Associations between Consumer Behavior Habits and Dietary Inflammatory Potential using Data from the National Health and Nutrition Examination Survey (2005-2016)

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Background and Hypotheses

• Chronic inflammation has been associated with numerous chronic diseases including cardiovascular disease and cancer.
• Diet is one of the strongest moderators of chronic inflammation in the body.

The Dietary Inflammatory Index (DII®) is comprised of “food parameters”, each with unhealthier consumer behaviors, respectively.

Pro-inflammatory diets
- High in fats, protein, and simple carbohydrates

Anti-inflammatory diets
- High in fruits and vegetables, whole grains, and fish

The Dietary Inflammatory Index (DII®) quantifies the inflammatory potential of a diet on a scale from anti-inflammatory to pro-inflammatory.

The type of diet an individual consumes is determined by consumer behaviors related to food shopping and food expenditure.

Higher food expenditure tends to be associated with consuming more unhealthy consumer behaviors, respectively.

Methods


Sample Size: Cross-sectional data from 27,438 participants

Outcome variable: DII scores were derived from a 24-hour dietary recall
- DII is comprised of “food parameters”, each with an inflammatory effect score. Participants’ intake for food parameters is standardized to world values, then are multiplied by the inflammatory effect score, and summed to obtain DII® score.
- More negative DII scores are anti-inflammatory and more positive values are pro-inflammatory.

Independent variables: Consumer behavior constructs were assessed using self-report questionnaires

Sample Consumer Behavior Items from NHANES

<table>
<thead>
<tr>
<th>Items</th>
<th>Response options</th>
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<tbody>
<tr>
<td>How often (does your family/do you) have fruits available at home?</td>
<td>Always/Most of the time/Sometimes/Rarely/Never</td>
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<tr>
<td>How often (does your family/do you) have salty snacks such as chips and crackers available at home? Do not include nuts.</td>
<td>Always/Most of the time/Sometimes/Rarely/Never</td>
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Statistical analyses: Using survey design procedures in SAS® (version 9.4, Cary, NC), multiple linear regression analyses were conducted

Results

Overall sample characteristics: Most were female (52%), Non-Hispanic White (67%), and married/living with a partner (64%)

Sample Characteristics N (%) Sex Male 13,389 (48%) Female 14,049 (52%) Race Non-Hispanic White 11,500 (67%) Non-Hispanic Black 5,866 (11%) Mexican-American 4,323 (9%) Other 5,749 (13%) Educational level Less than High School 6,579 (16%) High School 5,913 (22%) Some College or AA degree 7,554 (32%) College or above 5,974 (30%) Marital Status Married/living with partner 15,402 (64%) Widow, divorced, separated 5,797 (18%) Single 4,835 (18%) Income <20,000 6,867 (18%) <35,000 5,277 (16%) <65,000 6,166 (24%) >65,000 7,833 (42%) Consumer behavior and mean DII scores:
- Higher DII® scores were associated with having no fruits or vegetables at home compared to always having fruits or vegetables at home.
- Higher DII® scores were also associated with always having snacks at home versus never having snacks at home.
- Higher DII® scores were observed among those who bought foods because of the ease to prepare the foods.
- Higher DII® scores were associated with eating at restaurants, not using myPyramid, not using nutrition facts labels and not buying organic foods.

Conclusions

These findings suggest that consumers who spend less on grocery food, consume no fruits or vegetables, spend more money dining out, or do not use food nutrition information/education are more likely to consume more pro-inflammatory diets.

Future Studies: More research, especially studies using longitudinal data, are needed to better understand the causal relationships between consumer behaviors related to purchasing of food/meals and inflammatory quality of the diet.