3-5-2019

Fermentation of Prebiotics in Whole Food Powders by Probiotic Bacteria Strains

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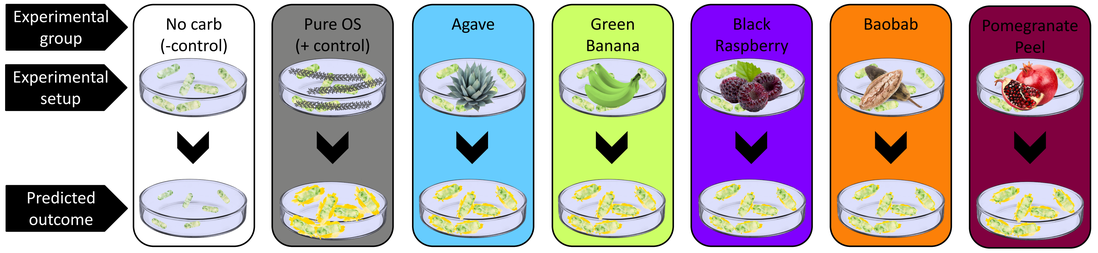
Figure 1- Methods and expected results



Bacterial strains were grown in media with different whole food powders as the carbohydrate source.

Introduction

Colorectal cancer (CRC) is the second leading cause of cancer death in the United States. Modification of the **gut microbiome** offers potential for CRC prevention.

Probiotic bacteria strains have been shown to reduce CRC risk and improve health outcomes. Selected strains for this study:

- ***Lactobacillus acidophilus* NCFM**
- ***Bifidobacterium lactis* HN019**

Prebiotics are complex dietary fibers fermented by probiotic bacteria and found in:

- **Agave**
- **Green Banana**
- **Black raspberry**
- **Baobab**
- **Pomegranate Peel**

The main objective of this study was to determine the **best combinations of probiotic bacteria and whole food powders** for future CRC dietary intervention studies.

Methods

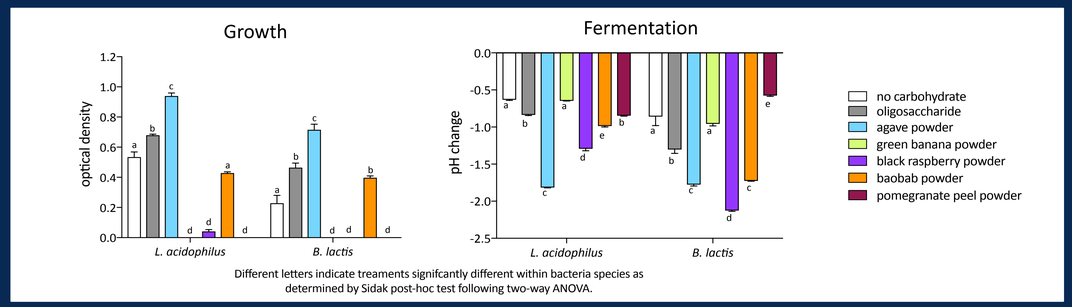
***L. acidophilus* NCFM** and ***B. lactis* HN019** were grown in MRS broth with different carbohydrate sources. Cultures were incubated for 48 hours at 37° C and then analyzed for:

1. **Growth-** Optical density of medium
2. **Fermentation-** Change in medium pH

Results

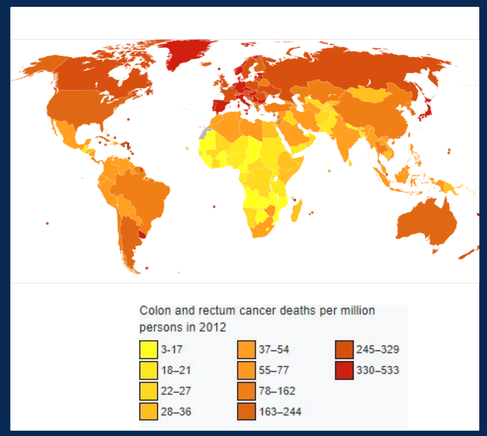
- **Agave** increased growth and fermentation activity of both bacterial strains, better than the positive control.
- Additionally, **black raspberry** and **baobab** appeared to have higher fermentation potentials than the positive control, in both bacterial strains.

Figure 2 – Bacterial growth and fermentation



Agave increased bacteria numbers. Additionally, agave, black raspberry, and baobab decreased pH after fermentation with probiotic bacteria strains.

Figure 3 – Colorectal cancer prevalence



The Western diet is a major contributing factor for colorectal cancer.

Conclusions

Green banana and **pomegranate peel** appear not to be utilized as a food source by probiotic bacterial strains. **Agave**, **black raspberry**, and **baobab** may be promising candidates for future preclinical dietary intervention studies. Further investigation is required before proceeding:

1. An improved measure of growth is needed to accurately evaluate opaque broths.
2. Additional trials (replicates) are needed to confirm these preliminary results.

Study conducted with funding from a USU Undergraduate Research and Creative Opportunity Grant and lab assistance from the USU Department of Animal, Dairy, and Veterinary Sciences.

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