Table S 1:Dietary fiber composition of different whole grains.

Crop	DF content (%)	Cellulose (%)	Hemicellulose (%)	Lignin (%)	β-glucan (%)	Arabinoxylan (%)	References
Whole Wheat	10.2-15.7	1.40-3.00	6.70-9.00	1.80-2.87	0.60	1.64-4.38	[1–9]
Bran	85.0-93.0	25.0-32.0	29.0-33.0	10.0-17.4	1.00-6.00	11.0-16.4 (including water soluble 3.00-5.00)	
Endosperm	4.12-4.47	0.30	1.00<	-	0.30-0.42	1.52-1.75 (including water soluble 0.56)	
Whole Oat	11.5*-37.7	8.20-24.0	4.00-22.00	1.67-7.36	1.80-7.00	9.70-13.20	[1,3,10–20]
Bran	24.26	11,03	21.10*	11.2	9.60-12.0	3.00	
Endosperm	3.60-25.0	-	-	<1.00	1.40-2.30	1.80-6.10	
Hull	65.2	19.6-29.8	30.8	14.8-25.4	1.40	24.0	
Whole Barley	14.6*-27.1	1.90-4.00	14,6	3.20-3.50	2.30–10.50	04.20-6.60	[1–4,6,10,17,18,21,22]
Bran	77.1**	23.0	32.7	21.4	4.50-7.10	7.99–10.26	
Endosperm	6.48-8.38	1.20	9.00	1.40	2.48-2.95 (including water soluble 0.48)	0.7-2.13 (including water soluble 0.45)	
Hull	59.4	19.2-35	28.6-33	11.5-25.0	1.60	23.5	
Whole Rye	14.7-20.9	2.24–2.80	1.90-2.90	3.0–4.5	1.30-2.20	1.28-1.44	[1,3,4,6,23,24]
Bran	49.0	3.90	38.4	6.80	4.50	29.2	
Endosperm	6.20	-	1.50-2.00	-	1.54	3.65-4.25 (include water soluble 1.64)	

Whole Sorghum	7.55-12.3	1.40	4.00	2.40	0.1-1.7	2.40	[3,4,25–30]
Bran	8.25-35.10	14.9-23.6	20.9-37.5	0.90-1.40	4.50	29.2	
Endosperm	6.00-16.8	1.40	0.10	n.d.	-	5.40	
Whole Corn	10.1	2.00	7.00	1.10	0.10	4.70	[4]
Bran	40.5	8.90	28.6	3.00	0.20	20.7	
Endosperm	2.60	-	2.10	0.40	0.10	1.00	
Whole Rice	12.29	3.26	11.54	4.74	0.1-1.6	2.86	[3,7,18,31–34]
Bran	33.9-58.7**	8.11-15.8 white rice 28.6 black rice	26.4-31.3	6.18-11.6	0.04-0.21	6.82-9.2	
Endosperm	-	-	-	n.d.	-	1.83	

“- “lack of information; n.d.- not detected; *-peeled varieties; **- determined by chemical method; DF – dietary fiber.

References

1. Rakha, A.; Saulnier, L.; Åman, P.; Andersson, R. Enzymatic Fingerprinting of Arabinoxylan and β-Glucan in Triticale, Barley and Tritordeum Grains. *Carbohydr Polym* 2012, *90*, 1226–1234, doi:10.1016/j.carbpol.2012.06.054.

2. Boukid, F. Comprehensive Review of Barley Dietary Fibers with Emphasis on Arabinoxylans. *Bioactive Carbohydrates and Dietary Fibre* 2024, *31*, 100410, doi:10.1016/j.bcdf.2024.100410.

3. Li, W.; Xu, R.; Qin, S.; Song, Q.; Guo, B.; Li, M.; Zhang, Y.; Zhang, B. Cereal Dietary Fiber Regulates the Quality of Whole Grain Products: Interaction between Composition, Modification and Processing Adaptability. *Int J Biol Macromol* 2024, *274*, 133223, doi:10.1016/j.ijbiomac.2024.133223.

4. Knudsen, K.E.B. Fiber and Nonstarch Polysaccharide Content and Variation in Common Crops Used in Broiler Diets. *Poult Sci* 2014, *93*, 2380–2393, doi:10.3382/ps.2014-03902.

5. Kulathunga, J.; Simsek, S. Dietary Fiber Variation in Ancient and Modern Wheat Species: Einkorn, Emmer, Spelt and Hard Red Spring Wheat. *J Cereal Sci* 2022, *104*, 103420, doi:10.1016/j.jcs.2022.103420.

6. Comino, P.; Collins, H.; Lahnstein, J.; Gidley, M.J. Effects of Diverse Food Processing Conditions on the Structure and Solubility of Wheat, Barley and Rye Endosperm Dietary Fibre. *J Food Eng* 2016, *169*, 228–237, doi:10.1016/j.jfoodeng.2015.08.037.

7. Zhong, J.; Xie, H.; Wang, Y.; Xiong, H.; Zhao, Q. Nanofibrillated Cellulose Derived from Rice Bran, Wheat Bran, Okara as Novel Dietary Fibers: Structural, Physicochemical, and Functional Properties. *Int J Biol Macromol* 2024, *273*, 132902, doi:10.1016/j.ijbiomac.2024.132902.

8. Ma, S.; Wang, Z.; Liu, H.; Li, L.; Zheng, X.; Tian, X.; Sun, B.; Wang, X. Supplementation of Wheat Flour Products with Wheat Bran Dietary Fiber: Purpose, Mechanisms, and Challenges. *Trends Food Sci Technol* 2022, *123*, 281–289, doi:10.1016/j.tifs.2022.03.012.

9. Saroj, R.; Kaur, S.; Malik, M.A.; Puranik, V.; Kaur, D. Thermal Processing of Wheat Bran: Effect on the Bioactive Compounds and Dietary Fiber. *Bioactive Carbohydrates and Dietary Fibre* 2024, *32*, 100433, doi:10.1016/j.bcdf.2024.100433.

10. Frølich, W.; Åman, P.; Tetens, I. Whole Grain Foods and Health – a Scandinavian Perspective. *Food Nutr Res* 2013, *57*, 18503, doi:10.3402/fnr.v57i0.18503.

11. Kanwar, P.; Yadav, R.B.; Yadav, B.S. Cross-Linking, Carboxymethylation and Hydroxypropylation Treatment to Sorghum Dietary Fiber: Effect on Physicochemical, Micro Structural and Thermal Properties. *Int J Biol Macromol* 2023, *233*, 123638, doi:10.1016/j.ijbiomac.2023.123638.

12. Konakbayeva, D.; Kuspangaliyeva, B.; Rajabzadeh, A.R.; Tabtabaei, S. Separation Behavior of Sieved Endosperm-Enriched Oat Fractions via Tribo-Electrostatic Approach. *Innovative Food Science & Emerging Technologies* 2022, *80*, 103098, doi:10.1016/j.ifset.2022.103098.

13. Nikinmaa, M.; Zehnder-Wyss, O.; Nyström, L.; Sozer, N. Effect of Extrusion Processing Parameters on Structure, Texture and Dietary Fibre Composition of Directly Expanded Wholegrain Oat-Based Matrices. *LWT* 2023, *184*, 114972, doi:10.1016/j.lwt.2023.114972.

14. Yang, C.; Li, J.; Luo, T.; Tu, J.; Zhong, T.; Zhang, Y.; Liang, X.; Zhang, L.; Zhang, Z.; Wang, J. Ultrasonic-microwave Assisted Extraction for Oat Bran Polysaccharides: Characterization and in Vivo Anti-Hyperlipidemia Study. *Ind Crops Prod* 2024, *220*, 119229, doi:10.1016/j.indcrop.2024.119229.

15. Kozan, H.İ.; Sarıçoban, C. Effect of Oat Bran Addition on the Survival of Selected Probiotic Strains in Turkish Fermented Sausage during Cold Storage. *Food Biosci* 2023, *54*, 102820, doi:10.1016/j.fbio.2023.102820.

16. Leung, H.; Arrazola, A.; Torrey, S.; Kiarie, E. Utilization of Soy Hulls, Oat Hulls, and Flax Meal Fiber in Adult Broiler Breeder Hens. *Poult Sci* 2018, *97*, 1368–1372, doi:10.3382/ps/pex434.

17. Neitzel, N.; Eder, M.; Hosseinpourpia, R.; Walther, T.; Adamopoulos, S. Chemical Composition, Particle Geometry, and Micro-Mechanical Strength of Barley Husks, Oat Husks, and Wheat Bran as Alternative Raw Materials for Particleboards. *Mater Today Commun* 2023, *36*, 106602, doi:10.1016/j.mtcomm.2023.106602.

18. Arzami, A.N.; Ho, T.M.; Mikkonen, K.S. Valorization of Cereal By-Product Hemicelluloses: Fractionation and Purity Considerations. *Food Research International* 2022, *151*, 110818, doi:10.1016/j.foodres.2021.110818.

19. Gu, Y.; Qian, X.; Sun, B.; Ma, S.; Tian, X.; Wang, X. Nutritional Composition and Physicochemical Properties of Oat Flour Sieving Fractions with Different Particle Size. *LWT* 2022, *154*, 112757, doi:10.1016/j.lwt.2021.112757.

20. Alfredo Zambrano, J.; Thyagarajan, A.; Sardari, R.R.R.; Olsson, O. Characterization of High Arabinoxylan Oat Lines Identified from a Mutagenized Oat Population. *Food Chem* 2023, *404*, 134687, doi:10.1016/j.foodchem.2022.134687.

21. Hikawczuk, T.; Szuba-Trznadel, A.; Wróblewska, P.; Wiliczkiewicz, A. Oat Hull as a Source of Lignin-Cellulose Complex in Diets Containing Wheat or Barley and Its Effect on Performance and Morphometric Measurements of Gastrointestinal Tract in Broiler Chickens. *Agriculture* 2023, *13*, 896, doi:10.3390/agriculture13040896.

22. Park, K.H.; Lee, K.Y.; Lee, H.G. Chemical Composition and Physicochemical Properties of Barley Dietary Fiber by Chemical Modification. *Int J Biol Macromol* 2013, *60*, 360–365, doi:10.1016/j.ijbiomac.2013.06.024.

23. Koj, K.; Pejcz, E. Rye Dietary Fiber Components upon the Influence of Fermentation Inoculated with Probiotic Microorganisms. *Molecules* 2023, *28*, 1910, doi:10.3390/molecules28041910.

24. Maina, N.H.; Rieder, A.; De Bondt, Y.; Mäkelä-Salmi, N.; Sahlstrøm, S.; Mattila, O.; Lamothe, L.M.; Nyström, L.; Courtin, C.M.; Katina, K.; et al. Process-Induced Changes in the Quantity and Characteristics of Grain Dietary Fiber. *Foods* 2021, *10*, 2566, doi:10.3390/foods10112566.

25. Adebo, J.A.; Kesa, H. Evaluation of Nutritional and Functional Properties of Anatomical Parts of Two Sorghum (Sorghum Bicolor) Varieties. *Heliyon* 2023, *9*, e17296, doi:10.1016/j.heliyon.2023.e17296.

26. Luna, P.; Risfaheri; Hoerudin; Charalampopoulos, D.; Chatzifragkou, A. Fractionation of Carbohydrate Polymers from Indonesian Sorghum By-Products. *Food and Bioproducts Processing* 2022, *135*, 114–122, doi:10.1016/j.fbp.2022.07.007.

27. de Oliveira, L. de L.; de Oliveira, G.T.; de Alencar, E.R.; Queiroz, V.A.V.; de Alencar Figueiredo, L.F. Physical, Chemical, and Antioxidant Analysis of Sorghum Grain and Flour from Five Hybrids to Determine the Drivers of Liking of Gluten-Free Sorghum Breads. *LWT* 2022, *153*, 112407, doi:10.1016/j.lwt.2021.112407.

28. Alvarenga, I.C.; Ou, Z.; Thiele, S.; Alavi, S.; Aldrich, C.G. Effects of Milling Sorghum into Fractions on Yield, Nutrient Composition, and Their Performance in Extrusion of Dog Food. *J Cereal Sci* 2018, *82*, 121–128, doi:10.1016/j.jcs.2018.05.013.

29. Zhang, Z.; Smith, C.; Li, W. Extraction and Modification Technology of Arabinoxylans from Cereal By-Products: A Critical Review. *Food Research International* 2014, *65*, 423–436, doi:10.1016/j.foodres.2014.05.068.

30. Qiu, S.; Yadav, M.P.; Yin, L. Characterization and Functionalities Study of Hemicellulose and Cellulose Components Isolated from Sorghum Bran, Bagasse and Biomass. *Food Chem* 2017, *230*, 225–233, doi:10.1016/j.foodchem.2017.03.028.

31. Ma, Q.; Wang, X.; Zhang, R.; Huang, F.; Jia, X.; Dong, L.; Liu, D.; Zhang, M. Structural, Physicochemical and Functional Properties of Dietary Fiber from Black Rice Bran Treated by Different Processing Methods. *Food Biosci* 2025, *65*, 106025, doi:10.1016/j.fbio.2025.106025.

32. Ma, Z.-Q.; Zhang, N.; Zhai, X.-T.; Tan, B. Structural, Physicochemical and Functional Properties of Dietary Fiber from Brown Rice Products Treated by Different Processing Techniques. *LWT* 2023, *182*, 114789, doi:10.1016/j.lwt.2023.114789.

33. Colasanto, A.; Travaglia, F.; Bordiga, M.; Coïsson, J.D.; Arlorio, M.; Locatelli, M. Impact of Traditional and Innovative Cooking Techniques on Italian Black Rice (Oryza Sativa L., Artemide Cv) Composition. *Food Research International* 2024, *194*, 114906, doi:10.1016/j.foodres.2024.114906.

34. Zhang, D.; Ye, Y.; Wang, L.; Tan, B. Nutrition and Sensory Evaluation of Solid-State Fermented Brown Rice Based on Cluster and Principal Component Analysis. *Foods* 2022, *11*, 1560, doi:10.3390/foods11111560.