Impact of WIC and SNAP Enrollment on Gestational Choline Methodology

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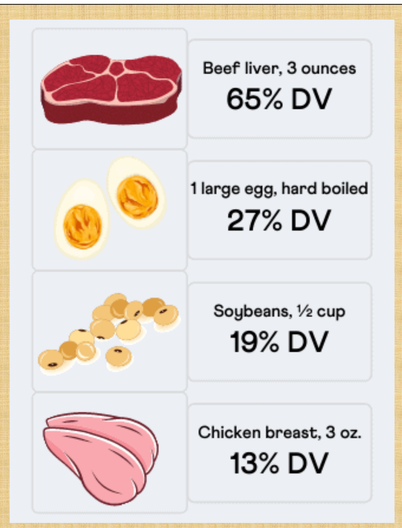
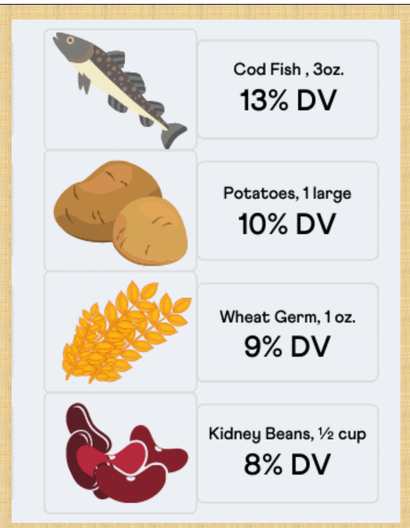
Background

- The gestational environment and compromise of maternal wellbeing can impact fetal development
- Therapeutic intervention during gestation has not yet been optimized as a risk reduction practice.
- Choline is a micronutrient naturally found in a variety of foods and may be synthesized and stored by the human liver.
- Choline is actively transported across the placenta through maternal serum and utilized in critical periods of fetal neurodevelopment.
- Recommended Adequate Intake (AI) for pregnancy and breastfeeding is 550mg/day, respectively
  - Corresponds with maternal serum levels ≥7. 5 µM
- It is estimated less than 10% of pregnant individuals achieve daily AI of choline
- Choline is generally not adequately supplemented by current prenatal vitamin formulations
- Vegan and Vegetarian individuals may be at increased risk for inadequate intake
- Individuals experiencing food insecurity may also be at increased risk
- Recent data suggest utilization of Special Supplementation Nutrition Program for Women, Infants, and Children (WIC) may correlate with suboptimal micronutrient intake, including that of choline
- Further research on WIC and/or Supplemental Nutrition Assistance Program (SNAP) utilization and choline intake during pregnancy and lactation is warranted

Objectives

- Describe the relationship between maternal choline levels measured during gestation with WIC and/or SNAP status during the same time period
- Determine whether WIC and/or SNAP status can help **identify additional nutritional needs** during gestational and lactation periods
- **Advocate for nutritional support** based upon needs identified (i. e. specific supplementation access or expansion of existing nutritional supplementation programs)

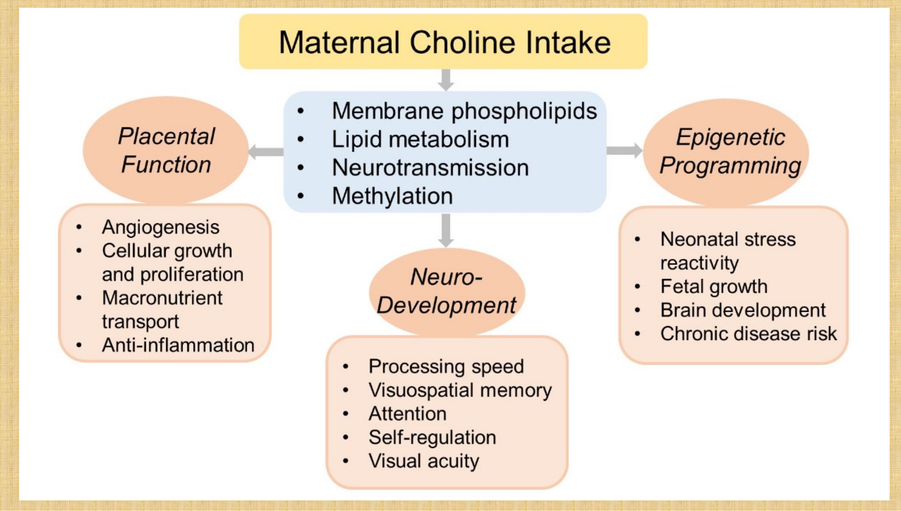





Peas, ½ cup, – 24mg, 4% DV


Mushrooms (*shiitake*), ½ cup – 27mg, 5% DV


Broccoli, ½ cup – 31mg, 6% DV



Choline may alter the activation of α7–nictonic cholinergic receptor (**CHRNA**7 gene), which promotes maturation of excitatory and inhibitory neurocircuits – can be impaired/ incomplete in *schizophrenia*. **CHRNA**7 gene has also been associated with other psychiatric diagnoses including *ASD* and *ADHD*.

Methods

Study Design
- Retrospective Cohort Study
- Data groups will include:
  - WIC, SNAP, WIC + SNAP, non–utilization

Participants
- Pregnant individuals were identified through Denver Health prenatal clinic
- Pregnancies confirmed by ultrasound prior to 16 wks gestation

Exclusion Criteria
- Fetal anomaly, severe intrauterine growth restriction, corticosteroid use

Choline Levels
- Measured via maternal blood sample obtained at 16 weeks
- Adequate or below adequate choline intake is correlated with maternal serum levels of < 7. 5 µM and ≥7. 5 µM, respectively

WIC and/or SNAP status during pregnancy
- Identified via retrospective chart review

Statistical Analyses
- Adequacy in maternal serum choline levels will be determined in all data groups: WIC , SNAP, WIC+SNAP, or non–utilization
- Existing differences in groups will be determined through Fischer Exact Test, or *t* test

Selected References

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