Demographic Profiles and Cultural Aspects of Barriers to Vegetarianism in the U.S.

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A vegetarian diet encompasses all meatless diets:

— “eating a diet consisting wholly of vegetables and fruits, and sometimes eggs or dairy products”
Vegetarians defined in a variety of ways:

- Lacto-vegetarian: includes plant foods, milk, and dairy
- Ovo-vegetarian: includes eggs
- Lacto-ovo-vegetarian: includes both eggs and dairy (90-95% in North America)
- Strict vegetarian/vegan: excludes animal flesh and animal products, sometimes honey
- Fruitarian: diet of foods that do not kill the plant of origin—fresh fruits, dried fruits, and selected vegetables
- Semi-vegetarian: occasional meat eaters
  - Pescovegetarian – includes fish in diet
  - Pollovegetarian – includes chicken in diet
  - Macrobiotic – often includes fish, emphasizes brown rice, whole grains, sea vegetables, legumes, root vegetables
Who are vegetarians in the U.S.?

– Very little is known as few nationally representative data sets exist to explore this issue; limitations are methodological differences in surveys (how issue is assessed – diet vs. self-report); marketing and/or special interest group surveys (ideology driven); small sample sizes not allowing sub-group and co-variate exploration

– Zogby polls (Vegetarian Research Group):
  • 1994: 1%  2000: 2.5% of U.S. population describe themselves as vegetarian; vegan 0.9%
– More prevalent in Western vs. Eastern U.S.
– Slightly older than general population
– More females
– Very little data exist on ethnic minority populations (African Americans, Latinos)
– Some suggest that racial and SES profiles are similar to general population; others that minorities are less likely to eat a plant-based diet
– Restaurant and food industry data/polls suggest increasing acceptance and incorporation of non-meat based food options in U.S. diet
Reasons for Choosing a Plant-based Diet

• Worldwide—mainly economic; religious beliefs in Asia
• Reasons Americans choose a vegetarian diet
  – Health 46%
  – Animal rights 15%
  – Family/friends influence 12%
  – Ethics 5%
  – Environmental issues 4%
  – Other reasons (i.e., religion)

Vegetarian Times, Yankelovich Partner Study, 1992
Vegetarianism and Health

• Meat intake associated with a variety of chronic diseases
• Benefits of vegetarian diet
  – Increases longevity in industrialized nations
  – Independently associated with decreased risk for chronic degenerative diseases such as:
    • Obesity
    • Coronary diseases
    • Type II Diabetes
    • Various cancers (e.g., colon, breast, prostate, etc.)

Foods of plant origin beneficial on their own merit regarding chronic disease prevention.
Plant-based Diets and Health Disparities?

Health Disparities:

“Differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States” (National Institute of Health, 2000)
Compared to Whites, African Americans (AA) and Latinos suffer disproportionately from preventable diseases

- Death rates of ALL cancers are 30% higher for AAs
- Latinos and AA have significantly higher risk of type 2 diabetes after controlling for BMI, age-adjusted relative risk: Latinos are 1.9 times more likely; Mexican Americans are 2.0 times more likely
- Hispanic/Latinos are at higher risk of developing hypertension, hyperlipidemia
- AA men have the highest incidence rate of prostate cancer in the world: 180.6 per 100,000
- Breast cancer, widely believed to be diet related, is the most common cancer among AA women, who are also 35% more likely to die from breast cancer
Causes are believed to be multi-fold:

- Diet*
- Exercise
- Environment
- Cultural factors
- Genetic predisposition
Reasons/Advantages for Implementing Plant-Based Diets in AA and Latino Communities

Low rates of obesity, CVD, type 2 diabetes, various cancers, increased longevity among vegetarians and vegans

Switching to plant-based diet can decrease disease rates (and in some cases reverse their effects)
Background

• Of the many factors that affect health disparities, diet is one of the few controllable variables, yet groups most affected are traditionally resistant to dietary changes and particularly resistant to a more plant-based diet.

• While this is an under-explored area of study, reasons for resistance identified in the literature are:
  – Logistical
    • Cost of fresh produce, grains, lean cuts of meat, fish, etc.
    • Availability of these items
  – Cultural (loss of identity)
  – False idea that plant-based diets are deficient in important nutrients
  – Meat is staple in diet for both AA and Latino cultures
Two-fold Objective for Today’s Presentation

• Comparison of demographic profiles and lifestyle correlates of individuals self-reporting a plant-based diet in 2 population-based national studies: NHANES and AHS-2 (quantitative)

• Exploration of cultural and other barriers to eating a plant-based diet among populations with health disparities (qualitative)
  – Example of African Americans and Latinos working in an institutional environment committed to a vegetarian lifestyle
Methods: National Health and Nutrition Examination Survey (NHANES)

• Household interview conducted face-to-face by trained interviewer
• Computer-assisted personal interview (CAPI) system used to collect interview data
• Recruitment
  – Direct mail from NCHS to households in study area

• To produce reliable data, some groups were oversampled; however all data presented are weighted back to existing patterns
Adventist Health Study-2 (AHS-2)

- Adventists are a Christian Protestant denomination that counsels its membership to avoid alcohol, tobacco, and pork, and recommends a vegetarian diet
- Dietary recommendations are followed to varying degrees by church members
- Within the U.S. probably the largest cohesive group of persons eating a plant-based diet
- Recruitment occurred through churches nationwide
- Eligibility:
  - Proficient in English
  - Blacks: At least 30 years or older
  - Whites: At least 35 years or older
  - Lower age eligibility used for Blacks due to tendency to develop chronic diseases earlier than Whites; realistic target recruitment numbers
- Oversampling of African Americans/Blacks
- Detailed self-administered survey data; emphasis on diet, lifestyle and health
Analytical Methods Used in Quantitative Study

- Data files with variables from NHANES and AHS-2 were created based on same variables (Note that NHANES dietary variables were created based on consistent answers to 2 random dietary food recalls vs. AHS-2 – direct measures from food frequency questionnaire)

- For comparability, same age cohorts were selected (age 30-59)
- Frequency tables were created and tested for significant differences among eating patterns sub-groups (AHS-2 vs. NHANES)
- Multivariate logistic regression models for NHANES and AHS-3 with “vegetable only” as outcome were also completed adjusting for age gender and race.
Analytical Methods Used in Qualitative Study

Literature review and small qualitative study based on grounded theory methods. Conducted by: Laurel Brown, Anjali Israni, Kate McCarthy, Hellen Ndiku, Shanthi Solomon, Diana Torres

• **Participants**
  – 19 participants affiliated with LLUAHSC as students, faculty, or staff.

• **Methods/Instruments**
  – Informed consent, audio-taping, verbatim transcription
  – Systematic sampling for triangulation
  – 12 in-depth, semi-structured key informant interviews
  – Confirmatory focus group
  – Inclusion criteria:
    • Self identified Latino/Hispanic, or African American
    • Self identified non-vegetarian
    • At least 18 years of age
    • Affiliation with LLUAHSC

• **Analysis**
  – Grounded theory coding methods
  – Constant comparison for emerging themes
**Quantitative Results**

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AHS-2 NHANES</td>
<td>AHS-2 NHANES</td>
<td>AHS-2 NHANES</td>
</tr>
<tr>
<td><strong>Proportion</strong></td>
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<tr>
<td></td>
<td>60.5% 72.1%</td>
<td>19.5% 12.3%</td>
<td>1.9% 11.1%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mean age</td>
<td>49.1 44.5</td>
<td>46.8 43.2</td>
<td>46.6 42.0</td>
</tr>
<tr>
<td><strong>Dietary pattern</strong></td>
<td></td>
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</tr>
<tr>
<td>Vegetable only</td>
<td>44.4% 1.2%</td>
<td>22.7% 0.3%</td>
<td>24.8% 0.5%</td>
</tr>
<tr>
<td>Vegetable &amp; fish</td>
<td>6.1% 1.6%</td>
<td>9.7% 0.8%</td>
<td>6.9% 2.3%</td>
</tr>
<tr>
<td>Vegetable &amp; poultry</td>
<td>3.7% 3.5%</td>
<td>2.9% 6.9%</td>
<td>5.9% 3.1%</td>
</tr>
<tr>
<td>Eat meat</td>
<td>37.0% 90.8%</td>
<td>47.7% 87.8%</td>
<td>51.7% 90.7%</td>
</tr>
</tbody>
</table>
# Quantitative Results

<table>
<thead>
<tr>
<th></th>
<th>Vegetable Only AHS-2 NHANES</th>
<th>Vegetable &amp; Fish AHS-2 NHANES</th>
<th>Vegetable &amp; Poultry AHS-2 NHANES</th>
<th>Eat Meat AHS-2 NHANES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proportion</strong></td>
<td>35.2% 1.1%</td>
<td>8.7% 1.7%</td>
<td>3.4% 3.8%</td>
<td>39.7% 90.2%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean age†</td>
<td>48.6 40.7 ***</td>
<td>48.0 44.9</td>
<td>47.4 42.1</td>
<td>47.7 44.1</td>
</tr>
<tr>
<td>**Gender ***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>35.9% 43.6%</td>
<td>31.4% 35.1%</td>
<td>28.9% 36.5%</td>
<td>36.2% 48.8%</td>
</tr>
<tr>
<td>Female</td>
<td>64.1% 56.4%</td>
<td>68.6% 64.9%</td>
<td>71.1% 63.5%</td>
<td>63.8% 51.2%</td>
</tr>
<tr>
<td>**Race ***</td>
<td></td>
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</tr>
<tr>
<td>White</td>
<td>76.3% 83.8%</td>
<td>42.9% 11.1%</td>
<td>66% 66.6%</td>
<td>56.6% 72.6%</td>
</tr>
<tr>
<td>Black</td>
<td>12.5% 3.2%</td>
<td>26.6% 69.4%</td>
<td>16.8% 22.8%</td>
<td>23.3% 12.0%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.3% 5.4%</td>
<td>1.5% 19.3%</td>
<td>3.3% 9.0%</td>
<td>2.5% 11.2%</td>
</tr>
<tr>
<td>**Marital status ***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>6.9% 9.3%</td>
<td>9.6% 11.1%</td>
<td>8.3% 19.2%</td>
<td>9.3% 10.7%</td>
</tr>
<tr>
<td>Married</td>
<td>81.9% 44.2%</td>
<td>74.4% 69.6%</td>
<td>78.5% 58.5%</td>
<td>72.0% 67.1%</td>
</tr>
<tr>
<td>Separated/Divorced</td>
<td>9.9% 3.6%</td>
<td>14.2% 19.3%</td>
<td>11.6% 17.8%</td>
<td>16.5% 14.3%</td>
</tr>
<tr>
<td>Widowed</td>
<td>1.3% 4.1%</td>
<td>1.8% 0%</td>
<td>1.5% 0.8%</td>
<td>2.2% 1.7%</td>
</tr>
<tr>
<td>**Education ***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; High school</td>
<td>2.2% 4.8%</td>
<td>4.2% 16.8%</td>
<td>3.8% 11.0%</td>
<td>4.9% 14.6%</td>
</tr>
<tr>
<td>High school diploma</td>
<td>8.0% 31.2%</td>
<td>9.3% 10.7%</td>
<td>9.1% 20%</td>
<td>14.1% 25.4%</td>
</tr>
<tr>
<td>&gt; High school</td>
<td>89.8% 64%</td>
<td>86.4% 72.5%</td>
<td>87.1% 69%</td>
<td>81.0% 60.1%</td>
</tr>
</tbody>
</table>
### Quantitative Results (cont’d)

<table>
<thead>
<tr>
<th>Income***</th>
<th>Vegetable only AHS-2 NHANES</th>
<th>Vegetable &amp; Fish AHS-2 NHANES</th>
<th>Vegetable &amp; Poultry AHS-2 NHANES</th>
<th>Eat meat AHS-2 NHANES</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; $10,000</td>
<td>6.5% 8.6%</td>
<td>7.3% 6.0%</td>
<td>7.5% 10.6%</td>
<td>9.6% 6.0%</td>
</tr>
<tr>
<td>$10,000 - $19,999</td>
<td>6.0% 15.5%</td>
<td>7.5% 15.0%</td>
<td>5.9% 12.9%</td>
<td>8.6% 10.6%</td>
</tr>
<tr>
<td>$20,000 - $34,999</td>
<td>8.0% 6.6%</td>
<td>9.3% 29.0%</td>
<td>8.2% 9.2%</td>
<td>10.8% 14.9%</td>
</tr>
<tr>
<td>$35,000 - $54,999</td>
<td>21.4% 9.6%</td>
<td>19.3% 9.4%</td>
<td>19.6% 13.6%</td>
<td>20.8% 21.0%</td>
</tr>
<tr>
<td>$55,000 - $74,999</td>
<td>24.0% 16.0%</td>
<td>21.3% 7.0%</td>
<td>21.1% 14.2%</td>
<td>19.7% 13.2%</td>
</tr>
<tr>
<td>≥ $75,000</td>
<td>34.0% 43.6%</td>
<td>35.4% 19.9%</td>
<td>37.8% 36.5%</td>
<td>30.4% 30.9%</td>
</tr>
</tbody>
</table>

† Values represent mean (standard deviation).

*significant at .01
** significant at .001
***significant at .0001
## Quantitative Results

<table>
<thead>
<tr>
<th></th>
<th>Vegetable only AHS-2 NHANES</th>
<th>Vegetable &amp; Fish AHS-2 NHANES</th>
<th>Vegetable &amp; Poultry AHS-2 NHANES</th>
<th>Eat meat AHS-2 NHANES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proportion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 5 hours/day</td>
<td>7.5%</td>
<td>11.0%</td>
<td></td>
<td>39.7%</td>
</tr>
<tr>
<td>2-4 hours/day</td>
<td>4.2%</td>
<td>7.7%</td>
<td></td>
<td>26.3%</td>
</tr>
<tr>
<td>≤ 1 hour/day</td>
<td>2.3%</td>
<td>4.8%</td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>2.9%</td>
<td>0.0%</td>
<td>1.8%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Normal</td>
<td>50.7%</td>
<td>72.3%</td>
<td>43.9%</td>
<td>36.7%</td>
</tr>
<tr>
<td>Overweight</td>
<td>29.8%</td>
<td>23.5%</td>
<td>34.5%</td>
<td>34.4%</td>
</tr>
<tr>
<td>Obese</td>
<td>16.6%</td>
<td>4.2%</td>
<td>19.9%</td>
<td>27.7%</td>
</tr>
<tr>
<td>Mean BMI†</td>
<td>25.6</td>
<td>23.4</td>
<td>26.4</td>
<td>26.7</td>
</tr>
<tr>
<td><strong>Smoking</strong>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>86.9%</td>
<td>81.0%</td>
<td>84.0%</td>
<td>72.7%</td>
</tr>
<tr>
<td>Past use</td>
<td>12.9%</td>
<td>19.0%</td>
<td>15.4%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Current use</td>
<td>0.2%</td>
<td>0.0%</td>
<td>0.6%</td>
<td>3.6%</td>
</tr>
<tr>
<td><strong>Alcohol use</strong>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>64.3%</td>
<td>11.1%</td>
<td>55.5%</td>
<td>38.6%</td>
</tr>
<tr>
<td>Past use</td>
<td>33.2%</td>
<td>11.2%</td>
<td>38.9%</td>
<td>45.2%</td>
</tr>
<tr>
<td>Current use</td>
<td>2.5%</td>
<td>75.5%</td>
<td>5.6%</td>
<td>16.2%</td>
</tr>
<tr>
<td><strong>Watching TV</strong>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 1 hour/day</td>
<td>63.5%</td>
<td>56.5%</td>
<td>51.5%</td>
<td>34.7%</td>
</tr>
<tr>
<td>2-4 hours/day</td>
<td>34.2%</td>
<td>45.3%</td>
<td>45.6%</td>
<td>57.8%</td>
</tr>
<tr>
<td>≥ 5 hours/day</td>
<td>2.3%</td>
<td>2.1%</td>
<td>2.9%</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

***: Significantly different from NHANES data.
Quantitative Results (cont’d)

<table>
<thead>
<tr>
<th>Perceived Health Status***</th>
<th>Vegetable only AHS-2 NHANES</th>
<th>Vegetable &amp; Fish AHS-2 NHANES</th>
<th>Vegetable &amp; Poultry AHS-2 NHANES</th>
<th>Eat meat AHS-2 NHANES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>37.1% 32.1%</td>
<td>30.9% 8.5%</td>
<td>27.9% 24.8%</td>
<td>20.7% 12.9%</td>
</tr>
<tr>
<td>Very good/Good</td>
<td>55.7% 70.1%</td>
<td>58.5% 82.3%</td>
<td>59.9% 65.2%</td>
<td>61.7% 66.5%</td>
</tr>
<tr>
<td>Fair</td>
<td>6.5% 0.0%</td>
<td>9.5% 6.5%</td>
<td>11.5% 5.6%</td>
<td>15.4% 12.9%</td>
</tr>
<tr>
<td>Poor</td>
<td>0.7% 11.7%</td>
<td>1.1% 1.8%</td>
<td>0.6% 0.3%</td>
<td>2.1% 2.8%</td>
</tr>
</tbody>
</table>

† Values represent mean (standard deviation)
*significant at .01
** significant at .001
***significant at .0001
Multivariate results: dependent variable “vegetable only” – age, gender and race adjusted

- **NHANES:**
  - Obese BMI (compared to normal weight) less likely
  - Current and past smoking (compared to never smoking); less likely
  - Never married and widowed more likely; (compared to married)

- **AHS-2:**
  - Obese/overweight BMI (compared to normal weight) less likely
  - Being male more likely (compared to female)
  - AA and Latinos less likely (compared to whites)
  - Separated/divorced less likely (compared to married)
  - HS grad or < , less likely (compared to more than HS);
  - Lower income (compared to > 75,000) all more likely
  - Current and past smoking less likely (compared to never smoking)
  - Current and past alcohol use less likely (compared to never)
  - More TV watching less likely (compared to <1 hour per day)
  - Excellent perceived health status more likely and fair/poor less likely (compared to good)
Discussion/Implications: Quantitative Analyses

- NHANES vegetable-only respondents were younger, had lower BMI (lower obesity and overweight), and fewer were married.

- As meat intake increased, TV watching and smoking increased and perceived health decreased; in AHS-2, alcohol consumption, while low, increased as meat intake increased.

- After controlling for age, gender and ethnicity; higher than normal BMI and smoking remained as correlates in both groups; marital status had a differential role - NHANES never married and widowed were more likely; in AHS-2 those who were divorced and separated were less likely. In AHS-2 while lower education was associate with less veg. those with incomes < $75,000 were more likely to be veg. Less TV watching and better perceived health status were also associated with veg.

- Very few AAs and Latinos subscribe to a more plant based diet, raising the issue of oxidated dietary stress and higher susceptibility to chronic diseases.
Discussion/Implications: Quantitative Analyses

• While these patterns are compelling, they are based on very small numbers for the NHANES group.
• Clearly, respondents are trying to eat a more plant-based diet, though many still add fish and chicken.
• This is one of the few nationwide studies that provides information about demographic and lifestyle patterns.
• With vegetarianism increasing, future studies should seek to better understand such patterns.
• Given the health benefits of a plant-based diet, we need to target minority populations who experience health disparities and would likely benefit from altering their meat-rich dietary patterns.
Qualitative Results

Reasons for resistance to a more plant-based diet among AAs and Latinos: Literature findings

Diet is key component in overall quality of life for all ethnic groups; ethnic identity is often closely related with diet.

African Americans
- Resisting assimilation by dominant culture
- Carrying on tradition/links to the past
- Means of celebrating life events
- Sense that plant-based diets are not as tasty; satisfying
- Satiety
- Being overweight not as taboo
- Availability and convenience

Latinos/Hispanics
- Cheap cost of fast food (desire to save money for family)
- Traditional foods heavy on starch, carbs, and SFA
- Pressure from children who’ve developed taste for unhealthy food choices
- Pervasive media saturation of fast food advertising
- Availability and convenience
- Latino parents feel children are healthy, not overweight
Reasons/themes for resistance to a more plant-based diet: Qualitative study findings

**Culture** – For both African American and Latino respondents, meat was integral to their cultural identity. This dynamic was exemplified in the description of family gatherings.

**Food preparation** – A majority of the respondents stated that not knowing how to prepare vegetarian food was a major barrier to adopting a plant-based diet. People felt they did not know how to make a meal made up exclusively of vegetables.
Cost & availability – For most respondents plant-based meals were a less attractive option because of cost & availability.

Meat analog issue – Most expressed strong dislike for the taste and texture. Consensus that meat analogs are high in sodium & fat and unhealthier than meat itself.

Perceived inability to change – Most respondents were unwilling to adopt a more plant-based diet due to lack of motivation, time. To them the potential health benefits did not outweigh the barriers.
Discussion/Implications: Qualitative Study

• Even among persons working or studying at a vegetarian-committed institution (familiar with significant experiences) much resistance to a more plant-based lifestyle was observed.

• To increase the “cultural desirability” of plant-based foods among AAs and Latinos one would need to:
  – Account for deep-rooted cultural and familial eating patterns; cultural notions re: “prestige” and body image (what is healthful)
  – Teach the proper preparation of plant-based foods within cultural contextual tastes and frameworks (presentations, preparation style, traditional recipes)
  – Image makeover: Emphasize how an “average” person can experience the health benefits of plant-based eating to take the place of negative stereotypes associated with vegetarians
  – Unlink vegetarianism from its association with meat analogs
Acknowledgements

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