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Food Choices and Diet-Related Disparities Among Socioeconomically Diverse White and African American Urban Women

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Abstract: Health disparities have been associated with diet quality inequalities. Study objectives were to determine if race and/or income were associated with the diet quality of White and African American urban women and to compare core food and beverage categories consumed at eating occasions by diet quality within race and income groups. Two 24 h dietary recalls were collected on 1219 women interviewed in the Healthy Aging in Neighborhoods of Diversity across the Life Span study, 2013–2017. Healthy Eating Index (HEI)-2010 scores were calculated. Linear regression Model 1 included race, marital status, and age. Model 2 included Model 1 variables plus income, education, literacy, employment, enough money for food, and food security. Core food categories and most frequently consumed items were identified at five eating occasions within the first and third tertile HEI-2010. Diet quality was associated with age, education, literacy, and employment. More fruit and vegetable categories at meals and snacks, and more water as a top beverage, were observed for women whose diets were in the third HEI-2010 tertile. The majority of foods reported by women in the first HEI-2010 tertile would be considered ultra-processed. The health benefits of consuming more minimally processed foods and unsweetened beverages may reduce health disparity gaps.

Keywords: African American women; diet quality; females; Healthy Eating Index; White women

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1. Introduction

Women's health has been an area of interest and growing concern in the last few decades. Health disparities are well documented among women [1]. When women's health is studied, research all too often focuses exclusively on sexual and reproductive health despite the fact that the main cause of death for women worldwide is cardiovascular disease [2,3]. Compared with men, women are nutritionally vulnerable for many reasons including but not limited to women's reproductive biology, lower socioeconomic status, the burden of caregiving, and the lack of education [4,5]. In 2023, it was estimated that globally 1.2 billion adolescent and adult women suffer from deficiencies of vitamins and minerals, especially iron, zinc, folate, and iodine [6]. There is evidence that the quality of the diets of African American and White low-income women in the United States (US) is poor [7,8]. High-quality diets are associated with a lower risk of developing nutrition-related chronic diseases [9]. Diet is a key contributor to health disparities [10–12].

Nutrition research on women tends to focus on select groups such as those enrolled in the Special Supplemental Nutrition Programs for Women, Infants, and Children [13] and professional women [14], but most research fails to adequately address women of diverse socioeconomic status across their lives [15]. A woman's nutritional status matters beyond her reproductive potential. It is fundamental to her rights as a person and to her overall physical and mental well-being throughout her life [16]. Diet quality, measured by the Healthy Eating Index (HEI)-2015, of non-pregnant, non-lactating women is lower than that of pregnant or lactating women (53 vs. 63 and 62 out of 100, respectively) [17]. There can be a compounding nature of nutritional disadvantages that can be perpetuated across many women's lives. Thus, more research on women across their lifespan is essential, especially for more vulnerable groups.

Although the US population may be aware of a diet–health relationship, less than 10% consume a diet fully consistent with the *Dietary Guidelines for Americans* (DGA) [18]. The DGA are recommendations developed by the US Department of Health and Human Services and US Department of Agriculture, which provide guidance to the American population on the foods and beverages to consume to promote health and reduce risk for chronic diseases [19]. US women scored a mean of 60 out of 100 on the HEI-2015, an assessment tool that measures compliance to the DGA, based on data from National Health and Nutrition Examination Survey—What We Eat in America (NHANES-WWEIA), 2017–2018 [20]. Mean scores of men, low-income persons (<131% of poverty income ratio), and non-Hispanic Black adults were 56, 56, and 54, respectively [21,22]. Similar to the scores of these groups, the HEI-2015 scores of women indicate that improvements in diet are needed to align with recommended food and beverage choices presented in the DGA. The selection of food and beverages consumed by people is complex and determined by multiple factors. They include but are not limited to taste, cost, convenience, culture, race/ethnicity, religion, education, and nutrition knowledge [23].

The attributes resulting in food choice as well as the types and quantities of foods consumed by women are also influenced by socioeconomic status [24–27]. For a group of diverse US women in the low socioeconomic status group, price was more important than taste, healthfulness, preparation time, or travel time to food market for a meal or ingredients compared to women in higher socioeconomic groups [24]. Among US African American women, socioeconomic status was found to have a significant indirect effect on diet-related behaviors, specifically the consumption of sweetened beverages and soda, through environmental and psychological factors [25]. Among older British women, fewer different fruits and vegetables were consumed by those with low socioeconomic status [27]. Education and household income were negatively associated with dietary energy density, an indicator of diet quality, in US women, aged 25–65 years [28].

Food is essential to our physical and mental well-being. A knowledge of the food and beverages people consume is important to our understanding of the sources of their nutrient intakes in addition to their food preferences. Previous research with participants of the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study has shown that their dietary patterns may be considered a Western-style diet [29]. We have found that race is intertwined with income and both contribute to eating behaviors [30]. HANDLS study participants with better diet quality, compared to those with poor quality, had a lower risk for cardiovascular disease [31], frailty [32], and greater muscle strength, measured by hand grip, a marker for nutritional status [33].

The current study extends our previous investigations on the associations of race and income with diet quality specifically focusing on women. To our knowledge, there have been no recent reports of foods mostly frequently consumed by eating occasion in White and African American women of diverse socioeconomic status. The objectives

are to (1) examine race and income as predictors of HEI scores in female participants of the HANDLS study; (2) identify the most frequently consumed foods and beverage categories at eating occasions by the first and third HEI tertiles by race and income; and (3) identify areas of modification to dietary intake to improve health and potentially reduce health disparities.

2. Methods

2.1. Study Sample

The study sample consisted of African American and White women interviewed and examined in the second follow-up visit (2013–2017) of the HANDLS study. Only women who completed two days of 24 h recalls and provided written informed consent were included in this study (n = 1219). Details regarding the HANDLS sample, design, and methods are available elsewhere [34]. In brief, the HANDLS study design was a 4-way factorial cross of age, sex assigned at birth, self-reported race, and household income operationalized as poverty status. HANDLS study participants were recruited from an area probability sample composed of 13 Baltimore, Maryland, US neighborhoods (groups of contiguous census tracts). The HANDLS protocol was approved by the National Institutes of Health Institutional Review Board. Participants were compensated.

2.2. Dietary Methods

Dietary data in the HANDLS study were collected by trained interviewers on two days, 4 to 10 days apart, using the US Department of Agriculture (USDA) Automated Multiple-Pass Method (AMPM) for the 24 h recall [35]. The first recall was obtained in-person and the second recall by telephone.

All foods and beverages reported were assigned USDA food codes using the USDA Food and Nutrient Database for Dietary Studies 2013–2014 [36]. This coding system allows for a sandwich to be coded as a single item from a fast-food restaurant or as many items with a combination code representing the ingredients for a sandwich made at home. Combination codes assigned initially by AMPM were reviewed in Survey Net, providing the dietary coder the ability to change, remove, or add new codes to ensure that foods eaten together were correctly linked [37,38]. To ensure consistency in coding, ingredients of combinations were aggregated, and the main ingredient of each combination was assigned to the appropriate food category for this study. Foods with a single code were also assigned a food category. A detailed description of the coding has been described elsewhere [39]. The list of the 36 food categories is presented in Table 1.

Table 1. Food categories.

Breakfast bars	Fish, shellfish	Nuts and nut butters
Beverages: diet, sweetened, unsweetened	Fish, mixed dish	Pasta and pasta dishes
Cakes, pastries: regular, diet	Fruit: berries, citrus, dried, other than citrus and berries	Pizza: cheese, cheese and vegetable, cheese and fruit, meat, meat and fruit, meat and vegetables, pepperoni
Candy	Fruit dessert items	Poultry: with fat, no fat
Cereal: cooked, ready-to-eat	Gelatin dessert: regular, sugar substitute	Rice and rice dishes
Cheese: natural, regular, reduced fat, processed	Grains, refined	Rice, sushi
Dairy desserts: regular, reduced fat	Grains, 100% whole grain	Salty snacks: regular, reduced sodium

Table 1. *Cont.*

Dairy products: regular, reduced fat	Hispanic dishes	Sandwich: cheese, deli meat with cheese, egg, fish, hot dog/sausage, meat, peanut butter, poultry, vegetable
Egg dishes	Legumes	Sausage/ham/bacon
Eggroll: meat, seafood, vegetable	Milk: regular, reduced fat	Soup
Fat: animal or vegetable-based/gravy/dressing	Meats, red: regular, lean	Soup, vegetable
Fish, fin: lean, fatty	Meat, mixed dish	Vegetables: dark green, dark green with cheese, orange, starchy, starchy mixed dish, other

Eating occasions were self-reported in Time and Occasion Pass of the AMPM. The interviewer shared a listing of the eating occasions, which included breakfast, brunch, lunch, dinner, supper, snack, beverage, and extended consumption. None of the occasions were defined. For this study, extended consumption was deleted since ≤1% of the women reported this eating occasion. Breakfast and brunch were combined as were dinner and supper, resulting in a total of 5 eating occasions.

2.2.1. Healthy Eating Index-2010

The HEI-2010 is an index that measures compliance with the DGA [40]. A detailed description of the procedure used to calculate the HEI-2010 is available on the HANDLS website [41]. The National Cancer Institute's Applied Research website provided the basic steps to calculate the HEI-2010 component and total scores and the statistical codes for 24 h dietary recalls [42]. For each visit, component and total HEI-2010 scores were calculated for each recall day and were averaged to obtain the mean for both days combined. The maximum possible score was 100.

2.2.2. Core Food Categories

Core food categories were defined as a food category that achieved 5% or higher mentions of all the foods consumed at an eating occasion. The number of food items consumed were counted for each food category at each eating occasion. Within each category, the most frequently reported single food was determined. Only core categories and the top reported food within these categories on the first dietary recall are reported. To determine reproducibility of the categories reported, a test–retest reliability of food intake was performed. The list of the categories with ≥5% mentions on both recall days were compared and the percent of agreement was calculated. Content validity was established by questionnaire responses of a panel of six registered dietitians. With six experts, the acceptable cut-off score for the content validation index should be at least 0.83 [43]. Criterion validity, namely, predictive validity, was assessed to determine if the foods reported in the first interview would also be reported on the second recall [44]. Since there is no specific analysis for criterion validity, phi-coefficient correlation for core categories by interview day by eating occasion was performed.

2.3. Covariates

Demographic factors included age (continuous, years), race (self-reported African American and White), marital status (married/partnered, single/widowed/divorced), education (<high school education, ≥high school education), literacy (<8th grade, ≥8th grade), food security (secure, insecure), enough money for food (yes, no), employment (working, unemployed), and income (self-reported household income <125% or >125% of the 2004 Health and Human Services poverty guidelines [45]). For ease of readability, the group with

income <125% of the poverty guidelines will be referred to as low income and the group with income >125% of the poverty guidelines will be referred to as higher income. Literacy was measured using the Wide Range Achievement Test—3rd Edition (WRAT-3)—a widely validated and used measurement of literacy [46,47]. The total WRAT-3 reading score was converted to grade-level equivalents for descriptive purposes [48]. Food security was measured by a response to the question, "In the past 12 months, did you ever eat less than you felt you should because there was not enough money to buy food?", a question adapted from the six-item Economic Research Service survey [49]. The possible responses were Often, Occasionally, No, and Don't know. If the response was often, the individual was coded as food insecure. Occasionally and No responses were coded as secure.

2.4. Statistical Analysis

Means and standard errors for continuous variables and proportion of participants for relevant categorical variables were calculated. Analysis of Variance (ANOVA) was used to compare the continuous demographic and life-style factors and diet quality. For sample characteristics that were categorical data, χ^2 tests were used. Statistical significance was established at $p < 0.05$.

Tertiles, a method of providing an overview of the distribution of the HEI, were used to compare the similarities and differences in consumption patterns of different groups of women. Tertiles for HEI were determined separately for both race and income groups. The first and third tertile cut points for low-income White women were 40.34 and 50.59, respectively, and for African American women were 42.72 and 51.73, respectively. The first and third tertile cut points for higher-income White women were 44.81 and 57.31, respectively, for African American women were 45.14 and 55.36, respectively.

Linear regression analyses were performed to determine the predictors of diet quality with HEI-2010 scores as a continuous variable. Model 1, the demographic model, performed the regression of age, marital status, and race with HEI-2010. Model 2, the socioeconomic model, performed the regression of the demographic variables as well as education, literacy, income, employment, food security, and enough money for food with HEI-2010. These models were also examined in logistic binary regression analyses as sensitivity analyses with HEI (0 = HEI $\geq$ 51; 1 = HEI < 51). An HEI score of <51 implies a poor diet [50].

3. Results

3.1. Sample Description

Demographic characteristics are presented by income within race and race in Table 2. The age of the women ranged between 56 and 58 years. African American women in the higher-income group were approximately a year older than African American women in the low-income group. Both White and African American women in the higher-income group had significantly higher mean HEI scores compared to women of the same race in the low-income group, resulting in a significantly lower percent of these women having poor diet quality. Within the higher-income group for both races, the percent of women with less than high school education and less than an 8th grade literacy level was smaller than that of the low-income group. There were significant differences in employment by income group for both races, with more women in the higher-income groups reported working at the time of the HANDLS study interview (Table 2). More African American women in the higher-income group were married or had a partner compared to those in the low-income group. The highest percent (10.2%) of women with food insecurity was found for White women in the low-income group, and their percent was significantly greater than White women in the higher-income group (3.9%).

Table 2. Characteristics of analytic sample (n = 1219).

Characteristic	White Women		African American Women	
	<125% Poverty ***n* = 170**	**>125% Poverty** ***n* = 305**	**<125% Poverty** ***n* = 364**	**>125% Poverty** ***n* = 380**
Age, years, X ± SE	56.2 ± 0.7	56.7 ± 0.5	56.3 ± 0.5	57.7 ± 0.5 *
Healthy Eating Index-2010, X ± SE	46.4 ± 0.9	51.5 ± 0.8 ***	48.2 ± 0.6	51.1 ± 0.6 ***
Healthy Eating Index-2010, % with score < 51	68.8	51.8 ***	62.9	53.2 **
Education, % < high school degree	45.2	22.8 ***	39.1	24.3 ***
Literacy, % < 8th grade level	36.0	18.7 ***	51.7	38.8 **
Married/partnered, %	43.1	51.3	24.0	35.3 ***
Food insecure, %	10.2	3.9 **	6.6	6.4
Not enough money for food, %	19.9	17.9	28.3	22.9
Employed, %	24.8	44.7 ***	27.9	43.7 ***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Demographic characteristics were also compared by race within income groups. Few significant findings were found. The percent of women with less than 8th-grade literacy was greater among African American women compared to White women ($p < 0.001$) for both income groups. Among the low-income group, more White women had less than a high school education compared to African American women ($p < 0.05$). More African American women in the higher-income group reported that they did not have enough money for food compared to White women in the same income category (22.9% vs. 17.9%, respectively) ($p < 0.05$).

3.2. Regression Analyses

The linear regression revealed that the HEI-2010 scores of women were positively associated with age in both the demographic and socioeconomic models (Table 3). The education, literacy, and employment variables were inversely associated with HEI-2010 scores. The influence of income was marginally significant with $p = 0.055$.

Table 3. Association between diet quality determined by Healthy Eating Index-2010 scores and demographic and socioeconomic factors.

	β Coefficient ± SE [a]	***p***
Demographic Model		
Race	0.38 ± 0.93	0.685
Age	0.18 ± 0.05	<0.001
Marital status	−1.64 ± 0.96	0.089
Socioeconomic Model		
Race	1.10 ± 0.92	0.234
Age	0.22 ± 0.05	<0.001
Marital status	−0.76 ± 0.94	0.418
Income	−1.77 ± 0.92	0.055
Education	−2.31 ± 1.02	0.024
Literacy	−3.04 ± 0.99	0.002
Employed	−3.99 ± 0.97	<0.001
Food security	0.73 ± 1.86	0.694
Enough money for food	1.42 ± 1.12	0.207

[a] Beta coefficient ± standard error.

The odds ratios and 95% confidence intervals from the binary logistic regression are presented in Table S1. The number of women whose diet was considered poor was 706 (275 White women and 431 African American women). The demographic and income models found odds of having a poor diet quality with younger age (Table S1). The socioeconomic model revealed that the odds of having a poor diet quality, a HEI score < 51, were significant with age (OR: 0.97; 95% CI: 0.95, 0.99), income (OR: 1.37; 95% CI: 1.01, 1.87),

unemployment (OR: 1.68; 95% CI: 1.21, 2.33), and less than 8th-grade literacy (OR: 1.44; 95% CI: 1.03, 2.01).

3.3. Description of the Core Food Categories

Overall, there were a total of 146 food categories mentioned by participants at breakfast (46 categories), lunch (49 categories), and dinner (51 categories) (Tables 4 and 5). For breakfast, there were 13 unique categories; lunch, 15 categories; dinner, 14 categories. For the majority of categories, the most frequently mentioned foods within a category were the same. For instance, French fries were the most mentioned starchy vegetable, and oatmeal was the most reported cooked cereal. There were nine unique food categories that were reported as snacks (Tables 6 and 7). There was 86% agreement between the breakfast, lunch, and dinner core food categories for interview 1 and 2, 89% agreement for snacks, 96% agreement for beverages reported at meals, and 95% agreement for reported beverages. Categories not appearing on interview 2 were noted within Tables 4–7. The content validity index equaled 1, indicating that all six experts rated each item of the questionnaire as relevant. The phi coefficients for all meals ranged from 0.79 to 0.91 ($p < 0.001$) across race/income/HEI tertile groups indicating a very strong relationship between recall days. Significant very strong relationships (0.33–0.41 phi coefficient) for snacks were found for 4 of the 8 groups (Table S2).

Observed differences in reported food intake between the first and third tertiles of HEI-2010 within income category were that the fruit and vegetable categories appeared more often in the listing at breakfast, lunch, and dinner in the third HEI-2010 tertile. Unsweetened beverages, compared to sweetened beverages and diet drinks also appeared more frequently at mealtimes (breakfast, lunch, and dinner) and as reported beverages and snacks for those in the third HEI-2010 tertile compared to the first HEI-2010 tertile. In addition, women in the higher-income group reported more fruit as snacks compared to women with low-income. Greek yogurt was only mentioned by White women in the higher-income group regardless of HEI-2010 tertile.

3.3.1. Breakfast

The number of core food categories in the first tertile of the HEI-2010 for White women exceeded those found for African American women, 6–7 vs. 4, respectively (Table 4). Egg dishes were ranked first among the top core food categories, regardless of income or race. Refined breads were found across all groups. White bread was the most frequently mentioned item by African American women, while bagels was the most frequently reported item for White women. The sausage/bacon/ham category appeared in the list for White women with higher income and for both low- and higher-income groups of African American women, with pork bacon as the top item. Cooked cereal was among the core categories of low-income White women. In contrast, ready-to-eat cereal with a sugar content > 21 gm/100 g of cereal was found for low-income White women and higher-income African American women. The fruit category was only found for White women with higher income. Bananas were the top item (Table 4).

Table 4. Core food categories and top food item ranked by frequency (%) of reported intake at breakfast, lunch, and dinner for White and African American women interviewed in the HANDLS study, 2013–2017, by poverty status categorized by first tertile of the Healthy Eating Index (HEI)-2010 score.

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≤ 40.34		**>125% Poverty HEI ≤ 44.81**		**<125% Poverty HEI ≤ 42.72**		**>125% Poverty HEI ≤ 45.14**	
	Foods	**%**	**Foods**	**%**	**Foods**	**%**	**Foods**	**%**
Breakfast	Egg dishes [omelet/scrambled]	28.1	Egg dishes [omelet/scrambled]	17.5	Egg dishes [omelet/scrambled]	21.5	Egg dishes [omelet/scrambled]	19.7
	Cereal, ready-to-eat [>21.1 g sugar/100 g cereal]	12.5	Breads, refined [bagel]	15.9	Sausage/bacon/ham [pork bacon]	21.5	Breads, refined [white bread]	16.2
	Breads, refined [bagel]	9.4	Cakes, pastries [doughnut]	12.7	Breads, refined [white bread]	9.2	Sausage/bacon/ham [pork bacon]	14.1
	Milk, regular [a] [whole, cow's]	9.4	Fruit [banana]	9.5	Egg sandwich [a]	6.2	Cereal, ready-to-eat [a] [>21.2 g sugar/100 g cereal]	5.6
	Cereal, cooked [oatmeal]	6.3	Dairy products, low fat [a] [Greek yogurt]	7.9				
	Pasta [a] [macaroni and cheese]	6.3	Sausage/bacon/ham [pork bacon]	6.3				
	Vegetables, other [a] [lettuce]	6.3						
Lunch	Sandwich, poultry [patty/fillet/tenders]	24.4	Sandwich, poultry [patty/fillet]	11.7	Sandwich, poultry [patty/fillet]	9.3	Sandwich, poultry [chicken or turkey deli meat]	13.8
	Soups [a] [noodle-based];	8.9	Salty snacks [potato chips]	9.6	Vegetables, starchy [white potatoes French fries]	9.3	Salty snacks [potato chips]	10.1
	Chicken with or without fat [a] [pieces, baked or fried]	8.9	Vegetables, starchy [white potato French fries]	7.4	Salty snacks [potato chips]	9.3	Vegetables, starchy [white potatoes French fries]	8.0

Table 4. *Cont.*

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≤ 40.34		**>125% Poverty HEI ≤ 44.81**		**<125% Poverty HEI ≤ 42.72**		**>125% Poverty HEI ≤ 45.14**	
	Foods	**%**	**Foods**	**%**	**Foods**	**%**	**Foods**	**%**
	Nuts/nut butters [a] [peanut butter]	6.7	Cakes, pastries [a] [chocolate chip/ shortbread cookies]	6.4	Breads, refined [white bread]	8.4	Chicken with or without fat [a] [pieces baked or fried]	7.2
					Chicken with fat only [pieces baked or fried]	7.5	Soups [mostly noodle]	5.8
					Soups [mostly noodles]	6.5	Vegetables, other [a] [Lettuce]	5.8
							Cakes, pastries [cake with icing]	5.1
Dinner	Vegetables, starchy [white potatoes, French fries]	18.9	Vegetables, starchy [corn]	11.2	Chicken with or without fat [pieces baked or fried]	15.2	Vegetables, starchy [white potatoes French fries]	12.7
	Sandwich, meat [cheeseburgers]	11.1	Vegetables, other [asparagus]	10.0	Vegetables, starchy [white potatoes French fries]	12.9	Chicken [pieces baked or fried]	12.7
	Breads, refined [white bread]	10.0	Breads, refined [white bread]	8.2	Breads, refined [a] [wheat bread]	7.4	Breads, refined [white bread]	8.2
	Pasta dishes [a] [spaghetti with tomato sauce and meat]	10.0	Chicken with or without fat [pieces baked or fried]	7.6	Pasta dishes [macaroni and cheese]	7.4	Vegetables, other [string beans]	6.1

Table 4. *Cont.*

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≤ 40.34		**>125% Poverty HEI ≤ 44.81**		**<125% Poverty HEI ≤ 42.72**		**>125% Poverty HEI ≤ 45.14**	
	Foods	**%**	**Foods**	**%**	**Foods**	**%**	**Foods**	**%**
	Meat mixed dishes [a] [beef stew]	8.9	Pasta dishes [spaghetti with tomato sauce and meat]	7.1	Vegetables, dark green [a] [spinach]	6.0	Pasta dishes [spaghetti with tomato sauce and meat]	5.3
	Chicken with or without fat [breast baked or fried]	6.6	Sandwich, meat [a] [cheeseburgers]	6.5	Meat mixed dishes [a] [meat loaf]	5.1		
	Vegetables, other [string beans]	5.6	Meats, red lean, or other	6.5	Sandwich, meat [a] [cheeseburgers]	5.1		

[a] Category was not mentioned ≥5% in interview day 2.

Table 5. Core food categories and top food item ranked by frequency (%) of reported intake at breakfast, lunch, and dinner for White and African American women interviewed in the HANDLS study, 2013–2017, by poverty status categorized by third tertile of the Healthy Eating Index (HEI)-2010 score.

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≥ 50.59		**>125% Poverty HEI > 57.31**		**<125% Poverty HEI ≥ 51.73**		**>125% Poverty HEI ≥ 55.36**	
	Foods	**%**	**Foods**	**%**	**Foods**	**%**	**Foods**	**%**
Breakfast	Fruit [banana]	19.0	Fruit [berries]	16.5	Fruit [banana]	15.2	Fruit [banana]	21.5
	Egg dishes [omelet/scrambled]	12.7	Cereal, ready-to-eat [raisin bran]	12.2	Cereal, cooked [oatmeal]	13.6	Cereal, cooked [oatmeal]	12.7
	Cereal, cooked [oatmeal]	11.1	Egg dishes [omelet/scrambled]	10.4	Egg dishes [omelet/scrambled]	13.1	Egg dishes [omelet/scrambled]	9.9
	Fruit, citrus [orange juice]	9.5	Dairy products, low fat [a] [Greek yogurt]	8.7	Breads, refined [wheat bread]	10.5	Breads, refined [wheat bread]	8.3

Table 5. *Cont.*

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≥ 50.59		**>125% Poverty HEI > 57.31**		**<125% Poverty HEI ≥ 51.73**		**>125% Poverty HEI ≥ 55.36**	
	Foods	**%**	**Foods**	**%**	**Foods**	**%**	**Foods**	**%**
	Breads, refined [wheat bread]	7.9	Breads, refined [white bread]	7.0	Sausage/bacon/ham [pork bacon]	10.5	Cereal, ready-to-eat [>21.2 g sugar/100 g cereal]	7.7
	Cereal, ready-to-eat [<21.1 g sugar/100 g cereal]	7.9	Cereal, cooked [oatmeal]	6.1	Fruit, citrus [orange juice]	6.3	Sausage/bacon/ham [pork bacon]	5.0
	Sausage/bacon/ham [a] [sausage]	6.3						
Lunch	Vegetables, other [mixed salad greens]	14.8	Fruit [apples]	12.7	Sandwich, poultry [fillet baked or fried]	13.2	Vegetables, other [lettuce]	10.6
	Salty snacks [potato chips]	11.1	Vegetables, other [lettuce salads]	12.7	Salty snacks [potato chips]	10.5	Salty snacks [potato chips]	9.4
	Sandwich, poultry [breast broiled or baked]	7.4	Salty snacks [potato chips]	7.3	Fruit [apple or banana]	9.9	Chicken with or without fat [pieces, baked or fried]	7.8
	Sandwich, fish [tuna salad]	6.2	Cakes, pastries [a] [brownies, chocolate chip cookies]	5.3	Vegetables, other [string beans]	8.6	Sandwich, poultry [patty/fillet]	6.7
					Vegetables, starchy [white potatoes, French fries]	5.3	Fruit [apples]	6.1
							Vegetables, starchy [a] [white potatoes, French fries]	6.1
							Fish, fin [a] [catfish]	5.5

Table 5. *Cont.*

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≥ 50.59		**>125% Poverty HEI > 57.31**		**<125% Poverty HEI ≥ 51.73**		**>125% Poverty HEI ≥ 55.36**	
	Foods	**%**	**Foods**	**%**	**Foods**	**%**	**Foods**	**%**
Dinner	Vegetables, starchy [mashed potatoes]	18.3	Vegetable, other [lettuce salads]	15.6	Vegetables, starchy [white potatoes, French fries]	14.7	Vegetables, starchy [white potatoes, French fries]	13.7
	Vegetables, other [string beans]	10.8	Vegetable, starchy [white potatoes, baked]	8.4	Chicken with or without fat [pieces, baked or fried]	13.4	Vegetables, dark green [broccoli]	12.9
	Chicken with or without fat [pieces baked or fried]	8.4	Fruit [apples]	7.6	Vegetables, other [string beans]	11.2	Chicken with or without fat [pieces, baked or fried]	11.0
	Vegetables, dark green [a] [broccoli]	7.5	Vegetables, dark green [a] [spinach]	5.5	Vegetables, dark green [broccoli]	7.7	Vegetables, other [lettuce]	10.3
	Meat mixed dishes [a] [meat loaf]	6.7	Meats, red lean or other [a] [steak]	5.5	Pasta dishes [macaroni and cheese]	5.6	Fish, fin [a]	6.1
	Meats, red lean or other [roast beef]	5.8	Breads, refined [wheat breads]	5.1				
	Breads, refined [a] [white bread];	5.0	Pasta dishes [a] [spaghetti with tomato sauce and meat]	5.1				
	Pasta dishes [spaghetti with tomato sauce and meat]	5.0	Chicken with or without fat [pieces, baked or fried]	5.1				

[a] Category was not mentioned ≥5% in interview day 2.

Table 6. Core beverage and snack categories and top food item ranked by frequency (%) of reported intake at various eating occasions for White and African American women interviewed in the HANDLS study, 2013–2017, by poverty status categorized by first tertile of the Healthy Eating Index (HEI)-2010 score.

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≤ 40.34		**>125% Poverty HEI ≤ 44.81**		**<125% Poverty HEI ≤ 42.72**		**>125% Poverty HEI ≤ 45.14**	
	Beverages	**%**	**Beverages**	**%**	**Beverages**	**%**	**Beverages**	**%**
Breakfast	Sweetened [soft drink]	74.1	Unsweetened [water]	34.0	Sweetened [fruit juice drink]	59.4	Sweetened [soft drink]	47.3
	Unsweetened [water]	14.8	Sweetened [coffee]	46.0	Unsweetened [water]	35.9	Unsweetened [water]	44.0
	Diet [soft drinks]	11.1	Diet [soft drinks]	20.0			Diet [carbonated water]	6.6
Lunch	Sweetened [soft drink]	64.5	Sweetened [soft drink]	40.9	Sweetened [soft drink]	55.4	Sweetened [soft drink]	53.8
	Unsweetened [water]	25.8	Unsweetened [water]	40.9	Unsweetened [water]	42.9	Unsweetened [water]	37.2
	Diet [soft drink]	9.7	Diet [soft drink]	18.2			Diet [soft drink]	5.1
Dinner	Sweetened [soft drink]	71.1	Unsweetened [water]	38.1	Sweetened [soft drink]	62.9	Sweetened [soft drink]	50.0
	Unsweetened [water]	13.2	Sweetened [soft drink]	34.9	Unsweetened [water]	36.1	Unsweetened [water]	38.2
	Diet [soft drink]	13.2	Diet [soft drink]	19.0			Alcoholic [a] [wine]	6.4
			Alcoholic [wine]	7.9			Diet [a] [soft drink]	5.5

Table 6. *Cont.*

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≤ 40.34		**>125% Poverty HEI ≤ 44.81**		**<125% Poverty HEI ≤ 42.72**		**>125% Poverty HEI ≤ 45.14**	
	Beverages	**%**	**Beverages**	**%**	**Beverages**	**%**	**Beverages**	**%**
Reported Beverage	Sweetened [soft drink]	45.5	Unsweetened [soft drink]	47.3	Unsweetened [water]	59.9	Unsweetened [water]	60.7
	Unsweetened [water]	40.6	Sweetened [water]	29.8	Sweetened [fruit-flavored drink]	27.9	Sweetened [soft drink]	25.5
	Diet [soft drink]	7.7	Diet [soft drink]	13.7			Alcoholic [beer]	7.1
Reported Snack	Cakes/pastries [cookies]	21.4	Cakes/pastries [cookies]	20.0	Sweetened beverage [soft drink]	18.5	Unsweetened beverage [water]	19.7
	Sweetened beverage [soft drinks]	20.4	Unsweetened beverage [water]	14.4	Unsweetened beverage [water]	14.7	Salty snack [potato chips]	18.1
	Salty snacks [potato chips]	10.2	Salty snacks [potato chips]	10.0	Salty snack [potato chips]	14.7	Cakes/pastries [cookies]	13.5
	Unsweetened beverage [water]	9.2	Candy [chocolate]	6.7	Cakes/pastries [cookies]	14.2	Sweetened beverage [soft drink]	12.4
	Diet beverage [a] [soft drinks]	7.1	Dairy dessert [ice cream]	5.1	Candy [hard candy]	10.3	Candy [fondant]	8.3
			Sweetened beverage [a] [tea]	5.0				

[a] Category was not mentioned ≥5% in interview day 2.

Table 7. Core beverage and snack categories and top food item ranked by frequency (%) of reported intake at various eating occasions for White and African American women interviewed in the HANDLS study, 2013–2017, by poverty status categorized by third tertile of the Healthy Eating Index (HEI)-2010 score.

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≥ 50.59		**>125% Poverty HEI > 57.31**		**<125% Poverty HEI ≥ 51.73**		**>125% Poverty HEI ≥ 55.36**	
	Beverages	**%**	**Beverages**	**%**	**Beverages**	**%**	**Beverages**	**%**
Breakfast	Unsweetened [water]	56.3	Unsweetened [water]	63.4	Unsweetened [water]	55.6	Unsweetened [water]	62.9
	Sweetened [tea]	28.1	Sweetened [tea]	28.0	Sweetened [fruit juice drink; tea]	34.6	Sweetened [tea]	24.7
	Diet [soft drink]	15.6	Diet [soft drink]	8.5	Diet [soft drink]	8.6	Diet [fruit juice drink]	12.4
Lunch	Unsweetened [water]	54.3	Unsweetened [water]	61.8	Unsweetened [water]	45.3	Unsweetened [water]	60.5
	Sweetened [tea]	22.9	Sweetened [tea]	20.6	Sweetened [soft drink]	40.6	Sweetened [soft drink]	25.9
	Diet [soft drink]	22.9	Diet [soft drink]	16.2	Diet [soft drink]	14.1	Diet [soft drink]	12.3
Dinner	Unsweetened [water]	44.4	Unsweetened [water]	58.8	Unsweetened [water]	53.9	Unsweetened [water]	60.2
	Sweetened [soft drink; tea]	28.9	Sweetened [tea]	16.5	Sweetened [soft drink]	34.3	Sweetened [soft drink]	22.2
	Diet [soft drink]	22.2	Alcoholic [wine]	14.1	Diet [soft drink]	8.8	Diet [soft drink]	11.1
			Diet [soft drink]	10.6			Alcoholic [a] [wine]	6.5

Table 7. *Cont.*

Eating Occasion	White Females				African American Females			
	<125% Poverty HEI ≥ 50.59		**>125% Poverty HEI > 57.31**		**<125% Poverty HEI ≥ 51.73**		**>125% Poverty HEI ≥ 55.36**	
	Beverages	**%**	**Beverages**	**%**	**Beverages**	**%**	**Beverages**	**%**
Reported Beverage	Unsweetened [water]	58.0	Unsweetened [water]	71.8	Unsweetened [water]	63.7	Unsweetened [water]	67.8
	Sweetened [tea]	22.7	Sweetened [tea]	10.9	Sweetened [soft drink]	18.5	Sweetened [soft drink]	13.6
	Diet [soft drink]	10.9	Diet [soft drink]	9.9	Diet [soft drink]	5.1	Diet [a] [tea]	6.0
Reported Snack	Unsweetened beverage [water]	17.0	Unsweetened beverage [water]	21.0	Unsweetened beverage [water]	21.0	Unsweetened beverage [water]	19.7
	Salty snack [potato chips]	12.5	Fruit [banana]	11.0	Salty snack [potato chip]	15.1	Fruit [grapes]	14.2
	Sweetened beverage [tea]	8.9	Salty snack [corn chips]	10.3	Fruit [banana]	12.1	Salty snack [corn chips]	12.3
	Fruit [banana]	8.0	Nuts and nut butters [a] [peanuts]	7.9	Candy [chocolate candy bars]	10.3	Candy [chocolate candy bars]	8.1
	Cakes/pastries [cookies]	7.1	Candy [milk chocolate]	7.6	Cakes/pastries [cookies]	9.6		
	Dairy desserts [a] [ice cream]	6.3	Cakes/pastries [cookies]	6.5	Sweetened beverage [fruit-flavored drink; soft drinks]	5.1		
	Candy [fondant]	5.4	Sweetened beverage [a] [tea]	5.8				

[a] Category was not mentioned ≥5% in interview day 2.

In the third tertile of the HEI-2010, the total number of core food categories across the four groups of women ranged from 6 to 7 (Table 5). The fruit category was ranked the top category with bananas mentioned as the most-frequent consumed item for 3 of the 4 groups. Berries was the most frequently reported item by the fourth group, namely, White women in the higher-income group. The citrus fruit category appeared in the listing of both low-income White and African American groups. Orange juice was the top food item for citrus fruits. Egg dishes, cooked cereal, and refined breads were in the listing of core food categories for all the groups. Omelets/scrambled eggs and oatmeal were the most frequently reported items from these categories. Wheat bread was reported as the top item for 3 of the 4 groups, while white bread appeared to be the most frequently consumed refined grain of higher-income White women. Greek yogurt, belonging to the low-fat dairy product category, was only found for higher-income White women. Similar to the first tertile HEI-2010 results, ready-to-eat cereal and the sausage/bacon/ham categories were among the core categories. The most frequently reported cereals varied in sugar content, and sausage or pork bacon were the most frequently reported single items (Table 5).

3.3.2. Lunch

The number of core food categories in the first tertile of the HEI-2010 was 4 for White women and 6–7 for African American women (Table 4). The chicken sandwich was the top core food category for all groups. Salty snack (potato chips) and starchy vegetable (French fried potatoes) categories predominated the core listings of 3 of the 4 groups. The soup category was found for 3 of the 4 low HEI tertile groups, and the other vegetable category was found for higher-income African American women. The top other vegetable item was lettuce.

The third tertile of the HEI-2010 consisted of 4 core food categories for White women and between 5 and 7 core categories for African American women (Table 5). The chicken sandwich was the top-ranked core category for only low-income African American women, although it did appear in the listings of low-income White and higher-income African American groups. The fruit category was ranked the top core category for higher-income White women and the other vegetable category were the top-ranked category for the remaining groups. The most frequently consumed items in these categories were apples and mixed salad greens or lettuce, respectively. The fruit category was also among the core categories for African American women, regardless of income. Similar to the results for the first HEI-2010 tertile, the salty snack category with potato chips as the most frequently reported food was found for all groups. Unlike the listings for the first HEI-2010 tertile, starchy vegetables (French fried potatoes) were only found to be a core category for African American women. Other unique core food categories included fish sandwich, fin fish, and cake/pastries (Table 5).

3.3.3. Dinner

The number of food categories at dinner was 7 for White women and ranged from 5–7 for African American women in the first tertile of HEI-2010 (Table 4). The starchy vegetable category ranked first among the core categories for White women regardless of income and higher income African American women. The most frequently reported starchy vegetables were either French fried potatoes or corn. The starchy vegetable category (French fried potatoes) ranked second for the low-income African American women. Chicken was the top-ranked category for low-income African American women and also appeared as a core category in the other groups varying in its ranking from the second to sixth position. The refined bread and pasta categories were found to be core categories for all groups. The meat sandwich category appeared on 3 of the 4 group lists with cheeseburgers as the top

food item. A vegetable category, either dark green and/or other vegetables, appeared in listings for African American women, regardless of income. The most frequently reported vegetables were spinach and green beans (Table 4).

The third tertile of HEI-2010 included five food categories for African American women and eight for White women (Table 5). Either the starchy vegetable (3 of 4 groups) or other vegetable (1 of 4 groups) category ranked as the top core food category. The most frequently consumed foods were either French fried or mashed potatoes and lettuce salads. The red/lean meat category was only found for White women, regardless of income. The top food item for the low-income White women was roast beef, and, for the higher-income White women, it was steak. Chicken category was found in the listings for all groups. Refined bread category was only found for White women. The most frequently reported item differed, white bread for low-income women and wheat bread for higher-income women. Pasta dishes were a core category for all but the higher-income African American women. Fin fish was only found for higher-income African American women and the fruit category was only found for higher-income White women. Dark green and other vegetable categories were included in the core food categories of all groups. The top dark green vegetable varied—either broccoli or spinach. The most frequently reported items in the other vegetable category included string beans and lettuce (Table 5).

3.3.4. Beverages at Breakfast, Lunch, and Dinner and as-Reported Beverages

There were three beverage categories—unsweetened, sweetened (with sugar), and diet (Tables 6 and 7). The unsweetened beverage category ranked first among these three beverage categories at breakfast, lunch, dinner, and reported beverage eating occasions for White and African American women in the third HEI tertile regardless of income category (Table 7). Sweetened beverages were the predominant category for women in the low HEI tertile (Table 6). Water was reported most frequently as an unsweetened beverage item, while soft drinks was the top item for the majority of the sweetened category (Tables 6 and 7). Fruit juice drinks also were a top food in this category (Tables 6 and 7).

3.3.5. Snacks

Snacks were associated with nine food categories. Cookies, the top food item in the cake/pastry category, were found in all groups except higher-income African American women in third HEI tertile (Tables 6 and 7). Top items in the salty snack category were either potato or corn chips. The top items for candy category varied. Ice cream, the top item in the dairy dessert category, only appeared in the list for higher-income White women in the first HEI tertile group (Table 6).

4. Discussion

The key findings of this study revealed that socioeconomic variables, not race, were associated significantly with diet quality in this sample. This finding is supported by other studies that reported persons varying in socioeconomic status differ in their food habits, and those in lower socioeconomic status and economically disadvantaged are less likely to report healthy food habits [51,52]. The income disparities in diet quality may be explained by the cost of nutrient dense foods as well as their availability. Foods of lower nutritional value generally cost less per calorie [53,54]. Individuals with low socioeconomic status, compared to those with higher status, may have diets with less variety, defined as a diverse assortment of foods and beverages across and within food groups, and a diet composed of less nutrient dense foods and beverages, resulting in a low-quality diet [54].

Many of the most commonly consumed foods by the HANDLS study women would be considered highly processed or ultra-processed. Ultra-processed foods, as defined using the Nova food classification system, are made mostly from substances extracted from foods, such as fats, starches, added sugars, and hydrogenated fats along with additives to enhance taste, texture, appearance, and durability, with minimal to no inclusion of whole foods [55]. These foods include a wide range of ready-to-eat products, including packaged snacks, carbonated soft drinks, instant noodles, and ready-made meals. There is strong evidence of the direct associations between greater exposure to ultra-processed foods and higher risks of all-cause mortality, cardiovascular disease related mortality, common mental disorder outcomes, overweight and obesity, and type 2 diabetes [55–57]. Researchers who examined representative dietary records of more than 100,000 French adults over a 5-year period found that, even after they adjusted for the nutritional quality of the diet, those who consumed more ultra-processed foods had statistically significant higher risks of cardiovascular disease, coronary heart disease, and cerebrovascular disease [58].

Disparities in fruit and vegetable intake can represent one of the pathways by which inequalities in health are produced and maintained in a population. The consumption of more fruit and vegetables, but not fruit juices and potatoes, have been associated with a lower risk of mortality [59]. Fruits and vegetables were among the top commonly consumed foods only for women with higher incomes. Others have observed that differences in fruit and vegetable intake in high-income countries are associated with socioeconomic status, and gender, as well as demographic characteristics such as age, marital status, age, and the region of residence [60]. There is strong evidence of the association of fruits and vegetables and unprocessed or minimally processed foods [55] with a lower risk of developing diet-related chronic conditions [61].

Beverages contribute to meeting an individual's total water intake requirements and to overall nutrient and energy intake for the US population [62]. The women in the HANDLS study reported drinking beverages with meals as well as reporting them as snacks and reported beverages at times different from other eating occasions. Of the three beverage categories, the unsweetened beverage category consistently ranked first for all women whose diet was in the third HEI tertile. Water was the top beverage in this category. In contrast, sweetened beverages were ranked higher in frequency than unsweetened beverages for women whose diet was categorized in the first HEI tertile. Soft drinks, which are considered nutrient-poor ultra-processed foods, were reported more often than sweetened coffee, tea, or fruit juice drinks. Sugar-sweetened beverages are a major contributor of calories and added sugars to diets of US adults [19,63]. Between 2011 and 2014, 27.3% of US women consumed one sugar-sweetened beverage, 11.5% consumed two sugar-sweetened beverages, and 6.4% consumed three or more on a given day [64]. Data from the NHANES 2015–2018 revealed that the contribution of sweetened beverages to total beverage consumption was higher among non-Hispanic black (14.5%) adults compared with non-Hispanic white (9.0%). In contrast, coffee and diet beverages as a percentage of total beverage consumption among US women were higher for White adults compared to Black adults [65]. Consuming too many added sugars can contribute to health problems such as weight gain and obesity, type 2 diabetes, and heart disease [66].

Snacks are considered a staple in the American diet [67]. Snacks can contribute to or detract from the quality of the diet. The majority of snacks were ultra-processed foods. The most nutrient-poor snacks observed were ice cream, cookies, soft drinks, and chips, which are typical in the American diet [63]. Fruits were the most nutrient-dense snack reported by the HANDLS women in the higher-income group. In the US, other nutrient-dense snacks include dairy products such as yogurt and milk [67].

These study findings suggest that the burden of diet disparities was not shared equally. To reduce the disparity gaps that currently exist in low-resource and underserved communities, more solution-oriented strategies promoting nutrient-dense foods need to be implemented. A study of adults to determine their perceptions on nutrient-dense foods found approximately 4 out of 10 people stated that nutrient-dense foods would be part of a healthy diet after the definition was read to them [68], yet 4 out of 10 also stated that other factors were also important. This study also found that White individuals and college-educated person were always likely to think that nutrient-dense foods are part of a healthy diet, while Black persons and individuals without a college degree felt nutrient-dense foods should not be [68]. By fully understanding the meaning of nutrient-dense foods and becoming more informed about economical healthy food and beverage choices, individuals may make wiser food choices and improve their health.

There are strengths and limitations to this study. The findings contribute new information on foods most frequently consumed at several eating occasions by a diverse group of women. The HANDLS study design facilitated the investigation of associations by race and income. Another strength is that multiple days of dietary recalls were collected, which allowed the evaluation of stability in eating behaviors. Intakes were coded in a consistent approach resulting in a more accurate picture of the foods being consumed. A limitation is the bias associated with self-reported dietary recalls. Eating occasions were also self-reported, which resulted in beverages appearing in all occasions, which may impact the snack and beverage findings. Also, the results of the study may not be generalizable to other samples.

5. Conclusions

Food is essential to health, and healthy eating should be a lifelong aim. This study is unique in that it provides a picture of the core food categories and the most reported foods within a category represented at several eating occasions for a sample of racially and socioeconomically diverse urban women. This knowledge is a valuable resource when providing guidance and targeting interventions on improving diet quality. Many of the foods and beverages the HANDLS study women ate were processed containing sodium, saturated fats, and added sugars. They were also lacking in the nutrients of concern—calcium, potassium, dietary fiber, and vitamin D [19]. Every nutrient-dense food and beverage choice is an opportunity to move toward a healthier dietary pattern. Small changes in single-food choices add up and can make a big difference in risk for developing chronic disease [69,70]. Public health professionals guiding not only this sample but all groups could benefit from using DGA resources that address modifications to the diet while considering personal preferences, cultural traditions, and budgetary considerations [19,63]. Future research could examine the implementation of the DGA basic message of "Make Every Bite Count" to motivate and facilitate behavioral change at the individual level [19].

Supplementary Materials: The following supporting information can be downloaded at https://www.mdpi.com/article/10.3390/dietetics4010010/s1. Table S1: Odds of having a poor diet defined as Healthy Eating Index-2010 score less than 51. Table S2: Phi coefficient correlations to establish predictive validity interview day 1 and interview day 2.

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Table S1. Odds of having a poor diet defined as Healthy Eating Index-2010 score less than 51.

Characteristic		Demographic model			Socioeconomic model	
	p	OR	95%CI	*p*	OR	95%CI
Race	0.531			0.224		
African American		0.91	0.68,1.22		0.82	0.60,1.13
White		Ref				
Marital status	0.640			0.830		
Single, widowed, divorced		1.08	0.79,1.46		0.97	0.70,1.33
Married, partner		Ref				
Age, years	<0.001	0.97	0.96,0.99	<0.001	0.97	0.95,0.99
Income				0.046		
<125% poverty					1.37	1.01,1.87
>125% poverty					Ref	
Education				0.165		
< High school degree					1.28	0.90,1.82
≥ High school degree					Ref	
Literacy				0.036		
< 8th grade					1.44	1.03,2.01
≥ 8th grade					Ref	
Employed				0.002		
Not working					1.68	1.21,2.33
Working					Ref	
Food Security				0.563		
Insecure					1.21	0.63,1.36
Secure					Ref	
Enough Money for Food				0.709		
No					0.93	0.63,1.36
Yes					Ref	

Table S2. Phi coefficient correlations to establish predictive validity of interview day 1 and interview day 2.

	Meals		Snacks		Beverages	
	Phi-coefficient	p	Phi-coefficient	p	Phi-coefficient	p
Low HEI						
White women						
<125% poverty	0.91	<0.001	0.51	0.05	0.07	0.82
>125% poverty	0.79	<0.001	0.36	0.34	0.07	0.71
African American women						
<125% poverty	0.84	<0.001	0.41	<0.001	0.17	0.04
>125% poverty	0.83	<0.001	0.35	0.14	0.09	0.51
High HEI						
White women						
<125% poverty	0.91	<0.001	0.37	0.65	0.12	0.47
>125% poverty	0.75	<0.001	0.34	0.03	0.11	0.29
African American women						
<125% poverty	0.82	<0.001	0.33	0.12	0.15	0.14
>125% poverty	0.80	<0.001	0.33	0.02	0.16	0.07

Interpretation of phi coefficient: >0.25, very strong relationship; >0.15, strong; > 0.10 moderate, >0.05, weak and 0, no correlation