**Supplementary Table 1** – Food groups according to industrial processing degree. CUME Study, 2019.

|  |  |
| --- | --- |
| **Food groups** | **Food items** |
| **U/MPF&CP** | |
| Rice and pasta | White rice, brown rice, pasta, gnocchi, soup prepared with rice/soup prepared with soup pasta |
| Legumes | Beans/lentil, chickpeas |
| Cereal, roots and tubers | Corn, corn kernel, polenta, cassava/yam/barley potato, cassava flour/bread flour, corn flour, baked potato, oats/wheat germ/granola |
| Fried foods | French fries, fried cassava, polenta fried |
| Meat and organ meats | Steak, red meat in cubes, pork, mutton, meat balls, chicken with skin, chicken without skin, salmon, liver/gizzard/heart, other fish, shrimp/seafood, sushi/sashimi, soy meat |
| Eggs | Boiled chicken eggs |
| Unprocessed dairy products | Whole milk, skimmed milk, semi-skimmed milk |
| Fruits | Banana, orange/tangerine, apple/pear, avocado, pineapple, acai berry (pulp), acerola, guava, kiwi, papaya, mango, watermelon, melon, strawberry/cherry, peach/plum/nectarine, grape, raisin, tropical fruits *(pitanga, mangostão, graviola, umbu, cupuaçu*), fruit salad |
| Vegetables and greens | Lettuce/chard, watercress/kale/arugula/spinach/chicory, squash/pumpkin, zucchini/chayote, aubergine, beetroot, carrot, cauliflower/cabbage, cucumber, red/green bell peppers, tomato, pod vegetables, legumes soup, peppers |
| Olive oil, nuts and seeds | Peanuts/nuts/Brazilian nut/cashew nut |
| Natural beverages | Coffee, mate/black tea, white/green tea, natural fruit juice. |
| Culinary preparations | Olive oil, soy oil, sunflower oil, butter, sugar, brown sugar, artificial sweeteners, honey, salt, light sugar, canola oil, corn oil, pork fat |
|  | |
| **Processed** | |
| Processed cheeses | Cheese (mozzarella/provolone/Traditional *Minas* cheese/*Canastra* cheese), ricotta, cottage |
| Processed meats | Corned meat, smoked meat, sardine, cod |
| French bread | French bread |
| Processed sweets | Fruit jelly, guava/peach/fig/marmalade, fruits in syrup |
| Fermented alcoholics beverages | Beer, wine, other types of wines |
|  | |
| **UPF** | |
| Ultra-processed dairy products | Plain curd, light curd, plain yogurt, light/low fat yogurt |
| Sausages | Bologna/salami/fatty ham, turkey/Chester, sausages, frankfurter/sausage, bacon |
| Ultra-processed breads | Sliced white bread, toast, Brazilian cheese bread, sweet bread, whole bread (rye/wheat/oats) light bread, breakfast cereal |
| Margarine | Margarine, light margarine/mayonnaise, mayonnaise |
| Sweetened beverages | Soft drinks, diet/light/zero calories soft drinks, industrialized fruit juice (can/box/powder instant), diet/light industrialized juice |
| Distilled alcoholics beverages | Vodka/rum/whisky, cachaça |
| Ultra-processed fast foods and sweets | Pizza, hot dog/red meat/chicken hamburger, fried finger foods (chicken croquet/pastry/*risole*/croquet), pastry/pie/quiche, popcorn, snacks such as industrialized chips, *lasagne*/cannelloni/*rondelli*, ice cream, light ice cream, soy milk, dark chocolate (50 – 70% cocoa), milk chocolate/ bonbon/Brazilian fudge balls, cereal bar, chocolate milk, pudding/ambrosia/*dulce de leche*/sweet rice/flan, sweet delicacies/*maria-mole* (a dessert popular in Brazil that is similar to a marshmallow)/merengue/candy , mustard |

U/MPF&CP, Unprocessed/Minimally Processed Foods and Culinary Preparations; UPF, Ultra-Processed Foods.

**Supplementary Table 2 –** Baseline characteristics of participants according to quintiles of unprocessed/minimally processed food and culinary preparation consumption. CUME Study, 2019 (n = 1.221).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Characteristics** | **Unprocessed/Minimally Processed Foods and Culinary Preparation Consumption** | | | | |  |
| **Q1**  **(n =245)** | **Q2**  **(n =244)** | **Q3**  **(n =244)** | **Q4**  **(n =244)** | **Q5**  **(n=244)** | ***p*†** |
| Age (Years)\* | 32.7 (7.5) | 33.4 (7.7) | 36.0 (10.0) | 36.5 (9.3) | 37.2 (10.0) | < 0.001 |
| Gender, n (%)\* |  |  |  |  |  | 0.552 |
| Male | 68 (27.8) | 48 (19.7) | 57 (23.4) | 67 (27.5) | 52 (21.3) |  |
| Female | 177 (72.2) | 196 (80.3) | 187 (76.6) | 177 (72.5) | 192 (78.7) |  |
| Skin colour\* |  |  |  |  |  | 0.098 |
| White | 163 (66.5) | 170 (69.7) | 162 (66.4) | 153 (62.7) | 148 (60.7) |  |
| Black/Brown | 79 (32.2) | 71 (29.1) | 80 (32.8) | 89 (36.5) | 95 (38.9) |  |
| Yellow/Indigenous | 3 (1.2) | 3 (1.2) | 2 (0.8) | 2 (0.8) | 1 (0.4) |  |
| Marital status\* |  |  |  |  |  | < 0.001 |
| Single | 147 (60.0) | 131 (53.7) | 120 (49.2) | 102 (41.8) | 102 (41.8) |  |
| Married/Stable union | 90 (36.7) | 102 (41.8) | 104 (42.6) | 131 (53.7) | 122 (50.0) |  |
| Separated/Divorced/widower/other | 8 (3.3) | 11 (4.5) | 20 (8.2) | 11 (4.5) | 20 (8.2) |  |
| Per capita income (US$/month)\*,\*\* | 720 (531) | 696 (528) | 891 (869) | 789 (570) | 784 (632) | 0.212 |
| Smoking status, n (%)\* |  |  |  |  |  | 0.003 |
| No | 186 (75.9) | 196 (80.3) | 206 (84.4) | 200 (81.8) | 202 (82.8) |  |
| Past | 27 (11.0) | 18 (7.4) | 22 (9.0) | 29 (11.9) | 29 (11.9) |  |
| Current | 32 (13.1) | 30 (12.3) | 16 (6.6) | 15 (6.3) | 13 (5.3) |  |
| Physical activity, n (%)\* |  |  |  |  |  | 0.001 |
| Inactive | 71 (29.0) | 69 (28.3) | 45 (18.4) | 54 (22.1) | 44 (18.0) |  |
| Insufficiently active | 59 (24.1) | 46 (18.8) | 45 (18.5) | 55 (22.6) | 53 (21.7) |  |
| Active | 115 (46.9) | 129 (52.9) | 154 (63.1) | 135 (55.3) | 147 (60.3) |  |
| Obesity |  |  |  |  |  | 0.084 |
| No | 223 (91.0) | 224 (91.8) | 228 (93.4) | 230 (94.3) | 230 (94.3) |  |
| Yes | 22 (9.0) | 20 (8.2) | 16 (6.6) | 14 (5.7) | 14 (5.7) |  |
| Pathological history family |  |  |  |  |  | 0.808 |
| No hypertension | 170 (69.4) | 178 (72.9) | 169 (69.3) | 182 (74.6) | 170 (69.7) |  |
| Hypertension | 75 (30.6) | 66 (27.1) | 75 (30.7) | 62 (25.4) | 74 (30.3) |  |
| Energy intake (kcal/day)\* | 2420.4 (999.7) | 2221.6 (838.3) | 2289.4 (889.0) | 2333.8 (856.8) | 2353.1 (914.0) | 0.216 |
| Macronutrients (% energy)\* |  |  |  |  |  |  |
| Carbohydrate | 45.2 (8.1) | 47.5 (8.2) | 47.6 (8.6) | 48.1 (8.8) | 47.2 (12.7) | 0.0092 |
| Protein | 16.8 (3.6) | 17.6 (4.0) | 17.9 (4.4) | 18.7 (4.7) | 18.7 (6.6) | < 0.001 |
| Fat | 35.5 (7.0) | 32.9 (6.1) | 32.6 (6.7) | 31.9 (6.8) | 33.0 (9.9) | < 0.001 |
| Alcohol (% energy) \* | 2.5 (3.5) | 2.0 (2.7) | 1.8 (2.6) | 1.3 (1.8) | 1.1 (1.5) | < 0.001 |
| Hypertension incident |  |  |  |  |  | 0.283 |
| No | 167 (68.2) | 172 (70.5) | 167 (68.4) | 161 (66.0) | 184 (75.4) |  |
| Yes | 78 (31.8) | 72 (29.5) | 77 (31.6) | 83 (34.0) | 60 (24.6) |  |
| Type 2 diabetes |  |  |  |  |  | 0.995 |
| No | 242 (98.8) | 236 (96.7) | 239 (98.0) | 238 (97.5) | 240 (98.4) |  |
| Yes | 3 (1.2) | 8 (3.3) | 5 (2.0) | 6 (2.5) | 4 (1.6) |  |
| Hypercholesterolemia |  |  |  |  |  | 0.458 |
| No | 211 (86.1) | 220 (90.2) | 214 (87.7) | 216 (88.5) | 218 (89.3) |  |
| Yes | 34 (13.8) | 24 (9.8) | 30 (12.3) | 28 (11.5) | 26 (10.7) |  |
| Hypertriglyceridemia |  |  |  |  |  | 0.790 |
| No | 232 (94.7) | 231 (94.7) | 231 (94.7) | 234 (95.9) | 231 (94.7) |  |
| Yes | 13 (5.3) | 13 (5.3) | 13 (5.3) | 10 (4.1) | 13 (5.3) |  |

Q1, first quintile; Q2, second quintile; Q3, third quintile; Q4, fourth quintile; Q5, fifth quintile.

\* Data are mean (standard deviation) or absolute frequency (relative frequency in %).

\*\* *Per capita* income: 1 US$ (Dollar) = 5.27 R$ (Real – official currency in Brazil) in 2nd April 2020.

† *P* values according to trend chi-square test (categorical variables) or Anova or Kruskal-Wallis test (continuous variables) when appropriate.

**Supplementary Table 3 –** Baseline characteristics of participants according to quintiles of processed food consumption. CUME Study, 2019 (n = 1.221).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Characteristics** | **Processed foods consumption** | | | | |  |
| **Q1**  **(n =245)** | **Q2**  **(n =244)** | **Q3**  **(n =244)** | **Q4**  **(n =244)** | **Q5**  **(n =244)** | ***p*†** |
| Age (Years)\* | 34.0 (9.1) | 33.9 (8.8) | 36.2 (9.9) | 35.7 (8.8) | 35.9 (8.9) | < 0.001 |
| Gender, n (%)\* |  |  |  |  |  | 0.002 |
| Male | 43 (17.5) | 46 (18.8) | 75 (30.7) | 59 (24.2) | 69 (28.3) |  |
| Female | 202 (82.5) | 198 (81.2) | 169 (69.3) | 185 (75.8) | 175 (71.7) |  |
| Skin colour\* |  |  |  |  |  | 0.799 |
| White | 162 (66.1) | 151 (61.9) | 158 (64.8) | 166 (68.0) | 159 (65.2) |  |
| Black/Brown | 81 (33.1) | 92 (37.7) | 83 (34.0) | 77 (31.6) | 81 (33.2) |  |
| Yellow/Indigenous | 2 (0.8) | 1 (0.4) | 3 (1.2) | 1 (0.4) | 4 (1.6) |  |
| Marital status\* |  |  |  |  |  | 0.009 |
| Single | 134 (54.7) | 136 (55.7) | 112 (45.9) | 109 (44.7) | 111 (45.5) |  |
| Married/Stable union | 95 (38.8) | 98 (40.2) | 120 (49.2) | 119 (48.8) | 117 (47.9) |  |
| Separated/Divorced/widower/other | 16 (6.5) | 10 (4.1) | 12 (4.9) | 16 (6.5) | 16 (6.6) |  |
| Per capita income (US$/month)\*,\*\* | 813 (850) | 764 (634) | 771 (632) | 798 (503) | 734 (555) | 0.917 |
| Smoking status, n (%)\* |  |  |  |  |  | < 0.001 |
| No | 214 (87.3) | 207 (84.8) | 198 (81.1) | 191 (78.3) | 180 (73.8) |  |
| Past | 20 (8.2) | 26 (10.7) | 20 (8.2) | 26 (10.7) | 33 (13.5) |  |
| Current | 11 (4.5) | 11 (4.5) | 26 (10.7) | 27 (11.0) | 31 (12.7) |  |
| Physical activity, n (%)\* |  |  |  |  |  | 0.707 |
| Inactive | 53 (21.6) | 57 (23.4) | 57 (23.4) | 55 (22.6) | 61 (25.0) |  |
| Insufficiently active | 55 (22.5) | 52 (21.3) | 54 (22.1) | 46 (18.8) | 51 (20.9) |  |
| Active | 137 (55.9) | 135 (55.3) | 133 (54.5) | 143 (58.6) | 132 (54.1) |  |
| Obesity |  |  |  |  |  | 0.299 |
| No | 231 (94.3) | 227 (93.0) | 227 (93.0) | 226 (92.6) | 224 (91.8) |  |
| Yes | 14 (5.7) | 17 (7.0) | 17 (7.0) | 18 (7.4) | 20 (8.2) |  |
| Pathological history family |  |  |  |  |  | 0.093 |
| No hypertension | 183 (74.7) | 169 (69.3) | 181 (74.2) | 176 (72.1) | 160 (65.6) |  |
| Hypertension | 62 (25.3) | 75 (30.7) | 63 (25.8) | 68 (27.9) | 84 (34.4) |  |
| Energy intake (kcal/day)\* | 2307.4 (955.1) | 2275.7 (774.4) | 2412.2 (943.8) | 2371.1 (879.4) | 2252.4 (943.9) | 0.077 |
| Macronutrients (% energy)\* |  |  |  |  |  |  |
| Carbohydrate | 48.0 (11.1) | 47.5 (9.5) | 47.6 (8.5) | 46.7 (9.0) | 45.8 (9.1) | 0.079 |
| Protein | 18.4 (6.2) | 18.0 (4.7) | 18.0 (4.2) | 17.9 (4.4) | 17.5 (4.1) | 0.348 |
| Fat | 33.0 (9.1) | 33.2 (7.4) | 32.9 (6.9) | 33.4 (6.9) | 33.3 (7.1) | 0.966 |
| Alcohol (% energy)\* | 0.5 (0.7) | 1.3 (2.1) | 1.5 (1.6) | 2.1 (2.2) | 3.4 (4.1) | < 0.001 |
| Hypertension incident |  |  |  |  |  | 0.771 |
| No | 173 (70.6) | 176 (72.1) | 161 (66.0) | 168 (68.8) | 173 (70.9) |  |
| Yes | 72 (29.4) | 68 (27.9) | 83 (34.0) | 76 (31.2) | 71 (29.1) |  |
| Type 2 diabetes |  |  |  |  |  | 0.092 |
| No | 242 (98.8) | 239 (97.9) | 240 (98.4) | 239 (98.0) | 235 (96.3) |  |
| Yes | 3 (1.2) | 5 (2.1) | 4 (1.6) | 5 (2.0) | 9 (3.7) |  |
| Hypercholesterolemia |  |  |  |  |  | 0.763 |
| No | 212 (86.5) | 224 (91.8) | 212 (86.9) | 211 (86.5) | 220 (90.2) |  |
| Yes | 33 (13.50 | 20 (8.2) | 32 (13.1) | 33 (15.5) | 24 (9.8) |  |
| Hypertriglyceridemia |  |  |  |  |  | 0.525 |
| No | 228 (93.1) | 234 (95.9) | 235 (96.3) | 229 (93.8) | 233 (95.5) |  |
| Yes | 17 (6.9) | 10 (4.1) | 9 (3.7) | 15 (6.2) | 11 (4.5) |  |

Q1, first quintile; Q2, second quintile; Q3, third quintile; Q4, fourth quintile; Q5, fifth quintile.

\* Data are mean (standard deviation) or absolute frequency (relative frequency in %).

\*\* *Per capita* income: 1 US$ (Dollar) = 5.27 R$ (Real – official currency in Brazil) in 2nd April 2020.

† *P* values according to trend chi-square test (categorical variables) or Anova or Kruskal-Wallis test (continuous variables) when appropriate.

**Supplementary Table 4 –** Baseline characteristics of participants according to quintile of ultra-processed food consumption. CUME Study, 2019 (n = 1.221).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Characteristics** | **Ultra-processed foods consumption** | | | | |  |
| **Q1**  **(n =245)** | **Q2**  **(n =244)** | **Q3**  **(n =244)** | **Q4**  **(n =244)** | **Q5**  **(n =244)** | ***p*†** |
| Age (Years)\* | 37.5 (9.5) | 37.1 (10.3) | 35.4 (8.5) | 33.5 (8.3) | 32.2 (7.7) | < 0.001 |
| Gender, n (%)\* |  |  |  |  |  | 0.162 |
| Male | 63 (25.7) | 63 (25.8) | 62 (25.4) | 49 (20.1) | 55 (22.5) |  |
| Female | 182 (74.3) | 181 (74.2) | 182 (74.6) | 195 (79.9) | 189 (77.5) |  |
| Skin colour\* |  |  |  |  |  | 0.072 |
| White | 153 (62.5) | 153 (62.7) | 157 (64.3) | 161 (66.0) | 172 (70.5) |  |
| Black/Brown | 90 (36.7) | 90 (36.9) | 85 (34.9) | 79 (32.4) | 70 (28.7) |  |
| Yellow/Indigenous | 2 (0.8) | 1 (0.4) | 2 (0.8) | 4 (1.6) | 2 (0.8) |  |
| Marital status\* |  |  |  |  |  | < 0.001 |
| Single | 97 (39.6) | 107 (43.8) | 104 (42.6) | 138 (56.6) | 156 (63.9) |  |
| Married/Stable union | 128 (52.2) | 118 (48.4) | 126 (51.6) | 98 (40.2) | 79 (32.4) |  |
| Separated/Divorced/widower/other | 20 (8.2) | 19 (7.8) | 14 (5.8) | 8 (3.2) | 9 (3.7) |  |
| Per capita income (US$/month)\*,\*\* | 807 (659) | 758 (558) | 775 (570) | 823 (854) | 716 (533) | 0.772 |
| Smoking status, n (%)\* |  |  |  |  |  | 0.380 |
| No | 200 (81.6) | 197 (80.7) | 196 (80.3) | 196 (80.3) | 201 (82.4) |  |
| Past | 30 (12.3) | 29 (11.9) | 26 (10,7) | 23 (9.4) | 17 (7.0) |  |
| Current | 15 (6.1) | 18 (7.4) | 22 (9.0) | 25 (10.3) | 26 (10.6) |  |
| Physical activity, n (%)\* |  |  |  |  |  | 0.003 |
| Inactive | 46 (18.8) | 48 (19.7) | 53 (21.7) | 65 (26.6) | 71 (29.1) |  |
| Insufficiently active | 54 (22.0) | 58 (23.8) | 45 (18.5) | 50 (20.5) | 51 (20.9) |  |
| Active | 145 (59.2) | 138 (56.5) | 146 (59.8) | 129 (52.9) | 122 (50.0) |  |
| Obesity |  |  |  |  |  | 0.176 |
| No | 232 (94.7) | 228 (93.4) | 225 (92.2) | 227 (93.0) | 223 (91.4) |  |
| Yes | 13 (5.3) | 16 (6.6) | 19 (7.8) | 17 (7.0) | 21 (8.6) |  |
| Pathological history family |  |  |  |  |  | 0.610 |
| No hypertension | 170 (69.4) | 173 (70.9) | 174 (71.3) | 181 (74.2) | 171 (70.1) |  |
| Hypertension | 75 (30.6) | 71 (29.1) | 70 (28.7) | 63 (25.8) | 73 (29.9) |  |
| Energy intake (kcal/day)\* | 2390.8 (936.6) | 2330.1 (878.8) | 2241.8 (856.7) | 2285.9 (871.3) | 2369.7 (963.00 | 0.43 |
| Macronutrients (% energy)\* |  |  |  |  |  |  |
| Carbohydrate | 46.4 (12.8) | 47.7 (8.9) | 47.6 (8.5) | 47.3 (7.9) | 46.5 (8.4) | 0.388 |
| Protein | 18.7 (6.2) | 18.5 (5.2) | 18.1 (4.4) | 17.6 (4.1) | 16.9 (3.5) | < 0.001 |
| Fat | 33.3 (9.9) | 32.1 (7.1) | 32.4 (6.5) | 33.2 (5.8) | 35.0 (7.2) | < 0.001 |
| Alcohol (% energy)\* | 1.6 (2.6) | 1.7 (2.4) | 1.9 (2.9) | 1.9 (2.5) | 1.6 (2.5) | 0.026 |
| Hypertension incident |  |  |  |  |  | 0.117 |
| No | 239 (97.5) | 240 (98.4) | 234 (95.9) | 239 (97.9) | 243 (99.6) |  |
| Yes | 6 (2.5) | 4 (1.6) | 10 (4.1) | 5 (2.1) | 1 (0.4) |  |
| Type 2 diabetes |  |  |  |  |  | 0.210 |
| No | 239 (97.5) | 240 (98.4) | 234 (95.9) | 239 (97.9) | 243 (99.6) |  |
| Yes | 6 (2.5) | 4 (1.6) | 10 (4.1) | 5 (2.1) | 1 (0.4) |  |
| Hypercholesterolemia |  |  |  |  |  | 0.404 |
| No | 224 (91.4) | 208 (85.3) | 218 (89.3) | 217 (88.9) | 212 (86.9) |  |
| Yes | 21 (8.6) | 36 (14.7) | 26 (10.7) | 27 (11.1) | 32 (13.1) |  |
| Hypertriglyceridemia |  |  |  |  |  | 0.574 |
| No | 233 (95.1) | 235 (96.3) | 230 (94.3) | 229 (93.8) | 232 (95.1) |  |
| Yes | 12 (4.9) | 9 (3.7) | 14 (5.7) | 15 (6.2) | 12 (4.9) |  |

Q1, first quintile; Q2, second quintile; Q3, third quintile; Q4, fourth quintile; Q5, fifth quintile.

\* Data are mean (standard deviation) or absolute frequency (relative frequency in %).

\*\* *Per capita* income: 1 US$ (Dollar) = 5.27 R$ (Real – official currency in Brazil) in 2nd April 2020.

† *P* values according to trend chi-square test (categorical variables) or Anova or Kruskal-Wallis test (continuous variables) when appropriate.