire and multiple 24-hour recalls for the ethnic groups was shown in a calibration substudy (11). In this article, we compared the usual daily intake of energy, Food Guide Pyramid servings, and adherence to the Food Guide Pyramid recommendations among African Americans, Latinos born in Mexico or Central and South America, and Latinos born in the United States.

We excluded cohort members with extreme values for total energy or its components. For each ethnic group, individuals were excluded whose energy intake was outside +3 "robust" standard deviations (SDs) of the ethnic-specific mean or whose fat, protein, or carbohydrate values were outside +3.5 "robust" SDs. The "robust" SD was used to adjust for outliers and was computed as 1.5 × the SD for the middle 90% of each ethnic group's data. Using servings specified in the Food Guide Pyramid, the US Department of Agriculture (USDA) developed a Pyramid servings database file. It identifies the number of servings provided per 100 g for foods reported during the 1994 to 1996 CSFII (7). We adapted this database for use with our food composition table (12). Each individual's Pyramid servings' intakes were computed by summing the daily servings across the food items. A person was considered to be adhering to the Food Guide Pyramid if the number of Pyramid servings consumed met or exceeded that recommended for that individual's daily energy intake level.

RESULTS AND DISCUSSION

Latino men and women born in Mexico or Central and South America reported the largest energy intakes compared with men or women in the other two groups (Table 1). They also had the largest mean intake of all food groups as well as added sugar and discretionary fat, but consumed the smallest mean number of alcoholic drinks per day (Table 2).

In terms of adherence to the Food Guide Pyramid recommendations, which are based on reported energy intake, more men than women adhered to the recommendations for the grain and meat groups; women were more likely than men to adhere to the recommendation for fruits and vegetables (Table 2). Compared with any other food group, the dairy recommendations were the least likely to be met for all ethnic and sex groups.

More than 50% of all ethnic groups in the lowest energy intake group did not meet the recommendations for any of the food groups. In all ethnic groups, there was a higher percentage of subjects who did not meet the grain and vegetable recommendations in the 2,200- to 2,800-kcal intake level compared with those in the 1,600- to 2,200-kcal level. In the highest energy intake group, more than one third of all ethnic groups did not meet the recommendations, except for the meat group. Within each energy intake level, there was little difference in the total amounts of discretionary fat and added sugar between the ethnic groups. However, fat increased fourfold and sugar increased more than threefold from the lowest to the highest energy intake categories.

In the Multiethnic Cohort, compared with Latinos born in Mexico or Central and South America, the percentage of Latinos born in the United States who were not adhering to the dietary recommendations was greater for all food groups. Other research has found similar results: in NHANES III, Latinos born in Mexico consumed more fruits, vegetables, grains, and legumes than did Latinos born in the United States, and consumed more traditional foods such as tortillas, beans, and rice (13,14). Other studies have shown that Latinos residing in the United States for longer periods of time have micronutrient profiles more similar to non-Latino whites (13).

We recently compared data about degree of nonadherence to the Food Guide Pyramid recommendations from other ethnic groups in the Multiethnic Cohort (Japanese Americans, Native Hawaiians, and whites), and found that the African Americans had a much greater percentage of people not adhering to the recommendations. For example, for grains, 27% of Japanese-American men and 35% of Native-Hawaiian men did not adhere to the recommendations, compared with 66% of African-American men. For vegetables, 57% of African-American men did not adhere to the recommendations, compared with 39% to 42% of male Japanese Americans, Native Hawaiians, and whites. However, there was a smaller percentage of African-American and Latino men and women who did not adhere to the fruit recommendations (men, 46% to 54%; women, 34% to 43%) compared with Japanese Americans, Native Hawaiians, and whites (men 59% to 64%; women 46% to 53%). As in our study, a study by Vitolins and colleagues (15) showed that the diets of African-American men consumed fewer vegetable servings than did other ethnic groups, such as whites and Native Americans. They also found fruit intake to be less among African Americans, but our study did not. For all ethnic groups, the greatest percentage of people not adhering to recommendations was found for the dairy group (65% to 100%).

Food Guide Pyramid serving recommendations are a current US food guide. The purpose of a food guide is to combine recommendations for nutrient intake with a food group pattern appropriate for a given population. For the Food Guide Pyramid, recommendations for intake of essential nutrients (from the Recommended Dietary Allowances) and for balance in macronutrients for prevention of chronic disease (fat, sodium, and fiber) were analyzed, and food group patterns were developed that were closely matched with

Table 1. Mean age, body mass index, energy, and Food Guide Pyramid servings[a] intake per day for each ethnic and sex group

	African-American men (n=11,772)	African-American women (n=20,130)	Latino men, born in Mexico, South or Central America (n=10,180)	Latino women, born in Mexico, South or Central America (n=10,903)	Latino men, US born (n=10,613)	Latino women, US born (n=11,255)
	← *mean± SD*[b] →					
Age (y)	62±8.9	61±9.0	59±7.7	58±7.6	61±7.6	60±7.9
BMI[c]	26.7±4.3	28.4±5.8	26.7±3.7	27.0±4.8	26.7±4.1	27.6±5.4
Energy (kcal)	2,194±1,166	1,879±993	2,716±1,401	2,316±1,238	2,468±1,261	2,056±1,104
Total grain	**7.1±4.2**	**6.2±3.8**	**9.5±5.1**	**8.4±4.8**	**8.7±4.9**	**7.7±4.7**
Grain whole grain	2.3±1.9	2.2±1.9	1.4±1.4	1.5±1.4	2.1±1.8	2.0±1.7
Grain non-whole grain	4.8±3.1	4.0±2.7	8.1±4.5	6.8±4.1	6.6±4.0	5.7±3.7
Total vegetables	**4.0±2.9**	**4.2±3.1**	**5.6±3.9**	**5.7±4.2**	**4.4±3.0**	**4.4±3.2**
Dark green	0.6±0.6	0.7±0.8	0.5±0.6	0.6±0.7	0.4±0.4	0.6±0.6
Deep yellow	0.4±0.5	0.5±0.6	0.6±0.7	0.7±0.8	0.4±0.5	0.5±0.5
Potato	0.6±0.5	0.4±0.4	0.6±0.5	0.5±0.5	0.5±0.5	0.4±0.4
Starchy	0.3±0.3	0.3±0.3	0.3±0.4	0.4±0.4	0.3±0.3	0.3±0.3
Tomato	0.6±0.5	0.6±0.5	1.1±0.9	1.0±0.8	1.0±0.8	0.9±0.7
Other	1.5±1.3	1.7±1.5	2.4±1.8	2.5±2.0	1.9±1.4	2.0±1.5
Total fruit	**3.2±3.2**	**3.7±3.6**	**4.2±4.0**	**4.9±4.4**	**3.4±3.4**	**3.8±3.7**
Citrus, melons, and berries	1.6±1.7	1.8±2.0	1.9±2.0	2.2±2.2	1.6±1.8	1.8±1.9
Other	1.6±1.8	1.9±2.0	2.3±2.3	2.7±2.7	1.9±2.0	2.1±2.1
Total dairy	**1.1±1.0**	**1.1±0.9**	**1.9±1.4**	**1.8±1.4**	**1.6±1.1**	**1.5±1.1**
Milk	0.7±0.8	0.7±0.7	1.1±1.0	1.1±1.0	0.9±0.8	0.8±0.8
Yogurt	0.05±0.2	0.1±0.2	0.1±0.2	0.1±0.2	0.1±0.2	0.1±0.2
Cheese	0.3±0.3	0.3±0.3	0.7±0.6	0.6±0.6	0.6±0.5	0.6±0.5
Total meats and alternatives (oz)	**6.4±4.2**	**5.5±3.7**	**8.8±6.0**	**6.9±5.1**	**6.9±4.5**	**5.5±3.9**
All meat, fish, and poultry	5.3±3.7	4.6±3.3	6.6±4.7	5.3±4.1	5.2±3.6	4.3±3.2
Meat	1.8±1.5	1.3±1.2	2.7±2.4	1.8±1.8	2.2±1.8	1.6±1.5
Organ meat	0.07±0.2	0.04±0.2	0.2±0.3	0.2±0.3	0.1±0.2	0.1±0.2
Frankfurter/sausage/ lunch meats	0.6±0.7	0.4±0.5	0.4±0.5	0.3±0.4	0.6±0.6	0.4±0.4
Poultry	2.2±2.1	2.3±2.2	2.7±2.3	2.4±2.2	1.9±1.8	1.8±1.8
Fish	0.7±0.7	0.6±0.6	0.7±0.8	0.5±0.7	0.5±0.6	0.4±0.5
Egg	0.4±0.4	0.3±0.3	0.4±0.4	0.3±0.3	0.4±0.4	0.3±0.3
Soy	0.06±0.1	0.1±0.1	0.1±0.1	0.1±0.1	0.1±0.1	0.1±0.1
Nuts	0.2±0.3	0.2±0.3	0.1±0.2	0.1±0.2	0.2±0.3	0.1±0.2
Legumes	0.4±0.5	0.3±0.5	1.6±1.7	1.2±1.4	0.9±1.2	0.7±1.0

[a]The Food Guide Pyramid recommendations are based on daily energy intake: <1,600 kcal: six servings grain, three servings vegetables, two servings fruit, two to three servings dairy, 5 oz meat or meat alternatives; 1,601 to 2,200 kcal: six servings grain, three servings vegetables, three servings fruit, two to three servings dairy, 5 oz meat or meat alternatives; 2,201 to 2,800 kcal: nine servings grain, four servings vegetables, three servings fruit, two to three servings dairy, 6 oz meat or meat alternatives; >2,800 kcal: 11 servings grain, five servings vegetables, four servings fruit, two to three servings dairy, 7 oz meat or meat alternatives.

[b]SD=standard deviation.

[c]BMI=body mass index; calculated as kg/m^2.

then current US eating patterns found in USDA surveys (such as CSFII). Thus, the Food Guide Pyramid recommendations were specifically developed according to a "mainstream" US eating pattern; specific ethnic foods may therefore not have been included. The recommendations of the Food Guide Pyramid are currently being reviewed and will be updated to reflect current science for nutrient adequacy and prevention of chronic disease as previously discussed (9).

We previously found that the different ethnic groups in the Multiethnic Cohort had somewhat varying abilities to recall their diets (11). However, we do not believe that this differential measurement error biased our findings, because the ability to recall diet was found to be similarly high in the groups after energy adjustment, and the analyses in Table 2 were based on energy intake categories.

In summary, there are clear differences in the degree to

Table 2. The percentage of each ethnic group not consuming the recommended number of Food Guide Pyramid servings and intakes for added sugar, discretionary fat, and alcohol, by sex and energy intake

	Men[a]	Women[a]	<1,600 kcal	1,600-2,200 kcal	2,201-2,800 kcal	>2,800 kcal
	←			%		→
Grain						
African American	66	70	90	48	68	45
Latinos (born in Mexico, South or Central America)	46	51	79	33	53	32
Latinos (US-born)	51	55	84	32	52	32
Vegetables						
African American	57	49	70	37	41	35
Latinos (born in Mexico, South or Central America)	38	32	63	27	28	19
Latinos (US-born)	51	45	70	38	43	32
Fruit						
African American	54	42	56	53	42	43
Latinos (born in Mexico, South or Central America)	46	34	54	50	38	34
Latinos (US-born)	53	43	59	57	47	45
Dairy						
African American	85	86	99	98	95	81
Latinos (born in Mexico, South or Central America)	65	65	99	95	87	61
Latinos (US-born)	74	76	99	96	92	71
Meat+Alternates						
African American	50	60	85	45	37	22
Latinos (born in Mexico, South or Central America)	30	50	81	42	32	14
Latinos (US-born)	47	61	89	51	41	21
Discretionary fat (g)						
African American	66	55	32	55	73	116
Latinos (born in Mexico, South or Central America)	77	64	31	51	68	117
Latinos (US-born)	73	60	33	54	73	119
Added sugar (teaspoon)						
African American	15	12	7	12	17	27
Latinos (born in Mexico, South or Central America)	16	12	6	10	14	23
Latinos (US-born)	14	11	6	12	13	23
Alcohol (drinks)						
African American	1.0	0.3	0.2	0.2	0.7	1.4
Latinos (born in Mexico, South or Central America)	0.8	0.1	0.2	0.3	0.4	0.9
Latinos (US-born)	1.2	0.2	0.3	0.5	0.7	1.5
Sample sizes (N)						
African American	11,772	20,130	13,759	7,690	4,589	5,864
Latinos (born in Mexico, South or Central America)	10,180	10,903	5,722	4,834	3,647	6,880
Latinos (US-born)	10,613	11,255	7,416	5,278	3,713	5,461

[a]Based on energy intake.

which ethnic groups meet the Food Guide Pyramid recommendations. In our cohort, we have shown that a high percentage of all the ethnic groups do not adhere to the recommendations, and particularly to the dairy serving recommendations. Latinos born in Mexico or Central and South America were more likely to meet the Food Guide Pyramid recommendations than Latinos born in the United States. One strategy for the Latino population could be to encourage the more traditional healthful diet.

African Americans were the least likely (compared with Latinos, Japanese Americans, Native Hawaiians, and whites) to meet any of the Food Guide Pyramid recommendations. Nutrition educators need to work more effectively in translating the Food Guide Pyramid recommendations to specific minority groups in the United States, and particularly to African Americans.

CONCLUSIONS

- Of the three ethnic groups, African Americans were the least likely to adhere to the dietary recommendations, and Latinos born outside the United States were the most likely.
- All three groups would benefit from interventions designed to promote healthy food choices.

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