Scientific Research Timelines Journal (2024), 2(2):33-34
Online Bimonthly Publication Frequency
https://scientificrtj.com/

Review Paper **Open Access**

FIBER CONTENT IN WHEAT GRAIN

Mehreen Arshad[1*], Anosha Laiba Javaid[1], Aleesha Fatima[1], Ayesha Ali[1]

[1]*Department of Human Nutrition and Dietetics (HND), The Islamia University of Bahawalpur (IUB), Pakistan*

***Corresponding author e-mail:** mehreenarshad379@gmail.com

ABSTRACT This article explores the nutritional insights of fiber content in wheat grain. Wheat, a global staple food, contains soluble and insoluble dietary fiber components. The fiber content varies based on factors like variety and growing conditions. Despite being a rich source of protein and essential nutrients, high fiber intake may have disadvantages, including digestive discomfort. The analysis emphasizes the importance of dietary fiber in wheat grains, impacting functional properties and contributing to healthful diets. Numerous studies and references support these findings, underscoring the significance of understanding wheat grain composition for overall health.

Keywords: *Fiber; Constipation; Whole Grains; Minerals; Gluten; Wheat Bran*

INTRODUCTION

Wheat holds significant nutritional importance, being a staple food source globally. Its seeds, when ground into flour or semolina, form the basis of various food products, serving as a primary nutrient source for a large part of the world population (Šramková and Gregová, 2009). Extensive studies have showcased the positive impacts of fiber intake, including protection against heart disease, cancer, blood lipid normalization, glucose absorption regulation, insulin secretion, and prevention of constipation and diverticular disease (Dreher, 2018). Health authorities globally recommend adults to consume 25 g to 35 g of fiber daily (Miller, 2020).

Definition of dietary fiber: Dietary fiber (DF) is defined as "the edible parts of plants or analogous carbohydrates resistant to digestion and absorption in the human small intestine with complete or partial fermentation in the large intestine" (Gebruers et al., 2008). It is categorized into soluble (e.g., pectin substances, hydrocolloids) and insoluble (e.g., cellulose, hemicellulose, lignin) components. Variability in Wheat Grain Fiber Content: The fiber content in wheat grain varies based on factors such as wheat variety, growing conditions, and processing methods. Wheat stands out as a significant source of dietary fiber, comprising non-starch polysaccharides derived from cell walls (Saulnier, 2018). A study on winter wheat samples reported a total DF content, including fructo-oligosaccharide and fructan, with an average of 13.4% and a range between 11.5% and 15.5%. The USDA's Dietary Guidelines recommend three servings of whole grains daily for heart disease and cancer prevention (Healey et al., 2017).

Composition of wheat grain: The wheat grain consists of three parts: bran (outer layer), endosperm (food reserves), and germ (embryo). The bran, comprising water-insoluble fiber, plays a vital role in regulating nutrient absorption and excretion. Various stresses, such as salinity, drought, high temperature, and waterlogging, can alter wheat grain composition and quality (Ashraf, 2014).

Benefits for human health: Wheat is hailed as a rich source of protein, minerals, B-group vitamins, and dietary fiber, making it an excellent food for health. Its characteristic protein, gluten, makes wheat the primary choice for bread making (Mohammed and Daniel, 2019). The USDA's guidelines emphasize consuming three

servings of whole grains daily for heart disease and cancer prevention. Wheat bran, a supplemental source of dietary fiber, is linked to preventing various conditions, including colon diseases, gastric cancer, and type 2 diabetes (Kumar et al., 2011).

Disadvantages of High Fiber Content: While high fiber content in wheat grains offers numerous health benefits, it comes with some disadvantages. Excessive fiber intake may lead to digestive discomfort, mineral absorption interference, and potential issues for individuals with gluten sensitivity or celiac disease (Torbica et al., 2022).

CONCLUSION

Fiber-rich foods, with their blend of dietary fiber, antioxidants, and bioactive compounds, contribute to nutritious and healthful diets. The analysis of dietary fiber in a diverse range of wheat grains underscores its importance, impacting functional properties such as water retention, viscosity, texture, and mouthfeel. In summary, dietary fiber was meticulously examined as the sum of polysaccharide residues in wheat grains.

REFERENCES

Ashraf, M. 2014. Stress-induced changes in wheat grain composition and quality. *Critical reviews in food science and nutrition,* 54**,** 1576-1583.

Dreher, M. L. 2018. Whole fruits and fruit fiber emerging health effects. *Nutrients,* 10**,** 1883.

Gebruers, K., Dornez, E., Boros, D., Dynkowska, W., Bedő, Z., Rakszegi, M. & Courtin, C. M. 2008. Variation in the content of dietary fiber and components thereof in wheats in the HEALTHGRAIN diversity screen. *Journal of Agricultural and Food Chemistry,* 56**,** 9740-9749.

Healey, G., Murphy, R., Butts, C., Brough, L., Rosendale, D., Blatchford, P. & Coad, J. 2017. Variability in gut microbiota response to an inulin-type fructan prebiotic within an in vitro three-stage continuous colonic model system. *Bioactive carbohydrates and dietary fibre,* 11**,** 26-37.

Kumar, P., Yadava, R. K., Gollen, B., Kumar, S., Verma, R. K. & Yadav, S. 2011. Nutritional contents and medicinal properties of wheat: a review. . *Life Sciences and Medicine Research,* 22**,** 1-1-0.

Miller, K. B. 2020. Review of whole grain and dietary fiber recommendations and intake levels in different countries. *Nutrition Reviews,* 78**,** 29-36.

Mohammed, S. Y. & Daniel, A. K. 2019. Comparative proximate evaluation of pearl millet (pennisetumtyphoides), maize (zea mays), garlic (allium sativum), ginger (zingeberofficinale) and great millet (sorghum bicolor). *African Journal of Agriculture and Food Science,* 2**,** 28-40.

Saulnier, L. 2018. Types and functionality of polysaccharides in cereal grains. In Cereal Grain-based Functional Foods: Carbohydrate and Phytochemical Components *The Royal Society of Chemistry***,** 54-84.

Šramková, Z. & Gregová, E., & Šturdík, E. 2009. Chemical composition and nutritional quality of wheat grain. *Acta chimica slovaca,,* 2**,** 115-138.

Torbica, A., Radosavljević, M., Belović, M., Tamilselvan, T. & Prabhasankar, P. 2022. Biotechnological tools for cereal and pseudocereal dietary fibre modification in the bakery products creation–Advantages, disadvantages and challenges. *Trends in Food Science & Technology.,* 129**,** 194-209.