

## Polyphenol-rich Mango Ameliorate Functional Constipation Symptoms in Humans Beyond Equivalent Amount of Fiber

**Mango fiber may improve constipation and reduce inflammation risk factors more effectively than a fiber supplement.**

Research shows healthy adults who ate a 300-gram daily serving of mango for 4 weeks had significantly improved constipation status – stool frequency, consistency and shape – compared to healthy adults who consumed an equal amount of fiber via a fiber powder supplement. The mango eaters also had increases in gastrin levels and short chain fatty acids (specifically valeric acid), important for intestinal health.

Additionally, mango eaters had lower endotoxins and interleukin-6 concentration, two markers associated with systemic inflammation, when elevated.

### WHY IS THIS TOPIC IMPORTANT?

- Upwards of 20% of the North American population suffers from chronic constipation.
- Dietary fiber and laxatives aid in the treatment of constipation, but don't fully address all its symptoms, including intestinal inflammation.
- Given the fiber profile of mangos, it may be a whole food solution to reduce inflammatory markers while alleviating constipation.

## KEY FINDINGS

### CONSTIPATION

- **Both the mango group and the fiber supplement group** improved constipation symptoms.
- **The mango group had significantly better 'evacuation'** than the fiber supplement group, as measured by a more normal stool shape.
- **The mango group had significantly higher gastrin production** than the fiber supplement group; low gastrin levels are associated with low intestinal motility.\*
- **The mango group had significantly higher production of valeric acid**, than the fiber supplement group; important for the maintenance of gut and immune homeostasis.\*\*

### INFLAMMATION

- **The mango group treatment significantly decreased the expression of interleukin-6 (IL-6)** while the fiber supplement group treatment showed no improvements; IL-6 triggers cytokine production, and too many cytokines can lead to excess inflammation and conditions like autoimmune diseases.\*
- **The mango group had significantly less production of endotoxins** compared to the fiber supplement group; endotoxins contribute to increased systemic inflammation.\*

\* Change in the levels of gastrin, interleukin-6 and endotoxins after 4 weeks of mango vs fiber consumption resulted in p values <.05, yielding significant results.  
\*\* Following the 4-week intervention mango intakes resulted in significantly higher valeric acid in stools compared to fiber intakes.

RESEARCH SPONSORED BY THE NATIONAL MANGO BOARD



# Eating Mangos May Significantly Improve Constipation Symptoms and Inflammatory Markers Compared to a Fiber Supplement

## STUDY APPROACH

The study included 36 generally healthy, normal weight adults: 11 males and 25 females. Participants were randomly assigned to one of two groups – a group (19 people) instructed to consume 300 grams of mango fruit daily for 4-weeks (~2.5 mangos; 5 g fiber) and a second group (17 people) instructed to consume a fiber supplement equal to the amount of fiber in 300 grams of mango (~5 g) for four weeks. Participants were told to maintain their normal diet and lifestyle, beyond the intervention protocols.

## MORE ABOUT THE STUDY

Adults between the ages of 20–38 years old were included in the study. Participants were excluded from the study if they had a history of acute cardiac event, stroke or cancer; recurrent hospitalization or drug treatment within the last 6 months; history of alcohol or substance abuse; smoking (>1 pack/week); excessive exercise (>60 min; >5X/week); mango or fiber allergy; hepatitis B or C; HIV; drug treatment against constipation (including steroids).

Participants were randomly assigned to either the mango group or fiber supplement group. The mango group was asked to include one daily serving of 300 grams of mango in their diets for 4 weeks, while the fiber group was asked to include the equivalent amount of fiber powder as found in 300-grams of mango into their diet for the same duration. Beyond the addition of the mango fruit or fiber supplement, participants were told to keep their normal diet and lifestyles.

Before the dietary component of the trial began, participants donated blood and stool samples. Each week, participants were contacted by a research nurse who noted adverse events and current constipation symptoms. At the end of the 4-week study, participants donated blood and stool samples again. Additionally, 72-hour food records were kept and collected during the start and end of the study.

This was a relatively small and short-term pilot study. In the future, larger, longer-term, studies that include more participants would be beneficial to better understand the effects of the interventions on constipation and inflammation.

The study's generalizability is limited by the number, health status, age and ethnic/cultural background of the participants.

**For about 70 calories, a 3/4 cup serving of Mango provides:**

More than **20** vitamins, minerals and **antioxidants**

**7%** of your daily **fiber**

**+Polyphenolic** compounds



**Reference:** Venancio VP, Kim H, Sirven MA, Tekwe CD, Honvoh G, Talcott ST, Mertens-Talcott SU. Polyphenol-rich Mango (*Mangifera indica L.*) Ameliorate Functional Constipation Symptoms in Humans beyond Equivalent Amount of Fiber. *Mol Nutr Food Res.* 2018 Jun;62(12):e1701034. doi: 10.1002/mnfr.201701034. Epub 2018 May 29. PMID: 29733520.



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