

## Consumption of Extrinsic Wheat Fiber Enhances Fecal Bulk and Stool Frequency; a randomized controlled trial<sup>1</sup>

Nicole de Wit, Diederik Esser, Els Siebelink, Anne Fischer, Jeurgen Sieg, Jurriaan Mes

### Introduction

Dietary Fiber has been identified as a Nutrient of Public Health Concern by the Dietary Guidelines Advisory Committee<sup>2</sup> because intakes are low enough to pose a substantial health concern. According to nutrition experts, strategies to help people meet recommended daily intake goals need to depend on both nutrient dense whole foods as well as fiber enriched foods.<sup>3</sup>

The Daily Value on the Nutrition Facts Panel for dietary fiber is currently 28g per day based on the Institute of Medicine's guidance for an Adequate Intake level of 14g per 1,000 kcal for total fiber or 25 g for adult women and 38 g for adult men. Americans only consume 17 grams of fiber per day, on average, leaving a shortfall of approximately 8–21g of fiber per day depending on gender and age.

Meeting daily fiber goals by relying mainly on whole, unprocessed foods is challenging considering the busy lifestyle of the average consumer and the desire for easy to prepare, convenient food options; therefore a wide variety of added fibers are needed to enable the development of fiber enriched products to help minimize the fiber deficiency that exists for more than 95% of consumers.

J. Rettenmaier & Söhne is the world's largest manufacturing company producing a diverse range of dietary fibers designed to help companies enhance food products. **VITACEL®** Wheat Fiber has been a commonly used fiber source for many years. JRS recently completed a randomized controlled clinical trial showing the physiological benefits of wheat fiber.



recommended DV  
**38g fiber/ day**



recommended DV  
**25g fiber/ day**

#### **VITACEL® Wheat Fiber**

- FDA approved mixed plant cell wall fiber<sup>4</sup>
- 90% insoluble (cellulose) fiber
- Contributes 0 calories to finished products
- Neutral flavor and color
- Ideal fiber to reach “good” or “excellent” source of fiber claims

<sup>1</sup>Nicole de Wit et al, Wageningen Food and Biobased Research, Wageningen University & Research, Wageningen, The Netherlands presented at International Dietary Fibre Conference, 6 June 2018 (Manuscript submitted for publication)

<sup>2</sup>U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015–2020 Dietary Guidelines for Americans. 8th Edition. December 2015. Available at <http://health.gov/dietaryguidelines/2015/guidelines>

<sup>3</sup>Identifying Practical Solutions to Meet America's Fiber Needs: Proceedings from the Food & Fiber Summit Nutrients 2014, 6, 2540-2551; doi:10.3390/nu6072540

<sup>4</sup>FDA Review of the Scientific Evidence on the Physiological Effects of Certain Non-Digestible Carbohydrates, June 2018

## Trial Overview

A double-blind, randomized cross-over controlled clinical study was recently conducted at Wageningen University, Food & Biobased Research to determine if the addition of 20g of **VITACEL®** Wheat Fiber per day to the diets of 18 healthy men with a typical fiber intake of <23g per day would have an effect on fecal bulk, stool pattern, gastrointestinal complaints and food liking.

## Results

The results (table 1) showed that consumption of Fiber **significantly enhanced fecal bulk** (fecal wet weight and fecal dry weight showed a 1.41 and 1.55 times increase compared to control, respectively ( $p < 0.01$ )) **and stool frequency** ( $1.3 \pm 0.1$  defecations/day compared to  $1.1 \pm 0.1$  defecations/day during control diet,  $p < 0.05$ ). The study also demonstrated that **VITACEL®** Wheat Fiber can be incorporated in various commonly consumed food products such as meatballs, pizza, bread, sandwiches, cookies, instant soup, and pancakes **without negatively impacting the appearance or taste** of the foods. **Gastrointestinal ratings** and complaints **were not significantly different** between test and control groups.

Table 1: Trial Data Summary

|                             | Control Diet                      | VITACEL® Wheat Fiber Diet | p-value      |        |
|-----------------------------|-----------------------------------|---------------------------|--------------|--------|
| Fecal Bulk                  | Fecal wet weight (g/day)          | 175.2 (21.0)              | 229.4 (24.8) | <0.001 |
|                             | Fecal dry weight (g/day)          | 41.5 (4.5)                | 60.5 (5.4)   | <0.001 |
|                             | Fecal dry weight (%)              | 26.0 (1.3)                | 28.3 (1.1)   | 0.002  |
| Stool Pattern               | Stool frequency (times/day)       | 1.1 (0.1)                 | 1.3 (0.1)    | 0.018  |
|                             | Stool consistency (BSC;1-7)       | 3.4 (0.2)                 | 3.6 (0.2)    | 0.503  |
| Product liking              | Average score all products (1-10) | 6.0 (0.4)                 | 5.9 (0.4)    | 0.244  |
| Gastrointestinal Complaints | Cramps (1-10)                     | 1.4 (0.1)                 | 1.4 (0.1)    | 0.593  |
|                             | Bloating (1-10)                   | 1.8 (0.3)                 | 1.6 (0.2)    | 0.290  |
|                             | Flatulence (1-10)                 | 1.4 (0.1)                 | 1.5 (0.1)    | 0.477  |



### WORLDWIDE HEADQUARTERS

J. RETTENMAIER & SÖHNE GMBH + CO KG

Business Unit Food

73494 Rosenberg (Germany)

Phone: +49 7967 152-276

Telefax: +49 7967 152-500 276

Web: www.jrsfood.de

## Conclusion

**VITACEL®** Wheat Fiber significantly increases fecal bulk and stool frequency and can be easily incorporated in a variety of food products without affecting appearance or taste. This could facilitate the development of more fiber enriched products to help consumers reach their fiber intake goals and ultimately lead to a healthier lifestyle with improved digestive wellness.

The table below contains actual results from the completion of a human clinical trial. The preliminary manuscript has been submitted for publication. Ask your JRS USA sales representative for more details on how to receive a copy once publication has been finalized.