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Diet Quality of Overweight and Obese Adults with Intellectual and Developmental Disabilities as Measured by the Healthy Eating Index-2005

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Abstract

Background—Little research has been conducted to examine diet quality of overweight and obese adults with intellectual and developmental disabilities (IDD) in the United States. The purpose of this study was to determine diet quality, as measured by the Healthy Eating Index-2005 (HEI-2005), of overweight and obese adults with IDD.

Methods—Data were obtained from community-dwelling overweight individuals. 3-day food records were administered and completed with assistance by staff or family members and then reviewed by a dietitian. All records were analyzed and HEI-2005 was calculated using NDSR output.

Results—178 records were analyzed from 70 subjects (28 male, 42 female; mean age 33.9 ±11.5 years). The mean energy intake was 1928 ± 891 kcals and the mean total HEI-2005 score was 46.7± 11.5. Participants scored the lowest in total fruits, whole grains, dark green and orange vegetables, non-hydrogenated vegetable oils, and sodium. Both male and females had diets deficient in fiber, vitamin A, vitamin D, vitamin E, folate, and potassium. Additionally men were deficient in vitamin K, and women were deficient in calcium.

Conclusions—Overweight and Obese adults with IDD had a lower HEI-2005 score compared to the general population and are at an increased risk of poor diet quality and nutritional deficiencies that could contribute to the development of diabetes, cardiovascular disease, cancer and other health complications

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Keywords

Intellectual and Developmental Disabilities; Developmental Disabilities; Diet Quality; Healthy Eating Index; Nutrition Status

Introduction

The prevalence of intellectual disability (ID) within the United States (US) is 1-3% of the population (Penn State Hershey Children's Hospital 2011). ID is defined by the American Association of Intellectual and Developmental Disabilities (AAID) as a disability originating before the age of 18 characterized by “significant limitations in both intellectual functioning and in adaptive behavior”(American Association on Intellectual and Developmental Disabilities 2012). In the past, people with ID often lived in institutions or nursing homes; however, a large majority of adults with ID are now living within the community in independent housing with appropriate staff and support (Alba et al. 2008). As such, many adults with ID have more control over their food choices and often have some responsibility for acquiring or preparing meals (Humphries et al. 2009).

Adults with ID are at increased risk for heart disease, obesity, osteoporosis, seizures, mental illness, and poor conditioning and fitness (Academy of Nutrition and Dietetics 2004). The rates of overweight and obesity are 2-3 times greater in individuals with ID, and up to 55% of adults with ID are considered obese (Rimmer et al. 1995; Harris et al. 2003; Yamaki 2005; Melville et al. 2007). Nutritional intake is thought to contribute to the increased rates of obesity and obesity-related disease, and The Academy of Nutrition and Dietetics, The World Health Organization, and Healthy People 2010 have stated a need for improvement of the diet quality of adults with ID (Academy of Nutrition and Dietetics 2004; World Health Organization 2000; U.S. Department of Health and Human Services). However, most research to date has concentrated on identifying obesity rates and successful weight management strategies (Marshall et al. 2003; Saunders et al. 2011; Rotatori 1981; Fisher 1986; Hamilton et al. 2007) and none of these studies have assessed dietary intake at baseline or post-intervention. Only four studies were identified that examined the dietary intake of adults with ID.

A study by Bertoli et al (2006) analyzed 7-day food records from 37 community dwelling adults living in Italy with ID, mean age 33.5±9.2 years. The researchers found the typical diet (mean energy intake 1472 ± 458 kcal) to be composed of 16% protein, 31% fat, and 50% carbohydrates; with a less than desirable dietary fat ratio of 3.1(Saturated fatty acids): 4.1(Monounsaturated fatty acids): 1.0(Polyunsaturated fatty acids) and excessive consumption of refined carbohydrates (mean 17.5±4.9% of total energy intake). Additionally, the diet was deficient in fiber, iron, calcium, potassium, and zinc.

In Sweden, Adolfsson and colleagues (2008) analyzed the dietary intake of 32 adults with ID for 3 days. Researchers reported the diets were low in fiber, vitamin A, thiamin, riboflavin, folic acid, iron, and selenium, and the majority of their daily calories came from milk products, bread, meat, and sweets. Furthermore, they found that most food was consumed as snacks.

A large US study by Draheim et al.(2007) assessed the dietary fat intake and fruit and vegetable consumption of 325 community dwelling adults with ID via questionnaires. Researchers found that 84% of men and 79.5% of women living in a group home consumed a high-fat diet (>30% of calories from dietary fat) as well as 71.4% of men and 70% of women living with family, and 75% of men and 71.4% of women who were living semi-independently. Furthermore, they found less than 7% of subjects consumed the

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recommended five servings of fruits and vegetables per day (4.4% of men and 6.4% of women living in group homes, 0% of men and women living with family members, and 1.7% of men and 0% of women living semi- independently). While this study was large in size, no other aspects of diet quality other than fruit, vegetable and fat intake were collected, and all data were self-reported via questionnaire.

Braunschweig et al (Braunschweig et al. 2004) assessed the dietary status of 89 community-dwelling adults in the United States using the 1998 version of the Block Food Frequency questionnaire that was modified for a 7-day period and filled out by the participant's primary caregiver. Mean caloric intake was 2,157± 111 calories per day with 29% of energy from fat, 18% from protein, and 54% from carbohydrates. No difference between genders for caloric intake or percentage of calories from fat was found. On average participants consumed 1.0±1.2 servings of vegetables, 2.8 ±2.6 servings of fruit, and 1.6 ±1.9 servings of dairy. No participants consumed the recommended 5 servings of fruits and vegetables per day.

Overall these studies suggest that the diet of individuals with ID is high in saturated fat and refined carbohydrates, such as white bread and sweets, and low in vitamin A, fiber, folate and iron., which may increase their risk of coronary heart disease, diabetes, some cancers, and obesity as these health complication have been related to low fiber intake and high refined grain intake (Park et al. 2011). Furthermore, it appears that this population does not consume enough fruits and vegetables. In all studies very few participants consumed the recommended 5 servings of fruits and vegetables per day, which is problematic as low intakes of fruits and vegetables are related to an increased risk of stroke and cardiovascular disease(Dauchet et al. 2006; He et al. 2007; Joshipura et al. 2001).

These studies suggest that the diet quality of US adults with ID may be poor; however, no global evaluation of diet quality has been conducted, and no dietary analysis of overweight and obese individuals with ID has been reported. The purpose of this study was to use a quantitative measure to determine the diet quality and intake of obese community-dwelling adults with ID living in the US.

Methods

Participant Selection

Baseline data were obtained from 70 community-dwelling overweight and obese individuals with ID (28 male, 42 female; mean age 33.9 ±11.5 years; mean weight 103.5 ± 89.6 kg; see table 1 for more demographic data). Participants were over the age of 18, with a diagnosis of mild to moderate ID as determined by a Community Service Provider operating in Kansas under the auspices of a Community Developmental Disability Organization (CDDO). Participants were overweight or obese (i.e. BMI≥25kg/m^2) and resided in a supported living condition either at home or with no more than 4 residents, and had a caregiver. Individuals were excluded if they had a diagnosis of any of the following: uncontrolled hypertension, severe heart disease, cancer, HIV, severe depression or an eating disorder. Individuals were also excluded if they were on a special diet (i.e. vegan, gluten-free) or had participated in a weight reduction program within the past 6 months.

All participants were judged competent to give informed consent by their CDDO or had a guardian with power of attorney who signed a consent form approved by the university's intuitional review board along with the individual.

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Diet Intake

All participants completed a three-day food record (two weekdays and one weekend day) with the help of their caretaking staff. A trained research dietitian then reviewed the records with the participant using food models and portion guides to obtain accurate portion sizes and missing details.

All dietary recalls were entered by trained staff into Nutrition Data Systems for Research (NDSR; version 2008). The NDSR output files, which provide total calories and amount of nutrient intake, were used to determine daily energy, nutrient intake, and servings of food groups.

Healthy Eating Index

Data obtained from the 3-day dietary records were used to calculate diet quality index scores using the Healthy Eating Index-2005 (HEI-2005). The HEI-2005 (P. M. Guenther et al. 2008) is a measure of diet quality developed by the United States Department of Agriculture that assesses conformance to the 2005 Dietary Guidelines for Americans (U.S. Department of Health and Human Services and U.S. Department of Agriculture 2005). The HEI-2005 assesses the intake of total fruit, whole fruit, total vegetables, dark green and orange vegetables, total grains, whole grains, milk, meat and beans, non-hydrogenated oils, saturated fat, sodium, and calories from solid fats, alcoholic beverages, and added sugars (SoFAAS). The HEI provides a point value based on how well a person meets the dietary guidelines, expressed as a percent per 1,000 kcals (P. M. Guenther et al. 2008).

The major strengths of the HEI-2005 are that it “1) assesses diets on a per 1,000 calorie basis in order to characterize diet quality while controlling for diet quantity; 2) addresses the consumption of energy-dense, nutrient-poor foods and ingredients; and 3) emphasizes those aspects of the American diet that are furthest from current recommendations” (P. M. Guenther et al. 2008).

The HEI-2005 was calculated using three separate NDSR output files (serving counts, intake property and component ingredients), and followed the method developed by Miller et al (Miller et al. 2011). Point values for each category were summed to give the final HEI score, with 100 points as the maximum score. Diet quality was considered “good” for total scores greater than 80, “needs improvement” for scores ranging between 51-80, and “poor” for scores less than 51.(P. M. Guenther et al. 2008).

Statistical Analyses

Descriptive statistics were calculated to provide baseline subject characteristics, total daily calories, % of calories from fat, protein and carbohydrates, and HEI-2005 component and total scores using SPSS version 20. Correlations between weight and diet were analyzed using *R* version 2.15.2 (2011).

Results

Three day food records were collected and analyzed from 70 participants (210 total records); 178 records were deemed to be of acceptable quality and representing a typical day. Eight records were removed because they did not represent a typical intake day and 24 records were deemed unreliable due to subjects being unable to recall some of the foods that were consumed.

Of the 178 records analyzed, the mean energy intake was 1928 ± 891 kcals. The macronutrient composition consisted of 49.7% carbohydrates, 32.9% fat, and 17.2% protein.

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The dietary fat composition consisted of 11.2 ± 4.4% from saturated fat, 12.2 ± 4.1% from monounsaturated fat and 6.4 ± 3.3% from polyunsaturated fat. There was a mean of 0.02 ± .10 grams of eicosapentenoic acid (EPA) and 0.07 ± 0.3 grams of docosahexenoic acid (DHA) per day.

The mean total HEI-2005 score was 46.7 ± 11.5. Females scored 46.8 ±11.7 and males scored 46.5±11.2; there was no significance difference between males and females (See Table 2 for more HEI-2005 scores). Weight was significantly associated with total fruit consumption ($p<.05$), whole fruit consumption ($p<.01$), total vegetables consumption ($p<.05$), dark green and orange consumption ($p<.01$), and whole grains consumption ($p<.05$), such that as the weight of participants increased, consumption of these foods decreased.

Both males and females had dietary intakes lower than the Estimated Average Requirement (EAR) for vitamin A, vitamin D, vitamin E, and potassium and lower than the RDA for dietary fiber (Otten et al. 2006). Additionally, men were deficient in vitamin K, and women were deficient in calcium (See Table 3 for Full Nutrient Intake Data).

On average, participants consumed 4.5 ± 3.6 servings of fruits and vegetables per day. Of the 2.9 ± 2.2 servings of total vegetables consumed per day, 0.5 ± 0.9 servings were from dark green and orange vegetables while potatoes (fried and non-fried) accounted for 0.4 ± 1.2 servings and chips accounted for 0.3 ± 0.8 servings per day. Of the 1.6 ± 2.6 servings of total fruit per day, 0.9 ± 1.8 servings were considered whole fruit, and 0.7 ± 1.7 servings were fruit juice. Additionally, participants drank 0.9 ± 0.3 servings of sugar-sweetened beverages and 2.0 ± 0.5 servings of artificially-sweetened beverages per day.

Breakfast was reported in 133 of the 178 records, indicating that breakfast was consumed 75% of the time. The average caloric intake for meals was 372.0 ± 32.0 kcals for breakfast, 602.5 ± 299.5 kcals for lunch, 749.0 ± 29.8 kcals for dinner and 254.4 ± 24.2 kcals for snacks. Snacks were the most frequently reported meal with 34% of all meals considered a snack. Late night eating, between the hours of 10pm and 3am, accounted for 4% of all meals. The majority of meals (72%) were consumed at home while 15% were consumed at work, 10% were consumed at restaurants, and 3% were consumed at a family member or friend's home.

Discussion

To our knowledge, limited data have been published on the dietary intake of overweight and obese individuals with ID. Overweight and obese participants with ID were found to have a HEI score of 45.6, which is categorized as poor diet quality. Additionally, participants had a poorer total HEI score compared to the average American (58.2), which is categorized as needs improvement. (P. M. J. Guenther, WenYen; Reedy,Jill; Britten, Patricia; Lino, Mark; Carlson, Andrea; Hiza, Hazel H; Krebs-Smith, Susan M. 2008). Average American intake was calculated from The National Health and Nutrition Examination Survey, 2001-02 (National Center for Health Statistics 2007). Categories in which the ID HEI score was at least 1 point lower than the average American score included total fruit, whole fruit, total vegetables, meat and beans, oils, and sodium.

HEI scores for ID participants were lowest in total fruits, whole fruits, dark green and orange vegetables, whole grains and non-hydrogenated vegetable oils; meeting 25.2%, 24.5%, 23.3, 23.0%, and 1.1% of the federal dietary guidelines, respectively. Participants also scored low on the HEI for sodium intake with 87.3% of individuals consuming more than the recommended intake of sodium (0.7 grams per 1,000 kcals). These low HEI scores for fruits, vegetables, whole grains and oils helps to explain the deficient intakes of vitamins

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A, D, and E, potassium, and fiber and low intake of omega- 3 fatty acids obtained from 3-day food records.

As the body weight of participants increased, the consumption of total fruit, whole fruit, total vegetables, dark green and orange vegetables, and whole grains decreased. This suggests that consuming fruits, vegetables, and whole grains may be beneficial to weight management and may help to prevent obesity.

Our findings are similar to other published findings on the dietary intake of adults with ID. The macronutrient composition of the diet was similar to that reported by Bertoli et al (2006) and Braunschweig et al (2004) and within the Institute of Medicine (IOM) Acceptable Macronutrient Distribution Range (Trumbo et al. 2002). However, daily energy intake was higher than that reported by Bertoli et al (2006) (1928 ± 891 kcals vs. 1472 ± 458 kcals) but similar to that of the US study by Braunschweig et al (2004) (2,157± 111kcals). Like Bertoli et al (2006) and Adolferson and colleagues (2008), the typical diet was deficient in fiber, vitamin A, folate and potassium; and females were deficient in calcium. Our findings also suggest that the dietary intake of overweight and obese adults with ID may be deficient in vitamins D and E.

Similar to findings reported by Draheim et al (2007) and Braunschweig (2004), individuals reported a low consumption of total fruits and vegetables. While the mean daily intake of total fruits and vegetables was close to the recommended 5 servings of fruits and vegetables per day, the consumption of whole fruits and dark green and orange vegetables was much less than the recommended servings as potatoes and fruit juice greatly contributed to the total intake. Low intake of dark green and orange vegetables suggests that adults with ID may have a deficient intake of carotenoids and flavonoids, and may contribute to the deficient vitamin A intake found in the diet as it is found in high quantities in the darker green and orange vegetables (Van Duyn and Pivonka 2000). The low intake of whole fruits and leafy green vegetables is concerning as consumption of these foods has been inversely associated with type 2 diabetes risk (Bazzano et al. 2008). Furthermore, consumption of fruit juice and other sugar-sweetened beverages have been found to be positively associated with type 2 diabetes, metabolic syndrome, and coronary artery disease (Bazzano et al. 2008; de Koning et al. 2012; Malik et al. 2010).

Total grain consumption was high while whole grain consumption was low, further supporting the findings of Bertoli (2006) and Adolferson (2008) that these individuals consume a diet rich in refined grains and sugar, and thus have lower dietary fiber intake Mean fiber intake was 16.2 ± 9.7 which is similar to that reported by Bertoli et al and Adolferson et al (13.5g ± 5.0g and 21.0g, respectively). This low fiber intake may increase risk of coronary heart disease, diabetes, some cancers, and obesity as these health complication have been inversely related to fiber intake (Park et al. 2011).

Sodium intake within the general population currently exceeds recommendations, and mean intake within this sample was higher than the mean reported in the general population (Morbidity and Mortality 2011). Dietary data revealed that these individuals consume high amounts of prepackaged meals such as frozen pizzas, chicken nuggets, and boxed pasta meals, as well as canned vegetables; all which are high in sodium. Sodium intake above the recommended levels is related to elevated blood pressure, which is a strong, consistent, continuous, independent, and etiologically relevant risk factor for cardiovascular and renal disease (Appel et al. 2006; Bray et al. 2004; He and MacGregor 2004). The data also suggest that adults with ID may not be getting sufficient non-hydrogenated vegetable oils in their diet resulting in low intakes of EPA and DHA, lipids which may improve cardiovascular health (Breslow 2006; Cottin et al. 2011).

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While the current study highlights many nutritional concerns that potentially should be addressed within the ID population, several limitations do exist. Non-randomly selected participants were used, which may affect the generalizability of these results. Furthermore, the participants in this study had volunteered for a weight loss study and thus may be more or less likely to consume a healthy diet. Another limitation to this study is that while 3-day food records have previously been used in this population (Adolfsson et al. 2008), dietary assessment in individuals with ID presents a challenge as many have compromised cognitive functioning, poor memory, and a shortened attention span, which may impact the validity of the records. However, in order to help mitigate this limitation, the participant's home-staff members were asked to help fill out records over the three-day period. Additionally after the records were completed, trained nutrition staff reviewed the food records with the participant and their staff member at the participant's home to verify portion sizes and to obtain missing details. Participants were able to show the nutrition staff the bags and packages of the food eaten as well as the plates their food was served on. Proxy-assisted diet records are commonly used in populations with limited reporting capabilities, such as young children and individuals with Alzheimer's (Emmett 2009). Researchers have not yet validated a method for dietary intake assessment in adults with ID due to the significant barriers to collecting valid data (Humphries et al. 2009). A study by Elinder et al (2010) demonstrates that the use of digital photography in dietary assessment may provide a more accurate and valid assessment of dietary intake in individuals with ID, but larger studies still need to be completed to determine the validity of this method.

In summary, it has been found that overweight and obese community-dwelling adults with ID are at increased risk of poor diet quality compared to adults without ID. Overall, adults with ID reported low consumption of total fruits and vegetables, whole grains, and non-hydrogenated vegetable oils and high sodium consumption. As the rates of obesity are higher in individuals with ID than in the general population, special attention should be given to these results as they suggest high consumption of refined grains, sugar and sodium and low consumption of whole fruits, vegetables, whole grains, and EPA and DHA; all of which may contribute to the development of diabetes, cardiovascular disease, cancer or other health complications.

Diet interventions being conducted within individuals with ID should aim to increase total fruits and vegetables, whole grains, and non-hydrogenated vegetable oils and decrease sodium consumption during their interventions, or train staff members on healthy eating and cooking to help them provide nutritionally complete meals. Future studies should examine whether poor dietary intake is related to the increased risk of comorbidities affecting overweight and obese individuals with ID.

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Table 1
Sociodemographic characteristics of IDD sample (n=70)

Characteristic	n (%)
Age (y) [1]	33.9 ± 11.5
Gender	
Male	28 (40%)
Female	42 (60%)
Race	
White	53 (75.7%)
Black	12 (17.1%)
Other	5 (7.1%)
Education Level	
Less than 9th Grade	3 (4.3%)
9th-12th Grade	15 (21.4%)
High school graduate or GED	40 (57.1%)
Post Graduate classes	12 (17.1%)
Severity of IDD	
Mild	34 (48.6%)
Moderate	36 (51.4%)

[1] mean ± SD

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Table 2

Diet quality as measured by the Healthy Eating Index - 2005

Component	Maximum score	Standard for maximum score (per 1000 kcals)	Mean American HEI core (2001-2002)[a]	Participants mean score	% of maximum score	Female Participants mean score	Male participants mean score
Total Fruit	5	≥0.8 cup	3.1	1.5± 2.0	30.1%	1.5 ± 2.0	1.7 ±2.1
Whole Fruit	5	≥0.4 cup	3.4	1.7 ± 2.1	33.7%	1.8 ± 2.2	1.4 ± 2.0
Total Vegetable	5	≥1.1 cup	3.3	2.8 ± 1.8	53.5%	2.9 ± 1.9	2.3 ± 1.6
Dark Green and Orange Vegetables	5	≥0.4 cup	1.4	1.3 ± 1.9	25.0%	1.4 ± 1.9	1.0 ±1.7
Total Grains	5	≥3.0 oz	5.3	4.3 ± 1.5	85.8%	4.3 ± 1.2	4.2 ±1.2
Whole Grains	5	≥1.5oz	1.2	1.5 ± 1.9	30.3%	1.8 ± 2.1	1.0 ±1.6
Milk	10	≥1.3 cup	6.8	6.1 ± 3.5	67.0%	6.5 ± 3.5	5.5 ±3.6
Meat and Beans	10	≥2.5 oz	10.2	8.1 ± 2.7	81.3%	8.1 ± 2.8	8.1 ±2.7
Oils	10	≥12 grams	6.8	1.3 ± 2.5	12.8%	1.2 ± 2.4	1.4 ±2.6
Saturate Fat	10	≤7% of energy	6.4	6.0 ± 2.7	59.9%	6.3 ± 2.5	5.4 ±3.0
Sodium	10	≤0.7 grams	4.1	1.6± 2.1	16.0%	1.4 ± 2.0	1.9 ±2.3
SoFAAS [b]	20	≤20% of energy	7.5	10.6± 7.5	52.8%	9.6 ± 7.5	12.5 ±7.3
Total Mean HEI Score[c]	**100**		**58.7**	**46.7± 11.5**		**46.8 ±11.7**	**46.5±11.2**

[a] NHANES 2001-2002

[b] SoFAAS = Calories from solid fats, alcoholic beverages and added sugars

[c] Measure of adherence to the 2005 US Dietary Guidelines. Scores range from 0 (no adherence) to 100 (complete adherence)

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Table 3
Nutrient Intake of Participants with ID

	All (n=70)	Males (n=28)	Females (n=42)
Energy (kcal)	1928.1 ± 891.0	2331.5 ±1059.4	1728.1 ± 719.3
Total Fat (g)	74.6 ± 48.0	96.2 ± 63.1	64.0 ± 33.9
Total Carbohydrate (g)	240.5 ±113.7	274.8 ± 123.2	223.4 ± 105.1
Total Protein (g)	80.1 ± 37.9	96.3 ± 48.1	72.1 ± 28.6
Total Dietary Fiber (g)	16.2 ± 9.7	15.1 ± 6.5	16.8 ± 10.9
Soluble Dietary Fiber (g)	4.8 ± 2.4	4.8 ± 2.2	4.8 ± 2.4
Insoluble Dietary Fiber (g)	11.4 ± 8.1	10.2 ± 4.8	11.9 ± 9.3
Vitamin A (mcg)	449.1 ± 329.6	488.1 ± 341.0	429.8 ± 323.6
Vitamin D (calciferol) (mcg)	4.4 ± 5.2	5.6 ± 7.1	3.9 ± 3.9
Vitamin E (Total Alpha-Tocopherol) (mg)	6.9 ± 4.7	6.8 ± 4.7	6.9 ± 4.7
Vitamin K ((mcg)	93.3 ± 169.0	68.8 ± 45.8	105.4 ± 203.4
Vitamin C (mg)	86.1 ± 93.1	106.0 ± 118.6	76.2 ± 76.1
Thiamin (mg)	1.7 ± 0.8	1.8 ± 0.9	1.7 ± 0.7
Riboflavin) (mg)	2.0 ± 0.9	2.3 ± 1.2	1.9 ± 0.8
Niacin (mg)	24.1 ± 12.5	26.4 ± 15.4	22.9 ± 10.7
Vitamin B-6 (mg)	1.9 ± 0.9	1.9 ± 1.0	1.9 ± 0.9
Total Folate (mcg)	429.5 ± 225.5	394.3 ± 184.0	446.9 ± 242.3
Vitamin B-12 (mcg)	5.1 ± 3.9	5.8 ± 4.9	4.7 ± 3.3
Calcium (mg)	866.2 ± 632.6	1017.0 ± 683.5	791.4 ± 594.6
Phosphorus (mg)	1241.0 ± 616.4	1421.2 ± 723.4	1151.6 ± 537.0
Magnesium (mg)	249.0 ± 122.0	265.4 ± 125.9	240.8 ± 119.8
Iron (mg)	16.3 ± 8.2	15.8 ± 6.0	16.6 ± 9.1
Zinc (mg)	11.6 ± 6.6	13.1 ± 7.4	10.8 ± 6.0
Copper (mg)	1.1 ± 0.5	1.2 ± 0.6	1.1 ± 0.5
Selenium (mcg)	110.3 ± 57.3	127.3 ± 72.9	101.9 ± 45.8
Sodium (mg)	3608.5 ±1653.3	4155.8 ± 1860.7	3337.2 ± 1474.6
Potassium (mg)	2264.1 ± 1069.9	2598.6 ± 1263.1	2098.3 ± 921.6