Are We What We Eat?: Identifying Microbial Communities of Fruits and Vegetables
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BACKGROUND
- Fermenting bacteria metabolize dietary fiber into short chain fatty acids, which can suppress gut inflammation.
- Dietary interventions have been shown to alter the gut microbiome.
- Alterations in gut microbiome has been associated with differential risk of atopic disease.

HYPOTHESIS
High-fiber fruits and vegetables will have unique intrinsic microbial compositions.
- Among alike produce samples there will be conserved microbial signatures.
- External factors including handling practices, farm practices, and grow location will also influence microbial colonization patterns of fruits and vegetables.

METHODS
- Surface samples were collected from 41 high-fiber produce items and 6 controls.
- Microbes were extracted using 16S rRNA chloroplast-excluding primers and sequenced using Illumina MiSeq platform.
- Data was processed using Divisive Amplicon Denoising Algorithm 2 (DADA2) to obtain amplicon sequence variants.
- Alpha and Beta diversity metrics were calculated to evaluate similarities and differences among produce samples.

RESULTS
- Alpha Diversity: Measure of how many microbes are present and how evenly they are distributed within a sample
- Beta Diversity: Measure of how different microbial communities are between samples

DISCUSSION
- Among alike produce samples, similarities and differences in microbial composition were observed.
  - Alpha diversity as calculated as Shannon index was relatively conserved among alike produce samples.
  - Beta diversity showed some clustering among alike produce samples suggesting there is some conservation of microbial communities.
    • However, grouping structure is not well-defined suggesting that microbial communities are influenced by factors other than host type.
- Dietary interventions have shown promising results in the alteration of gut microbiome and high-fiber fruits and vegetables may be good sources of beneficial bacteria.
- The microbial communities of fruits and vegetables are likely influenced by both the nutritional composition of the food as well as other factors such as pre-purchase handling, farming practices, grow location, soil conditions, and/or seasonal variation.
- Early introduction of fresh fruits and vegetables with rich and diverse bacterial communities may be beneficial to the development of a healthy gut microbiome.

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