School Meals: Building Blocks for Healthy Children

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IOM Committee on Nutrition Standards for the National School Lunch and Breakfast Programs

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The Task

• Review and assess the food and nutritional needs of school-aged children in the United States using the 2005 *Dietary Guidelines for Americans* and the IOM Dietary Reference Intakes (DRI).

• Use that review as a basis for recommended revisions to the NSLP and SBP Nutrition Standards and Meal Requirements.
The Goal

Development of a set of well-conceived, practical, and economical recommendations for standards that:

• reflect current nutritional science,
• increase the availability of key food groups as appropriate, and
• allow the NSLP and SBP to better meet the nutritional needs of children, foster healthy eating habits, and safeguard children’s health.
Criteria Identified to Guide Setting Nutrition Standards and Meal Requirements

- Consistent with current dietary guidance and nutrition recommendations
- Considered on basis of age-grade groupings consistent with age-gender groups used in reference values & school grade configurations
- Resulting in a simplified menu planning and monitoring process
- Sensitive to program costs and school administrative concerns
Phase I: Develop criteria, propose approach, and assess dietary intakes of schoolchildren for recommending revisions to Nutrition Standards and Meal Requirements

Consider public comment

Phase II: Use criteria and proposed planning method to revise current Nutrition Standards and Meal Requirements

Test methods of setting Nutrient Targets

Propose Nutrient Targets

Propose Meal Requirements

Evaluate consistency with DRIs and DGAs

Select age-grade groups

Consider practicality

Consider administrative concerns

Consider student acceptance

Recommend Nutrient Targets and Meal Requirements

Write menus

Evaluate nutrients offered

Consider costs
Recommendation 1: Nutrient Targets

The Food and Nutrition Service of USDA should adopt the Nutrient Targets as the scientific basis for setting standards for menu planning for school meals but should not adopt a nutrient-based standard for school meal planning and monitoring.
Dietary Reference Intakes (DRIs)

- DRIs are nutrient reference values developed for use in the assessment and planning of diets of healthy people (IOM, 2006)
- Reference values used included: EAR, AI, UL & estimated energy requirement
- DRIs aim is to achieve usual nutrient intake distribution such that there is:
  - Low prevalence of inadequate intakes
  - Low prevalence at risk of excessive intakes
Basis for Revising Terminology

• Current nutrition standards used in menu planning do not necessarily result in meals that are consistent with Dietary Guidelines.

• Thus, the committee developed the concept of Nutrient Targets to replace Nutrition Standards.

• Nutrient Targets are used to set standards consistent with DRIs.

• Nutrient Targets provide the scientific basis, but are only one of the elements comprising menu planning standards.
Key Aspects of Recommended Nutrient Targets

1. Nutrient Targets recommended for development of standards for menu planning, not for menu planning or routine monitoring of nutritional quality of meals.

2. Nutrient targets cover both minimum and maximum calorie levels.

3. Number of specified nutrients increased from 8 to 24 for nutrients and other dietary components.
Recommended Elements

- Nutrient Targets
  Goals for School Meals

- Meal Requirements

- Standards for *Menu Planning*
- Standards for *Meals as Selected*
Menu Pattern Development Process

- Consideration of expanded nutrient list and need to ensure appropriate calorie range, saturated fat and sodium levels
- MyPyramid and Thrifty Food Plan guides
- Baseline menus from SNDA-III
- MenuDevelopment spreadsheets to create modified baseline menus
- Sample menus based on recommended standards
Achieving Balance of Nutrition, Student Acceptance, Practicality and Cost

- Foods in M/MA group
- Amounts of food by meal, by day, by week
- Forms of fluid milk
- Discretionary calories
- Defining whole grains
- Challenges to reducing sodium level
Recommendation 2:
Standards for Menu Planning

To align school meals with the *Dietary Guidelines* for Americans and improve the healthfulness of school meals, the Food and Nutrition Service should adopt standards for menu planning that:

- increase the amounts of fruits, vegetables and whole grains,
- increase the focus on reducing the amounts of saturated fat and sodium provided, and
- set a minimum and maximum level of calories.
Major Change in Approach to Menu Planning

A single approach that combines a food-based meal pattern with 3 nutrient-based specifications:

- minimum and maximum calorie levels,
- maximum saturated fat content, and
- maximum sodium content.
Recommended Changes in Food

• More fruit is specified.
• Fruits and vegetables are not interchangeable.
• Weekly amount of vegetable subgroups are specified for lunch.
• Whole grain-rich foods are defined and minimum amounts specified.
• Selections from food groups must not provide more calories than the maximum (averaged over the 5-day week).
• Commercial products must indicate zero grams of trans fat per serving.
Breakfast Changes:
Minimum Amounts and Types of Food

• ½ cup of fruit increased to 1 cup per day.
• 2 grains or 2 meats/meat alternates or 1 of each changed to a daily average of
  – 1.4 to 2 grains per day plus
  – 1 to 2 meat or meat alternates per day.
(Ranges reflect differences by grade group.)
• At least half of the grains to be whole grain-rich.
• Fat content of milk to be 1% or less.
Lunch Changes:
Minimum Amounts and Types of Food

• ½ to 1 cup per day of fruit and vegetables combined increased to
  – ¾ to 1 cup of vegetables plus
  – ½ to 1 cup of fruit per day.

• No specifications for vegetables changed to
  – Weekly requirements for dark green and orange vegetables and legumes and
  – Limits on starchy vegetables.
Dark Green Vegetables

- Broccoli
- Greens (collards, mustard, kale, turnip)
- Spinach
- Romaine, escarole, dark green leaf lettuce, endive
Orange Vegetables

- Carrots
- Pumpkin
- Sweet Potato
- Winter Squash (Hubbard, acorn, butternut)
Legumes

• Black beans
• Garbanzo beans
• Kidney beans
• Pinto beans

• Black eyed peas
• Split peas
• Soy beans
• Tofu
Limit on Starchy Vegetables

- Corn
- Green Peas
- White Potatoes
Other Vegetables

- Cabbage
- Cauliflower
- Celery
- Cucumbers
- Green or wax beans
- Green or red peppers
- Lettuce, iceberg
- Mushrooms
- Onions
- Tomatoes
- Summer squash
- Zucchini
Additional Lunch Changes:
Minimum Amounts and Types of Food

- 1.8 to 3 oz eq of grains changed to 1.8 to 2.6 oz eq (daily average over 5-day week).
- 1.5 to 3 oz eq of meat/meat alternate changed to 1.6 to 2.4 oz eq (daily average over 5-day week).
- At least half of grains to be whole grain-rich.
- Fat content of milk to be 1% or less.
- Inclusion of unsaturated vegetable oils is encouraged within calorie limits.
Whole Grain-Rich Foods

- Portion size provides at least 1 serving B/G as defined by USDA Buying Guide.
- Product meets at least one of the following criteria:
  - Contains ≥ 8 grams of whole grains per serving.
  - Carries the FDA whole grain health claim on package.
  - Ingredient listing lists whole grain first.
Only Fluid Milk Choices

• Plain low-fat (1%)
• Plain or flavored fat-free (skim)
## Recommended *as Offered* Meal Standards – Elementary School (Grades K-5)

<table>
<thead>
<tr>
<th><strong>Meal Pattern</strong></th>
<th><strong>Breakfast</strong></th>
<th><strong>Lunch</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount of Foods Per Week</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Minimum Per Day)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit (cups)</td>
<td>5 (1)</td>
<td>2.5 (.5)</td>
</tr>
<tr>
<td>Vegetables (cups)</td>
<td>0</td>
<td>3.75 (.75)</td>
</tr>
<tr>
<td>Dark green</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Orange</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Legumes</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Starchy</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>1.25</td>
</tr>
<tr>
<td>Grains, ≥ half whole grain-rich (oz eq)</td>
<td>7–10 (1)</td>
<td>9–10 (1)</td>
</tr>
<tr>
<td>Meats, Beans, Cheese, Yogurt (oz eq)</td>
<td>5 (1)</td>
<td>8–10 (1)</td>
</tr>
<tr>
<td>Fat-free Milk (plain or flavored)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-fat Milk (cups)</td>
<td>5 (1)</td>
<td>5 (1)</td>
</tr>
</tbody>
</table>
### Recommended as Offered Meal Standards: Other Specifications

Daily Amount based on the Average for a 5-Day Week—Elementary School (Grades K–5)

<table>
<thead>
<tr>
<th></th>
<th>Breakfast</th>
<th>Lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min–Max Calories (kcal)</td>
<td>350–500</td>
<td>550–650</td>
</tr>
<tr>
<td>Saturated Fat (% of total calories)</td>
<td>&lt; 10</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>Sodium (mg)</td>
<td>[ ≤ 430]</td>
<td>[ ≤ 640]</td>
</tr>
</tbody>
</table>

[Sodium targets are to be reached by the year 2020.]

*trans fat* Nutrition label must specify zero grams of *trans* fat per serving.
## Recommended as Offered Meal Standards –
### Middle School (Grades 6-8)

<table>
<thead>
<tr>
<th>Meal Pattern</th>
<th>Breakfast</th>
<th>Lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount of Foods Per Week</strong> (Minimum Per Day)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit (cups)</td>
<td>5 (1)</td>
<td>2.5 (.5)</td>
</tr>
<tr>
<td>Vegetables (cups)</td>
<td>0</td>
<td>3.75 (.75)</td>
</tr>
<tr>
<td>Dark green</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Orange</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Legumes</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Starchy</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>1.25</td>
</tr>
<tr>
<td>Grains, ≥ half whole grain-rich (oz eq)</td>
<td>8–10 (1)</td>
<td>9–10 (1)</td>
</tr>
<tr>
<td>Meats, Beans, Cheese, Yogurt (oz eq)</td>
<td>5 (1)</td>
<td>9–10 (1)</td>
</tr>
<tr>
<td>Fat-free Milk (plain or flavored) or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-fat Milk (cups)</td>
<td>5 (1)</td>
<td>5 (1)</td>
</tr>
</tbody>
</table>
### Recommended *as Offered* Meal Standards: Other Specifications

Daily Amount based on the Average for a 5-Day Week—Middle School (Grades 6–8)

<table>
<thead>
<tr>
<th></th>
<th>Breakfast</th>
<th>Lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min–Max Calories (kcal)</td>
<td>400–550</td>
<td>600–700</td>
</tr>
<tr>
<td>Saturated Fat (% of total calories)</td>
<td>&lt; 10</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>Sodium (mg)</td>
<td>([ \leq 470])</td>
<td>([ \leq 710])</td>
</tr>
<tr>
<td><strong>trans</strong> fat</td>
<td>Nutrition label must specify zero grams of <em>trans</em> fat per serving.</td>
<td></td>
</tr>
</tbody>
</table>
### Recommended as Offered Meal Standards – High School (Grades 9–12)

<table>
<thead>
<tr>
<th>Meal Pattern</th>
<th>Breakfast (Minimum Per Day)</th>
<th>Lunch (Minimum Per Day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit (cups)</td>
<td>5 (1)</td>
<td>5 (1)</td>
</tr>
<tr>
<td>Vegetables (cups)</td>
<td>0</td>
<td>5 (1)</td>
</tr>
<tr>
<td>Dark green</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Orange</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Legumes</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Starchy</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>2.5</td>
</tr>
<tr>
<td>Grains, ≥ half whole grain-rich (oz eq)</td>
<td>9–10 (1)</td>
<td>12–13 (2)</td>
</tr>
<tr>
<td>Meats, Beans, Cheese, Yogurt (oz eq)</td>
<td>7–10 (1)</td>
<td>10–12 (2)</td>
</tr>
<tr>
<td>Fat-free Milk (plain or flavored) or Low-fat Milk (cups)</td>
<td>5 (1)</td>
<td>5 (1)</td>
</tr>
</tbody>
</table>
Recommended *as Offered* Meal Standards: Other Specifications

Daily Amount based on the Average for a 5-Day Week—High School (Grades 9–12)

<table>
<thead>
<tr>
<th></th>
<th>Breakfast</th>
<th>Lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min–Max Calories (kcal)</td>
<td>450–600</td>
<td>750–850</td>
</tr>
<tr>
<td>Saturated Fat (% of total calories)</td>
<td>&lt; 10</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>Sodium (mg)</td>
<td>[ ≤ 500]</td>
<td>[ ≤ 740]</td>
</tr>
</tbody>
</table>

[Sodium targets are to be reached by the year 2020.]

*trans* fat

Nutrition label must specify zero grams of *trans* fat per serving.
Recommendation 3:
Standards for Meals as Selected

To achieve a reasonable balance between the goals of reducing waste and preserving the nutritional integrity of school meals, the Food and Nutrition Service, in conjunction with state and local educational agencies and students, should weigh the strengths and limitations of the committee’s two options when setting standards for the meals as selected by the student.
Committee’s Preferred Option for Standards for Meals
As Selected by the Student Under Offer versus Serve

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Breakfast</th>
<th>Lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of items that may be declined</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Required items</td>
<td>1 fruit or juice</td>
<td>1 fruit or vegetable</td>
</tr>
</tbody>
</table>
## Estimated Increases in Food Costs of a Reimbursable Meal Based on Modified Menus

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Assumptions about Student Take-up Rates</th>
<th>Breakfast % increase</th>
<th>Lunch % increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moderate increase in fruit and vegetable selection</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>More optimistic increase in fruit and vegetable selection</td>
<td>23</td>
<td>9</td>
</tr>
</tbody>
</table>
Reasons for Change in the Estimated Food Costs of School Meals Assuming the Adoption of the Recommended Meal Requirements

• Addition of fruits and vegetables, and additional meat or meat alternate*
  – Fruit serving (about $0.14–0.15 per serving)
  – Vegetable serving (about $0.07–0.09 per serving)
• Addition of meat or meat alternates (about $0.30–0.33 per 2 oz serving)
• Whole grain-rich item in place of refined item (increase 3–20%)

Factors Limiting the Precision of Food Cost Estimates

- Students’ food selections under the new Meal Requirements cannot be known in advance.
- Relative shifts in food prices have occurred since the cost data were collected.
- Limitations in the nutrient database limited the ability to find good matches for foods in the modified menus.

NOTE: The menus were selected as “representative” on the basis of foods offered. They are not “better” or “worse” than is typical.
Recommendation 4: Technical Assistance and Monitoring

The Food and Nutrition Service, working together with state agencies, professional organizations, and industry, should provide extensive support to enable food service operators to adapt to the many changes required by revised Meal Requirements.
Types of Support Recommended

- Technical assistance related to menus, ordering, controlling costs, and maintaining quality—including revisions to the *Food Buying Guide*.
- New procedures for monitoring the quality of school meals that
  - Focus on meeting relevant *Dietary Guidelines* and
  - Provide information for continuous quality improvement and for mentoring food service workers to assist in performance improvement.
Facilitating Change

- Stakeholder involvement in planning for change
- Nutrition education and student involvement
- Equipment needs
- Staff training
- Food industry involvement

- Encourage use of cycle menus
- Variety and choice
- Developing bid specifications
- Assuring SFAs have access to effective systems for procuring USDA foods that meet the Dietary Guidelines
Recommendation 5:
Implementation-Available Foods

USDA should work cooperatively with Health and Human Services, the food industry, professional organizations, state agencies, advocacy groups, and parents to develop strategies and incentives to reduce the sodium content of prepared foods and to increase the availability of whole grain-rich products while maintaining acceptable palatability, cost, and safety.
Recommendation 6: Labeling of Whole Grains

The **Food and Drug Administration** should take action to **require labeling** for the **whole grain content of food products**.
Recommendation 7: Evaluation

Relevant agencies in USDA and other federal departments should provide support for the conduct of studies to evaluate the revised Meal Requirements for the School Breakfast Program and the National School Lunch Program.
Recommendation 7a

USDA should continue funding for periodic School Nutrition Dietary Assessment studies, with the intermittent addition of a cost component.
Recommendation 7b

USDA should take the lead in providing funding to conduct well-designed short term studies in varied school settings to better understand how the new Meal Requirements change children’s total and school meal dietary intakes, student participation, food service operations, and cost.
Recommendation 8: Research

The committee recommends that agencies of USDA, of other federal departments, and relevant foundations fund research studies on topics related to the implementation of the new Meal Requirements, children’s acceptance of and participation in school meals, and children’s health.
Acknowledgements

The committee would like to thank the individuals and organizations who educated the committee by submitting and presenting during the two public workshops.

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For More Information

- Fact sheets  
  www.iom.edu/schoolmeals
- Report available to purchase or free download  
  www.nap.edu