**Online supplementary material**

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| **Supplemental Table 1.** Nutrient composition of lunch and dinner (per 100 g)a |
| *Nutrient composition*b | *Lunch* | *Dinner* |
| Energy (kJ) | 597 | 520 |
| Energy (kcal) | 143 | 120 |
| Fat (g) | 7.1 | 2 |
| Protein (g) | 4 | 6 |
| Carbohydrate (g) | 15.5 | 19 |
| Dietary fibre (g) | 0.5 | 1.5 |
| a150 mL of tap water was included in both meals. bAccording to the manufacturers’ data. |

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| **Supplemental Table 2.** Amino acid content of breakfast productsa (per 100 g DM) |
| *Amino acid* | *RPHI* | *RPIG* | *RPHG* | *RP55**/RP40* | *WB* |
| Alanineb | 0.4 | 0.6 | 0.7 | 0.4 | 0.4 |
| Arginineb | 0.6 | 0.7 | 0.9 | 0.5 | 0.5 |
| Aspartic acidb | 0.7 | 0.8 | 1.0 | 0.6 | 0.6 |
| Cysteineb | 0.3 | 0.4 | 0.6 | 0.2 | 0.3 |
| Glutamineb | 3.5 | 5.5 | 7.4 | 1.8 | 4.3 |
| Glycineb | 0.5 | 0.7 | 0.84 | 0.4 | 0.5 |
| Histidineb | 0.3 | 0.4 | 0.3 | 0.2 | 0.3 |
| Isoleucineb | 0.5 | 0.7 | 0.9 | 0.3 | 0.5 |
| Leucineb | 0.8 | 1.2 | 1.6 | 0.5 | 0.9 |
| Lysineb | 0.3 | 0.4 | 0.5 | 0.4 | 0.3 |
| Methionineb | 0.2 | 0.3 | 0.4 | 0.2 | 0.2 |
| Phenylalanineb | 0.6 | 0.8 | 1.2 | 0.4 | 0.7 |
| Prolineb | 1.3 | 1.9 | 2.7 | 0.7 | 1.5 |
| Serineb | 0.6 | 0.9 | 1.1 | 0.4 | 0.7 |
| Threonineb | 0.4 | 0.5 | 0.6 | 0.3 | 0.4 |
| Tryptophanc | 0.1 | 0.2 | 0.3 | 0.1 | 0.1 |
| Tyrosineb | 0.3 | 0.6 | 0.7 | 0.2 | 0.4 |
| Valineb | 0.6 | 0.8 | 1.0 | 0.4 | 0.6 |
| BCAA | 1.9 | 2.7 | 3.5 | 1.3 | 2.0 |
| EAA | 3.8 | 5.3 | 6.7 | 2.7 | 3.8 |
| Abbreviations: RPHI, porridge: 40 g rye flakes inulin:wheat gluten 9:3 g; RPIG, porridge: 40 g rye flakes inulin:wheat gluten 6:6 g; RPHG, porridge: 40 g rye flakes inulin:wheat gluten 3:9 g; RP55, porridge: 55 g rye flakes; RP40, porridge: 40 g rye flakes; WB, 55 g refined wheat bread; BCAA, isoleucine, leucine, valine; EAA, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, valine. aNot including content in additional food items. bDetermined by the EN ISO 13903:2005. cDetermined by EN ISO 13904:2005.  |

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| **Supplemental Table 3.** *Ad libitum* food intake at dinner (kJ)a |
| *Breakfast meal* |  | *All (n = 21)* | *Males (n = 11)* | *Females (n = 10)* | *P*-value |
| RPHI | Mean | 2774  | 3368x  | 2121y  | 0.05 |
|  | SD | 1049 | 880 | 824 |  |
|  | Range | 1074-4162 | 1411-4162 | 1074-3454 |  |
| RPIG | Mean | 2406 | 3003x  | 1676y  | 0.05 |
|  | SD | 1114 | 1005 | 770 |  |
|  | Range | 567-5156 | 1501-5156 | 567-3284 |  |
| RPHG | Mean | 2604  | 3149x  | 1937y  | 0.05 |
|  | SD | 1154 | 1159 | 760 |  |
|  | Range | 768-4810 | 1300-4810 | 768-3299 |  |
| RP55 | Mean | 2600  | 3279x  | 1853y  | 0.05 |
|  | SD | 1171 | 1111 | 702 |  |
|  | Range | 818-4519 | 1436-4519 | 818-2922 |  |
| RP40 | Mean | 2703 | 3395x | 1858y  | 0.05 |
|  | SD | 1108 | 815 | 790 |  |
|  | Range | 828-4393 | 1792-4393 | 828-3143 |  |
| WB | Mean | 2683  | 3283x  | 2024y  | 0.05 |
|  | SD | 1086 | 1076 | 644 |  |
|  | Range | 1034-4835 | 1245-4835 | 1034-2922 |  |
| aThere were no differences in food intake between breakfast meals. Values not sharing the same superscript letter are significantly different, *P*<0.05. Abbreviations: SD, standard deviation; RPHI, porridge: 40 g rye flakes inulin:wheat gluten 9:3 g; RPIG, porridge: 40 g rye flakes inulin:wheat gluten 6:6 g; RPHG, porridge: 40 g rye flakes inulin:wheat gluten 3:9 g; RP55, porridge: 55 g rye flakes; RP40, porridge: 40 g rye flakes; WB, 55 g refined wheat bread. |

**Online supplementary material**

**Supplemental Fig. 1.** A:Mean concentrations of methane in breath (*n* = 17) during the whole day (-30-480 min) after intake of six isoenergetic breakfast meals. The concentration was higher during the whole day for RPHI, RP55 and RP40 compared with RPHG (*P*<0.05) and WB (*P*<0.01). B: AUC for methane in breath (*n* = 17) during the whole day (0-480 min) after intake of six isoenergetic breakfast meals. Bars not sharing the same letter are significantly different, *P*<0.05. Analysed by ANCOVA. Abbreviations: RP40, porridge: 40 g rye flakes; RP55, porridge: 55 g rye flakes; RPHG, porridge: 40 g rye flakes inulin:wheat gluten 3:9 g; RPHI, porridge: 40 g rye flakes inulin:wheat gluten 9:3 g; RPIG, porridge: 40 g rye flakes inulin:wheat gluten 6:6 g; WB, 55 g refined wheat bread.

**Supplemental Fig. 2.** Mean concentrations of insulin (n = 21) during the whole day (-15-470 min) after intake of six isoenergetic breakfast meals. No difference was observed between breakfast meals, P<0.05. Analysed by ANCOVA. Abbreviations: RP40, porridge: 40 g rye flakes; RP55, porridge: 55 g rye flakes; RPHG, porridge: 40 g rye flakes inulin:wheat gluten 3:9 g; RPHI, porridge: 40 g rye flakes inulin:wheat gluten 9:3 g; RPIG, porridge: 40 g rye flakes inulin:wheat gluten 6:6 g; WB, 55 g refined wheat bread.

**Supplemental Fig. 3.** Mean concentrations of total GLP-1 (n = 14) during the whole day (-15-470 min) after intake of three isoenergetic breakfast meals. No difference was observed between breakfast meals, P<0.05. Analysed by ANCOVA. Abbreviations: RP40, porridge: 40 g rye flakes; RP55, porridge: 55 g rye flakes; RPHG, porridge: 40 g rye flakes inulin:wheat gluten 3:9 g; RPHI, porridge: 40 g rye flakes inulin:wheat gluten 9:3 g; RPIG, porridge: 40 g rye flakes inulin:wheat gluten 6:6 g; WB, 55 g refined wheat bread.