Choline: Nutrient of Concern for Moms & More

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Today’s objectives

1. Understand the vital role choline plays in positive health throughout the life cycle, particularly during pregnancy and lactation
2. Identify foods and supplements that help consumers meet choline recommendations
3. Recommend choline-rich foods during consumer counseling

Choline – Essential nutrient

a compound similar to B vitamins, but not a vitamin... made by humans but not sufficient to meet needs... common in our food sources yet consistently under-consumed... a nutrient of concern!

What's the issue?

What is choline?

A unique micronutrient naturally present in some foods, and produced in less-than-adequate amounts in the human body.
What does choline do?

- Structure
- Metabolism
- Regulation

Wide range of roles in humans — from cell structure to neurotransmitter synthesis

How does choline work?

Methylation

The public health concern...

U.S. population has suboptimal intakes of choline

Choline deficiency believed to impact:
- liver disease
- atherosclerosis and heart disease
- breast cancer
- possibly neurological disorders

Is especially vital during pregnancy and lactation

Who’s at risk?

- Pregnant women
- Lactating mothers
- Elderly individuals

K-STATE Research and Extension
**Choline during pregnancy**

- Important role in brain and memory development in fetus
- Decreases risk of neural tube defects and other congenital abnormalities
- Despite enhanced capacity to make choline during pregnancy, demand exceeds supply. Lactation further increases maternal needs

**More benefits of prenatal choline**

- High maternal choline intake
  - Eases baby’s response to stress
  - Decreases risk of pre-eclampsia
  - Helps to facilitate transport of nutrients, including DHA, across placenta to the fetus

High choline intake during perinatal period has been demonstrated to have **lasting neuroprotective effect**

**What can we do now?**

- Learn about good food sources of choline
- Educate consumers and providers
- Recommend supplements if appropriate
- Watch for expanding science on choline
Food sources of choline

<table>
<thead>
<tr>
<th>Food</th>
<th>Serving</th>
<th>Total Choline (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef liver, pan fried</td>
<td>3 oz.</td>
<td>355</td>
</tr>
<tr>
<td>Egg</td>
<td>1 lg.</td>
<td>126</td>
</tr>
<tr>
<td>Soybeans</td>
<td>½ c.</td>
<td>107</td>
</tr>
<tr>
<td>Salmon</td>
<td>3 oz.</td>
<td>91</td>
</tr>
<tr>
<td>Atlantic cod</td>
<td>3 oz.</td>
<td>71</td>
</tr>
<tr>
<td>Beef, lean, cooked</td>
<td>3 oz.</td>
<td>67</td>
</tr>
<tr>
<td>Brussels sprouts, cooked</td>
<td>1 c.</td>
<td>63</td>
</tr>
<tr>
<td>Broccoli, cooked</td>
<td>1 c.</td>
<td>62</td>
</tr>
<tr>
<td>Red potato</td>
<td>1 lg.</td>
<td>57</td>
</tr>
<tr>
<td>Milk, skim</td>
<td>1 c.</td>
<td>38</td>
</tr>
<tr>
<td>Peanut butter, smooth</td>
<td>2 Tbsp.</td>
<td>20</td>
</tr>
</tbody>
</table>

What about supplements?

- Difficult or impossible to meet AI by diet
- AAP recommends prenatal supplement
  - Multivitamin + choline is preferred
  - Like folic acid (before pregnancy?)

In summary...

- Structural component of all cell membranes
- Transport and metabolism of fat and cholesterol
- Helps make some important neurotransmitters
- Helps maintain normal levels of homocysteine in the blood

During breastfeeding...

- Mammary cells are capable of uptake of choline from maternal blood supply for transfer through breastmilk
Need to increase awareness

• among health professionals
  – articles, tool-kits, webinars
  – outreach education pieces
• 2020 Dietary Guidelines for Americans
  – specific recommendations for pregnant and lactating women to increase consumption of choline-rich foods, supplements

References


Thank you!