Optimizing Nutritional Intake for Restrictive Diets: How to effectively implement elimination diet meal plans

RDs In Practice: Advancing Practice in Pediatric Nutrition

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Objectives

• Discuss a practical approach to implementing therapeutic dietary elimination for management of pediatric EoE

• Review alternative food products available to families following elimination diets

• Learn strategies for successful implementation of an elimination diet
## Nutrition Risk Associated with EoE

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Typical Presentation</th>
<th>Nutrition Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants &amp; Toddlers</td>
<td>Feeding problems</td>
<td>Poor growth, delayed feeding milestones, suboptimal micronutrient intakes</td>
</tr>
<tr>
<td>Children</td>
<td>Vomiting</td>
<td>Feeding refusal, poor growth, inadequate micronutrient intakes</td>
</tr>
<tr>
<td>Teenagers</td>
<td>Abd pain, dysphagia, food impaction</td>
<td>Food avoidance, underweight, inadequate micronutrient intakes</td>
</tr>
</tbody>
</table>

Nutrition Risk Factors Associated with EoE

- Delayed diagnosis
- Elimination of multiple foods from the diet
- Early satiety, poor appetite
- Self limitation of food
- Fear of eating
- Poor compliance to dietary management
- Poor acceptance of alternative foods
Nutrition Risk Associated with EoE

• FA associated with poor growth\textsuperscript{1-3}
  – Wt-for-age & ht-for-age significantly lower than controls
  – Children with ≥ 2 food allergies smaller than those with 1

• Lower energy, protein, calcium and zinc intakes sees in children with FA compared to controls\textsuperscript{1}
  – Difference s/p nutrition counseling no longer significant btw groups

Nutrition Assessment

• Assessment of growth

• Dietary intake and food pattern
  – Dietary exclusions, food preferences, frequency and amount consumed, preparation methods (scratch vs. processed)
  – Typical meal intake and pattern
  – Eating behaviors, feeding practices

• Medical history
  – Co-morbid conditions that may also affect nutritional status
    • E.g., Celiac disease, Diabetes, Metabolic disorder, Ketogenic diet
Types of Elimination Diets

- Directed elimination
  - Positive foods from testing removed
  - SPT &/or Patch
  - Fewest foods eliminated
  - High false negative rate

Types of Elimination Diets

• Empiric elimination
  - 6 Food Elimination
    ▪ Milk, egg, wheat, soy, fish/shellfish, peanuts/tree nuts
    ▪ Fewer EGDs
    ▪ Reintroduction period shorter
  - 4 Food Elimination
    ▪ Milk, egg, wheat, soy
  - Others may eliminate grains (rice, corn), meats (beef, chicken, turkey, pork), legumes as well

Types of Elimination Diets

• **Elemental**
  - Neocate Infant, Neocate Junior, EO28 Splash, Elecare, PurAmino
  - Neocate Nutra – semi-solid
  - Potential barriers to overcome: Compliance, taste and cost
  - May need NGT or G.T.T.

• **Combination**
  - Multiple foods are removed and elemental formula is used to supplement the diet
  - Directed + empiric
Considerations that may preclude initiation of elimination diet

- Poor growth
- Feeding difficulties
- Limited food repertoire, ability to accept new foods
- Acceptance of diet by pt/family, Quality of life

May consider pharmacotherapy with later initiation of elimination diet once nutritional status, food acceptance, and/or feeding skills have improved
Clinic Flow

- **Initial EoE visit with team**
  - Complete initial nutrition assessment
  - Obtain diet hx
  - Start discussion of treatment options

- **F/u EoE visit**
  - Review allergy test results
  - Determine best therapeutic approach
Clinic Flow

• Nutrition Outpt visit
  − Provide in-depth education regarding elimination diet

• F/u EoE visit
  − Monitor intake and growth
  − 3-day food record analysis, if potential nutritional concerns identified

• Ongoing support via telephone & email
Education

- What to avoid
- Label reading
- Foods allowed
- Foods allowed that are already present in diet
- Alternative foods
- Calcium rich
- Sample meal plan
Reviewing what foods to avoid

- Start with the basics
- Assure no further restrictions are made than necessary
  - Examples:
    - Highly processed soy oil & soy lecithin (however, avoid expeller pressed, cold pressed and extruded oil)\(^1\)
    - Corn syrup and corn derivatives (dextrose, citric acid, etc.)
    - This may result in avoidance of many processed foods that are allowed on the diet

Food Labels

• Food Allergen Labeling and Consumer Protection Act (FALCPA)

Under the FALCPA, food labels are required by the FDA to clearly state the presence of the top 8 allergens: egg, wheat, milk, soy, peanut, tree nuts, fish, crustacean shellfish. Labels have to include either of the following:

1. Common name in the ingredient list
2. Include the allergen name in parenthesis after the ingredient Example: whey (milk)
3. A “Contains statement” after or next to the ingredient list Example: Contains wheat, milk

*These requirements apply to any flavoring, coloring, spice or incidental additive

• Always review food labels – ingredients may change

• The statements, “May contain…,” “Processed on shared equipment with…,” and “Manufactured in a plant that also produces…” are not regulated by the FDA
  - Contact manufacturer for more information
Food Allowed

• What is the patient already consuming that they may continue to eat
• Review alternative foods in each food group
• Suggest substitutions of similar foods
Meal Planning: Back to the Basics

- Protein source
- Grains/starches
- Healthy fats
- Fruit/vegetables
- Calcium rich food source
# Nutrient Tables

<table>
<thead>
<tr>
<th>Food</th>
<th>Nutrients</th>
<th>Alternative Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>Protein, fat, vitamin A, vitamin D, riboflavin, pantothenic acid, vitamin B&lt;sub&gt;12&lt;/sub&gt;, calcium, phosphorus</td>
<td>liver, fortified milk alternatives, fortified margarine, dark green vegetables, orange fruit and vegetables</td>
</tr>
<tr>
<td>Egg</td>
<td>Protein, vitamin B&lt;sub&gt;12&lt;/sub&gt;, riboflavin, pantothenic acid, biotin, selenium</td>
<td>Self-synthesis from sunlight; fortified dairy alternatives, fortified margarine, liver</td>
</tr>
<tr>
<td>Soy</td>
<td>Protein, thiamin, riboflavin, pyridoxine, folate, calcium, phosphorus, magnesium, iron, zinc</td>
<td>Polyunsaturated plant oils, leafy greens, whole-grain products, seeds</td>
</tr>
<tr>
<td>Wheat</td>
<td>Thiamin, riboflavin, niacin, iron, folate</td>
<td>Pork, beef, liver, whole or enriched grains, legumes</td>
</tr>
<tr>
<td>Peanut/Tree nuts</td>
<td>Protein, fat, vitamin E, niacin, magnesium, manganese, chromium</td>
<td>Meat, leafy greens, whole or enriched grains and cereals</td>
</tr>
<tr>
<td>Fish/Shellfish</td>
<td>Protein, ω-3 FA, vitamin A, vitamin D, vitamin B&lt;sub&gt;12&lt;/sub&gt;</td>
<td>Folic acid, Liver, leafy greens, legumes, seeds, yeast</td>
</tr>
</tbody>
</table>

**Not as helpful when avoiding multiple foods. More useful when trying to increase a certain nutrient.**

Mofidi S. *Pediatr.* 2003;111:1645-1653
Meal Planning using Exchanges

<table>
<thead>
<tr>
<th>Daily Amount of Food From Each Group</th>
<th>1,000</th>
<th>1,200</th>
<th>1,400</th>
<th>1,600</th>
<th>1,800</th>
<th>2,000</th>
<th>2,200</th>
<th>2,400</th>
<th>2,600</th>
<th>2,800</th>
<th>3,000</th>
<th>3,200</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calorie Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruits</td>
<td>1 cup</td>
<td>1 cup</td>
<td>1.5 cups</td>
<td>1.5 cups</td>
<td>1.5 cups</td>
<td>2 cups</td>
<td>2 cups</td>
<td>2 cups</td>
<td>2 cups</td>
<td>2.5 cups</td>
<td>2.5 cups</td>
<td>2.5 cups</td>
</tr>
<tr>
<td>Vegetables</td>
<td>1 cup</td>
<td>1.5 cups</td>
<td>1.5 cups</td>
<td>2 cups</td>
<td>2.5 cups</td>
<td>2.5 cups</td>
<td>3 cups</td>
<td>3 cups</td>
<td>3.5 cups</td>
<td>3.5 cups</td>
<td>4 cups</td>
<td>4 cups</td>
</tr>
<tr>
<td>Grains</td>
<td>3 oz-eq</td>
<td>4 oz-eq</td>
<td>5 oz-eq</td>
<td>5 oz-eq</td>
<td>6 oz-eq</td>
<td>6 oz-eq</td>
<td>7 oz-eq</td>
<td>8 oz-eq</td>
<td>9 oz-eq</td>
<td>10 oz-eq</td>
<td>10 oz-eq</td>
<td>10 oz-eq</td>
</tr>
<tr>
<td>Meat and Beans</td>
<td>2 oz-eq</td>
<td>3 oz-eq</td>
<td>4 oz-eq</td>
<td>5 oz-eq</td>
<td>5.5 oz-eq</td>
<td>6 oz-eq</td>
<td>6.5 oz-eq</td>
<td>6.5 oz-eq</td>
<td>7 oz-eq</td>
<td>7 oz-eq</td>
<td>7 oz-eq</td>
<td>7 oz-eq</td>
</tr>
<tr>
<td>Milk</td>
<td>2 cups</td>
<td>2 cups</td>
<td>2 cups</td>
<td>3 cups</td>
<td>3 cups</td>
<td>3 cups</td>
<td>3 cups</td>
<td>3 cups</td>
<td>3 cups</td>
<td>3 cups</td>
<td>3 cups</td>
<td>3 cups</td>
</tr>
<tr>
<td>Oils</td>
<td>3 tsp</td>
<td>4 tsp</td>
<td>4 tsp</td>
<td>5 tsp</td>
<td>5 tsp</td>
<td>6 tsp</td>
<td>6 tsp</td>
<td>7 tsp</td>
<td>8 tsp</td>
<td>8 tsp</td>
<td>10 tsp</td>
<td>11 tsp</td>
</tr>
<tr>
<td>Discretionary calorie allowance</td>
<td>165</td>
<td>171</td>
<td>171</td>
<td>132</td>
<td>195</td>
<td>267</td>
<td>290</td>
<td>362</td>
<td>410</td>
<td>426</td>
<td>512</td>
<td>648</td>
</tr>
</tbody>
</table>

Meal planning

<table>
<thead>
<tr>
<th>FOOD GROUPS</th>
<th>EXAMPLES &amp; SERVING SIZES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breads, Grains, &amp; Cereals</td>
<td></td>
</tr>
<tr>
<td>6-10 of these choices</td>
<td></td>
</tr>
<tr>
<td>Choose whole grains more often</td>
<td></td>
</tr>
<tr>
<td>Whole grains or products made from the following:</td>
<td></td>
</tr>
<tr>
<td>Amaranth, arrowroot, buckwheat, cassava, millet, quinoa, sorghum, tapioca, teff,</td>
<td></td>
</tr>
<tr>
<td>If allowed: barley, corn, oats, rice, rye</td>
<td></td>
</tr>
<tr>
<td>Bread, tortilla, roll, muffin, pancake, waffle – ½</td>
<td></td>
</tr>
<tr>
<td>Dry cereal – ½ cup</td>
<td></td>
</tr>
<tr>
<td>Noodles, cooked cereal – ¼ cup</td>
<td></td>
</tr>
<tr>
<td>Crackers – 3 small</td>
<td></td>
</tr>
<tr>
<td>Proteins</td>
<td></td>
</tr>
<tr>
<td>2-4 of these choices</td>
<td></td>
</tr>
<tr>
<td>Animal protein (if allowed):</td>
<td></td>
</tr>
<tr>
<td>Meat, chicken, turkey – 1 ounce (2 rounded Tablespoons)</td>
<td></td>
</tr>
<tr>
<td>Vegetable protein:</td>
<td></td>
</tr>
<tr>
<td>Cooked beans, peas, lentils (if allowed) – ¼ cup</td>
<td></td>
</tr>
<tr>
<td>Seed butter – 1 Tablespoon</td>
<td></td>
</tr>
<tr>
<td>Elemental formula:</td>
<td></td>
</tr>
<tr>
<td>Elecare Jr, Neocate Junior, – ½ cup</td>
<td></td>
</tr>
<tr>
<td>Neocate Nutra – ½ cup</td>
<td></td>
</tr>
<tr>
<td>Milk Alternative</td>
<td></td>
</tr>
<tr>
<td>4 of these choices</td>
<td></td>
</tr>
<tr>
<td>Calcium enriched coconut, hemp, oat, potato or rice milk (if allowed) – ½ cup</td>
<td></td>
</tr>
<tr>
<td>Elemental formula: Elecare Jr, Neocate Junior – ½ cup</td>
<td></td>
</tr>
<tr>
<td>If these are not accepted, a calcium supplement may be recommended</td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
</tr>
<tr>
<td>1 – 1 ½ cups</td>
<td></td>
</tr>
<tr>
<td>Asparagus, beets, bell peppers, broccoli, brussel sprouts, cabbage, carrots, cauliflower, celery, cucumber, leafy greens, mushrooms, onions, squash, string beans, sweet potato</td>
<td></td>
</tr>
<tr>
<td>If allowed: beans, corn, peas, potato</td>
<td></td>
</tr>
<tr>
<td>Cooked or raw – ½ cup</td>
<td></td>
</tr>
<tr>
<td>Choose a variety of colors each day.</td>
<td></td>
</tr>
<tr>
<td>Fruits</td>
<td></td>
</tr>
<tr>
<td>1 – 1 ½ cups</td>
<td></td>
</tr>
<tr>
<td>Apples, apricots, avocado, bananas, berries, grapes, kiwi, oranges, mango, melons, nectarines, papaya, peaches, pears, pineapple, plums</td>
<td></td>
</tr>
<tr>
<td>Fresh, frozen or canned – ¼ - ½ cup</td>
<td></td>
</tr>
<tr>
<td>Juice – limit to ½ cup per day</td>
<td></td>
</tr>
<tr>
<td>Oils</td>
<td></td>
</tr>
<tr>
<td>3 – 4 teaspoons</td>
<td></td>
</tr>
<tr>
<td>Canola, olive, safflower, vegetable</td>
<td></td>
</tr>
</tbody>
</table>
Breads, Grains, & Cereals

Choose whole grains or products made from the following:

- Amaranth, arrowroot, buckwheat, cassava, millet, quinoa, sorghum, tapioca, teff
- If allowed: barley, corn, oats, rice, rye

<table>
<thead>
<tr>
<th></th>
<th>1 - 3 year</th>
<th>4 – 6 year</th>
<th>7 – 10 year</th>
<th>11 – 18 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread, tortilla, roll,</td>
<td>6-10 servings</td>
<td>5-6 servings</td>
<td>5-6 servings</td>
<td>7-10 servings</td>
</tr>
<tr>
<td>muffin, pancake</td>
<td>½</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Dry Cereal</td>
<td>½ cup</td>
<td>1 cup</td>
<td>1 cup</td>
<td>1 cup</td>
</tr>
<tr>
<td>Noodles, cooked</td>
<td>¼ cup</td>
<td>½ cup</td>
<td>½ cup</td>
<td>½ cup</td>
</tr>
<tr>
<td>cereal/grain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crackers</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>
Wheat Alternatives

• Amaranth, arrowroot, barley, buckwheat, corn, lentil/pea flour, oats, potato, quinoa, rice, rye, soy, sago, tapioca, teff

• Can use Gluten free products
  – Still need to check ingredient label
  – May contain soy or egg

• Watch out for stores advertising Kamut, spelt and triticale as wheat free or wheat alternatives

• Note that not all products are fortified like their wheat counterparts
## Nutrient Content of Alternative Grains

<table>
<thead>
<tr>
<th>Grain (1 cup raw)</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
<th>Magnesium (mg)</th>
<th>Zinc (mg)</th>
<th>Thiamine (mg)</th>
<th>Riboflavin (mg)</th>
<th>Niacin (mg)</th>
<th>Folate (µg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amaranth</td>
<td>307</td>
<td>14.7</td>
<td>479</td>
<td>5.5</td>
<td>0.22</td>
<td>0.39</td>
<td>1.8</td>
<td>158</td>
</tr>
<tr>
<td>Brown rice</td>
<td>63</td>
<td>3.4</td>
<td>272</td>
<td>3.8</td>
<td>0.79</td>
<td>0.08</td>
<td>8.2</td>
<td>38</td>
</tr>
<tr>
<td>Buckwheat</td>
<td>31</td>
<td>3.7</td>
<td>393</td>
<td>4.1</td>
<td>0.17</td>
<td>0.72</td>
<td>11.9</td>
<td>51</td>
</tr>
<tr>
<td>Millet</td>
<td>16</td>
<td>6</td>
<td>228</td>
<td>3.4</td>
<td>0.84</td>
<td>0.58</td>
<td>9.4</td>
<td>170</td>
</tr>
<tr>
<td>Oat</td>
<td>84</td>
<td>7.4</td>
<td>276</td>
<td>6.2</td>
<td>1.2</td>
<td>0.2</td>
<td>1.5</td>
<td>87</td>
</tr>
<tr>
<td>Quinoa</td>
<td>80</td>
<td>7.8</td>
<td>335</td>
<td>5.3</td>
<td>0.61</td>
<td>0.54</td>
<td>2.6</td>
<td>313</td>
</tr>
<tr>
<td>Sorghum</td>
<td>25</td>
<td>6.5</td>
<td>317</td>
<td>3.2</td>
<td>0.64</td>
<td>0.18</td>
<td>7.1</td>
<td>38</td>
</tr>
<tr>
<td>Teff</td>
<td>347</td>
<td>14.7</td>
<td>355</td>
<td>7.0</td>
<td>0.75</td>
<td>0.52</td>
<td>6.5</td>
<td>--</td>
</tr>
<tr>
<td>Wheat</td>
<td>65</td>
<td>6.8</td>
<td>276</td>
<td>8.0</td>
<td>0.80</td>
<td>0.23</td>
<td>12.9</td>
<td>83</td>
</tr>
</tbody>
</table>

Some Favorite Alternatives

- Bob’s Red Mill Gluten free product line
  - Whole grains (millet, teff, sorghum, amaranth)
  - Single grain flours & starches (buckwheat, teff, tapioca)
- Namaste baking mixes & pasta meals
- Arrowhead Mills All purpose baking mix, & whole grains
- Food for Life rice breads
Some Favorite Alternatives

• Pocono (manufactured in a GF facility)
  – Buckwheat flour
  – Cream of Buckwheat cereal

• General Mills cereal (CHEX, Kix, Lucky Charms, Trix)

• Enjoy Life granolas, cereals and bars

• King Arthur GF pancake mix

• Nature’s Path Buckwheat waffles
Some Favorite Alternatives

• Tinkyada rice pastas
• DeBoles rice plus golden flax angel hair pasta
• Ian’s Mac & No Cheese
• Simple truth multigrain rice crackers
• Lundberg rice cakes
Proteins

Animal protein (if allowed):
• Beef, chicken, turkey, ham
• Wild game (elk, venison)
• Bison
• Lamb

Vegetable protein:
• Cooked beans, peas, lentils (if allowed)
• Seed butter, seeds (sunflower, pepitas)

Elemental formula:
• Elecare Jr, Neocate Junior, Neocate Splash
# Protein Recommendations for Children Following Vegan Diet

<table>
<thead>
<tr>
<th>Age</th>
<th>Adjusted Protein Needs (g/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 yr</td>
<td>1.4-1.5</td>
</tr>
<tr>
<td>2-3 yr</td>
<td>1.3-1.4</td>
</tr>
<tr>
<td>4-6 yr</td>
<td>1.1-1.2</td>
</tr>
<tr>
<td>6-8 yr</td>
<td>1.1</td>
</tr>
<tr>
<td>9-13 yr</td>
<td>1.1</td>
</tr>
<tr>
<td>14-18 yr Males</td>
<td>1.0</td>
</tr>
<tr>
<td>14-18 yr Females</td>
<td>1.0</td>
</tr>
</tbody>
</table>

## Recommended Daily Servings & Serving Size

<table>
<thead>
<tr>
<th>Food</th>
<th>1 - 3 year</th>
<th>4 – 6 year</th>
<th>7 – 10 year</th>
<th>11 – 18 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat, poultry</td>
<td>2-4 servings</td>
<td>2-3 servings</td>
<td>2-3 servings</td>
<td>3 servings</td>
</tr>
<tr>
<td>Beans, peas, lentils</td>
<td>1 ounce</td>
<td>2 ounces</td>
<td>2 ounces</td>
<td>2-3 ounces</td>
</tr>
<tr>
<td>Seed butter</td>
<td>1 TBS</td>
<td>2 TBS</td>
<td>2 TBS</td>
<td>2-4 TBS</td>
</tr>
<tr>
<td>Elemental formula</td>
<td>½ cup</td>
<td>1 cup</td>
<td>1 cup</td>
<td>1 cup</td>
</tr>
<tr>
<td>Neocate Nutra</td>
<td>¼ cup</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Some Favorite Alternatives

• Applegate chicken nuggets, deli meats, sausage, hot dogs
• Ian’s chicken strips, turkey corn dogs and chicken nuggets
• Open Nature chicken sausage
• Ground bison
• Dried lentils
• SunButter
• Pepitas
Milk Alternatives

- Enriched coconut, hemp, oat, potato & rice milk
- Elemental formula (Elecare Jr, Neocate Junior, Neocate Splash)

<table>
<thead>
<tr>
<th></th>
<th>1 - 3 year</th>
<th>4 – 6 year</th>
<th>7 – 10 year</th>
<th>11 – 18 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium enriched</td>
<td>4 servings</td>
<td>3-4 servings</td>
<td>3 servings</td>
<td>3 servings</td>
</tr>
<tr>
<td>beverage</td>
<td>½ cup</td>
<td>¾ cup</td>
<td>1 cup</td>
<td>1 cup</td>
</tr>
<tr>
<td>Elemental formula</td>
<td>½ cup</td>
<td>¾ cup</td>
<td>1 cup</td>
<td>1 cup</td>
</tr>
</tbody>
</table>
# Milk Alternatives

<table>
<thead>
<tr>
<th></th>
<th>Whole milk</th>
<th>Skim milk</th>
<th>Soy milk, enriched</th>
<th>Soy milk enriched</th>
<th>Rice milk, enriched</th>
<th>Coconut milk, enriched*</th>
<th>Hemp milk, enriched**</th>
<th>Almond milk, enriched</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy (kcal)</strong></td>
<td>152</td>
<td>83</td>
<td>105</td>
<td>132</td>
<td>113</td>
<td>75</td>
<td>100-140</td>
<td>70</td>
</tr>
<tr>
<td><strong>Protein (g)</strong></td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td><strong>Fat (g)</strong></td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td><strong>Calcium (mg)</strong></td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>60</td>
<td>300</td>
<td>100-300</td>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td><strong>Phosphorus (mg)</strong></td>
<td>200</td>
<td>250</td>
<td>100</td>
<td>125</td>
<td>130</td>
<td>---</td>
<td>---</td>
<td>20</td>
</tr>
<tr>
<td><strong>Vitamin D (D&lt;sub&gt;2&lt;/sub&gt; + D&lt;sub&gt;3&lt;/sub&gt;) (µg)</strong></td>
<td>3.2</td>
<td>2.9</td>
<td>2.7</td>
<td>0</td>
<td>2.4</td>
<td>2.5-3</td>
<td>2-3</td>
<td>2.4</td>
</tr>
<tr>
<td><strong>Vitamin A, RAE (µg)</strong></td>
<td>115</td>
<td>150</td>
<td>135</td>
<td>0</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td><strong>Vitamin B-12 (µg)</strong></td>
<td>1.1</td>
<td>1.2</td>
<td>2.1</td>
<td>0</td>
<td>1.5</td>
<td>1.5-3</td>
<td>1.5</td>
<td>3</td>
</tr>
</tbody>
</table>


*Average of So Delicious Coconut milk and Coconut Dream

**Average of Living Harvest Hemp milk and Pacific Foods Hemp milk
Daily Values

- Educate on reading Food Label/Daily Values

- Examples
  - Calcium: 20% Daily Value
    - Daily Value set at 1,000mg
    - $1,000\text{mg} \times 20\% = 200\text{mg}$ per serving

  - Vitamin D: 30% Daily Value
    - Daily Value set at 400 IU
    - $400\text{IU} \times 0.3 = 120\text{IU}$ (3µg)
Milk Alternatives

- Infants – elemental formulas
- Toddler – elemental formula or fortified soy beverage*
- Older child - Enriched rice, soy, coconut, hemp or nut milks*
  - Rice and coconut milks low in protein and fat – make sure adequate intake from other sources
  - Include calcium rich foods – dark green leafy vegetables, fortified juices, fortified cereals and breads, fortified tofu*, beans, broccoli, almonds*
  - May need calcium supplement with vitamin D

*if allowed on diet
Arsenic and Rice Products

- ESPGHAN and NASPGHAN recommend avoidance of rice drinks in infants and young children R/t inorganic arsenic.
- Arsenic content in rice ranges from 2.6-7.2µg per serving
  - Instant rice being the lowest end of range, brown rice the highest
- Arsenic content in rice products ranges from 0.1-6.6µg per serving
  - Infant formula being the lowest end of range, pasta the highest
- Rice drinks: 3.3µg/serving


U.S. Food and Drug Administration

CHOC Children's.
Dairy Free Favorites

- So Delicious coconut milk yogurt
  - Unsweetened & Greek style provides 2µg vitamin D per 4oz
- Smart Balance light (twin pack), Smart Balance Light with EVOO (2µg vitamin D per 1TBS)
- Earth Balance soy free spreads
- Daiya Cheese
  - Low nutritional value
- Go Vegie Dairy free cheese
  - 200mg Calcium per slice
Vegetables & Fruits

Asparagus, beets, bell peppers, broccoli, brussel sprouts, cabbage, carrots, cauliflower, celery, cucumber, leafy greens, mushrooms, onions, squash, string beans, sweet potato

- *If allowed: beans, corn, peas, potato*

Apples, apricots, avocado, bananas, berries, grapes, kiwi, oranges, mango, melons, nectarines, papaya, peaches, pears, pineapple, plums

- Choose a variety of colors each day
## Recommended Serving Size and Servings per day

<table>
<thead>
<tr>
<th></th>
<th>1 - 3 year</th>
<th>4 – 6 year</th>
<th>7 – 10 year</th>
<th>11 – 18 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooked or raw</td>
<td>1-1.5 cups</td>
<td>1.5-2 cups</td>
<td>2-2.5 cups</td>
<td>2.5 -4 cups</td>
</tr>
<tr>
<td></td>
<td>¼ - ½ cup</td>
<td>½ cup</td>
<td>½ - 1 cup</td>
<td>½ - 1 cup</td>
</tr>
<tr>
<td>Fresh, frozen, canned</td>
<td>1-1.5 cups</td>
<td>1-1.5 cups</td>
<td>1.5-2 cups</td>
<td>1.5-2.5 cups</td>
</tr>
<tr>
<td></td>
<td>¼ - ½ cup</td>
<td>½ cup</td>
<td>½ - 1 cup</td>
<td>½ - 1 cup</td>
</tr>
<tr>
<td>Juice</td>
<td>Limit to ½ cup/day</td>
<td>Limit to ½ cup/day</td>
<td>Limit to ¾ cup/day</td>
<td>Limit to 1 cup/day</td>
</tr>
</tbody>
</table>

Limit to ½ cup/day in cooked or raw form, ¼ - ½ cup in fresh, frozen, and canned form.
Oils

- Canola, olive, safflower, vegetable, grapeseed, flaxseed
- Seeds, seed butter
- Avocado
- Olives
- Allergen free salad dressings, mayo, margarine

Recommended Daily amount

<table>
<thead>
<tr>
<th></th>
<th>1 - 3 year</th>
<th>4 – 6 year</th>
<th>7 – 10 year</th>
<th>11 – 18 year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-4 tsp</td>
<td>4-5 tsp</td>
<td>4-6 tsp</td>
<td>5-10 tsp</td>
</tr>
</tbody>
</table>
## Amount of oil in foods

<table>
<thead>
<tr>
<th>Food</th>
<th>Amount of food</th>
<th>Amount of oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetable oil</td>
<td>1 tsp</td>
<td>1 tsp</td>
</tr>
<tr>
<td>Salad dressing</td>
<td>1 TBS</td>
<td>1 tsp</td>
</tr>
<tr>
<td>Seed butter</td>
<td>1 TBS</td>
<td>2 tsp</td>
</tr>
<tr>
<td>Seeds</td>
<td>1 oz</td>
<td>3 tsp</td>
</tr>
<tr>
<td>Dairy-free margarine</td>
<td>1 TBS</td>
<td>2 ½ tsp</td>
</tr>
<tr>
<td>Avocado</td>
<td>½ med</td>
<td>3 tsp</td>
</tr>
<tr>
<td>Olives</td>
<td>4 large</td>
<td>½ tsp</td>
</tr>
<tr>
<td>Egg-free, soy-free mayo</td>
<td>1 TBS</td>
<td>1 tsp</td>
</tr>
</tbody>
</table>

Choosemyplate.gov, accessed 1/12/15.
FIGURE 3-3. Fatty Acid Profiles of Common Fats and Oils

- **Saturation**
  - Coconut oil, palm kernel oil, and palm oil are called oils because they come from plants. However, they are semi-solid at room temperature due to their high content of short-chain saturated fatty acids. They are considered solid fats for nutritional purposes.

- **Monounsaturated**
  - Partially hydrogenated vegetable oil shortening, which contains trans fats.

- **Polyunsaturated**
  - Most stick margarines contain partially hydrogenated vegetable oil, a source of trans fats.

- **Solid fats**
  - Coconut oil, palm kernel oil, palm oil, butter, beef fat (tallow), pork fat (lard), chicken fat, shortening, stick margarine.

- **Oils**
  - Cottonseed oil, soft margarine, peanut oil, soybean oil, olive oil, corn oil, sunflower oil, canola oil, safflower oil.

d. The primary ingredient in soft margarine with no trans fats is liquid vegetable oil.

Condiment Favorites

• Coconut Aminos
• Follow Your Heart soy free vegenaise and salad dressings
• Earth Balance mayo
• Make your own mock Ranch dressing or Balsamic dressing (see choc.org/eoe/nutrition for recipes)
### Sample Meal Plan – 8yo active Male

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>1 ounce Grains</th>
<th>1 small buckwheat pancake with 1 Tablespoon syrup, 1 tsp margarine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>½ cup Fruit</td>
<td>½ medium banana</td>
</tr>
<tr>
<td></td>
<td>½ cup Milk Alternative</td>
<td>½ cup hemp milk, enriched</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Morning Snack</th>
<th>Snack Mix:</th>
<th>1 cup wheat-free cereal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>½ cup Fruit</td>
<td>¼ cup dried fruit</td>
</tr>
<tr>
<td></td>
<td>1 ounce Protein</td>
<td>2 Tablespoons sunflower seeds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lunch</th>
<th>1 ounce Grains</th>
<th>2 ounce Protein</th>
<th>Turkey roll-up:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 cup milk Alternative</td>
<td>1 corn tortilla</td>
<td>1 cup sprouts, 2 cucumber slices, ¼ avocado</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Afternoon Snack</th>
<th>½ cup Fruit</th>
<th>½ cup Vegetables</th>
<th>½ cup Milk Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>½ cup sliced strawberries</td>
<td>½ cup sugar snap peas</td>
<td>½ cup coconut-milk yogurt</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dinner</th>
<th>2 ounce Grains</th>
<th>2 ounce Protein</th>
<th>1 cup Vegetables</th>
<th>1 cup Milk Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 cup rice</td>
<td>½ cup red lentil curry</td>
<td>1 cup sautéed green peas &amp; cauliflower</td>
<td>1 cup hemp milk, enriched</td>
</tr>
</tbody>
</table>

**Percentage of Calories**
- 10% Protein
- 65% CHO
- 25% Fat

**Provides 1600 kcal, 42gm Pro**
- Meets/exceeds DRI for EFAs, Calcium, Iron, Vitamin A, B vitamins, Vitamin C, Vitamin E, Zinc, Magnesium

**Depending on products used, vitamin D intake may be difficult to meet DRI. Current example meeting 77% DRI**

Data analyzed using Nutritionist Pro Diet Analysis (Axxya Systems, Stafford, TX)
Sample Meal ideas

• Breakfast
  – Oatmeal, fruit, hemp milk
  – Smoothie (Elemental formula, fruit, ground flax seed)
  – GF waffles, fruit, coconut milk
  – Chia seed pudding with fruit and pepitas
  – Rice bread toast with dairy-free margarine, coconut milk yogurt, fruit

• Lunch
  – Cold rice pastas with veggies and chicken, fruit, EO28 Splash
  – SunButter sandwich with rice bread, veggie sticks, corn chips, water
  – Homemade soup or chili in thermos, veggie sticks, rice crackers, coconut milk
  – Turkey avocado wraps, apple slices, potato chips, calcium enriched juice
Sample Meal Ideas

• Dinner
  − Pot roast, salad with homemade vinaigrette dressing, hemp milk
  − Veggie stir fry with rice noodles, fruit salad, coconut milk
  − Tacos with ground meet or beans, avocado, salsa, salad, rice milk
  − Rice pasta with marinara and chicken sausage, steamed broccoli, coconut milk
  − Soup, homemade wheat-free biscuits, veggies and dip, hemp milk
  − Daiya pizza, salad with homemade ranch dressing, water
Example Snack Ideas

• Snacks
  – Hummus or bean dip and veggies or corn chips
  – Snack mix (wheat-free cereal, Enjoy-life chocolate chips, dried fruit, pepitas)
  – Pumpkin seed or sunflower seed butter with fruit, celery or rice crackers
  – Deli meat slices with rice crackers
  – Smoothies
  – Homemade granola bars or muffins
Tips for Success

• Invite other caregivers to education session
• Direct pt/family to helpful resources
  • Support groups, websites
• Have family bring in food packages to review labels or ask questions
• Peer support
  – Connect families with those who have been through the elimination process
• Provide sample products & brochures during visit if able
Tips for Success

• Allow time for planning and prep before starting diet
  • Experiment with allergen friendly foods/recipes
  • Review recipes in basic cookbook
  • Visit grocery store to get ideas

• Allow few hours for first shopping trip

• Purchase majority of foods from usual grocery, then a few specialty items from on-line or specialty store
Tips for Success

• Stock pantry/freezer
  • Canned beans, corn, rice, fruit cup, etc.
  • Frozen allergen friendly meals
• Focus on foods that are allowed
• Keep mealtime as normal as possible
• Involve child in shopping, food prep
• Pack food when out and about
  - Elemental formula, bars, fruit, snack mix
Tips for Success

• Be prepared when dining out
  – Talk with manager or chef
  – Go at off peak hours
  – Look at menu options online if available
  – Ask for food to be prepared in separate pan
  – Provide chef card with foods to be avoided

• Educate on hidden sources
  ▪ “dairy free” may still contain casein (milk pro)

• Avoid Cross Contact
  – Wash all cooking and prep utensils with soap and water
  – Salad bars, bulk bins, deli items, frying foods, shared utensils
Monitoring

- Weight and height
- Nutritional intake
- Compliance with diet
Vitamin & Mineral supplementation

• When to recommend
  − Poor intake of fruits & vegetables
  − Low intake of fortified processed foods
  − Poor acceptance of fortified dairy alternative

• Nano VM
• Flintstone’s (does contain gelatin)
• Freeda Vitalets
• One A Day Women’s
• Tums (not smoothie flavors)
• Nature Made calcium + vitamin D
If poor weight gain

- High kcal boosters
  - Duocal
  - Avocado
  - Vegetable oils
  - Bean dips
  - Ground flax seed
  - Egg-free, soy-free mayo
  - Dairy-free margarines
  - Canned coconut milk

- Elemental formulas &/or high kcal smoothies

- More frequent weight checks

- Assure set mealtime schedule, adequate eating opportunities
Helpful Resources

• CHOC’s EoE website www.choc.org/eoe/nutrition
• Food Allergy Research & Education (FARE) www.foodallergy.org
• Kids with Food Allergies www.kidswithfoodallergies.org
• The American Partnership for Eosinophilic Disorders www.apfed.org
• American Academy of Allergy Asthma & Immunology www.aaaai.org
References


References


