Initial Findings from the Nutrition Services Program Outcomes Evaluation

National Evaluation Results Webinar
The National Resource Center on Nutrition and Aging

September 14, 2017
Administration for Community Living Team

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AoA Nutrition Programs Evaluation Objectives

1. Process study
   – Provide information to support program planning
   – Analyze program structure, administration, staffing, coordination, processes, and service delivery

2. Cost study
   – Estimate the average cost of a congregate and a home-delivered meal
   – Assess variation in costs by select characteristics of local providers

3. Outcomes evaluation (ongoing)
   – Assess program effectiveness in improving food security, socialization, and diet quality
   – Assess program effectiveness in improving longer-term health and delaying or avoiding institutionalization
Objectives of the Outcomes Evaluation

1. Describe participants’ demographic and household characteristics, health status, mobility, eating behaviors, diet quality, food security, and socialization

2. Describe participants’ experiences with and impressions of the program and their valuation of meals and supportive services received through the program

3. Determine the impact of meals and related services on participants’ nutrition, food security, and diet quality

4. Determine the impact of meals and nutrition services on overall wellness and well-being
Study Design of Outcomes Evaluation

1. Sample of LSPs from process and cost studies
2. Selected congregate meal site for each LSP
3. Sampled congregate meal program participants
4. Identified and surveyed nonparticipants with similar demographic and health characteristics
Study Design of Outcomes Evaluation

1. Sample of LSPs from process and cost studies
2. Selected congregate meal site for each LSP
3. Sampled congregate meal program participants
4. Selected home-delivered meal distribution location
5. Sampled distribution route and sampled home-delivered meal participants
6. Identified and surveyed nonparticipants with similar demographic and health characteristics
Data Collection Instruments

- Outcomes survey
  - NSP Participation History, Usage, and Frequency
  - Types of Services Received
  - Recreational and Social Activities Available
  - Information and Referrals Available
  - Impression of Helpfulness of Program
  - Impressions of NSP Services and Meals
  - Participants’ Monetary Contributions
  - Eating Behavior, Diet, Food Preparation
  - Food Security
  - Health Insurance Status, Mobility, Prescriptions
  - Depression, Loneliness, and Social Isolation
  - Demographic Characteristics

- 24-hour dietary recall
  - Automated Self-Administered 24-hour dietary recall (ASA-24) module
  - Administered in-person by interviewer
Survey Timeline and Sample Sizes

Baseline survey with 1,137 participants

Baseline survey with 1,164 nonparticipants

Followup survey with 754 participants and 939 nonparticipants
Outcome Measure: Food Security

• Having access at all times to enough food for an active, healthy life for all household members

• Based on USDA’s six-item food security module based on 30-day recall

• Food insecurity and very low food security
Outcome Measure: Socialization

- Revised UCLA Loneliness Scale (R-UCLA) based on responses to three questions related to how often one feels lack of companionship, left out, and isolated from others
- Patient Health Questionnaire 2 (PHQ-2) based on two questions assessing frequency of depressed mood over past two weeks. Used to screen for depression
- Self-reported satisfaction with opportunities to spend time with other people
Outcome Measure: Diet Quality

- Percentage contribution program meals made to participants’ nutrient intakes
- Usual intakes of vitamins, minerals, and macronutrients relative to recommendations
- Healthy Eating Index 2010 scores (HEI-2010) to assess overall diet quality
Descriptive Analysis Methods

• Describe characteristics of older adults, impressions of program, valuation of meals and services

• Use percentages, means, and medians

• Describe characteristics separately for congregate meal (CM) and home-delivered meal (HDM) participants

• Based on weighted data, participant findings are nationally representative of the population of CM and HDM participants
Characteristics of Program Participants and Impressions of Meals and Services
Demographic Characteristics

• CM and HDM participants similar in terms of gender, veteran status, whether they lived alone, and race and ethnicity
  – More than 2/3rds were women
  – 15 to 17 percent were veterans
  – About 60 percent lived alone
  – 14 to 18 percent non-Hispanic black; 9 to 13 percent Hispanic

• Compared with CM participants, HDM participants were older, had less education, and were more likely to be widowed
  – Average age was 77 (CM) versus 82 (HDM)
  – 24 to 40 percent had not completed high school
  – 47 to 52 percent were widowed

Source: AoA NSP outcomes survey, weighted data, Tables III.1.
Monthly Income Relative to Poverty Guidelines

Source: AoA NSP outcomes survey, weighted data, Tables III.2.
General Health Status

- In fair or poor health: 23 CM participants, 46 HDM participants
- Have experienced trouble eating because of dental issue: 12 CM participants, 26 HDM participants
- Take 3 or more prescription medications daily: 68 CM participants, 82 HDM participants

Source: AoA NSP outcomes survey, weighted data, Tables III.3.
Doctor-Diagnosed Chronic Health Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>CM participants</th>
<th>HDM participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>High blood pressure</td>
<td>70</td>
<td>74</td>
</tr>
<tr>
<td>Medical conditions of the eye</td>
<td>68</td>
<td>69</td>
</tr>
<tr>
<td>Arthritis or rheumatism</td>
<td>60</td>
<td>69</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>57</td>
<td>53</td>
</tr>
<tr>
<td>Breathing or lung problems</td>
<td>39</td>
<td>44</td>
</tr>
<tr>
<td>Heart disease</td>
<td>35</td>
<td>41</td>
</tr>
<tr>
<td>Diabetes or high blood sugar</td>
<td>33</td>
<td>36</td>
</tr>
</tbody>
</table>

Source: AoA NSP outcomes survey, weighted data, Tables III.4.
Diet and Eating Behaviors

Source: AoA NSP outcomes survey, weighted data, Tables III.7 and III.8.
Percentage of Participants on Special or Therapeutic Diets

Source: AoA NSP outcomes survey, weighted data, Table III.7.
Frequency of Participation

CM participants
- 5 or more days: 43%
- 3 to 4 days: 39%
- 1 to 2 days: 18%

HDM participants
- 5 or more days: 71%
- 3 to 4 days: 14%
- 1 to 2 days: 15%

Source: AoA NSP outcomes survey, weighted data, Table III.14.
Food Security

CM participants

- Food secure: 84%
- Food insecure with low food security: 12%
- Food insecure with very low food security: 4%

HDM participants

- Food secure: 77%
- Food insecure with low food security: 16%
- Food insecure with very low food security: 7%

Source: AoA NSP outcomes survey, weighted data, Table III.26.
Adequacy of Income and Food Coping Strategies

Income does not cover needs

Has to choose between buying food and buying medications

Has to choose between buying food and paying utility bills

Has to choose between buying food and paying rent

Would skip meals or eat less in absence of NSP

Source: AoA NSP outcomes survey, weighted data, Table III.29.
Socialization Outcomes

**Very or somewhat satisfied with opportunities to spend time with other people**

- CM participants: 93%
- HDM participants: 81%

**R-UCLA Loneliness Scale Mean Score**

- CM participants: 4.1
- HDM participants: 4.6

**Percentage of participants who screen positively for depression (PHQ-2)**

- CM participants: 7%
- HDM participants: 19%

Source: AoA NSP outcomes survey, weighted data, Table III.36.
Impressions of the NSP

Overall rating of the program

<table>
<thead>
<tr>
<th></th>
<th>CM participants</th>
<th>HDM participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>42</td>
<td>44</td>
</tr>
<tr>
<td>Very good</td>
<td>37</td>
<td>33</td>
</tr>
<tr>
<td>Good</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>Fair</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Poor</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: AoA NSP outcomes survey, weighted data, Table III.32.
Impressions of the NSP Staff

Overall rating of the nutrition program staff

<table>
<thead>
<tr>
<th>Percentage of participants</th>
<th>Excellent</th>
<th>Very good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM participants</td>
<td>62</td>
<td>28</td>
<td>7</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>HDM participants</td>
<td>60</td>
<td>25</td>
<td>13</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: AoA NSP outcomes survey, weighted data, Table III.32.
Impressions of Meal Delivery

Meal arrives at the scheduled time:
- Always: 59
- Usually: 32
- Sometimes: 6
- Seldom: 0
- Never: 0

Delivery person is pleasant:
- Always: 92
- Usually: 5
- Sometimes: 2
- Seldom: 0
- Never: 1

Delivery person spends time talking:
- Always: 16
- Usually: 25
- Sometimes: 23
- Seldom: 23
- Never: 0

Source: AoA NSP outcomes survey, weighted data, Table III.33.
Impressions of Meals

• Many congregate meal participants were satisfied with:
  – Attractiveness of dining area (96 percent)
  – Overall meals (95 percent)
  – Amount of food (91 percent)
  – Proper temperature of food (91 percent)
  – Appearance of food (86 percent)
  – Way food smells (85 percent)
  – Variety of food (84 percent)
  – Taste of food (81 percent)
  – Foods provided (79 percent)
  – Meets special dietary needs or restrictions (73 percent)

• Similar findings for home-delivered meal participants

Source: AoA NSP outcomes survey, weighted data, Table III.35.
Effects of Program Participation on Food Security and Socialization Outcomes
Analysis Methods

• Selected matched comparison group using Medicare records and geography
  – Collected participants’ SSNs as part of outcomes survey
  – Obtained Medicare records for participants
  – Identified potential nonparticipants in same geographic service area with similar characteristics to participants
  – Screened nonparticipants for eligibility
  – Conducted interview with nonparticipants

• Multivariate regression analysis to account for observed differences between participants and nonparticipants

• Propensity-score matching based on machine-learning algorithm
Effects of CM Program Participation on Being Food Insecure or Having Very Low Food Security

Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.1.

***/**/*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.
Effects of HDM Program Participation on Being Food Insecure or Having Very Low Food Security

Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.2.

***/**/*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.
Effects of HDM Program Participation on Being Food Insecure or Having Very Low Food Security, by Number of Meals Received per Week

**Food insecure**

<table>
<thead>
<tr>
<th></th>
<th>HDM participants</th>
<th>HDM nonparticipants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive fewer than 5 delivered meals per week</td>
<td>13.6</td>
<td>3.5***</td>
</tr>
<tr>
<td>Receive 5 or more delivered meals per week</td>
<td>4.6</td>
<td>2.4</td>
</tr>
</tbody>
</table>

**Food insecure with very low food security**

<table>
<thead>
<tr>
<th></th>
<th>HDM participants</th>
<th>HDM nonparticipants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive fewer than 5 delivered meals per week</td>
<td>25.8</td>
<td>15.9***</td>
</tr>
<tr>
<td>Receive 5 or more delivered meals per week</td>
<td>20.4</td>
<td>17.7</td>
</tr>
</tbody>
</table>

***/**/*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.

Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.3.
## Effects of CM Program Participation on Socialization Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Participants</th>
<th>Nonparticipants</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-UCLA loneliness score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average score</td>
<td>4.1</td>
<td>4.1</td>
<td>0.0</td>
</tr>
<tr>
<td>PHQ-2 depression screener questions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage affirmed 4 out of 6</td>
<td>2.3</td>
<td>6.5</td>
<td>-4.2**</td>
</tr>
<tr>
<td>Satisfaction with socialization opportunities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage that were satisfied</td>
<td>94.0</td>
<td>85.8</td>
<td>8.2***</td>
</tr>
<tr>
<td>Percentage that were very satisfied</td>
<td>67.5</td>
<td>55.5</td>
<td>12.0***</td>
</tr>
</tbody>
</table>

Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.4.

**/***/*/Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.
## Effects of HDM Program Participation on Socialization Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Participants</th>
<th>Nonparticipants</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-UCLA loneliness score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average score</td>
<td>4.5</td>
<td>4.3</td>
<td>0.2*</td>
</tr>
<tr>
<td>PHQ-2 depression screener questions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage affirmed 4 out of 6</td>
<td>11.5</td>
<td>11.6</td>
<td>-0.1</td>
</tr>
<tr>
<td>Satisfaction with socialization opportunities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage that were satisfied</td>
<td>82.3</td>
<td>85.7</td>
<td>-3.3</td>
</tr>
<tr>
<td>Percentage that were very satisfied</td>
<td>44.5</td>
<td>53.4</td>
<td>-8.9**</td>
</tr>
</tbody>
</table>

Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.5.

***/**/*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.
### Effects of HDM Program Participation on Socialization Outcomes, by Number of Meals Received per Week

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Participants</th>
<th>Nonparticipants</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R-UCLA loneliness score (average)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receive fewer than five meals</td>
<td>4.6</td>
<td>4.2</td>
<td>0.4*</td>
</tr>
<tr>
<td>Receive five or more meals</td>
<td>4.5</td>
<td>4.3</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Percentage satisfied with socialization opportunities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receive fewer than five meals</td>
<td>79.7</td>
<td>87.2</td>
<td>-7.6**</td>
</tr>
<tr>
<td>Receive five or more meals</td>
<td>84.1</td>
<td>85.2</td>
<td>-1.1</td>
</tr>
<tr>
<td><strong>Percentage very satisfied with socialization opportunities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receive fewer than five meals</td>
<td>34.5</td>
<td>55.0</td>
<td>-20.5***</td>
</tr>
<tr>
<td>Receive five or more meals</td>
<td>49.7</td>
<td>53.0</td>
<td>-3.4</td>
</tr>
</tbody>
</table>

Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.6.

***/***/***/Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.
Diet Quality Analysis
Background on the Diet Quality Analysis

• Objectives of the analysis
  – Describe the quality of participants’ diets
  – Determine the impact of participation on diet quality

• 24-hour dietary recall data
  – Collected detailed information on all foods and beverages consumed during preceding 24 hours
  – Subset of participants and nonparticipants completed 2nd recall
  – Provide data on the amounts of nutrients and food groups consumed over 24 hours
Outcome Measure: Diet Quality

• Percentage contribution program meals made to participants’ nutrient intakes
• Usual intakes of vitamins, minerals, and macronutrients relative to recommendations
• Healthy Eating Index-2010 scores (HEI-2010) to assess overall diet quality
Contribution of Program Meals to Participants’ Daily Nutrient Intakes

• Identified foods consumed from program meals versus other sources

• Both congregate and home-delivered meals contributed substantially to participants’ diets

<table>
<thead>
<tr>
<th></th>
<th>CM participants</th>
<th>HDM participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of daily calories</td>
<td>41</td>
<td>38</td>
</tr>
<tr>
<td>Percentage of daily nutrients</td>
<td>39 to 47</td>
<td>35 to 47</td>
</tr>
</tbody>
</table>

• Program meals made largest contributions to participants’ intakes of protein, vitamin C, vitamin A, alpha-linolenic acid, and sodium

Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table III.9.
Assessing Whether Participants’ Usual Nutrient Intakes Met Recommendations

• Federal nutrition standards provide recommendations for amounts of nutrients to consume
  – Dietary Reference Intakes
  – Dietary Guidelines for Americans

• Nutrient recommendations should be met over time and applied to measures of usual intake

• Estimated usual nutrient intakes using method developed by the National Cancer Institute
  – Provides estimates of the percentage of participants with usual nutrient intakes that met recommendations
Usual Intakes of Vitamins and Minerals

Percentage of participants that met recommendations

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>CM participants</th>
<th>HDM participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>99</td>
<td>98</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>99</td>
<td>95</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>98</td>
<td>96</td>
</tr>
<tr>
<td>Niacin</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>94</td>
<td>93</td>
</tr>
<tr>
<td>Thiamin</td>
<td>86</td>
<td>89</td>
</tr>
</tbody>
</table>

Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table III.11.
Usual Intakes of Vitamins and Minerals (cont.)

Percentage of participants that met recommendations

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>CM participants</th>
<th>HDM participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>77</td>
<td>73</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>76</td>
<td>65</td>
</tr>
<tr>
<td>Folate</td>
<td>72</td>
<td>73</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>55</td>
<td>51</td>
</tr>
<tr>
<td>Magnesium</td>
<td>31</td>
<td>22</td>
</tr>
<tr>
<td>Calcium</td>
<td>26</td>
<td>24</td>
</tr>
</tbody>
</table>

Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table III.11.
Usual Intakes of Macronutrients

Percentage of participants that met recommendations

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>CM participants</th>
<th>HDM participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>76</td>
<td>73</td>
</tr>
<tr>
<td>Total fat</td>
<td>54</td>
<td>59</td>
</tr>
<tr>
<td>Linoleic acid</td>
<td>85</td>
<td>76</td>
</tr>
<tr>
<td>Alpha-linolenic acid</td>
<td>75</td>
<td>51</td>
</tr>
</tbody>
</table>

Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table III.11.
Usual Intakes of Saturated Fat and Sodium

Percentage of participants that met recommendations

Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table III.11.
Healthy Eating Index-2010

• Diet quality index that assesses conformance to the 2010 Dietary Guidelines for Americans

• Consists of 12 components and a total score
  - 9 adequacy components
    • Total fruit
    • Whole fruit
    • Total vegetables
    • Greens and beans
    • Whole grains
    • Dairy
    • Total protein foods
    • Seafood and plant proteins
    • Fatty acids
  - 3 moderation components
    • Refined grains
    • Sodium
    • Empty calories
Healthy Eating Index-2010 (cont.)

• HEI-2010 scoring
  – Each component has a maximum score
  – Scores assigned based on amounts of foods and calories consumed
  – Total score is sum of component scores

• Higher scores indicate better conformance with Dietary Guidelines recommendations and higher diet quality

• Estimated mean HEI-2010 scores using method developed by the National Cancer Institute
  – Scores are expressed as percentage of maximum possible score
Total HEI-2010 Scores

Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table III.13.
### HEI-2010 Scores for Adequacy Components

Higher scores reflect higher consumption.

<table>
<thead>
<tr>
<th>Component</th>
<th>CM Participants</th>
<th>HDM Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole fruit</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total protein foods</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total fruit</td>
<td>97</td>
<td>92</td>
</tr>
<tr>
<td>Seafood and plant proteins</td>
<td>92</td>
<td>75</td>
</tr>
<tr>
<td>Total vegetables</td>
<td>90</td>
<td>87</td>
</tr>
<tr>
<td>Greens and beans</td>
<td>76</td>
<td>53</td>
</tr>
<tr>
<td>Dairy</td>
<td>69</td>
<td>72</td>
</tr>
<tr>
<td>Fatty acids</td>
<td>42</td>
<td>40</td>
</tr>
<tr>
<td>Whole grains</td>
<td>38</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table III.13.
HEI-2010 Scores for Moderation Components

Higher score reflects lower consumption (which is desired)

Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table III.13.
Effects of Program Participation on Diet Quality Outcomes
## Effects of CM Program Participation on Usual Nutrient Intakes

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>CM Participants</th>
<th>CM Nonparticipants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus</td>
<td>99%</td>
<td>98%</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>89***</td>
<td>89**</td>
</tr>
<tr>
<td>Niacin</td>
<td>95%</td>
<td>79**</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>94%</td>
<td>81***</td>
</tr>
<tr>
<td>Zinc</td>
<td>78%</td>
<td>61***</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>77%</td>
<td>59**</td>
</tr>
<tr>
<td>Sodium</td>
<td>37*</td>
<td></td>
</tr>
</tbody>
</table>

### Source
AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table IV.7.

**/***/*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.
Effects of HDM Program Participation on Usual Nutrient Intakes

Percentage of HDM participants and nonparticipants that met recommendations

- Zinc: 78% participants, 59% nonparticipants
- Vitamin B6: 73% participants, 60% nonparticipants
- Vitamin A: 65% participants, 53% nonparticipants
- Total fat: 59% participants, 48% nonparticipants
- Alpha-linolenic acid: 51% participants, 75% nonparticipants

Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table IV.7.

***/**/*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.
Effects of CM and HDM Participation on Overall Diet Quality

• CM participants had significantly higher HEI-2010 scores than nonparticipants for:
  – Total HEI-2010 score (66 versus 59 percent)
  – Total fruit (97 versus 72 percent)
  – Dairy (69 versus 57 percent)
  – Total vegetables (90 versus 78 percent)
  – Refined grains (78 versus 60 percent)

• HDM participants had significantly higher HEI-2010 scores than nonparticipants for:
  – Dairy (72 versus 58 percent)
  – Refined grains (74 versus 64 percent)

Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table IV.8.
Note: All differences between participants and nonparticipants were significantly different from zero at the 0.10 level or lower.
Conclusion
### Summary of Evaluations’ Findings for Key Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>2016 Evaluation</th>
<th>1995 Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Congregate meal program</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants had greater food security than nonparticipants</td>
<td>✓</td>
<td>Not measured</td>
</tr>
<tr>
<td>Participants had higher levels of socialization than nonparticipants</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Participants had higher diet quality than nonparticipants. Program meals made substantial contribution to participants’ diets</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Home-delivered meal program</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants had similar food security as nonparticipants</td>
<td>No effect</td>
<td>Not measured</td>
</tr>
<tr>
<td>Participants had similar levels of socialization as nonparticipants</td>
<td>Mixed</td>
<td>✓</td>
</tr>
<tr>
<td>Participants had higher diet quality than nonparticipants. Program meals made substantial contribution to participants’ diets</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Thank You!

- Mathematica extends our sincere thanks to all of the SUA, AAA, and LSP staff who completed study surveys, provided data for the meal cost analysis, and helped facilitate a successful outcomes survey.

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Evaluation Reports

- Process study report

- Cost study report

- First outcomes evaluation report

- Nutritional quality of program meals issue brief (anticipated fall 2017)

- Second outcomes evaluation report (anticipated summer 2018)
  - Present participants’ healthcare utilization and behavior characteristics
  - Estimate effect of participation on hospital admissions and readmissions, emergency department visits, primary care physician visits, home health episodes, admittance to a skilled nursing facility, admittance to a nursing home, and total Medicare costs