Adaptation of the NEMS-S to assess a Mexican-American nutrition environment

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Background
- Environmental determinations of diet and health
- Correlated with health indicators
  - body mass index (BMI)
  - presence of CVD and type 2 diabetes risk factors

Food and Diet
- Poor access to affordable fresh food sources worsens diets
  - particularly in low income and minority neighborhoods
- These areas known as food deserts
  - But are they really deserts? Or are we overlooking culturally appropriate foods?

Food Deserts
- "Areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up the full range of a healthy diet" (CDC)

Assessment of Nutrition Environments
- Some objective measurements of nutrition environment developed:
  - Accessibility
  - Quality
  - Cost
  - Healthiness of products sold
- Consumer - community food environ.
  - What consumers encounter within and around retail food outlets

Culture & nutrition environment assessment
- Food plays an important role in maintaining cultural traditions and affirming group identification
- Cultural sensitivity at individual level
- Lack of cultural sensitivity at neighborhood level
NEMS-S — most widely used

- Nutrition Environment Measures Survey in Stores
- Assesses the quality, cost and healthiness of food sold in retail outlets – reliable measure for its purpose and original target population.

NEMS-S critique

- NEMS-S is an excellent tool for suburban, mainstream neighborhoods
- Inappropriate for Latino environment
  - the type of food items included
  - the type of food retail outlets included

Does not include culture-specific items

- Stores in Latino neighborhoods are more likely to stock culturally appropriate foods
- Inclusion of culturally preferred items such as tortillas, tropical fruits would give more accurate picture

Ethnic Markets

- Some ethnic food sources are not captured by existing measures
  - Assumed to have a limited range of products
- However, ethnic food sources
  - sell a variety of products incl. prepared foods
  - are culturally familiar
  - are preferred over supermarkets by some Latinos

Adapted instrument NEMS-S-Mex

- Several sources for formative research to incorporate cultural food patterns and preferences
- Ethnographic data on perceptions of healthy food
- Survey data from ethnic market managers
- National Health and Nutrition Examination Survey (NHANES) food consumption frequency data
- Literature on Mexican foodways
### Adding fruits and vegetables

<table>
<thead>
<tr>
<th>Fruits – original NEMS-S</th>
<th>Fruits added to NEMS-S Mex</th>
<th>Vegetables – original NEMS-S</th>
<th>Vegetables – add NEMS-S Mex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bananas</td>
<td>Grapefruit</td>
<td>Tomatoes</td>
<td>Chayotes and other squashes</td>
</tr>
<tr>
<td>Apples</td>
<td>Papaya</td>
<td>Tomatoes</td>
<td>Chayotes and other squashes</td>
</tr>
<tr>
<td>Oranges</td>
<td>Mango</td>
<td>Sweet peppers (green bell)</td>
<td>Spinach</td>
</tr>
<tr>
<td>Grapes</td>
<td>Plums</td>
<td>Broccoli</td>
<td>Onion</td>
</tr>
<tr>
<td>Cantaloupe</td>
<td>Pineapple</td>
<td>Lettuce</td>
<td>Jicama</td>
</tr>
<tr>
<td>Peaches</td>
<td>Pears</td>
<td>Corn</td>
<td>Nopal</td>
</tr>
<tr>
<td>Strawberries</td>
<td>Cabbage</td>
<td>Celery</td>
<td>Chiles (anahaim, pasilla, poblano)</td>
</tr>
<tr>
<td>Honeydew melon</td>
<td>10 original fruits + 5 cultural</td>
<td>Cabbage</td>
<td>10 original veggies + 7 cultural</td>
</tr>
<tr>
<td>Watermelon</td>
<td>10 original fruits + 5 cultural</td>
<td>Cabbage</td>
<td>10 original veggies + 7 cultural</td>
</tr>
</tbody>
</table>

### NEMS-S-Mex other modifications
- Expanded the typology of food sources – added carnerias, panaderias and other ethnic food stores
- Modifying the indicator food categories to account for cultural food preferences (e.g. adding tortillas)
- Modifying foods within categories (e.g. tropical fruits)
- Defining healthy options for common Latino food items (e.g. corn vs. flour tortillas)
- Altering response options to either match the sizes typically found in ethnic stores or for specific ethnic products and brands

### Next steps
- Inter-rater reliability was tested by having raters independently visit a subsample of food sources to conduct the assessment on the same day.
- Test-retest reliability of the adapted measures was assessed by having a subsample of food sources reassessed within one month after initial observation by the same rater.
- We assessed 34 food outlets in 2 Phoenix communities with significant Latino populations.

### Summary
- Application of the original NEMS-S in some Latino areas would miss the availability of healthy and nutritious foods that are desired and consumed by the residents.
- Healthy versions of foods central to the American diet may be available but is irrelevant to an accurate measure if Latino consumers do not desire or consume these foods.
Food desert or oasis?

It would be misleading to label a nutrition environment deficient, a desert, when judged by mainstream standards of what is healthy and consumed.

Citation


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Thank You!