**Supplementary tables and figures**

Table S1. Wheat as a source of β-glucan based on average annual consumption 2014-2017. Different β-glucan contents were assumed in order to calculate consumption values. At a β-glucan content of 1% DW the recommended daily intake of 3g would be reached in Europe.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **β-glucan consumed per capita (g/day)** | | |
| **Region** | **Wheat consumption per capita (kg/day)a** | **Assuming 0.5%DW** | **Assuming 0.8%DW** | **Assuming 1.0%DW** |
| **Asia** | 0.172 | 0.860 | 1.38 | 1.72 |
| **Africa** | 0.136 | 0.678 | 1.08 | 1.36 |
| **Americas** | 0.168 | 0.841 | 1.35 | 1.68 |
| **Europe** | 0.303 | 1.514 | 2.42 | 3.03 |
| **Oceania** | 0.207 | 1.033 | 1.65 | 2.07 |

a Consumption data from Erenstein et al (2022)

Reference

Erenstein, O., Jaleta, M., Mottaleb, K. A., Sonder, K., Donovan, J., & Braun, H. J., 2022. Global Trends in Wheat Production, Consumption and Trade, in: Reynolds, M.P., Braun, H.-J. (Eds.), Wheat Improvement: Food Security in a Changing Climate. Springer International Publishing, Cham., pp. 47-66.

Table S2. Mean β-glucan measured in soluble flour fractions extracted at 100°C. SD – standard deviation; CV – coefficient of variation; n – number of samples.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sample** | **Mean β-glucan content (%DW)** | **SD** | **CV (%)** | **n** |
| Bran | 0.276 | 0.053 | 19.3 | 6 |
| Wholemeal | 0.133 | 0.057 | 43.0 | 6 |
| 1st break | 0.103 | 0.059 | 57.7 | 6 |
| 2nd break | 0.105 | 0.042 | 39.9 | 6 |

Table S3. Mean G3:G4 ratio measured in soluble β-glucan fraction extracted at 100°C. SD – standard deviation; CV – coefficient of variation; n – number of samples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sample** | **Mean G3:G4 ratio** | **SD** | **CV (%)** | **n** |
| Bran | 2.3 | 0.15 | 6.6 | 3 |
| Wholemeal | 3.5 | 1.1 | 32 | 3 |
| 1st break | 2.7 | 0.82 | 30 | 3 |
| 2nd break | 3.2 | 1.0 | 31 | 3 |

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Fig. S1. Scheme for milling using the Buhler-MLU-202 mill. Ten flour fractions in total are produced: breaks 1-3, reductions 1-3, bran flour, bran overtails, offal overtails and offal flour. Bran and offal over tails are the results of an additional sieving from Bran and Offal fractions, respectively. In the over tails remain the larger particles. (Reproduced from González-Thuillier et al, 2015 with permission from the authors).

Reference

González-Thuillier, I., Salt, L., Chope, G., Penson, S., Skeggs, P., Tosi, P., Powers, S.J., Ward, J.L., Wilde, P., Shewry, P.R. and Haslam, R.P., 2015. Distribution of lipids in the grain of wheat (cv. Hereward) determined by lipidomic analysis of milling and pearling fractions. Journal of Agricultural and Food Chemistry, 63(49), 10705-10716.

A screenshot of a graph

Description automatically generated

Fig. S2 β-glucan content (% dry weight) in 1st and 2nd break flour, calculated in soluble (blue) and insoluble (yellow) fractions treated with lichenase only (L) or lichenase and xylanase together (L+X). No significant differences were found between L and L+X in either 1st or 2nd break flour. Box plots show the mean and interquartile range. Values above boxes indicate the amount of β-glucan as a proportion of the whole, calculated as the sum of soluble and insoluble β-glucan representing 100% of the content. Outliers are indicated by dots. n=3-5.

A graph of a diagram

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Fig. S3 G3:G4 ratio measured in total, soluble and insoluble β-glucan from different milling fractions. Boxplots show mean and interquartile range. Outliers are indicated by dots. Significant differences within any given fraction (total, soluble or insoluble) were determined by ANOVA and post-hoc Tukey HSD. Samples sharing the same letter (within total, soluble or insoluble fractions) are not significantly different. n=4 for all analyses.

Chart

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Fig. S4. Analysis of total β-glucan in 1st break and bran fractions by PACE after digestion with lichenase (L) or lichenase and xylanase (LX) on 20% gels (A) and 12% gels (B)