Supplementary materials:

**Table S1.** Categories of food products and beverages.

| Category | Examples of products from the specific category |
|---|---|
| Grains, grain-based products | Pasta, oats, rice, breakfast cereals, muesli, etc. |
| Bread | White bread, rye bread, seed bread |
| Potatoes | Boiled, fried potatoes, French fries |
| Meat, offal | Pork, beef, lamb, poultry, liver |
| Meat products | Sausages, smoked meat, canned meat |
| Eggs | Hen eggs, quail eggs |
| Fish | Freshwater fish, seawater fish |
| Fish products | Canned fish, fish sticks, smoked fish |
| Milk and milk products | Milk, kefir, buttermilk, yoghurt, sour cream, cottage cheese, cheese, etc. |
| Vegetable oils, plant and animal-based fats | Olive oil, other vegetable oils, margarine, butter, etc. |
| Vegetables | Fresh and cooked vegetables |
| Fruits, berries | Fresh and dried fruits, fresh berries |
| Mushrooms | Wild and cultivated edible mushrooms |
| Legumes, nuts, seeds, milk alternatives | Beans, peas, lentils, soy and its products, nuts, peanuts and peanut butter, plant-based drinks, tofu, vegan cheese, etc. |
| Sweets, bakery goods | Pastries, cookies, chocolate and other candies, etc. |
| Condiments | Sugar, honey, sugar substitutes, soy sauce, mayonnaise |
| Fast food, salty snacks | Hamburgers, pizza, dumplings, instant soups, potato and corn chips |
| Lemonades, energy drinks | Lemonades with and without caffeine and sugar, energy drinks |
| Coffee | Filtered coffee, instant coffee, etc. |
| Tea | Black tea, green tea, herbal tea, etc. |
| Water | Tap water |
| Dietary supplements | Fish oil, multivitamins, iron, calcium, vitamin D, vitamin C, magnesium, B group vitamins, probiotics, fibre supplements, meal replacements, other dietary supplements |

**Table S2.** Calculated average daily intake (g per day) [1] of food products and beverages based on data from the food frequency questionnaire ($n$ = 52).

| Food products or beverages | Control group ($n$ = 26) | Experimental groups ($n$ = 26) |
|---|---|---|
| Grains, grain-based products | 82.11 ± 101.77 (3.66–482.22) | 65.87 ± 65.54 (1.74–313.78) |
| Bread | 11.34 ± 9.38 (0.27–31.06) | 12.20 ± 10.36 (0.00–40.79) |
| Potatoes | 38.38 ± 31.70 (3.95–120.00) | 54.36 ± 38.40 (0.00–147.78) |
| Meat, offal | 63.00 ± 50.15 (0.00–230.55) | 81.83 ± 49.93 (0.00–198.58) |
| Meat products | 7.81 ± 8.96 (0.00–31.66) | 14.48 ± 15.60 (0.00–70.52) |
| Eggs | 29.53 ± 31.19 (1.97–150.33) | 27.27 ± 15.27 (4.93–60.08) |
| Fish | 31.98 ± 39.56 (0.82–200.00) | 28.77 ± 31.27 (3.56–156.71) |
| Fish products | 9.25 ± 15.69 (0.22–68.55) | 7.05 ± 12.21 (0.25–62.68) |
| Milk and milk products | 320.78 ± 245.75 (11.84–875.62) | 344.08 ± 188.47 (0.00–824.52) |
| Vegetable oils, plant- and animal-based fats | 14.65 ± 11.91 (1.38–54.87) | 11.82 ± 5.49 (1.49–25.61) |
| Vegetables | 124.00 ± 64.00 (23.67–280.00) | 177.62 ± 138.69 (39.89–700.00) |
| Fruits, berries | 170.96 ± 150.54 (12.82–525.00) | 158.31 ± 125.77 (22.93–464.96) |
| Mushrooms | 2.17 ± 2.24 (0.08–6.41) | 1.31 ± 1.70 (0.00–6.41) |
| Legumes, nuts, seeds, milk alternatives | 35.36 ± 37.37 (2.38–144.05) | 32.86 ± 35.96 (0.25–162.96) |
| Sweets, bakery goods | 15.45 ± 15.41 (0.00–59.18) | 21.78 ± 21.09 (0.00–67.32) |
| Condiments | 6.54 ± 7.12 (0.00–23.63) | 6.82 ± 5.65 (0.00–20.62) |
| Fast food, salty snacks | 14.92 ± 23.34 (0.00–104.49) | 11.12 ± 16.15 (0.44–71.12) |
| Lemonades, energy drinks | 15.70 ± 25.99 (0.00–110.30) | 29.32 ± 51.10 (0.00–220.00) |
| Coffee | 313.57 ± 267.07 (0.00–1080.00) | 445.68 ± 228.70 (119.67–1080.00) |
| Tea | 260.75 ± 320.18 (0.00–1440.00) | 270.08 ± 219.77 (1.97–600.00) |
| Water | 877.58 ± 398.64 (47.01–1320.00) | 941.63 ± 417.55 (172.38–1320.00) |

[1] Mean ± standard deviation (minimal–maximal value).

**Table S3.** Significant correlations between food, beverage intake and gut microbiome.

| Food products or beverages | Taxonomic gut microbiome composition | Spearman's rank correlation coefficient (ϱ), *p*-value |
|---|---|---|
| Grains, grain-based products | genus *Bifidobacterium* | ϱ = 0.517, *p* = 0.002 |
| | genus *Atopobium* | ϱ = 0.513, *p* = 0.003 |
| Potatoes | *Enterobacter* spp. | ϱ = -0.532, *p* = 0.002 |
| Meat, offal | genus *Gastranaerophilales* | ϱ = -0.500, *p* = 0.004 |
| | genus *Victivallis* | ϱ = -0.600, *p* < 0.0001 |
| | genus *Anaeroplasma* | ϱ = -0.521, *p* = 0.002 |
| | genus *Terrisporobacter* | ϱ = -0.571, *p* = 0.001 |
| | genus *Enterobacter* | ϱ = -0.521, *p* = 0.002 |
| Fish | order *Coriobacteriales* | ϱ = 0.511, *p* = 0.003 |
| Milk and milk products | *Subdoligranulum* spp. | ϱ = 0.500, *p* = 0.004 |
| Vegetable oils, plant- and animal-based fats | genus *Campylobacter* | ϱ = 0.528, *p* = 0.002 |
| | genus *Fusobacterium* | ϱ = 0.528, *p* = 0.002 |
| | genus *Leptotrichia* | ϱ = 0.528, *p* = 0.002 |
| | genus *Porhphyromonas* | ϱ = 0.528, *p* = 0.002 |
| | genus *Faecalitalea* | ϱ = 0.528, *p* = 0.002 |
| | genus *Gemelia* | ϱ = 0.521, *p* = 0.002 |
| | genus *Epulopiscium* | ϱ = 0.528, *p* = 0.002 |
| | genus *Hungatella* | ϱ = 0.514, *p* = 0.003 |
| | genus *Parvimonas* | ϱ = 0.525, *p* = 0.002 |
| | family *Veillonellaceae* | ϱ = 0.529, *p* = 0.002 |
| Vegetables | family *Oscillospiraceae* | ϱ = -0.542, *p* = 0.001 |
| | *Paludicola* spp. | ϱ = 0.539, *p* = 0.001 |
| Legumes, nuts, seeds, milk alternatives | *Citrobacter* spp. | ϱ = -0.518, *p* = 0.002 |
| Sweets, bakery goods | *Mitsuokella* spp. | ϱ = -0.527, *p* = 0.002 |
| Condiments | *Anaerotruncus* spp. | ϱ = 0.576, *p* = 0.001 |
| Coffee | genus *Gastranaerophilales* | ϱ = -0.590, *p* < 0.0001 |
| | genus *Victivallis* | ϱ = -0.514, *p* = 0.003 |
| | genus *Anaeroplasma* | ϱ = -0.558, *p* = 0.001 |
| Tea | *Coprobacter* spp. | ϱ = -0.645, *p* < 0.0001 |
| Water | Family *Methanomethylophilaceae* | ϱ = -0.579, *p* = 0.001 |

**Table S4.** Dietary habits and gut microbiome composition related profiles based on principal component analysis.

| Microorganisms at phylum level | First profile (eigenvalue = 3.05) | Second profile (eigenvalue = 2.29) | Third profile (eigenvalue = 1.43) |
|---|---|---|---|
| *Actinobacteriota* | **0.502**[1] | 0.111 | -0.231 |
| *Bacteriodota* | **-0.560** | **0.534** | 0.079 |
| *Firmicutes* | 0.451 | **-0.566** | 0.145 |
| *Proteobacteria* | 0.116 | 0.036 | **-0.586** |
| Other phyla | -0.246 | -0.244 | 0.033 |
| **Foods products and beverages** | | | |
| Grains, grain-based products | 0.136 | -0.239 | 0.025 |
| Bread | 0.207 | 0.149 | -0.030 |
| Potatoes | 0.059 | **0.633** | 0.027 |
| Meat, offal | 0.327 | 0.110 | 0.003 |
| Meat products | 0.438 | 0.012 | 0.247 |
| Eggs | -0.083 | -0.255 | -0.110 |
| Fish | 0.454 | -0.123 | 0.411 |
| Fish products | 0.355 | -0.080 | 0.166 |
| Milk and milk products | 0.236 | 0.201 | -0.236 |
| Vegetable oils, plant- and ani-mal-based fats | -0.211 | -0.282 | -0.053 |
| Vegetables | -0.199 | **0.526** | 0.317 |
| Fruits, berries | -0.292 | 0.181 | -0.079 |
| Mushrooms | -0.440 | -0.041 | -0.127 |
| Legumes, nuts, seeds, milk alternatives | -0.104 | **-0.554** | -0.019 |
| Sweets, bakery goods | **0.520** | 0.266 | -0.097 |
| Condiments | -0.316 | -0.288 | 0.040 |
| Fast food, salty snacks | **0.600** | 0.221 | 0.232 |
| Lemonades, energy drinks | 0.273 | -0.056 | **-0.533** |
| Coffee | -0.168 | 0.131 | 0.266 |
| Tea | -0.292 | -0.219 | 0.334 |
| Water | -0.388 | 0.148 | -0.136 |

[1] Rotated component matrix coefficients above 0.5 or less than -0.5 bolded as statistically significant values.

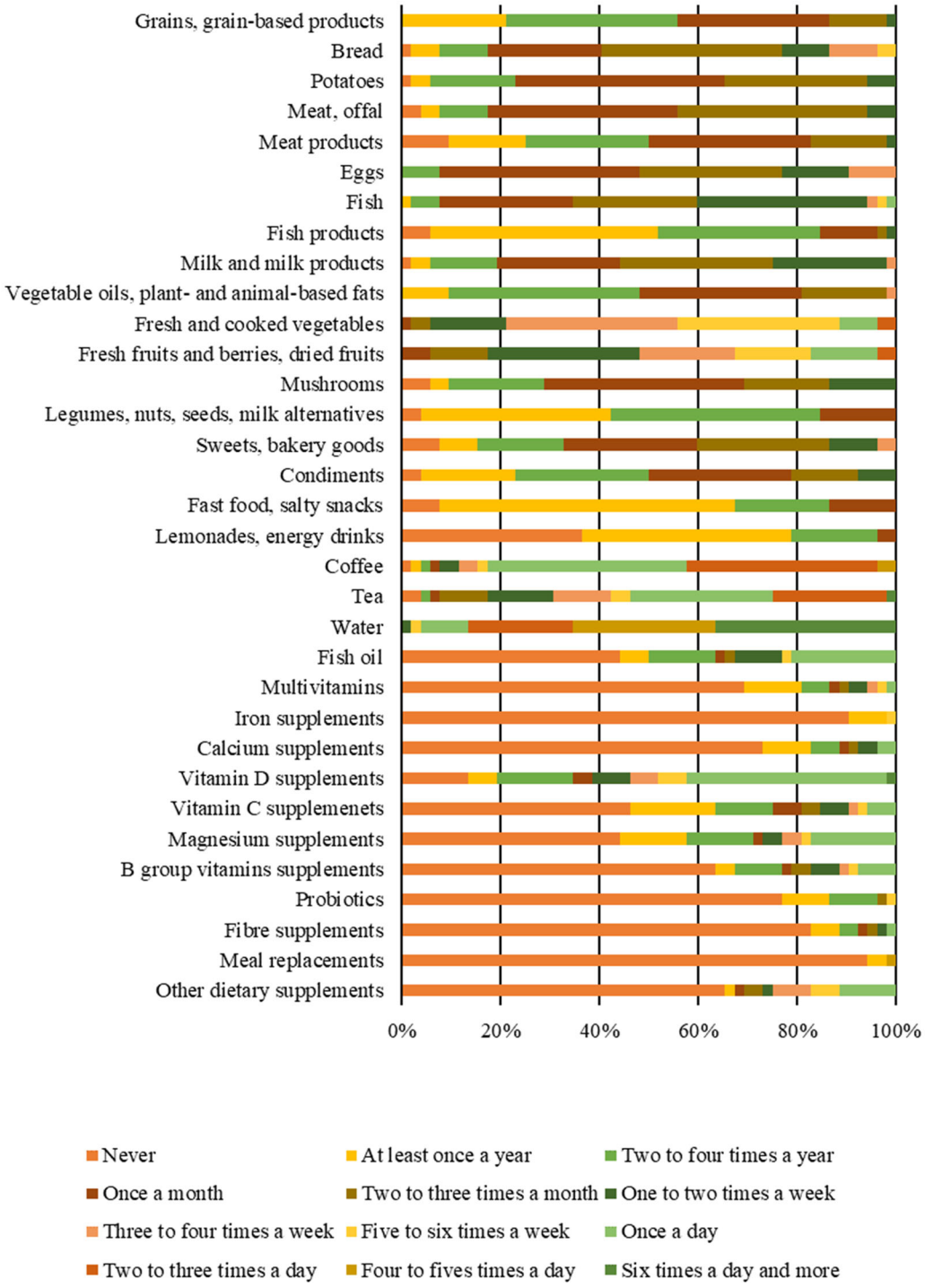


**Figure S1.** Average food, beverage and dietary supplements intake. Data from the food frequency questionnaire ($n$ = 52).