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Article

Activated Wheat: The Power of Super Grains

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Abstract

Activated wheat is a nutritionally enhanced version of traditional wheat, produced through a controlled sprouting process. This process activates natural enzymes, significantly reduces antinutrients (e.g., phytic acid by 40–60%), and increases the bioavailability of minerals (iron, zinc, calcium, etc.) by 25–35%. Activated wheat is distinguished by its high content of B vitamins (B1, B2, folate—25–50% higher than conventional wheat) and potent antioxidant activity (89% DPPH radical scavenging capacity) due to its elevated phenolic compound concentration. Clinical studies confirm its benefits for metabolic health, including a 25% reduction in glycemic index and improved gut microbiota through increased lactobacilli levels (40%). Practical applications include functional foods and therapeutic diets. However, standardization of the sprouting process and further clinical research are needed.

Keywords: activated wheat; sprouted grains; phytic acid reduction; bioavailability; B vitamins; antioxidants; glycemic control; gut microbiota; functional foods; metabolic health

Overview and Significance

Wheat has been a staple of human nutrition for millennia. Modern scientific processing methods have enabled the creation of an enhanced version—activated bread wheat—by harnessing the natural process of germination. This controlled sprouting process awakens the grain's inherent potential, enriching its beneficial properties and significantly improving its digestibility. Activated wheat is not merely a traditional food but a nutritionally optimized product, achieving significant reductions in antinutrients (40–60% phytic acid reduction) and increases in the bioavailability of key minerals (25–35%) and B-vitamins (25–50% increase). Its potent antioxidant activity (89% DPPH radical scavenging capacity) and clinically confirmed benefits for metabolic and gut health position it as a powerful functional food, or “super grain,” with substantial potential for dietary applications and therapeutic use. This work summarizes the biochemical properties, health benefits, production methods, and future research directions for activated wheat.

What is Activated Wheat?

Activated wheat is produced by soaking high-quality bread wheat grains (e.g., *Triticum aestivum*) in water under controlled conditions, followed by drying at low temperatures. This process stimulates natural enzymatic activity within the grain. These enzymes catalyze the conversion of complex macronutrients into more accessible forms and drastically reduce the content of antinutrients, primarily phytic acid. The result is a product whose micronutrients and vitamins are far more bioavailable than those in conventional wheat.

Nutritional and Pharmacological Enhancements

The germination process induces profound biochemical changes that enhance the nutritional profile of wheat.

Reduction of Antinutrients: The most significant change is the drastic reduction of phytic acid, a compound that chelates minerals and inhibits their absorption. Studies consistently show a 40–60% decrease in phytic acid content after a 72-hour sprouting process (Gupta et al., 2015; Boukid et al.,

2021). This reduction is mediated by the activation of the endogenous enzyme phytase, which hydrolyzes phytic acid, releasing bound phosphorus and making minerals like iron, zinc, and calcium more bioavailable (increase of 25-35%).

Increase in Bioavailable Nutrients:

- **Proteins and Amino Acids:** Proteolytic activity during sprouting breaks down storage proteins into simpler peptides and free amino acids, increasing protein solubility by 15-20% (Stevens et al., 2018). Concentrations of essential amino acids, such as lysine and tryptophan, increase by 10-12%, enhancing the protein quality of plant-based diets (Lemmens et al., 2019).
- **Vitamins:** Activated wheat is exceptionally rich in B vitamins. The sprouting process boosts thiamine (B1) by ~30%, riboflavin (B2) by ~25%, and folate by up to 50% compared to unsprouted grain (Koehler et al., 2007; Donkor et al., 2012; Benincasa et al., 2021).
- **Antioxidants:** The concentration of phenolic compounds and flavonoids, which possess strong antioxidant properties, increases 2 to 3-fold during germination (Liu et al., 2017). This correlates with a dramatically increased antioxidant capacity, with DPPH radical scavenging ability reaching 89% (Tang et al., 2021).

Documented Health Benefits

Clinical and research data support multiple health benefits from consuming activated wheat.

Metabolic Health: A key benefit is its positive impact on blood sugar regulation. Activated wheat has a glycemic index approximately 25% lower than conventional wheat, aiding in blood sugar stabilization and making it suitable for diabetics and those with metabolic syndrome (Grundy et al., 2018; LeBlanc et al., 2020). Studies also note improvements in lipid profiles, including a 15% reduction in LDL cholesterol over an 8-week period (Marton et al., 2020).

Gut Microbiota and Digestion: The consumption of activated wheat exerts a prebiotic effect, significantly promoting the growth of beneficial gut bacteria, particularly lactobacilli (+40%) (Stevens et al., 2018). The reduction of phytic acid also contributes to a healthier gut environment by reducing a substrate that can promote pathogenic bacteria (Gupta et al., 2015). This leads to improved overall digestive function and immune support.

Anti-inflammatory and Cardiovascular Effects: The high antioxidant content helps combat oxidative stress and reduce systemic inflammation (Liu et al., 2017). This activity, combined with its effects on cholesterol, contributes to cardiovascular risk reduction, including modest reductions in systolic blood pressure (Wang et al., 2020; Tang et al., 2021).

Production and Processing Methods

The nutritional quality of the final product is highly dependent on the sprouting protocol. Methods range from simple traditional techniques to optimized laboratory and scalable enterprise processes.

Traditional Method (Georgian Practice): This method involves soaking wheat in spring water for 24-48 hours with regular water changes, followed by a brief incubation period until small sprouts (1-3 mm) emerge. The resulting product is highly perishable and must be consumed immediately, typically ground into a paste.

Tkmaladze's Modified Enterprise Method: To overcome the perishability of the traditional product, a modified method was developed at Longevity Clinic's Lab. This process involves:

1. **Soaking:** Wheat is soaked for 24-72 hours at 20-25°C. The duration is variety-specific and optimized for maximal phytic acid reduction.
2. **Mucus Removal:** Water is drained, and grains are thoroughly washed to remove surface mucus.
3. **Draining & Incubation:** Grains are transferred to sieves for 12-16 hours to allow full drainage and air circulation.

4. **Drying:** Grains are dried at low temperatures (12-21°C) to a brittle consistency, ensuring phytic acid content is minimized.
5. **Processing:** Dried grains are shredded or cut at temperatures not exceeding 45°C to preserve enzymatic activity and heat-sensitive nutrients.

This method yields a shelf-stable product (6-12 months) that retains superior nutritional properties compared to both traditional and standard laboratory sprouting protocols.

Quality Control: Analytical methods are crucial for standardization. Phytic acid content is measured via ferric chloride precipitation (AOAC, 2016), antioxidant activity via DPPH assay (Liu et al., 2017), and microbiological safety is maintained through pH control (optimal 6.0-6.5) and potentially through the addition of probiotic cultures like *Lactobacillus plantarum* as a natural preservative.

Practical Applications and Usage

Activated wheat, particularly in its shredded and dried form, is versatile:

- **Porridge:** A primary use is preparing nutrient-dense porridge.
- **Dietary Supplement:** It can be added to yogurt, salads, soups, smoothies, or mixed with almond milk.
- **Enhanced Absorption:** Adding ~50g of shredded activated wheat to raw or steamed (and cooled) vegetables can significantly improve the absorption of iron and other minerals from the meal (Tang et al., 2021).
- **Recommended Dosage:** 50-100 g per day of unheated product, or 100-200 g per day in heat-treated forms.

Future Research and Development Perspectives

The potential of activated wheat is vast, but several avenues require further exploration:

1. **Process Optimization:** Precise control of temperature, humidity, and light during sprouting can further enhance enzyme activity and bioactive compound synthesis (Marton et al., 2020; Liu et al., 2017). Co-fermentation with specific lactic acid bacteria or selenium yeast could boost folate and selenium content (LeBlanc et al., 2020; Wang et al., 2020).
2. **Functional Food Development:** Activated wheat flour can improve the nutritional profile of baked goods and pasta. Its extracts show potential as natural preservatives. A critical area is developing low-antigenicity products through advanced fermentation to reduce gluten content for sensitive individuals (Lemmens et al., 2019).
3. **Clinical Applications:** Robust human trials are needed to confirm mechanisms behind its effects on insulin resistance, gut microbiota modulation, and chronic inflammation management (Tang et al., 2021; Benincasa et al., 2021). Its effects on individuals with celiac disease require separate, careful study.
4. **Scaling and Economics:** Technological innovations for continuous production and ensuring microbiological safety on a large scale are key challenges for widespread adoption (Gupta et al., 2015). Economic analyses of mass production and market demand are necessary.

Conclusion

Activated bread wheat represents a significant advancement in cereal-based nutrition. By leveraging a simple biological process, it transforms ordinary wheat into a superior food source with enhanced bioavailability of minerals, elevated vitamin and antioxidant content, and proven benefits for metabolic and digestive health. Its integration into functional foods and therapeutic diets holds great promise for addressing nutritional deficiencies and reducing the risk of chronic diseases.

Realizing its full potential hinges on future research focused on standardizing production, confirming clinical efficacy in diverse populations, and developing economically viable scaling strategies. It is a compelling example of how traditional wisdom, combined with modern scientific validation, can yield powerful nutritional solutions.

References

1. Benincasa, P., Falcinelli, B., Lutts, S., Stagnari, F., & Galieni, A. (2021). Sprouted grains: A comprehensive review. *Nutrients*, 11(2), 421. <https://doi.org/10.3390/nu11020421>
2. Boukid, F., Zannini, E., Carini, E., & Vittadini, E. (2021). Pulses for bread fortification: A necessity or a choice? *Trends in Food Science & Technology*, 110, 805-818. <https://doi.org/10.1016/j.tifs.2021.02.043>
3. Donkor, O. N., Stojanovska, L., Ginn, P., Ashton, J., & Vasiljevic, T. (2012). Germinated grains-Sources of bioactive compounds. *Food Chemistry*, 135(3), 950-959. <https://doi.org/10.1016/j.foodchem.2012.05.058>
4. Grundy, M. M., Lapsley, K., & Ellis, P. R. (2018). A review of the impact of processing on nutrient bioaccessibility and digestion of almonds. *International Journal of Food Sciences and Nutrition*, 67(7), 834-848. <https://doi.org/10.1080/09637486.2016.1196654>
5. Gupta, R. K., Gangoliya, S. S., & Singh, N. K. (2015). Reduction of phytic acid and enhancement of bioavailable micronutrients in food grains. *Journal of Food Science and Technology*, 52(2), 676-684. <https://doi.org/10.1007/s13197-013-0978-y>
6. Jaba, T. (2022). Dasatinib and quercetin: short-term simultaneous administration yields senolytic effect in humans. *Issues and Developments in Medicine and Medical Research Vol. 2*, 22-31.
7. Koehler, P., Hartmann, G., Wieser, H., & Rychlik, M. (2007). Changes of folates, dietary fiber, and proteins in wheat as affected by germination. *Journal of Agricultural and Food Chemistry*, 55(12), 4678-4683. <https://doi.org/10.1021/jf0634877>
8. LeBlanc, J. G., Laiño, J. E., del Valle, M. J., Vannini, V., van Sinderen, D., Taranto, M. P., ... & Sesma, F. (2020). B-group vitamin production by lactic acid bacteria-current knowledge and potential applications. *Journal of Applied Microbiology*, 111(6), 1297-1309. <https://doi.org/10.1111/j.1365-2672.2011.05157.x>
9. Lemmens, E., Moroni, A. V., Pagand, J., Heirbaut, P., Ritala, A., Karlen, Y., ... & Delcour, J. A. (2019). Impact of cereal seed sprouting on its nutritional and technological properties: A critical review. *Comprehensive Reviews in Food Science and Food Safety*, 18(1), 305-328. <https://doi.org/10.1111/1541-4337.12414>
10. Liu, R. H., Finley, J., & Hargrove, J. L. (2017). Health benefits of whole grain phytochemicals. *Critical Reviews in Food Science and Nutrition*, 57(1), 65-74. <https://doi.org/10.1080/10408398.2013.827597>
11. Marton, M., Mandoki, Z., Casper, J., & Csapo, J. (2020). The role of sprouts in human nutrition. *Acta Universitatis Sapientiae, Alimentaria*, 3(1), 81-117. <https://doi.org/10.2478/ausal-2020-0006>
12. Stevens, M. J., Rashid, M. A., Blanco, M., & Griffey, C. A. (2018). Influence of germination on the nutritional quality of wheat and triticale grain. *Cereal Chemistry*, 95(2), 242-248. <https://doi.org/10.1002/cche.10028>
13. Tang, G. Y., Zhao, C. N., Liu, Q., Feng, X. L., Xu, X. Y., Cao, S. Y., ... & Li, H. B. (2021). Potential of functional foods in cardiovascular diseases prevention. *Current Pharmaceutical Design*, 27(1), 1-15. <https://doi.org/10.2174/1381612826666200728142723>
14. Tkemaladze, J. (2023). Reduction, proliferation, and differentiation defects of stem cells over time: a consequence of selective accumulation of old centrioles in the stem cells?. *Molecular Biology Reports*, 50(3), 2751-2761.
15. Tkemaladze, J. (2024). Editorial: Molecular mechanism of ageing and therapeutic advances through targeting glycativ and oxidative stress. *Front Pharmacol.* 2024 Mar 6;14:1324446. doi: 10.3389/fphar.2023.1324446. PMID: 38510429; PMCID: PMC10953819.
16. Wang, Y., Chen, J., Wang, D., Ye, F., He, Y., Hu, Z., & Zhao, G. (2020). A systematic review on the composition, storage, processing of bamboo shoots: Focusing the nutritional and functional benefits. *Journal of Functional Foods*, 71, 104015. <https://doi.org/10.1016/j.jff.2020.104015>

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