**Supplementary material**

**Table S1.** List of countries in the study, according to continents and global hunger index.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **List of countries in the study, according to continents** | | | | | | | | | | | |
| **Africa** | | **Asia** | | **America** | | | **Europe** | | | **Oceania** | |
| Algeria | | Afghanistan | | Antigua and Barbuda | | | Albania | | | Australia | |
| Angola | | Armenia | | Argentina | | | Austria | | | Fiji | |
| Benin | | Azerbaijan | | Bahamas | | | Belarus | | | French Polynesia | |
| Botswana | | Bangladesh | | Barbados | | | Belgium | | | Kiribati | |
| Burkina Faso | | Cambodia | | Belize | | | Bosnia and Herzegovina | | | New Caledonia | |
| Cabo Verde | | China | | Bolivia | | | Bulgaria | | | New Zealand | |
| Cameroon | | India | | Brazil | | | Croatia | | | Samoa | |
| Central African Republic | | Indonesia | | Canada | | | Cyprus | | | Solomon Islands | |
| Chad | | Iran | | Chile | | | Czechia | | | Vanuatu | |
| Congo | | Iraq | | Colombia | | | Denmark | | | .......... | |
| Cote d’Ivoire | | Israel | | Costa Rica | | | Estonia | | | .......... | |
| Djibouti | | Japan | | Cuba | | | Finland | | | .......... | |
| Egypt | | Jordan | | Dominica | | | France | | | .......... | |
| Eswatini | | Kazakhstan | | Dominican Republic | | | Georgia | | | .......... | |
| Ethiopia | | Kuwait | | Ecuador | | | Germany | | | .......... | |
| Gabon | | Kyrgyzstan | | El Salvador | | | Greece | | | .......... | |
| Gambia | | Lao People’s Dem Rep | | Grenada | | | Hungary | | | .......... | |
| Ghana | | Lebanon | | Guatemala | | | Iceland | | | .......... | |
| Guinea | | Malaysia | | Guyana | | | Ireland | | | .......... | |
| Guinea-Bissau | | Maldives | | Haiti | | | Italy | | | .......... | |
| Kenya | | Mongolia | | Honduras | | | Latvia | | | .......... | |
| Lesotho | | Myanmar | | Jamaica | | | Lithuania | | | .......... | |
| Liberia | | Nepal | | Mexico | | | Luxembourg | | | .......... | |
| Madagascar | | North Korea | | Nicaragua | | | Malta | | | .......... | |
| Malawi | | Oman | | Panama | | | Montenegro | | | .......... | |
| Mali | | Pakistan | | Paraguay | | | Netherlands | | | .......... | |
| Mauritania | | Philippines | | Peru | | | North Macedonia | | | .......... | |
| Mauritius | | Saudi Arabia | | Saint Kitts and Nevis | | | Norway | | | .......... | |
| Morocco | | South Korea | | Saint Lucia | | | Poland | | | .......... | |
| Mozambique | | Sri Lanka | | St Vincent and Grenadines | | | Portugal | | | .......... | |
| Namibia | | Taiwan\* | | Suriname | | | Republic of Moldova | | | .......... | |
| Niger | | Tajikistan | | Trinidad and Tobago | | | Romania | | | .......... | |
| Nigeria | | Thailand | | United States of America | | | Russian Federation | | | .......... | |
| Rwanda | | Turkmenistan | | Uruguay | | | Serbia | | | .......... | |
| Sao Tome and Principe | | United Arab Emirates | | Venezuela | | | Slovakia | | | .......... | |
| Senegal | | Uzbekistan | | .......... | | | Slovenia | | | .......... | |
| Sierra Leone | | Vietnam | | .......... | | | Spain | | | .......... | |
| South Africa | | Yemen | | .......... | | | Sweden | | | .......... | |
| Sudan | | .......... | | .......... | | | Switzerland | | | .......... | |
| Timor-Leste | | .......... | | .......... | | | Turkey | | | .......... | |
| Togo | | .......... | | .......... | | | Ukraine | | | .......... | |
| Tunisia | | .......... | | .......... | | | United Kingdom | | | .......... | |
| Uganda | | .......... | | .......... | | | .......... | | | .......... | |
| Unit Rep Tanzania | | .......... | | .......... | | | .......... | | | .......... | |
| Zambia | | .......... | | .......... | | | .......... | | | .......... | |
| Zimbabwe | | .......... | | .......... | | | .......... | | | .......... | |
| **Distribution of countries according to the global hunger index 2021** | | | | | | | | | | | |
| **Group 1\*** | ISO3 Code | | **Group 2\*\*** | | ISO3 Code | **Group 3\*\*\*** | | ISO3 Code | **Group 4 \*\*\*\*** | | ISO3 Code |
| Australia | AUS | | Antigua and Barbuda | | ATG | Albania | | ALB | Afghanistan | | AFG |
| Austria | AUT | | Argentina | | ARG | Armenia | | ARM | Algeria | | DZA |
| Belgium | BEL | | Bahamas | | BHS | Azerbaijan | | AZE | Angola | | AGO |
| Canada | CAN | | Barbados | | BRB | Belarus | | BLR | Bangladesh | | BGD |
| Cyprus | CYP | | Belize | | BLZ | Bosnia & Herzegovina | | BIH | Benin | | BEN |
| Czechia | CZE | | Bolivia | | BOL | Bulgaria | | BGR | Botswana | | BWA |
| Denmark | DNK | | Brazil | | BRA | China | | CHN | Burkina Faso | | BFA |
| Finland | FIN | | Chile | | CHL | Croatia | | HRV | Cabo Verde | | CPV |
| France | FRA | | Colombia | | COL | Estonia | | EST | Cambodia | | KHM |
| Germany | DEU | | Costa Rica | | CRI | Georgia | | GEO | Cameroon | | CMR |
| Greece | GRC | | Cuba | | CUB | Hungary | | HUN | Ctr African Rep | | CAF |
| Iceland | ISL | | Dominica | | DMA | Iran | | IRN | Chad | | TCD |
| Ireland | IRL | | Dominican Republic | | DOM | Israel | | ISR | Congo | | COG |
| Italy | ITA | | Ecuador | | ECU | Kazakhstan | | KAZ | Cote d’Ivoire | | CIV |
| Japan | JPN | | El Salvador | | SLV | Kuwait | | KWT | Djibouti | | DJI |
| Luxembourg | LUX | | Grenada | | GRD | Kyrgyzstan | | KGZ | Egypt | | EGY |
| Malta | MLT | | Guatemala | | GTM | Latvia | | LVA | Eswatini | | SWZ |
| Netherlands | NLD | | Guyana | | GUY | Lithuania | | LTU | Ethiopia | | ETH |
| New Zealand | NZL | | Haiti | | HTI | Mongolia | | MNG | Fiji | | FJI |
| Norway | NOR | | Honduras | | HND | Montenegro | | MNE | French Polynesia | | PYF |
| Poland | POL | | Jamaica | | JAM | North Macedonia | | MKD | Gabon | | GAB |
| Portugal | PRT | | Mexico | | MEX | Rep Moldova | | MDA | Gambia | | GMB |
| South Korea | KOR | | Nicaragua | | NIC | Romania | | ROU | Ghana | | GHA |
| Spain | ESP | | Panama | | PAN | Russian Federation | | RUS | Guinea | | GIN |
| Sweden | SWE | | Paraguay | | PRY | Saudi Arabia | | SAU | Guinea-Bissau | | GNB |
| Switzerland | CHE | | Peru | | PER | Serbia | | SRB | India | | IND |
| United Kingdom | GBR | | St Kitts and Nevis | | KNA | Slovakia | | SVK | Indonesia | | IDN |
| Un States America | USA | | Saint Lucia | | LCA | Slovenia | | SVN | Iraq | | IRQ |
| .......... | .......... | | St Vincent & Grenad | | VCT | Taiwan\* | | TWC | Jordan | | JOR |
| .......... | .......... | | Suriname | | SUR | Tajikistan | | TJK | Kenya | | KEN |
| .......... | .......... | | Trinidad and Tobago | | TTO | Thailand | | THA | Kiribati | | KIR |
| .......... | .......... | | Uruguay | | URY | Turkey | | TUR | Lao People’s DR | | LAO |
| .......... | .......... | | Venezuela | | VEN | Ukraine | | UKR | Lebanon | | LBN |
| .......... | .......... | | .......... | | .......... | Unit Arab Emirates | | ARE | Lesotho | | LSO |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Liberia | | LBR |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Madagascar | | MDG |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Malawi | | MWI |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Malaysia | | MYS |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Maldives | | MDV |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Mali | | MLI |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Mauritania | | MRT |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Mauritius | | MUS |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Morocco | | MAR |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Mozambique | | MOZ |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Myanmar | | MMR |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Namibia | | NAM |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Nepal | | NPL |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | New Caledonia | | NCL |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Niger | | NER |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Nigeria | | NGA |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | North Korea | | PKR |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Oman | | OMN |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Pakistan | | PAK |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Philippines | | PHL |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Rwanda | | RWA |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Samoa | | WSM |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | S Tome & Princ | | STP |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Senegal | | SEN |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Sierra Leone | | SLE |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Solomon Islands | | SLB |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | South Africa | | ZAF |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Sri Lanka | | LKA |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Sudan | | SDN |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Timor-Leste | | TLS |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Togo | | TGO |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Tunisia | | TUN |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Turkmenistan | | TKM |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Uganda | | UGA |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Un Rep Tanzania | | TZA |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Uzbekistan | | UZB |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Vanuatu | | VUT |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Vietnam | | VNM |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Yemen | | YEM |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Zambia | | ZMB |
| .......... | .......... | | .......... | | .......... | .......... | | .......... | Zimbabwe | | ZWE |

Note: \* Developed countries with hunger eradication; \*\* countries on the American continent with low or moderate global hunger index; \*\*\* continent and European and Asian countries with low global hunger rate; \*\*\*\* Countries with low, moderate or high global hunger. Source: Kaggle, 2020.

**Table S2.** Food items included in each food group.

|  |  |
| --- | --- |
| **Food groups** | **Food products** |
| Alcoholic beverages | beer, beverages alcoholic, beverages fermented and wine |
| Animal fats | butter ghee; cream; fats animals raw; fish body oil and fish liver oil |
| Animal products | aquatic animals, bovine meat, butter ghee, cephalopods, cream, crustaceans, demersal fish, eggs, fats animals raw, fish body oil, fish liver oil, freshwater fish, marine fish, meat aquatic mammals, milk - excluding butter, molluscs, mutton, goat meat, offals edible, pelagic fish, pigmeat, poultry meat and others |
| Cereals | cereals, maize and products, millet and products, oats, rice-milled equivalent, rye and products, sorghum and products, wheat and products- excluding beer |
| Fish-seafood | cephalopods, crustaceans, demersal fish, freshwater fish, marine fish, molluscs, pelagic fish and others |
| Fruits | apples and products, bananas, citrus, dates, grapefruit and products, grapes and products [excluding wine], lemons, limes and products, oranges, mandarines, pineapples and products and plantains |
| Meat | bovine meat, mutton, goat meat, pigmeat and poultry meat- excluding butter |
| Miscellaneous | infant food and miscellaneous |
| Offals | offals, edible |
| Oil crops | coconuts - including copra |
| Pulses | beans, peas, pulses and other and products |
| Spices | cloves, pepper, pimento, spices and other |
| Starchy roots | cassava and products, potatoes and products, sweet potatoes, yams, roots and other |
| Stimulants | cocoa beans and products, coffee and products, tea [including mate] |
| Sugar and sweeteners | honey, sugar [raw equivalent], sugar non-centrifugal, sweeteners and other |
| Sugar crops | sugar beet and sugar cane |
| Tree nuts | nuts and products |
| Vegetable oils | coconut oil, cottonseed oil, groundnut oil, maize germ oil, oilcrops oil, olive oil, palm oil, palm kernel oil, rape and mustard oil, ricebran oil, sesame seed oil, soyabean oil and sunflower seed oil |
| Vegetables | onions, tomatoes and products, vegetables and other |
| Vegetal products | apples and products, bananas, barley and products, beans, beer, beverages, cassava and products, cereals, citrus, cloves, cocoa beans and products, coconut oil, coconuts - incl copra, coffee and products, cottonseed, cottonseed oil, dates, fruits, grapefruit and products, grapes and products [excluding wine], groundnut oil, groundnuts [shelled equivalent], honey, infant food, lemons, limes and products, maize and products, maize germ oil, millet and products, miscellaneous, nuts and products, oats, oilcrops oil, oilcrops, other, olive oil, olives [including preserved], oranges, mandarines, palm kernels, palm oil, palm kernel oil, peas, pepper, pimento, pineapples and products, plantains, potatoes and products, pulses, other and products, rape and mustard oil, rape and mustard seed, rice [milled equivalent], ricebran oil, roots, rye and products, sesame seed, sesame seed oil, sorghum and products, soyabean oil, soyabeans, spices, sugar beet, sugar non-centrifugal, sunflower seed, sunflower seed oil, sweet potatoes, sweeteners, tea, tomatoes and products, vegetables, wheat and products, wine and yams |

Source: Kaggle, 2020.

**Table S3.** Components of food groups of starchy roots, vegetable oil and fruits consumed in 170 countries, 2017.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Groups / Food items | Quantities of food consumed (kg / per capita / year) | | | | |
| **Group 1\*** | **Group 2\*\*** | **Group 3\*\*\*** | **Group 4\*\*\*\*** | |
| Starchy roots | | | | | |
| Potatoes | 52.50 | 22.48 | 49.66 | | 20.50 |
| Cassava | 0.02 | 16.56 | 1.58 | | 23.81 |
| Sweet potatoes | 1.73 | 1.40 | 14.57 | | 6.68 |
| Roots (other) | 0.35 | 1.28 | 0.98 | | 2.99 |
| Yam | 0.18 | 0.70 | 0.00 | | 9.36 |
| Vegetable oils | | | | | |
| Soybean oil | 6.63 | 6.51 | 2.52 | | 1.49 |
| Groundnut oil | 0.18 | 0.03 | 0.47 | | 0.77 |
| Rape mustard oil | 1.98 | 1.10 | 1.87 | | 0.86 |
| Sunflower oil | 3.51 | 0.60 | 1.05 | | 0.78 |
| Cotton oil | 0.25 | 0.41 | 0.43 | | 0.40 |
| Palm kernel | 0.03 | 0.05 | 0.11 | | 0.39 |
| Palm oil | 0.61 | 3.01 | 1.78 | | 2.32 |
| Coconut oil | 0.14 | 0.02 | 0.08 | | 0.22 |
| Sesame oil | 0.04 | 0.04 | 0.18 | | 0.06 |
| Olive oil | 2.00 | 0.17 | 0.15 | | 0.08 |
| Maize germ oil | 0.97 | 0.23 | 0.33 | | 0.09 |
| Oilcrops oil | 1.61 | 1.35 | 0.64 | | 0.38 |
| Ricebran oil | 0.042 | 0.02 | 0.06 | | 0.07 |
| Fruits | | | | | |
| Oranges | 18.55 | 24.39 | 15.25 | | 5.95 |
| Lemons | 3.05 | 6.92 | 1.68 | | 0.95 |
| Grapefruit | 1.06 | 1.22 | 2.27 | | 0.40 |
| Citrus | 0.21 | 0.96 | 2.40 | | 1.56 |
| Banana | 10.68 | 17.37 | 7.20 | | 14.02 |
| Plantains | 0.54 | 8.42 | 0.16 | | 5.34 |
| Pineapple | 3.40 | 8.21 | 1.61 | | 2.50 |
| Apple | 12.79 | 6.20 | 18.14 | | 2.30 |
| Grapes | 6.72 | 3.11 | 7.79 | | 1.95 |
| Dates | 0.17 | 0.016 | 1.18 | | 1.20 |
| Fruits, other | 22.15 | 28.08 | 35.85 | | 21.82 |

Note: \* Developed countries with hunger eradication; \*\* countries on the American continent with low or moderate global hunger index; \*\*\* continent and European and Asian countries with low global hunger rates; \*\*\*\* Countries with low, moderate or high global hunger. Source: Kaggle, 2020.

**Table S4.** COVID-19 recovery rate of 170 countries, according to the global hunger index groups, 2021.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Group 1\* | Recovery rate (%) | Group 2\*\* | Recovery rate (%) | Group 3\*\*\* | Recovery rate (%) | Group 4 \*\*\*\* | Recovery rate (%) |
| AUS | 0.100555 | ARG | 3.442191 | ALB | 1.39623 | AFG | 0.116713 |
| AUT | 4.097083 | ATG | 0.159184 | ARE | 2.239599 | AGO | 0.049566 |
| BEL | 0.0000 | BHS | 1.655725 | ARM | 5.152909 | BEN | 0.026579 |
| CAN | 1.592883 | BLZ | 2.541766 | AZE | 2.114889 | BFA | 0.033617 |
| CHE | 0.170423 | BOL | 1.223064 | BGR | 2.25249 | BGD | 0.277443 |
| CYP | 0.100555 | BRA | 3.51164 | BIH | 2.580006 | BWA | 0.58347 |
| CZE | 6.696239 | BRB | 0.171777 | BLR | 2.181333 | CAF | 0.101139 |
| DEU | 1.99781 | CHL | 3.170889 | CHN | 0.006496 | CIV | 0.088267 |
| DNK | 2.844759 | COL | 3.435112 | EST | 1.919835 | CMR | 0.093586 |
| ESP | 0.315684 | CRI | 2.766073 | GEO | 6.169475 | COG | 0.373686 |
| FIN | 0.56068 | CUB | 0.114724 | HRV | 5.338532 | CPV | 2.167986 |
| FRA | 0.32953 | DMA | 0.140278 | HUN | 2.303891 | DJI | 0.588664 |
| GBR | 0.011452 | DOM | 1.3422 | IRN | 1.315521 | DZA | 0.158234 |
| GRC | 0.876299 | ECU | 1.105482 | ISR | 4.916743 | EGY | 0.120822 |
| IRL | 0.4670 | GRD | 0.114159 | KAZ | 0.997539 | ETH | 0.100446 |
| ISL | 1.56712 | GTM | 0.737391 | KGZ | 1.196027 | FJI | 0.005246 |
| ITA | 2.841034 | GUY | 0.772935 | KWT | 3.204626 | GAB | 0.43290 |
| JPN | 0.189185 | HND | 0.60884 | LTU | 3.596815 | GHA | 0.177762 |
| KOR | 0.002387 | HTI | 0.078076 | LVA | 2.154101 | GIN | 0.106035 |
| LUX | 7.223734 | JAM | 0.414026 | MDA | 0.020000 | GMB | 0.152627 |
| MLT | 2.374138 | KNA | 0.059259 | MKD | 3.340192 | GNB | 0.124546 |
| NLD | 0.066875 | LCA | 0.180769 | MNE | 7.136334 | IDN | 0.26448 |
| NOR | 0.334101 | MEX | 0.938877 | MNG | 0.027046 | IND | 0.727071 |
| NZL | 0.043012 | NIC | 0.064054 | ROU | 3.215389 | IRQ | 1.424516 |
| POL | 3.035472 | PAN | 5.470348 | RUS | 1.962123 | JOR | 2.769033 |
| PRT | 3.842662 | PER | 2.979747 | SAU | 1.017043 | KEN | 0.153555 |
| SWE | 3.67848 | PRY | 1.320675 | SRB | 0.00000 | KHM | 0.002465 |
| USA | 1.37043 | SLV | 0.683598 | SVK | 2.990168 | KIR | 0.000000 |
| .......... | .......... | SUR | 1.09438 | SVN | 5.748645 | LAO | 0.000566 |
| .......... | .......... | TTO |  | THA | 0.013386 | LBN | 2.164777 |
| .......... | .......... | URY | 0.635033 | TJK | 0.140185 | LBR | 0.03363 |
| .......... | .......... | VCT | 0.099099 | TUR | 2.682264 | LKA | 0.201755 |
| .......... | .......... | VEN | 0.392110 | TWC | 0.013386 | LSO | 0.076331 |
| .......... | .......... | .......... | .......... | UKR | 2.101558 | MAR | 1.203204 |
| .......... | .......... | .......... | .......... | .......... | .......... | MDG | 0.063006 |
| .......... | .......... | .......... | .......... | .......... | .......... | MDV | 2.490573 |
| .......... | .......... | .......... | .......... | .......... | .......... | MLI | 0.027051 |
| .......... | .......... | .......... | .......... | .......... | .......... | MMR | 0.000000 |
| .......... | .......... | .......... | .......... | .......... | .......... | MOZ | 0.058946 |
| .......... | .......... | .......... | .......... | .......... | .......... | MRT | 0.307914 |
| .......... | .......... | .......... | .......... | .......... | .......... | MUS | 0.040791 |
| .......... | .......... | .......... | .......... | .......... | .......... | MWI | 0.031228 |
| .......... | .......... | .......... | .......... | .......... | .......... | MYS | 0.351505 |
| .......... | .......... | .......... | .......... | .......... | .......... | NAM | 1.033215 |
| .......... | .......... | .......... | .......... | .......... | .......... | NCL | 0.000000 |
| .......... | .......... | .......... | .......... | .......... | .......... | NER | 0.011832 |
| .......... | .......... | .......... | .......... | .......... | .......... | NGA | 0.041009 |
| .......... | .......... | .......... | .......... | .......... | .......... | NPL | 0.868672 |
| .......... | .......... | .......... | .......... | .......... | .......... | OMN | 2.622385 |
| .......... | .......... | .......... | .......... | .......... | .......... | PAK | 0.213677 |
| .......... | .......... | .......... | .......... | .......... | .......... | PHL | 0.419541 |
| .......... | .......... | .......... | .......... | .......... | .......... | PKR | 0.000000 |
| .......... | .......... | .......... | .......... | .......... | .......... | PYF | 0.000000 |
| .......... | .......... | .......... | .......... | .......... | .......... | RWA | 0.054262 |
| .......... | .......... | .......... | .......... | .......... | .......... | SDN | 0.034756 |
| .......... | .......... | .......... | .......... | .......... | .......... | SEN | 0.112924 |
| .......... | .......... | .......... | .......... | .......... | .......... | SLB | 0.001399 |
| .......... | .......... | .......... | .......... | .......... | .......... | SLE | 0.025385 |
| .......... | .......... | .......... | .......... | .......... | .......... | STP | 0.472857 |
| .......... | .......... | .......... | .......... | .......... | .......... | SWZ | 0.731522 |
| .......... | .......... | .......... | .......... | .......... | .......... | TCD | 0.012324 |
| .......... | .......... | .......... | .......... | .......... | .......... | TGO | 0.045066 |
| .......... | .......... | .......... | .......... | .......... | .......... | TKM | 0.000000 |
| .......... | .......... | .......... | .......... | .......... | .......... | TLS | 0.003414 |
| .......... | .......... | .......... | .......... | .......... | .......... | TUN | 1.056111 |
| .......... | .......... | .......... | .......... | .......... | .......... | TZA | 0.000306 |
| .......... | .......... | .......... | .......... | .......... | .......... | UGA | 0.028602 |
| .......... | .......... | .......... | .......... | .......... | .......... | UZB | 0.223527 |
| .......... | .......... | .......... | .......... | .......... | .......... | VNM | 0.001434 |
| .......... | .......... | .......... | .......... | .......... | .......... | VUT | 0.000312 |
| .......... | .......... | .......... | .......... | .......... | .......... | WSM | 0.001000 |
| .......... | .......... | .......... | .......... | .......... | .......... | YEM | 0.004758 |
| .......... | .......... | .......... | .......... | .......... | .......... | ZAF | 1.782200 |
| .......... | .......... | .......... | .......... | .......... | .......... | ZMB | 0.131119 |
| .......... | .......... | .......... | .......... | .......... | .......... | ZWE | 0.103707 |

Note: \* Developed countries with hunger eradication; \*\* countries on the American continent with low or moderate global hunger index; \*\*\* continent and European and Asian countries with low global hunger rates; \*\*\*\* Countries with low, moderate or high global hunger.

**Figure S1**. Food supply changes in the different continents (in kg/capita/year), 2014-2017.

|  |  |
| --- | --- |
| (A) Africa | (B) Americas |
|  |  |
| (C) Asia | (D) Europe |
|  |  |
| (E) Oceania |  |
|  |  |

**Table S5**. Food supply changes in the different continents (in kg/capita/year), 2014-2017.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **ASIA** | | | | **AFRICA** | | | |
| **Foods** | Years | Value | Mean | SD | **CV (%)** | Value | Mean | SD | **CV (%)** |
| Cereals | 2014 | 194.18 | 194.7725 | 0.574536 | **0.294978** | 163.34 | 162.8175 | 0.673566 | **0.413694** |
| Cereals | 2015 | 194.51 |  |  |  | 161.89 |  |  |  |
| Cereals | 2016 | 195.52 |  |  |  | 163.29 |  |  |  |
| Cereals | 2017 | 194.88 |  |  |  | 162.75 |  |  |  |
| Eggs | 2014 | 9.38 | 9.7375 | 0.272932 | **2.802892** | 2.56 | 2.5425 | 0.070415 | **2.769535** |
| Eggs | 2015 | 9.67 |  |  |  | 2.62 |  |  |  |
| Eggs | 2016 | 9.97 |  |  |  | 2.45 |  |  |  |
| Eggs | 2017 | 9.93 |  |  |  | 2.54 |  |  |  |
| Fish and seafood | 2014 | 22.52 | 23.2625 | 0.578871 | **2.48843** | 11.09 | 10.75 | 0.284839 | **2.649666** |
| Fish and seafood | 2015 | 23.21 |  |  |  | 10.88 |  |  |  |
| Fish and seafood | 2016 | 23.40 |  |  |  | 10.50 |  |  |  |
| Fish and seafood | 2017 | 23.92 |  |  |  | 10.53 |  |  |  |
| Fruits | 2014 | 71.12 | 71.955 | 0.706093 | **0.981297** | 64.86 | 63.7575 | 1.508075 | **2.36533** |
| Fruits | 2015 | 72.18 |  |  |  | 65.25 |  |  |  |
| Fruits | 2016 | 71.73 |  |  |  | 62.54 |  |  |  |
| Fruits | 2017 | 72.79 |  |  |  | 62.38 |  |  |  |
| Meat | 2014 | 31.36 | 31.8675 | 0.422562 | **1.325996** | 18.66 | 17.925 | 0.558002 | **3.112984** |
| Meat | 2015 | 31.73 |  |  |  | 18.05 |  |  |  |
| Meat | 2016 | 32.03 |  |  |  | 17.56 |  |  |  |
| Meat | 2017 | 32.35 |  |  |  | 17.43 |  |  |  |
| Miscellaneous | 2014 | 0.45 | 0.455 | 0.01 | **2.197802** | 0.75 | 0.725 | 0.028868 | **3.981726** |
| Miscellaneous | 2015 | 0.45 |  |  |  | 0.75 |  |  |  |
| Miscellaneous | 2016 | 0.45 |  |  |  | 0.70 |  |  |  |
| Miscellaneous | 2017 | 0.47 |  |  |  | 0.70 |  |  |  |
| Pulses | 2014 | 6.42 | 6.49 | 0.171853 | **2.647961** | 10.85 | 11.1225 | 0.294887 | **2.651265** |
| Pulses | 2015 | 6.35 |  |  |  | 11.02 |  |  |  |
| Pulses | 2016 | 6.45 |  |  |  | 11.08 |  |  |  |
| Pulses | 2017 | 6.74 |  |  |  | 11.54 |  |  |  |
| Vegetable Oils | 2014 | 8.70 | 9.035 | 0.321299 | **3.556164** | 8.64 | 8.665 | 0.103441 | **1.193777** |
| Vegetable Oils | 2015 | 8.91 |  |  |  | 8.67 |  |  |  |
| Vegetable Oils | 2016 | 9.07 |  |  |  | 8.55 |  |  |  |
| Vegetable Oils | 2017 | 9.46 |  |  |  | 8.80 |  |  |  |
|  |  | **EUROPE** | | | | **OCEANIA** | | | |
| Foods | Years | Value | Mean | SD | **CV (%)** | Value | Mean | SD | **CV (%)** |
| Cereals | 2014 | 134.54 | 137.3325 | 1.882275 | **1.370597** | 98.29 | 99.0975 | 1.65842 | **1.673524** |
| Cereals | 2015 | 138.13 |  |  |  | 97.25 |  |  |  |
| Cereals (no beer) | 2016 | 138.65 |  |  |  | 99.85 |  |  |  |
| Cereals | 2017 | 138.01 |  |  |  | 101.00 |  |  |  |
| Eggs | 2014 | 12.90 | 12.82 | 0.059442 | **0.463665** | 7.97 | 7.9875 | 0.168201 | **2.105806** |
| Eggs | 2015 | 12.77 |  |  |  | 7.78 |  |  |  |
| Eggs | 2016 | 12.78 |  |  |  | 8.01 |  |  |  |
| Eggs | 2017 | 12.83 |  |  |  | 8.19 |  |  |  |
| Fish and seafood | 2014 | 21.85 | 21.4375 | 0.352834 | **1.645872** | 27.14 | 26.9775 | 0.314364 | **1.165284** |
| Fish and seafood | 2015 | 20.99 |  |  |  | 26.51 |  |  |  |
| Fish and seafood | 2016 | 21.49 |  |  |  | 27.18 |  |  |  |
| Fish-seafood | 2017 | 21.42 |  |  |  | 27.08 |  |  |  |
| Fruits | 2014 | 76.61 | 76.955 | 1.068036 | **1.38787** | 69.74 | 71.830 | 2.884869 | **4.016245** |
| Fruits | 2015 | 75.75 |  |  |  | 69.73 |  |  |  |
| Fruits | 2016 | 78.30 |  |  |  | 75.85 |  |  |  |
| Fruits | 2017 | 77.16 |  |  |  | 72.00 |  |  |  |
| Meat | 2014 | 74.52 | 75.320 | 0.575674 | **0.764304** | 107.76 | 109.5975 | 4.327943 | **3.948943** |
| Meat | 2015 | 75.33 |  |  |  | 111.24 |  |  |  |
| Meat | 2016 | 75.57 |  |  |  | 114.70 |  |  |  |
| Meat | 2017 | 75.86 |  |  |  | 104.69 |  |  |  |
| Miscellaneous | 2014 | 2.88 | 2.8475 | 0.040311 | **1.415673** | 9.92 | 9.915 | 0.031091 | **0.313578** |
| Miscellaneous | 2015 | 2.85 |  |  |  | 9.94 |  |  |  |
| Miscellaneous | 2016 | 2.87 |  |  |  | 9.93 |  |  |  |
| Miscellaneous | 2017 | 2.79 |  |  |  | 9.87 |  |  |  |
| Pulses | 2014 | 2.54 | 2.5575 | 0.041932 | **1.639589** | 1.96 | 1.845 | 0.080623 | **4.369787** |
| Pulses | 2015 | 2.54 |  |  |  | 1.84 |  |  |  |
| Pulses | 2016 | 2.53 |  |  |  | 1.80 |  |  |  |
| Pulses | 2017 | 2.62 |  |  |  | 1.78 |  |  |  |
| Vegetable Oils | 2014 | 15.64 | 15.6475 | 0.239357 | **1.529681** | 20.73 | 20.5025 | 0.447316 | **2.181764** |
| Vegetable Oils | 2015 | 15.32 |  |  |  | 20.09 |  |  |  |
| Vegetable Oils | 2016 | 15.75 |  |  |  | 20.17 |  |  |  |
| Vegetable Oils | 2017 | 15.88 |  |  |  | 21.02 |  |  |  |
|  |  | **AMERICA** | | | |  |  |  |  |
| Foods | Years | Value | Mean | SD | **CV (%)** |  |  |  |  |
| Cereals | 2014 | 128.40 | 127.980 | 0.646684 | **0.505301** |  |  |  |  |
| Cereals | 2015 | 127.20 |  |  |  |  |  |  |  |
| Cereals | 2016 | 127.71 |  |  |  |  |  |  |  |
| Cereals | 2017 | 128.61 |  |  |  |  |  |  |  |
| Eggs | 2014 | 12.57 | 12.8775 | 0.358457 | **2.783594** |  |  |  |  |
| Eggs | 2015 | 12.66 |  |  |  |  |  |  |  |
| Eggs | 2016 | 12.91 |  |  |  |  |  |  |  |
| Eggs | 2017 | 13.37 |  |  |  |  |  |  |  |
| Fish and seafood | 2014 | 14.76 | 14.7025 | 0.086554 | **0.588705** |  |  |  |  |
| Fish and seafood | 2015 | 14.59 |  |  |  |  |  |  |  |
| Fish and seafood | 2016 | 14.68 |  |  |  |  |  |  |  |
| Fish and seafood | 2017 | 14.78 |  |  |  |  |  |  |  |
| Fruits | 2014 | 98.67 | 99.60 | 1.06855 | **1.072842** |  |  |  |  |
| Fruits | 2015 | 99.96 |  |  |  |  |  |  |  |
| Fruits | 2016 | 98.82 |  |  |  |  |  |  |  |
| Fruits | 2017 | 100.95 |  |  |  |  |  |  |  |
| Meat | 2014 | 87.10 | 88.215 | 0.94016 | **1.065759** |  |  |  |  |
| Meat | 2015 | 88.15 |  |  |  |  |  |  |  |
| Meat | 2016 | 88.21 |  |  |  |  |  |  |  |
| Meat | 2017 | 89.40 |  |  |  |  |  |  |  |
| Miscellaneous | 2014 | 0.87 | 0.9075 | 0.025 | **2.754821** |  |  |  |  |
| Miscellaneous | 2015 | 0.92 |  |  |  |  |  |  |  |
| Miscellaneous | 2016 | 0.92 |  |  |  |  |  |  |  |
| Miscellaneous | 2017 | 0.92 |  |  |  |  |  |  |  |
| Pulses | 2014 | 8.09 | 8.0675 | 0.139613 | **1.730555** |  |  |  |  |
| Pulses | 2015 | 7.89 |  |  |  |  |  |  |  |
| Pulses | 2016 | 8.06 |  |  |  |  |  |  |  |
| Pulses | 2017 | 8.23 |  |  |  |  |  |  |  |
| Vegetable Oils | 2014 | 16.78 | 16.845 | 0.082664 | **0.490733** |  |  |  |  |
| Vegetable Oils | 2015 | 16.96 |  |  |  |  |  |  |  |
| Vegetable Oils | 2016 | 16.85 |  |  |  |  |  |  |  |
| Vegetable Oils | 2017 | 16.79 |  |  |  |  |  |  |  |

\*SD: standard deviation; \*\*CV: coefficient of variation

**Table S6.** Mean amount of foods groups consumed in 170 countries, according to the global hunger index groups, 2017.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Food groups | Amount of foods consumed (kg/per capita/year) | | | |
| **Group 1\*** | **Group 2\*\*** | **Group 3\*\*\*** | **Group 4\*\*\*\*** |
| Alcoholic beverages | 90.260 | 58.80 | 40.330 | 12.560 |
| Animal fats | 6.800 | 2.700 | 2.700 | 0.540 |
| Cereals | 124.830 | 147.920 | 186.340 | 190.270 |
| Eggs | 13.650 | 12.680 | 19.200 | 3.410 |
| Fish-seafood | 28.060 | 11.160 | 30.970 | 13.980 |
| Fruits | 79.480 | 104.220 | 93.570 | 58.020 |
| Meat | 92.650 | 72.500 | 58.510 | 14.180 |
| Milk | 205.880 | 120.420 | 56.750 | 66.790 |
| Miscellaneous | 2.710 | 0.827 | 0.820 | 0.563 |
| Offals | 1.920 | 3.650 | 3.620 | 1.420 |
| Oil crops | 5.610 | 5.220 | 8.170 | 8.380 |
| Pulses | 3.140 | 9.970 | 2.430 | 11.420 |
| Seafood | 1.500 | 0.123 | 0.500 | 0.000 |
| Spices | 0.800 | 0.710 | 0.790 | 2.310 |
| Starchy roots | 54.880 | 42.450 | 66.810 | 63.370 |
| Stimulants | 4.980 | 2.570 | 1.880 | 1.430 |
| Sugar | 50.630 | 45.910 | 20.790 | 19.240 |
| Sugar crops | 0.320 | 4.540 | 0.080 | 2.780 |
| Tree nuts | 3.480 | 1.170 | 3.080 | 1.340 |
| Vegetable oils | 18.240 | 13.610 | 9.700 | 7.990 |
| Vegetables | 111.270 | 60.500 | 305.640 | 71.440 |

Note: \* Developed countries with hunger eradication; \*\* countries on the American continent with low or moderate global hunger index; \*\*\* continent and European and Asian countries with low global hunger rates; \*\*\*\* Countries with low, moderate or high global hunger. Source: Kaggle, 2020.

**Table S7.** Akaike’s Information Criterion (AIC) coefficients of percentage of COVID-19 recovery of different groups for Gaussian distribution, gamma distribution and tweedie distribution, according to data strata.

|  |  |  |  |
| --- | --- | --- | --- |
| AIC coefficients | | | |
| Strata | Gaussian | Gamma | Tweedie |
| Recovery (general data) | 646.444 | 304.038 | 522.360 |
| Recovery 1(countries of group 1) | 121.938 | 76.281 | 106.542 |
| Recovery 2 (countries of group 2) | 114.152 | 84.546 | 95.368 |
| Recovery 3 (countries of group 3) | 139.213 | 126.232 | 134.450 |
| Recovery 3 (countries of group 4) | 180.423 | -19.373 | 106.911 |