Can Adding Black Raspberries to the Western Diet Reduce Factors that Lead to Colorectal Cancer?

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Can adding black raspberries to the Western diet reduce factors that lead to colorectal cancer?

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Introduction

- Americans with leaky gut, or increased intestinal permeability, often develop chronic inflammation (colitis) and are at a greater risk for developing colorectal cancer (CRC).
- A poor diet, high in processed foods but low in fruits and vegetables, is another notable risk factor for CRC.
- Micronutrient supplementation reduces colitis and prevents progression to colitis associated colorectal cancer (CAC).
- Due to their high concentration of anthocyanins, black raspberries have demonstrated protective effects against inflammation in the body.
- Certain antibodies are indicative of inflammation which leads to CRC.

Study conducted with funding from the USU Undergraduate Research and Creative Opportunity Grant.

Figure 1 - Methods

<table>
<thead>
<tr>
<th>Positive/Negative Controls</th>
<th>TWD (−)</th>
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<tbody>
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<td>AIN93G (+)</td>
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Dietary intervention with black raspberry powder

<table>
<thead>
<tr>
<th>TWD</th>
<th>Low BRB (5%)</th>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>TWD</td>
<td>High BRB (10%)</td>
</tr>
</tbody>
</table>

Figure 1. A timeline showing data collection and procedures during the sixteen week mouse study is outlined above. Mice were fed an experimental diet with and without supplementation of black raspberry (BRB). Colon samples were collected for examination.

Figure 2 – Tissue Examination

1. Tissue preparation
2. Antigen retrieval and blocking
3. Addition of primary antibody
4. Secondary antibody added
5. Addition of red pigment
6. Tissue is counterstained blue

Figure 3 – Tumor Burden

Figure 3. Addition of 5% BRB significantly reduced tumor burden and 10% BRB reduced tumor burden such that the cancer response was similar to that of mice given supplements.

Conclusions

- Previous study results indicate mice fed diets supplemented with 5% and 10% BRB showed reduced tumor burden.
- Based on this information, we expect to see a decrease in the presence of inflammatory biomarkers.
- These results can help us better understand how inflammation plays a role in colorectal cancer.