Impact of the Total Western Diet and supplementation on TNF, IBA1, and PAX5, biomarkers of inflammation

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Western Dietary Pattern

Western dietary pattern

Void of fiber and micronutrients

Microbial community

Inflammation

Colorectal Cancer

Rich in bioactive anthocyanins

Flavonoids

Polyphenols

DNA damage and repair

Reduce the presence of inflammatory biomarkers in the body

Reduce risk against diseases such as colorectal cancer (CRC)
<table>
<thead>
<tr>
<th>Pre-initiation</th>
<th>Colitis</th>
<th>Recovery</th>
<th>Terminal</th>
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</table>

**AIN93G**

**TWD**

**E**

**M**

**L**

**C**

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**Utah State University**
Hypotheses

Consumption of a TWD will increase the expression of inflammatory biomarkers in mouse tissues.

Supplementation with TC or BRB will decrease the presence of inflammatory biomarkers in mouse tissues.
Study Design

- **Pos/Neg Controls for all experiments**
  - AIN93G
  - TWD

- **Dietary intervention with functional foods**
  - AIN93G: Tart Cherries
  - TWD: Tart Cherries
  - TWD: Low BRB
  - TWD: High BRB

AOM – azoxymethane (10mg/kg)
DSS – dextran sodium sulfate @ 1% (w/v)
Immunohistochemistry Procedure

1. Tissue preparation

2. Antigen retrieval and blocking performed.

3. Addition of primary antibody.

4. Secondary antibody added followed by streptavidin HRP.

5. Addition of chromagen produces a red pigment.

6. Tissue is counterstained with hematoxylin.
Expected Results

Negative Control – Mouse Spleen (no primary antibody)

Positive Control – Mouse Spleen (1/200 primary IBA1 antibody)

Positive Control – Mouse Spleen (1/5000 primary PAX5 antibody)
**β-catenin**

- **transcriptional factor in signaling**
- **Ki67**
  - associated with cell proliferation

**Normal colon**

**β-catenin, normal colon**

**AOM/DSS; β-catenin, adenoma**

**Normal**

**GIN**

**AOM/DSS**

**AOM/DSS, Ki67**

**AOM/DSS; Ki67, adenoma**
Increased presence of inflammatory and immune response biomarkers from mice fed a TWD.
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