The Safety of Probiotics
Considerations Following the 2011 AHRQ Report

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Disclosures

- Council for Responsible Nutrition
- Developing Solutions, LLC
- Feeding Tomorrow – Trustee and Treasurer
- Steering Committee - JACN
- Robust systematic review of RCTs specifically focused on the safety of probiotic interventions.

The report reviewed over 11,981 articles identified and 622 studies included on probiotics.

“Only limited evidence to address questions the review set forth to answer.”
Conventional Foods: History of Safe Use
Probiotics: Theoretical Side Effects

- Systemic infections
- Deleterious metabolic activities
  - Deconjugation or dehydroxylation of bile salts $\rightarrow$ Diarrhea
- Excessive immune simulation in susceptible individuals
  - Stimulation of cytokine production $\rightarrow$ Fever, arthritis, etc.
- Gene transfer
  - E.g. antibiotic resistance
Probiotics: Theoretical Side Effects

- Historically probiotics associated with food and supplements have been considered safe as they are normal commensals of the GI tract.

- Despite their use in foods and supplements the incidence of bacteremia attributed to probiotic strains remains extremely low.
We do NOT suggest that the scientific community discontinue researching the safety of probiotics.

However, in the absence of drug-like safety data, health care authorities and policy-makers should consider a risk-benefit analysis that utilizes all available evidence pertaining to the potential for benefit or harm.
Was Evidence-Based Review Appropriate?

- Evidence-based reviews can be powerful tools to identify and synthesize relevant data, they are limited when available data are not designed with the same research question as the review intends to address. It is essential that we use a scientific framework that is fit for the purpose.

- Using evidence-based reviews assumes the literature will include drug-like safety and toxicological data.
Was Evidence-Based Review Appropriate?

- Foods, food components and dietary supplements are not studied the same way as drugs.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Drugs</th>
<th>Nutrients</th>
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<tbody>
<tr>
<td>True Placebo</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Systematic Function</td>
<td>Isolated</td>
<td>Complex networks</td>
</tr>
<tr>
<td>Effect Size</td>
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<td>Small</td>
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<tr>
<td>Nature of Effect</td>
<td>Therapeutic</td>
<td>Preventive</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Large</td>
<td>Small</td>
</tr>
</tbody>
</table>
Conclusions

- While it is important that safety not be presumed, the specific nature of any probiotic should be considered during a safety evaluation.

- Given the increasingly wide-spread use of probiotic foods and supplements with few adverse events reported in clinical trials and/or the general public, a risk-benefit assessment and discussion of totality of evidence should be considered when judging safety.
Conclusions

- Growing public interest in probiotics calls for appropriate regulatory and policy action.

- The lack of adverse events reported throughout the AHRQ report should strengthen the argument that probiotics are safe.

- The totality of evidence supports that probiotics interventions in both healthy and some diseased populations can be considered safe.
Thank You!... Questions?