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Citation to Publisher Version: No citation available.

Citation to *this* Version: Schefske, Scott D., Cuite, Cara L., Byrd-Bredbenner, Carol & Hallman, William K.. *Characterization of foods stored in Oaxacan and African-American households in New Brunswick, NJ*, 2009. Retrieved from http://dx.doi.org/doi:10.7282/t3-577r-2f38.

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Characterization of Foods Stored in Oaxacan and African-American Households in New Brunswick, NJ

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Introduction

Characterizing the quantity and nutritional quality of food products in consumers' homes is important to developing programs to educate consumers on healthy dietary habits and increasing healthy food availability. It has been well-documented that the availability of healthy food directly contributes to the quality of a diet. However, obtaining an accurate picture of food stored in the home for everyday use can be extremely difficult. Self-reports by consumers and estimations derived from food-frequency questionnaires typically have significant margins of error. Traditional line-item written records have shown to be accurate but time consuming. Therefore, estimating the nutritional adequacy of household food supplies is quite difficult and new technological approaches may be warranted.

Recent research comparing Universal Product Code (UPC) scanning and traditional line-item recording found that UPC scanning produced a 32% times savings while also having 95.6% accuracy.[1] UPC scanning to conduct household kitchen audits is a new novel methodology that can be used to obtain an accurate picture of food stored in the home.

The objective of this study is to provide an accurate assessment of the caloric and nutrient content of household food inventories of Oaxacan and African-American households and also to compare and contrast findings from previous kitchen audits conducted in a reference sample of households of varying socioeconomic status (SES).

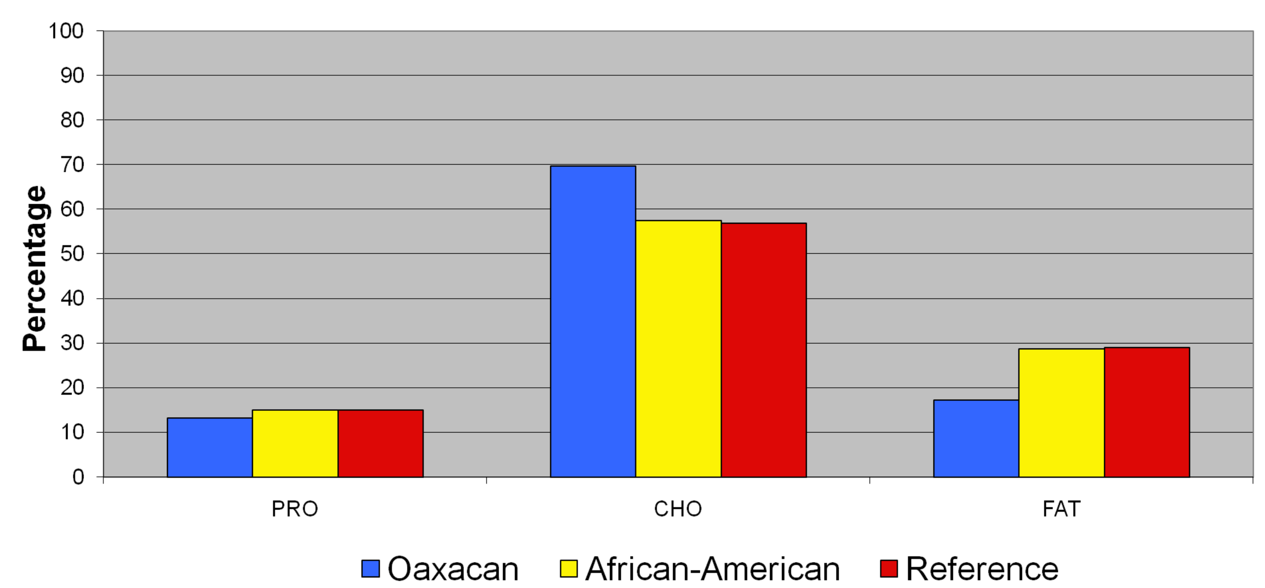
Methods

Through the use of electronic scanning technology and pre-existing databases of foods and their nutrient content, 60 New Brunswick, New Jersey household pantries were audited. Alcoholic beverages, baby food and formula, pet foods, dietary supplements, and leftovers were not recorded during the audit. 30 Oaxacan and 30 African-American households were recruited to participate in the study. Women over the age of 17 years with at least one child under the age of 12 years were eligible to participate. Snowball sampling was then employed to identify other potential participants. Demographic information, attitudes concerning emergency preparedness and other psycho-social factors of participating mothers were assessed using a survey instrument. The reference sample used for this study was part of a larger study conducted by Byrd-Bredbenner et al. that contained 100 New Jersey households of varying SES.[2]

Results

The food stores of both the Reference and the African-American samples had 15% of their calories made up of proteins, 57% from carbohydrates, and 29% from fats.[2] In contrast, proteins contributed 13% of the calories to the household food stores of the Oaxacan sample, while 70% were from carbohydrates, and 17% from fats (Figure 1).

Figure 1: Proportions of Calories From Macronutrients In Household Food Supply



The household food stores in both the African-American and Reference samples had Nutrient Adequacy Ratios (NARs) for total fat that approached 1.00 (0.99±0.26SD, and 0.99±0.21SD respectively). In contrast, the Oaxacan NAR for total fat was 0.64±0.25SD. Similarly, in terms of saturated fat, the African-American and Reference samples had similar a mean household NARs of 0.96±0.13SD and 0.94±0.35SD, versus 0.66±0.43SD in the Oaxacan sample. No significant differences were observed in the mean household NARs for cholesterol.

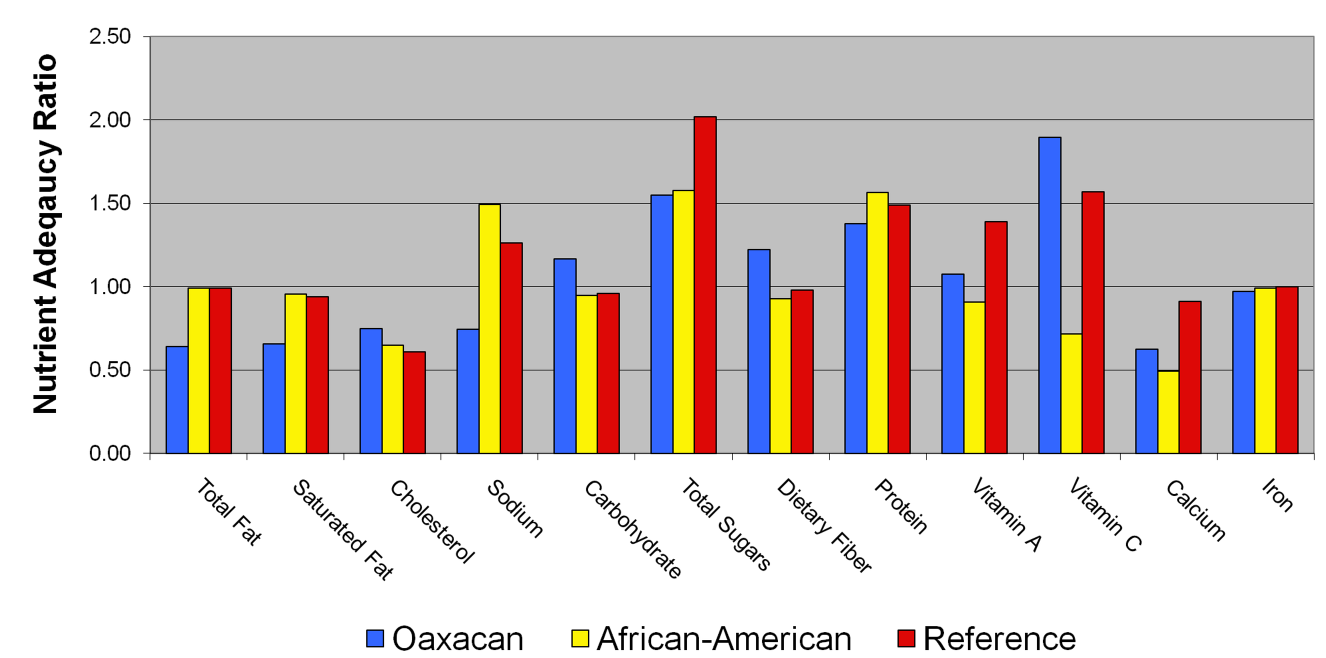
The African-American and Reference samples had similar mean NARs for carbohydrates (0.95± 0.14SD and 0.96±0.13SD respectively), while that of the Oaxacan sample was 1.17±0.95SD. Mean household NARs for fiber for the Oaxacan, African-American, and Reference samples were 1.22±0.52SD, 0.93±0.37SD, and 0.98±0.35SD respectively. The Reference sample had a mean household NAR for sugar of 2.02±0.58SD while the Oaxacan and African-American samples had mean NARs of 1.55±0.71SD and 1.58±0.50SD respectively.

The mean household NAR for protein of the reference sample was 1.49±0.29SD and not significantly different from both the Oaxacan and African-American mean household NARs for protein. The mean household NARs for protein of the Oaxacan and African-American samples were found to be 1.38±0.32SD and 1.56±0.31SD respectively and also significantly different from each other.

The mean household NARs for vitamin A for the Oaxacan and African-American populations are 1.08±0.80SD and 0.91±0.53SD, respectively versus the reference sample's mean household NAR for vitamin A of 1.39±1.25SD. In regards to vitamin C, the Oaxacan sample has a mean household NAR of 1.90±1.40SD; the reference sample has a mean household NAR of 1.57±1.09SD while the African-American sample has a mean household NAR of 0.72±0.56SD. The reference sample has a mean household NAR for calcium of 0.91±0.47SD. The Oaxacan and African-American sample have a mean household calcium NARs of 0.63±0.25SD and 0.72±0.56SD respectively. Mean household NARs for iron had no significant difference between the three groups. The Oaxacan, African-American, and reference samples were 0.97±0.32SD, 0.99±0.30, and 1.00±0.27 respectively.

In terms of sodium, the Oaxacan sample had a mean household NAR for sodium with 0.74±0.51SD. The African-American mean household NAR for sodium is 1.49±0.35SD. The reference sample has a mean household NAR for sodium of 1.26±0.34SD.

Figure 2: Comparison of Nutrient Adequacy Ratios of Oaxacan, African-American, and New Jersey Samples



- Although the Oaxacan sample had the largest mean household NAR for total carbohydrates, the reference sample had the largest mean household NAR for sugar. 20% of the reference sample's total calories came from sugar and one-third of carbohydrate calories. Further exam- ination of the Oaxacan and African-American samples' household food supply is required in order to determine what food groups may or may not contribute to these findings.

When considering micronutrients, it was shown that the African-American sample's household food supply did not provide adequate amounts of vitamin A, vitamin C, calcium or iron per 2000 kcal. All three samples' household food supply did not provide adequate amounts of calcium in 2000 kcal to reach the DRI of 1000mg.[4] Again, further examination of the samples' household food supply is required to determine what food groups may be contributing to these micronutrient findings.

The above findings can be used to better plan and implement programs tailored to the Oaxacan and African-American consumers in the New Brunswick, NJ area. These programs, designed based on the knowledge and familiarity of the household food supply of the Oaxacan and African-American samples, can help to educate on healthy dietary habits and increase the availability of healthy foods. These programs would thereby increase the quality and effectiveness of their diets.

The novel methodology of UPC scanning can be used to obtain an accurate picture of a population's household food supply in a timely and efficient manner. The findings of this methodology can then be used to implement tailored programs for these populations and increase diet quality and quality of life. Further research of

Conclusions

In terms of macronutrients, African-American and the reference sample proportions were similar to each other, and were within reference ranges of Dietary Recommended Intake guidelines of the Institute of Medicine. Two out of three Oaxacan sample's proportions were not within the reference ranges of Dietary Recommended Intake for macronutrient guidelines set forth by the Institute of Medicine. Percentage of carbohydrates (~70%) was higher than the reference range (45-65%) and percentage of fat (~17%) was less than the reference range (20-35%).[3] This could explain why the Oaxacan sample had the lowest mean household NARs for total fat and saturated fat and the highest mean household NAR for total carbohydrate as well as dietary fiber.

References

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