The Food System model has some structural constraints that make fully updating for new data difficult for the Spring 2021 update. These structural issues should be noted for any Python migration, to create a more flexible model for future data availability and updates.

The model appears to have been set up for the commodity/country pairings appearing in the 2010-2013 FBS table. All possible pairings (195 countries x 95 commodities = 18,525) did not appear in those years (presumably because of reporting gaps). For pairings reporting “0” values (commodity not consumed in that country in those years), some appear to have been purged based on spot checking, but others retained (possibly to reduce data file size? Possibly purged if all years 2010-2013 were “0”, but retained if any single year reflected a value?).

Instead of containing the full 18,525 theoretically possible records, the model currently contains 10,714 rows of country-commodity pairings. Without completing restructuring every data table in the model, updates to the REF and Plant-Rich diet models are limited to only the existing pairings, so any new FBS or Plant-Rich Diet data cannot be fully incorporated.

The 2018 FBS data table has 14,073 pairings, representing 175 countries (see Table A) and a total of 499,330 kcal per capita per day globally. The REF Demand table captures only 10,714 of these, representing 447,476 kcal per capita per day, or 90% of the FBS 2018 raw data (see Table B). The remaining 10% of kcals do not flow through our model. It would take further investigation to identify specifically which country-commodity pairings do not flow through to REF Demand, but it is likely that these represent a smaller percentage than 10% when extended out by country population, given the findings described in the next paragraph.

When it comes to modeling Plant-Rich Diets, Kim, et al. model 12,770 country-commodity pairings, with a total of 2,300 kcal/capita/day for each of 175 countries, for a total of 402,500 kcal/capita/day globally (see Table C). Because of the mismatch between Kim’s country-commodity pairings and those reflected in the PD model’s data tables, only 10,713 pairings and 390,857 kcal/capita/day, or 97% of the calories modeled by Kim et al., flow through to Plant-Rich Demand (see Table D).

The structural limitation related to REF Demand will tend to UNDERESTIMATE emissions, since the gap between REF Demand and Plant-Rich Demand (as well as any waste reduction impacts) will be calculated for fewer global calories and therefore underestimate the savings realized in agricultural production.

The structural limitation related to Plant-Rich Demand will tend to OVERESTIMATE emissions, since a number of countries register <2,300 kcal/capita/day. When multiplied out over the course of ~80 years, and for the populations of those countries, this limitation will artificially reduce the ag production needed to meet Plant-Rich Demand. However, taking REF 2 population forecasts for 2050, the missing kcals for Plant-Rich Demand represent less than **0.02%** of all potential calories, so the bias will be de minimus (see Table E).

**Table A: 2018 FBS raw data**

|  |  |  |
| --- | --- | --- |
| **Country** | **Count of FBS items** | **Sum of Value kcal/capita/day** |
| Afghanistan | 73 | 2038 |
| Albania | 77 | 3361 |
| Algeria | 85 | 3321 |
| Angola | 88 | 2383 |
| Antigua and Barbuda | 87 | 2442 |
| Argentina | 82 | 3308 |
| Armenia | 81 | 2992 |
| Australia | 85 | 3391 |
| Austria | 86 | 3694 |
| Azerbaijan | 81 | 3145 |
| Bahamas | 88 | 2654 |
| Bangladesh | 90 | 2564 |
| Barbados | 86 | 2955 |
| Belarus | 79 | 3268 |
| Belgium | 82 | 3764 |
| Belize | 83 | 2776 |
| Benin | 86 | 2757 |
| Bolivia (Plurinational State of) | 88 | 2410 |
| Bosnia and Herzegovina | 81 | 3302 |
| Botswana | 89 | 2339 |
| Brazil | 88 | 3300 |
| Bulgaria | 81 | 2857 |
| Burkina Faso | 87 | 2739 |
| Cabo Verde | 81 | 2540 |
| Cambodia | 85 | 2492 |
| Cameroon | 91 | 2732 |
| Canada | 88 | 3567 |
| Central African Republic | 88 | 1784 |
| Chad | 81 | 2113 |
| Chile | 83 | 3028 |
| China | 93 | 3193 |
| China, Hong Kong SAR | 88 | 3267 |
| China, Macao SAR | 89 | 3326 |
| China, mainland | 89 | 3191 |
| China, Taiwan Province of | 86 | 2985 |
| Colombia | 87 | 3112 |
| Congo | 89 | 2285 |
| Costa Rica | 84 | 3027 |
| Côte d'Ivoire | 90 | 2777 |
| Croatia | 82 | 3071 |
| Cuba | 85 | 3342 |
| Cyprus | 84 | 3015 |
| Czech Republic | 80 | 3278 |
| Democratic People's Republic of Korea | 78 | 2012 |
| Denmark | 85 | 3399 |
| Djibouti | 78 | 2695 |
| Dominica | 80 | 2953 |
| Dominican Republic | 88 | 2892 |
| Ecuador | 84 | 2607 |
| Egypt | 87 | 3288 |
| El Salvador | 87 | 2696 |
| Estonia | 80 | 3247 |
| Ethiopia | 89 | 2337 |
| Fiji | 85 | 2775 |
| Finland | 83 | 3340 |
| France | 84 | 3501 |
| French Polynesia | 83 | 2908 |
| Gabon | 87 | 2634 |
| Gambia | 83 | 2531 |
| Georgia | 79 | 2838 |
| Germany | 87 | 3554 |
| Ghana | 90 | 3029 |
| Greece | 84 | 3381 |
| Grenada | 83 | 2401 |
| Guatemala | 90 | 2550 |
| Guinea | 87 | 2743 |
| Guinea-Bissau | 84 | 2229 |
| Guyana | 84 | 2912 |
| Haiti | 85 | 2120 |
| Honduras | 87 | 2670 |
| Hungary | 84 | 3317 |
| Iceland | 81 | 3656 |
| India | 86 | 2530 |
| Indonesia | 88 | 2882 |
| Iran (Islamic Republic of) | 84 | 3084 |
| Iraq | 87 | 2606 |
| Ireland | 83 | 3885 |
| Israel | 84 | 3527 |
| Italy | 85 | 3500 |
| Jamaica | 83 | 2785 |
| Japan | 87 | 2707 |
| Jordan | 85 | 2729 |
| Kazakhstan | 83 | 3065 |
| Kenya | 90 | 2191 |
| Kiribati | 75 | 3078 |
| Kuwait | 80 | 3471 |
| Kyrgyzstan | 78 | 2728 |
| Lao People's Democratic Republic | 83 | 2756 |
| Latvia | 80 | 3229 |
| Lebanon | 84 | 2851 |
| Lesotho | 82 | 2321 |
| Liberia | 86 | 2164 |
| Lithuania | 80 | 3410 |
| Luxembourg | 81 | 3470 |
| Madagascar | 87 | 1934 |
| Malawi | 87 | 2392 |
| Malaysia | 87 | 2843 |
| Maldives | 83 | 2235 |
| Mali | 87 | 2873 |
| Malta | 83 | 3419 |
| Mauritania | 89 | 2871 |
| Mauritius | 85 | 3046 |
| Mexico | 88 | 3157 |
| Mongolia | 85 | 2575 |
| Montenegro | 85 | 3499 |
| Morocco | 86 | 3410 |
| Mozambique | 86 | 2097 |
| Myanmar | 88 | 2671 |
| Namibia | 87 | 2464 |
| Nepal | 93 | 2769 |
| Netherlands | 79 | 3297 |
| New Caledonia | 85 | 2828 |
| New Zealand | 88 | 3192 |
| Nicaragua | 87 | 2582 |
| Niger | 89 | 2569 |
| Nigeria | 91 | 2569 |
| North Macedonia | 78 | 3069 |
| Norway | 85 | 3366 |
| Oman | 84 | 2938 |
| Pakistan | 86 | 2484 |
| Panama | 87 | 2849 |
| Papua New Guinea | 86 | 2283 |
| Paraguay | 83 | 2768 |
| Peru | 89 | 2774 |
| Philippines | 89 | 2657 |
| Poland | 82 | 3536 |
| Portugal | 82 | 3479 |
| Republic of Korea | 87 | 3417 |
| Republic of Moldova | 78 | 2385 |
| Romania | 81 | 3578 |
| Russian Federation | 84 | 3342 |
| Rwanda | 90 | 2186 |
| Saint Kitts and Nevis | 81 | 2579 |
| Saint Lucia | 85 | 2619 |
| Saint Vincent and the Grenadines | 81 | 2967 |
| Samoa | 79 | 3028 |
| Sao Tome and Principe | 82 | 2447 |
| Saudi Arabia | 83 | 3307 |
| Senegal | 92 | 2548 |
| Serbia | 79 | 2824 |
| Sierra Leone | 84 | 2368 |
| Slovakia | 81 | 2870 |
| Slovenia | 83 | 3194 |
| Solomon Islands | 79 | 2412 |
| South Africa | 87 | 2895 |
| Spain | 85 | 3324 |
| Sri Lanka | 90 | 2737 |
| Sudan (former) | 93 | 2576 |
| Suriname | 79 | 2694 |
| Swaziland | 84 | 2423 |
| Sweden | 87 | 3182 |
| Switzerland | 83 | 3355 |
| Tajikistan | 76 | 2107 |
| Thailand | 87 | 2801 |
| Timor-Leste | 79 | 2286 |
| Togo | 87 | 2441 |
| Trinidad and Tobago | 86 | 2984 |
| Tunisia | 86 | 3452 |
| Turkey | 81 | 3708 |
| Turkmenistan | 69 | 2832 |
| Uganda | 90 | 1981 |
| Ukraine | 79 | 3102 |
| United Arab Emirates | 76 | 3312 |
| United Kingdom | 85 | 3343 |
| United Republic of Tanzania | 91 | 2370 |
| United States of America | 87 | 3777 |
| Uruguay | 83 | 3198 |
| Uzbekistan | 80 | 3011 |
| Vanuatu | 80 | 2605 |
| Venezuela (Bolivarian Republic of) | 88 | 2120 |
| Viet Nam | 79 | 3023 |
| Yemen | 88 | 2152 |
| Zambia | 89 | 2000 |
| Zimbabwe | 88 | 1904 |
| **Grand Total** | **14703** | **499330** |

**Table B: REF Demand**

|  |  |  |  |
| --- | --- | --- | --- |
| **Country** | **Count of FAO commodity** | **Sum of REF Demand 2018 kcal/capita/day** | **% of 2018 FBS kcals captured in REF Demand** |
| Afghanistan | 44 | 1,953 | 96% |
| Albania | 58 | 2,835 | 84% |
| Algeria | 59 | 3,019 | 91% |
| Angola | 52 | 2,326 | 98% |
| Antigua and Barbuda | 81 | 2,270 | 93% |
| Argentina | 60 | 3,070 | 93% |
| Armenia | 52 | 2,435 | 81% |
| Australia | 73 | 2,809 | 83% |
| Austria | 68 | 3,166 | 86% |
| Azerbaijan | 48 | 2,490 | 79% |
| Bahamas | 73 | 2,469 | 93% |
| Bangladesh | 49 | 2,485 | 97% |
| Barbados | 69 | 2,666 | 90% |
| Belarus | 58 | 2,781 | 85% |
| Belgium | 71 | 3,231 | 86% |
| Belize | 66 | 2,569 | 93% |
| Benin | 60 | 2,709 | 98% |
| Bermuda | 76 | 0 | 0% |
| Bolivia (Plurinational State of) | 59 | 2,226 | 92% |
| Bosnia and Herzegovina | 58 | 2,687 | 81% |
| Botswana | 64 | 2,303 | 98% |
| Brazil | 62 | 3,014 | 91% |
| Brunei Darussalam | 74 | 0 | 0% |
| Bulgaria | 65 | 2,409 | 84% |
| Burkina Faso | 48 | 2,701 | 99% |
| Cabo Verde | 56 | 2,500 | 98% |
| Cambodia | 48 | 2,416 | 97% |
| Cameroon | 63 | 2,680 | 98% |
| Canada | 78 | 2,763 | 77% |
| Central African Republic | 48 | 1,752 | 98% |
| Chad | 39 | 2,085 | 99% |
| Chile | 60 | 2,804 | 93% |
| China | 79 | 2,740 | 86% |
| China, Hong Kong SAR | 73 | 3,163 | 97% |
| China, Macao SAR | 73 | 3,223 | 97% |
| China, mainland | 78 | 2,737 | 86% |
| China, Taiwan Province of | 76 | 2,897 | 97% |
| Colombia | 62 | 2,845 | 91% |
| Congo | 65 | 2,245 | 98% |
| Costa Rica | 63 | 2,815 | 93% |
| Côte d'Ivoire | 62 | 2,727 | 98% |
| Croatia | 63 | 2,609 | 85% |
| Cuba | 55 | 3,099 | 93% |
| Cyprus | 69 | 2,525 | 84% |
| Czech Republic | 65 | 2,818 | 86% |
| Democratic People's Republic of Korea | 41 | 1,688 | 84% |
| Denmark | 64 | 2,900 | 85% |
| Djibouti | 59 | 2,656 | 99% |
| Dominica | 63 | 2,735 | 93% |
| Dominican Republic | 60 | 2,677 | 93% |
| Ecuador | 63 | 2,398 | 92% |
| Egypt | 63 | 2,953 | 90% |
| El Salvador | 58 | 2,493 | 92% |
| Estonia | 64 | 2,769 | 85% |
| Ethiopia | 51 | 2,306 | 99% |
| Fiji | 66 | 2,172 | 78% |
| Finland | 66 | 2,845 | 85% |
| France | 73 | 2,984 | 85% |
| French Polynesia | 67 | 2,366 | 81% |
| Gabon | 57 | 2,585 | 98% |
| Gambia | 52 | 2,498 | 99% |
| Georgia | 52 | 2,329 | 82% |
| Germany | 71 | 3,050 | 86% |
| Ghana | 62 | 2,966 | 98% |
| Greece | 68 | 2,828 | 84% |
| Grenada | 64 | 2,214 | 92% |
| Guatemala | 58 | 2,355 | 92% |
| Guinea | 54 | 2,697 | 98% |
| Guinea-Bissau | 53 | 2,189 | 98% |
| Guyana | 65 | 2,683 | 92% |
| Haiti | 52 | 1,973 | 93% |
| Honduras | 56 | 2,421 | 91% |
| Hungary | 64 | 2,835 | 85% |
| Iceland | 67 | 3,149 | 86% |
| India | 61 | 2,459 | 97% |
| Indonesia | 55 | 2,795 | 97% |
| Iran (Islamic Republic of) | 54 | 2,975 | 96% |
| Iraq | 53 | 2,311 | 89% |
| Ireland | 70 | 3,246 | 84% |
| Israel | 67 | 3,249 | 92% |
| Italy | 69 | 2,977 | 85% |
| Jamaica | 60 | 2,525 | 91% |
| Japan | 73 | 2,357 | 87% |
| Jordan | 64 | 2,498 | 92% |
| Kazakhstan | 62 | 2,839 | 93% |
| Kenya | 62 | 2,157 | 98% |
| Kiribati | 48 | 2,991 | 97% |
| Kuwait | 65 | 3,175 | 91% |
| Kyrgyzstan | 53 | 2,482 | 91% |
| Lao People's Democratic Republic | 48 | 2,598 | 94% |
| Latvia | 66 | 2,750 | 85% |
| Lebanon | 68 | 2,604 | 91% |
| Lesotho | 40 | 2,142 | 92% |
| Liberia | 49 | 2,127 | 98% |
| Lithuania | 61 | 2,868 | 84% |
| Luxembourg | 69 | 2,946 | 85% |
| Madagascar | 55 | 1,907 | 99% |
| Malawi | 43 | 2,329 | 97% |
| Malaysia | 64 | 2,760 | 97% |
| Maldives | 69 | 2,168 | 97% |
| Mali | 54 | 2,806 | 98% |
| Malta | 71 | 2,870 | 84% |
| Mauritania | 56 | 2,834 | 99% |
| Mauritius | 73 | 3,002 | 99% |
| Mexico | 66 | 2,927 | 93% |
| Mongolia | 51 | 2,356 | 91% |
| Montenegro | 63 | 2,959 | 85% |
| Morocco | 62 | 3,078 | 90% |
| Mozambique | 55 | 2,061 | 98% |
| Myanmar | 53 | 2,590 | 97% |
| Namibia | 66 | 2,427 | 99% |
| Nepal | 55 | 2,688 | 97% |
| Netherlands | 71 | 2,720 | 83% |
| Netherlands Antilles (former) | 50 | 0 | 0% |
| New Caledonia | 74 | 2,284 | 81% |
| New Zealand | 74 | 2,570 | 81% |
| Nicaragua | 52 | 2,377 | 92% |
| Niger | 48 | 2,537 | 99% |
| Nigeria | 54 | 2,524 | 98% |
| Norway | 67 | 2,869 | 85% |
| Oman | 69 | 2,673 | 91% |
| Pakistan | 53 | 2,398 | 97% |
| Panama | 63 | 2,638 | 93% |
| Paraguay | 61 | 2,588 | 94% |
| Peru | 66 | 2,567 | 93% |
| Philippines | 65 | 2,516 | 95% |
| Poland | 66 | 2,978 | 84% |
| Portugal | 69 | 2,956 | 85% |
| Republic of Korea | 73 | 3,311 | 97% |
| Republic of Moldova | 55 | 1,968 | 83% |
| Romania | 62 | 2,956 | 83% |
| Russian Federation | 64 | 2,814 | 84% |
| Rwanda | 48 | 1,998 | 91% |
| Saint Kitts and Nevis | 58 | 2,408 | 93% |
| Saint Lucia | 64 | 2,334 | 89% |
| Saint Vincent and the Grenadines | 64 | 2,748 | 93% |
| Samoa | 57 | 2,484 | 82% |
| Sao Tome and Principe | 55 | 1,972 | 81% |
| Saudi Arabia | 71 | 3,011 | 91% |
| Senegal | 61 | 2,498 | 98% |
| Serbia | 58 | 2,336 | 83% |
| Sierra Leone | 52 | 2,335 | 99% |
| Slovakia | 66 | 2,427 | 85% |
| Slovenia | 71 | 2,670 | 84% |
| Solomon Islands | 44 | 1,808 | 75% |
| South Africa | 62 | 2,856 | 99% |
| Spain | 71 | 2,871 | 86% |
| Sri Lanka | 58 | 2,605 | 95% |
| Sudan (former) | 54 | 2,539 | 99% |
| Suriname | 64 | 2,489 | 92% |
| Swaziland | 66 | 2,375 | 98% |
| Sweden | 68 | 2,728 | 86% |
| Switzerland | 71 | 2,892 | 86% |
| Tajikistan | 38 | 1,874 | 89% |
| Thailand | 64 | 2,714 | 97% |
| The former Yugoslav Republic of Macedonia | 62 | 0 | 0% |
| Timor-Leste | 45 | 2,214 | 97% |
| Togo | 56 | 2,403 | 98% |
| Trinidad and Tobago | 72 | 2,676 | 90% |
| Tunisia | 65 | 3,142 | 91% |
| Turkey | 59 | 3,406 | 92% |
| Turkmenistan | 37 | 2,550 | 90% |
| Uganda | 50 | 1,943 | 98% |
| Ukraine | 59 | 2,571 | 83% |
| United Arab Emirates | 65 | 3,021 | 91% |
| United Kingdom | 73 | 2,846 | 85% |
| United Republic of Tanzania | 65 | 2,335 | 99% |
| United States of America | 71 | 3,136 | 83% |
| Uruguay | 66 | 2,974 | 93% |
| Uzbekistan | 42 | 2,728 | 91% |
| Vanuatu | 51 | 2,103 | 81% |
| Venezuela (Bolivarian Republic of) | 67 | 1,902 | 90% |
| Viet Nam | 56 | 2,924 | 97% |
| Yemen | 57 | 1,936 | 90% |
| Zambia | 48 | 1,957 | 98% |
| Zimbabwe | 58 | 1,880 | 99% |
| **Grand Total** | **10713** | **447,476** | 90% |

Table C: PD Plant-Rich Demand (composite of diets in Kim, et. al)

|  |  |  |
| --- | --- | --- |
| **Country** | **Count of fbs\_item** | **Sum of kcal/capita/day** |
| Afghanistan | 50 | 2,300.00 |
| Albania | 73 | 2,300.00 |
| Algeria | 73 | 2,300.00 |
| Angola | 71 | 2,300.00 |
| Antigua and Barbuda | 73 | 2,300.00 |
| Argentina | 73 | 2,300.00 |
| Armenia | 72 | 2,300.00 |
| Australia | 75 | 2,300.00 |
| Austria | 75 | 2,300.00 |
| Azerbaijan | 72 | 2,300.00 |
| Bahamas | 72 | 2,300.00 |
| Bangladesh | 77 | 2,300.00 |
| Barbados | 74 | 2,300.00 |
| Belarus | 73 | 2,300.00 |
| Belgium | 75 | 2,300.00 |
| Belize | 71 | 2,300.00 |
| Benin | 72 | 2,300.00 |
| Bermuda | 66 | 2,300.00 |
| Bolivia (Plurinational State of) | 73 | 2,300.00 |
| Bosnia and Herzegovina | 72 | 2,300.00 |
| Botswana | 74 | 2,300.00 |
| Brazil | 76 | 2,300.00 |
| Brunei Darussalam | 75 | 2,300.00 |
| Bulgaria | 73 | 2,300.00 |
| Burkina Faso | 72 | 2,300.00 |
| C√É¬¥te d'Ivoire | 75 | 2,300.00 |
| Cabo Verde | 66 | 2,300.00 |
| Cambodia | 72 | 2,300.00 |
| Cameroon | 74 | 2,300.00 |
| Canada | 75 | 2,300.00 |
| Central African Republic | 68 | 2,300.00 |
| Chad | 72 | 2,300.00 |
| Chile | 73 | 2,300.00 |
| China | 76 | 2,300.00 |
| China, Hong Kong SAR | 76 | 2,300.00 |
| China, Macao SAR | 74 | 2,300.00 |
| China, mainland | 76 | 2,300.00 |
| China, Taiwan Province of | 74 | 2,300.00 |
| Colombia | 76 | 2,300.00 |
| Congo | 71 | 2,300.00 |
| Costa Rica | 76 | 2,300.00 |
| Croatia | 73 | 2,300.00 |
| Cuba | 76 | 2,300.00 |
| Cyprus | 75 | 2,300.00 |
| Czechia | 74 | 2,300.00 |
| Democratic People's Republic of Korea | 72 | 2,300.00 |
| Denmark | 74 | 2,300.00 |
| Djibouti | 73 | 2,300.00 |
| Dominica | 63 | 2,300.00 |
| Dominican Republic | 63 | 2,300.00 |
| Ecuador | 75 | 2,300.00 |
| Egypt | 74 | 2,300.00 |
| El Salvador | 76 | 2,300.00 |
| Estonia | 73 | 2,300.00 |
| Ethiopia | 73 | 2,300.00 |
| Fiji | 74 | 2,300.00 |
| Finland | 74 | 2,300.00 |
| France | 75 | 2,300.00 |
| French Polynesia | 70 | 2,300.00 |
| Gabon | 74 | 2,300.00 |
| Gambia | 70 | 2,300.00 |
| Georgia | 73 | 2,300.00 |
| Germany | 75 | 2,300.00 |
| Ghana | 74 | 2,300.00 |
| Greece | 73 | 2,300.00 |
| Grenada | 63 | 2,300.00 |
| Guatemala | 75 | 2,300.00 |
| Guinea | 74 | 2,300.00 |
| Guinea-Bissau | 74 | 2,300.00 |
| Guyana | 73 | 2,300.00 |
| Haiti | 76 | 2,300.00 |
| Honduras | 74 | 2,300.00 |
| Hungary | 73 | 2,300.00 |
| Iceland | 72 | 2,300.00 |
| India | 77 | 2,300.00 |
| Indonesia | 76 | 2,300.00 |
| Iran (Islamic Republic of) | 73 | 2,300.00 |
| Iraq | 73 | 2,300.00 |
| Ireland | 75 | 2,300.00 |
| Israel | 71 | 2,300.00 |
| Italy | 76 | 2,300.00 |
| Jamaica | 74 | 2,300.00 |
| Japan | 77 | 2,300.00 |
| Jordan | 74 | 2,300.00 |
| Kazakhstan | 73 | 2,300.00 |
| Kenya | 76 | 2,300.00 |
| Kiribati | 59 | 2,300.00 |
| Kuwait | 73 | 2,300.00 |
| Kyrgyzstan | 71 | 2,300.00 |
| Lao People's Democratic Republic | 75 | 2,300.00 |
| Latvia | 74 | 2,300.00 |
| Lebanon | 74 | 2,300.00 |
| Lesotho | 75 | 2,300.00 |
| Liberia | 71 | 2,300.00 |
| Lithuania | 73 | 2,300.00 |
| Luxembourg | 73 | 2,300.00 |
| Madagascar | 72 | 2,300.00 |
| Malawi | 72 | 2,300.00 |
| Malaysia | 75 | 2,300.00 |
| Maldives | 71 | 2,300.00 |
| Mali | 73 | 2,300.00 |
| Malta | 74 | 2,300.00 |
| Mauritania | 72 | 2,300.00 |
| Mauritius | 71 | 2,300.00 |
| Mexico | 75 | 2,300.00 |
| Mongolia | 72 | 2,300.00 |
| Montenegro | 73 | 2,300.00 |
| Morocco | 73 | 2,300.00 |
| Mozambique | 72 | 2,300.00 |
| Myanmar | 75 | 2,300.00 |
| Namibia | 74 | 2,300.00 |
| Nepal | 74 | 2,300.00 |
| Netherlands | 75 | 2,300.00 |
| New Caledonia | 71 | 2,300.00 |
| New Zealand | 73 | 2,300.00 |
| Nicaragua | 75 | 2,300.00 |
| Niger | 73 | 2,300.00 |
| Nigeria | 72 | 2,300.00 |
| Norway | 74 | 2,300.00 |
| Oman | 75 | 2,300.00 |
| Pakistan | 75 | 2,300.00 |
| Panama | 75 | 2,300.00 |
| Paraguay | 73 | 2,300.00 |
| Peru | 74 | 2,300.00 |
| Philippines | 75 | 2,300.00 |
| Poland | 74 | 2,300.00 |
| Portugal | 75 | 2,300.00 |
| Republic of Korea | 75 | 2,300.00 |
| Republic of Moldova | 72 | 2,300.00 |
| Romania | 73 | 2,300.00 |
| Russian Federation | 75 | 2,300.00 |
| Rwanda | 74 | 2,300.00 |
| Saint Kitts and Nevis | 73 | 2,300.00 |
| Saint Lucia | 73 | 2,300.00 |
| Saint Vincent and the Grenadines | 73 | 2,300.00 |
| Samoa | 73 | 2,300.00 |
| Sao Tome and Principe | 59 | 2,300.00 |
| Saudi Arabia | 74 | 2,300.00 |
| Senegal | 74 | 2,300.00 |
| Serbia | 73 | 2,300.00 |
| Sierra Leone | 74 | 2,300.00 |
| Slovakia | 73 | 2,300.00 |
| Slovenia | 73 | 2,300.00 |
| Solomon Islands | 61 | 2,300.00 |
| South Africa | 75 | 2,300.00 |
| Spain | 75 | 2,300.00 |
| Sri Lanka | 75 | 2,300.00 |
| Sudan (former) | 76 | 2,300.00 |
| Suriname | 69 | 2,300.00 |
| Swaziland | 76 | 2,300.00 |
| Sweden | 74 | 2,300.00 |
| Switzerland | 75 | 2,300.00 |
| Tajikistan | 71 | 2,300.00 |
| Thailand | 75 | 2,300.00 |
| The former Yugoslav Republic of Macedonia | 73 | 2,300.00 |
| Timor-Leste | 75 | 2,300.00 |
| Togo | 71 | 2,300.00 |
| Trinidad and Tobago | 73 | 2,300.00 |
| Tunisia | 73 | 2,300.00 |
| Turkey | 73 | 2,300.00 |
| Turkmenistan | 72 | 2,300.00 |
| Uganda | 75 | 2,300.00 |
| Ukraine | 72 | 2,300.00 |
| United Arab Emirates | 74 | 2,300.00 |
| United Kingdom | 75 | 2,300.00 |
| United Republic of Tanzania | 76 | 2,300.00 |
| United States of America | 75 | 2,300.00 |
| Uruguay | 74 | 2,300.00 |
| Uzbekistan | 71 | 2,300.00 |
| Vanuatu | 67 | 2,300.00 |
| Venezuela (Bolivarian Republic of) | 76 | 2,300.00 |
| Viet Nam | 76 | 2,300.00 |
| Yemen | 73 | 2,300.00 |
| Zambia | 74 | 2,300.00 |
| Zimbabwe | 73 | 2,300.00 |
| **Grand Total** | **12770** | **402,500.00** |

**Table D: PD Plant-Rich Demand by country**

|  |  |  |
| --- | --- | --- |
| **Country** | **Count of FAO commodity** | **Sum of 2019 kcal/capita/day** |
| Afghanistan | 44 | 2,300.00 |
| Albania | 58 | 2,300.00 |
| Algeria | 59 | 2,300.00 |
| Angola | 52 | 2,030.95 |
| Antigua and Barbuda | 81 | 2,300.00 |
| Argentina | 60 | 2,117.48 |
| Armenia | 52 | 2,245.42 |
| Australia | 73 | 2,292.66 |
| Austria | 68 | 2,299.29 |
| Azerbaijan | 48 | 2,295.22 |
| Bahamas | 73 | 2,300.00 |
| Bangladesh | 49 | 2,201.75 |
| Barbados | 69 | 2,300.00 |
| Belarus | 58 | 2,220.44 |
| Belgium | 71 | 2,297.21 |
| Belize | 66 | 2,300.00 |
| Benin | 60 | 2,300.00 |
| Bermuda | 76 | 2,300.00 |
| Bolivia (Plurinational State of) | 59 | 2,296.19 |
| Bosnia and Herzegovina | 58 | 2,300.00 |
| Botswana | 64 | 2,300.00 |
| Brazil | 62 | 2,298.68 |
| Brunei Darussalam | 74 | 2,300.00 |
| Bulgaria | 65 | 2,300.00 |
| Burkina Faso | 48 | 2,293.83 |
| Cabo Verde | 56 | 2,300.00 |
| Cambodia | 48 | 2,300.00 |
| Cameroon | 63 | 2,300.00 |
| Canada | 78 | 2,300.00 |
| Central African Republic | 48 | 2,262.56 |
| Chad | 39 | 2,189.66 |
| Chile | 60 | 2,300.00 |
| China | 79 | 2,298.79 |
| China, Hong Kong SAR | 73 | 2,300.00 |
| China, Macao SAR | 73 | 2,300.00 |
| China, mainland | 78 | 2,298.79 |
| China, Taiwan Province of | 76 | 2,300.00 |
| Colombia | 62 | 2,297.73 |
| Congo | 65 | 2,300.00 |
| Costa Rica | 63 | 2,274.00 |
| Côte d'Ivoire | 62 | 0.00 |
| Croatia | 63 | 2,240.64 |
| Cuba | 55 | 2,173.58 |
| Cyprus | 69 | 2,300.00 |
| Czech Republic | 65 | 0.00 |
| Democratic People's Republic of Korea | 41 | 2,074.29 |
| Denmark | 64 | 2,300.00 |
| Djibouti | 59 | 2,244.11 |
| Dominica | 63 | 2,300.00 |
| Dominican Republic | 60 | 2,263.73 |
| Ecuador | 63 | 2,269.92 |
| Egypt | 63 | 2,299.75 |
| El Salvador | 58 | 2,297.31 |
| Estonia | 64 | 2,300.00 |
| Ethiopia | 51 | 2,300.00 |
| Fiji | 66 | 2,300.00 |
| Finland | 66 | 2,300.00 |
| France | 73 | 2,294.32 |
| French Polynesia | 67 | 2,300.00 |
| Gabon | 57 | 1,711.77 |
| Gambia | 52 | 2,300.00 |
| Georgia | 52 | 2,226.04 |
| Germany | 71 | 2,299.77 |
| Ghana | 62 | 2,300.00 |
| Greece | 68 | 2,300.00 |
| Grenada | 64 | 2,295.16 |
| Guatemala | 58 | 2,293.16 |
| Guinea | 54 | 1,977.51 |
| Guinea-Bissau | 53 | 2,240.73 |
| Guyana | 65 | 2,230.60 |
| Haiti | 52 | 2,206.23 |
| Honduras | 56 | 2,296.35 |
| Hungary | 64 | 2,288.32 |
| Iceland | 67 | 2,300.00 |
| India | 61 | 2,299.71 |
| Indonesia | 55 | 2,299.70 |
| Iran (Islamic Republic of) | 54 | 2,293.71 |
| Iraq | 53 | 2,281.75 |
| Ireland | 70 | 2,300.00 |
| Israel | 67 | 2,299.58 |
| Italy | 69 | 2,298.39 |
| Jamaica | 60 | 2,300.00 |
| Japan | 73 | 2,300.00 |
| Jordan | 64 | 2,299.43 |
| Kazakhstan | 62 | 2,288.58 |
| Kenya | 62 | 2,299.82 |
| Kiribati | 48 | 2,300.00 |
| Kuwait | 65 | 2,300.00 |
| Kyrgyzstan | 53 | 2,298.49 |
| Lao People's Democratic Republic | 48 | 2,150.25 |
| Latvia | 66 | 2,287.85 |
| Lebanon | 68 | 2,300.00 |
| Lesotho | 40 | 1,907.83 |
| Liberia | 49 | 1,706.69 |
| Lithuania | 61 | 2,270.68 |
| Luxembourg | 69 | 2,300.00 |
| Madagascar | 55 | 2,300.00 |
| Malawi | 43 | 2,300.00 |
| Malaysia | 64 | 2,300.00 |
| Maldives | 69 | 2,300.00 |
| Mali | 54 | 2,300.00 |
| Malta | 71 | 2,300.00 |
| Mauritania | 56 | 2,300.00 |
| Mauritius | 73 | 2,300.00 |
| Mexico | 66 | 2,291.77 |
| Mongolia | 51 | 2,250.32 |
| Montenegro | 63 | 2,300.00 |
| Morocco | 62 | 2,297.91 |
| Mozambique | 55 | 2,242.37 |
| Myanmar | 53 | 2,208.44 |
| Namibia | 66 | 2,300.00 |
| Nepal | 55 | 2,300.00 |
| Netherlands | 71 | 2,299.74 |
| Netherlands Antilles (former) | 50 | 0.00 |
| New Caledonia | 74 | 2,300.00 |
| New Zealand | 74 | 2,300.00 |
| Nicaragua | 52 | 2,300.00 |
| Niger | 48 | 2,300.00 |
| Nigeria | 54 | 2,019.65 |
| Norway | 67 | 2,300.00 |
| Oman | 69 | 2,300.00 |
| Pakistan | 53 | 2,299.92 |
| Panama | 63 | 2,296.30 |
| Paraguay | 61 | 1,786.58 |
| Peru | 66 | 2,299.82 |
| Philippines | 65 | 2,300.00 |
| Poland | 66 | 2,299.69 |
| Portugal | 69 | 2,298.62 |
| Republic of Korea | 73 | 2,300.00 |
| Republic of Moldova | 55 | 2,267.63 |
| Romania | 62 | 2,287.78 |
| Russian Federation | 64 | 2,273.49 |
| Rwanda | 48 | 2,300.00 |
| Saint Kitts and Nevis | 58 | 2,234.94 |
| Saint Lucia | 64 | 2,031.56 |
| Saint Vincent and the Grenadines | 64 | 2,281.45 |
| Samoa | 57 | 2,079.04 |
| Sao Tome and Principe | 55 | 2,300.00 |
| Saudi Arabia | 71 | 2,299.14 |
| Senegal | 61 | 2,300.00 |
| Serbia | 58 | 2,251.86 |
| Sierra Leone | 52 | 1,900.22 |
| Slovakia | 66 | 2,296.19 |
| Slovenia | 71 | 2,300.00 |
| Solomon Islands | 44 | 2,300.00 |
| South Africa | 62 | 2,290.31 |
| Spain | 71 | 2,300.00 |
| Sri Lanka | 58 | 2,300.00 |
| Sudan (former) | 54 | 2,249.86 |
| Suriname | 64 | 2,300.00 |
| Swaziland | 66 | 2,181.68 |
| Sweden | 68 | 2,299.24 |
| Switzerland | 71 | 2,300.00 |
| Tajikistan | 38 | 2,280.43 |
| Thailand | 64 | 2,299.85 |
| The former Yugoslav Republic of Macedonia | 62 | 2,281.05 |
| Timor-Leste | 45 | 2,121.14 |
| Togo | 56 | 2,300.00 |
| Trinidad and Tobago | 72 | 2,133.31 |
| Tunisia | 65 | 2,299.68 |
| Turkey | 59 | 2,295.75 |
| Turkmenistan | 37 | 2,191.75 |
| Uganda | 50 | 2,300.00 |
| Ukraine | 59 | 2,270.73 |
| United Arab Emirates | 65 | 2,253.00 |
| United Kingdom | 73 | 2,300.00 |
| United Republic of Tanzania | 65 | 2,293.23 |
| United States of America | 71 | 2,299.77 |
| Uruguay | 66 | 2,277.37 |
| Uzbekistan | 42 | 2,167.56 |
| Vanuatu | 51 | 2,300.00 |
| Venezuela (Bolivarian Republic of) | 67 | 2,284.22 |
| Viet Nam | 56 | 2,176.01 |
| Yemen | 57 | 2,299.77 |
| Zambia | 48 | 2,300.00 |
| Zimbabwe | 58 | 2,300.00 |
| **Grand Total** | **10713** | **390,856.56** |

**Table E: Countries with <2,300 kcal/capita/day; impact on Plant-Rich Diet Demand**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Row Labels** | **Count of FAO commodity** | **Sum of 2019** |  | **Pop (Ref 2)** | **Kcal/day missing** |
| Afghanistan | 44 |  |  | - | - |
| Albania | 58 | 0.00 |  | - | - |
| Algeria | 59 | 0.00 |  | - | - |
| Angola | 52 | -269.05 |  | 77,420,355 | (20,829,692,544) |
| Antigua and Barbuda | 81 | 0.00 |  | - | - |
| Argentina | 60 | -182.52 |  | 54,867,248 | (10,014,286,839) |
| Armenia | 52 | -54.58 |  | 2,573,147 | (140,435,284) |
| Australia | 73 | -7.34 |  | 30,282,450 | (222,325,002) |
| Austria | 68 | -0.71 |  | 8,451,514 | (5,990,692) |
| Azerbaijan | 48 | -4.78 |  | 10,081,609 | (48,154,361) |
| Bahamas | 73 | 0.00 |  | - | - |
| Bangladesh | 49 | -98.25 |  | 173,337,329 | (17,030,520,134) |
| Barbados | 69 | 0.00 |  | - | - |
| Belarus | 58 | -79.56 |  | 7,937,582 | (631,527,008) |
| Belgium | 71 | -2.79 |  | 11,282,232 | (31,517,260) |
| Belize | 66 | 0.00 |  | - | - |
| Benin | 60 | 0.00 |  | - | - |
| Bermuda | 76 | 0.00 |  | - | - |
| Bolivia (Plurinational State of) | 59 | -3.81 |  | 15,839,561 | (60,384,840) |
| Bosnia and Herzegovina | 58 | 0.00 |  | - | - |
| Botswana | 64 | 0.00 |  | - | - |
| Brazil | 62 | -1.32 |  | 208,556,615 | (274,728,833) |
| Brunei Darussalam | 74 | 0.00 |  | - | - |
| Bulgaria | 65 | 0.00 |  | - | - |
| Burkina Faso | 48 | -6.17 |  | 43,432,174 | (267,938,618) |
| Cabo Verde | 56 | 0.00 |  | - | - |
| Cambodia | 48 | 0.00 |  | - | - |
| Cameroon | 63 | 0.00 |  | - | - |
| Canada | 78 | 0.00 |  | - | - |
| Central African Republic | 48 | -37.44 |  | 8,400,954 | (314,553,096) |
| Chad | 39 | -110.34 |  | 34,031,310 | (3,755,035,855) |
| Chile | 60 | 0.00 |  | - | - |
| China | 79 | -1.21 |  | 1,293,619,069 | (1,559,522,978) |
| China, Hong Kong SAR | 73 | 0.00 |  | - | - |
| China, Macao SAR | 73 | 0.00 |  | - | - |
| China, mainland | 78 | -1.21 |  | 779,178 | (939,338) |
| China, Taiwan Province of | 76 | 0.00 |  | - | - |
| Colombia | 62 | -2.27 |  | 50,840,584 | (115,404,342) |
| Congo | 65 | 0.00 |  | - | - |
| Costa Rica | 63 | -26.00 |  | 5,277,529 | (137,217,486) |
| Côte d'Ivoire | 62 | -2,300.00 |  | 51,263,670 | (117,906,440,979) |
| Croatia | 63 | -59.36 |  | 3,094,248 | (183,679,651) |
| Cuba | 55 | -126.42 |  | 9,346,996 | (1,181,682,020) |
| Cyprus | 69 | 0.00 |  | - | - |
| Czech Republic | 65 | -2,300.00 |  | 9,761,839 | (22,452,229,696) |
| Democratic People's Republic of Korea | 41 | -225.71 |  | 24,258,244 | (5,475,222,780) |
| Denmark | 64 | 0.00 |  | - | - |
| Djibouti | 59 | -55.89 |  | 1,295,368 | (72,398,206) |
| Dominica | 63 | 0.00 |  | - | - |
| Dominican Republic | 60 | -36.27 |  | 12,795,809 | (464,128,388) |
| Ecuador | 63 | -30.08 |  | 23,316,455 | (701,269,385) |
| Egypt | 63 | -0.25 |  | 159,956,809 | (39,266,472) |
| El Salvador | 58 | -2.69 |  | 6,216,814 | (16,742,342) |
| Estonia | 64 | 0.00 |  | - | - |
| Ethiopia | 51 | 0.00 |  | - | - |
| Fiji | 66 | 0.00 |  | - | - |
| Finland | 66 | 0.00 |  | - | - |
| France | 73 | -5.68 |  | 62,382,292 | (354,437,617) |
| French Polynesia | 67 | 0.00 |  | - | - |
| Gabon | 57 | -588.23 |  | 3,809,049 | (2,240,590,646) |
| Gambia | 52 | 0.00 |  | - | - |
| Georgia | 52 | -73.96 |  | 3,206,867 | (237,185,338) |
| Germany | 71 | -0.23 |  | 74,196,577 | (16,776,771) |
| Ghana | 62 | 0.00 |  | - | - |
| Greece | 68 | 0.00 |  | - | - |
| Grenada | 64 | -4.84 |  | 104,730 | (506,856) |
| Guatemala | 58 | -6.84 |  | 26,920,714 | (184,156,709) |
| Guinea | 54 | -322.49 |  | 25,971,807 | (8,375,629,892) |
| Guinea-Bissau | 53 | -59.27 |  | 3,557,202 | (210,838,465) |
| Guyana | 65 | -69.40 |  | 824,958 | (57,256,200) |
| Haiti | 52 | -93.77 |  | 14,877,785 | (1,395,049,234) |
| Honduras | 56 | -3.65 |  | 13,830,802 | (50,504,072) |
| Hungary | 64 | -11.68 |  | 7,789,260 | (90,991,880) |
| Iceland | 67 | 0.00 |  | - | - |
| India | 61 | -0.29 |  | 1,639,176,036 | (474,790,378) |
| Indonesia | 55 | -0.30 |  | 330,904,672 | (99,371,352) |
| Iran (Islamic Republic of) | 54 | -6.29 |  | 103,098,083 | (648,940,468) |
| Iraq | 53 | -18.25 |  | 70,940,131 | (1,294,416,404) |
| Ireland | 70 | 0.00 |  | - | - |
| Israel | 67 | -0.42 |  | 12,720,415 | (5,399,228) |
| Italy | 69 | -1.61 |  | 50,390,741 | (81,299,121) |
| Jamaica | 60 | 0.00 |  | - | - |
| Japan | 73 | 0.00 |  | - | - |
| Jordan | 64 | -0.57 |  | 12,932,404 | (7,403,835) |
| Kazakhstan | 62 | -11.42 |  | 24,024,036 | (274,303,400) |
| Kenya | 62 | -0.18 |  | 91,575,092 | (16,415,105) |
| Kiribati | 48 | 0.00 |  | - | - |
| Kuwait | 65 | 0.00 |  | - | - |
| Kyrgyzstan | 53 | -1.51 |  | 9,126,098 | (13,758,594) |
| Lao People's Democratic Republic | 48 | -149.75 |  | 9,479,753 | (1,419,607,449) |
| Latvia | 66 | -12.15 |  | 1,363,398 | (16,567,757) |
| Lebanon | 68 | 0.00 |  | - | - |
| Lesotho | 40 | -392.17 |  | 2,665,265 | (1,045,232,217) |
| Liberia | 49 | -593.31 |  | 9,339,755 | (5,541,358,010) |
| Lithuania | 61 | -29.32 |  | 1,957,597 | (57,396,964) |
| Luxembourg | 69 | 0.00 |  | - | - |
| Madagascar | 55 | 0.00 |  | - | - |
| Malawi | 43 | 0.00 |  | - | - |
| Malaysia | 64 | 0.00 |  | - | - |
| Maldives | 69 | 0.00 |  | - | - |
| Mali | 54 | 0.00 |  | - | - |
| Malta | 71 | 0.00 |  | - | - |
| Mauritania | 56 | 0.00 |  | - | - |
| Mauritius | 73 | 0.00 |  | - | - |
| Mexico | 66 | -8.23 |  | 155,150,814 | (1,277,071,950) |
| Mongolia | 51 | -49.68 |  | 4,448,931 | (221,009,244) |
| Montenegro | 63 | 0.00 |  | - | - |
| Morocco | 62 | -2.09 |  | 46,165,497 | (96,319,723) |
| Mozambique | 55 | -57.63 |  | 65,312,931 | (3,764,169,048) |
| Myanmar | 53 | -91.56 |  | 56,207,043 | (5,146,415,548) |
| Namibia | 66 | 0.00 |  | - | - |
| Nepal | 55 | 0.00 |  | - | - |
| Netherlands | 71 | -0.26 |  | 15,841,892 | (4,062,204) |
| Netherlands Antilles (former) | 50 | -2,300.00 |  | 15,841,892 | (36,436,351,594) |
| New Caledonia | 74 | 0.00 |  | - | - |
| New Zealand | 74 | 0.00 |  | - | - |
| Nicaragua | 52 | 0.00 |  | - | - |
| Niger | 48 | 0.00 |  | - | - |
| Nigeria | 54 | -280.35 |  | 401,314,997 | (112,508,651,912) |
| Norway | 67 | 0.00 |  | - | - |
| Oman | 69 | 0.00 |  | - | - |
| Pakistan | 53 | -0.08 |  | 338,013,194 | (25,566,680) |
| Panama | 63 | -3.70 |  | 5,852,939 | (21,643,678) |
| Paraguay | 61 | -513.42 |  | 9,101,631 | (4,672,959,427) |
| Peru | 66 | -0.18 |  | 40,373,987 | (7,356,756) |
| Philippines | 65 | 0.00 |  | - | - |
| Poland | 66 | -0.31 |  | 30,715,963 | (9,485,586) |
| Portugal | 69 | -1.38 |  | 8,404,258 | (11,583,512) |
| Republic of Korea | 73 | 0.00 |  | - | - |
| Republic of Moldova | 55 | -32.37 |  | 3,065,639 | (99,244,410) |
| Romania | 62 | -12.22 |  | 14,953,593 | (182,700,278) |
| Russian Federation | 64 | -26.51 |  | 124,608,519 | (3,303,972,922) |
| Rwanda | 48 | 0.00 |  | - | - |
| Saint Kitts and Nevis | 58 | -65.06 |  | 56,156 | (3,653,291) |
| Saint Lucia | 64 | -268.44 |  | 165,679 | (44,474,203) |
| Saint Vincent and the Grenadines | 64 | -18.55 |  | 98,547 | (1,827,564) |
| Samoa | 57 | -220.96 |  | 267,390 | (59,083,234) |
| Sao Tome and Principe | 55 | 0.00 |  | - | - |
| Saudi Arabia | 71 | -0.86 |  | 44,562,484 | (38,469,128) |
| Senegal | 61 | 0.00 |  | - | - |
| Serbia | 58 | -48.14 |  | 6,473,849 | (311,642,903) |
| Sierra Leone | 52 | -399.78 |  | 12,944,875 | (5,175,136,118) |
| Slovakia | 66 | -3.81 |  | 4,592,105 | (17,486,447) |
| Slovenia | 71 | 0.00 |  | - | - |
| Solomon Islands | 44 | 0.00 |  | - | - |
| South Africa | 62 | -9.69 |  | 75,517,909 | (731,964,699) |
| Spain | 71 | 0.00 |  | - | - |
| Sri Lanka | 58 | 0.00 |  | - | - |
| Sudan (former) | 54 | -50.14 |  | 101,155,536 | (5,072,139,867) |
| Suriname | 64 | 0.00 |  | - | - |
| Swaziland | 66 | -118.32 |  | 1,704,428 | (201,670,176) |
| Sweden | 68 | -0.76 |  | 10,516,417 | (7,940,520) |
| Switzerland | 71 | 0.00 |  | - | - |
| Tajikistan | 38 | -19.57 |  | 16,208,246 | (317,183,445) |
| Thailand | 64 | -0.15 |  | 60,483,428 | (9,244,186) |
| The former Yugoslav Republic of Macedonia | 62 | -18.95 |  | 1,700,489 | (32,227,883) |
| Timor-Leste | 45 | -178.86 |  | 2,019,297 | (361,176,422) |
| Togo | 56 | 0.00 |  | - | - |
| Trinidad and Tobago | 72 | -166.69 |  | 1,225,072 | (204,203,371) |
| Tunisia | 65 | -0.32 |  | 13,796,600 | (4,472,497) |
| Turkey | 59 | -4.25 |  | 88,728,836 | (376,682,132) |
| Turkmenistan | 37 | -108.25 |  | 7,949,276 | (860,500,550) |
| Uganda | 50 | 0.00 |  | - | - |
| Ukraine | 59 | -29.27 |  | 32,203,978 | (942,534,428) |
| United Arab Emirates | 65 | -47.00 |  | 9,433,626 | (443,419,806) |
| United Kingdom | 73 | 0.00 |  | - | - |
| United Republic of Tanzania | 65 | -6.77 |  | 129,386,845 | (875,541,230) |
| United States of America | 71 | -0.23 |  | 348,569,657 | (80,771,426) |
| Uruguay | 66 | -22.63 |  | 3,320,634 | (75,157,927) |
| Uzbekistan | 42 | -132.44 |  | 42,942,489 | (5,687,240,147) |
| Vanuatu | 51 | 0.00 |  | - | - |
| Venezuela (Bolivarian Republic of) | 67 | -15.78 |  | 37,023,121 | (584,058,756) |
| Viet Nam | 56 | -123.99 |  | 100,536,391 | (12,465,383,940) |
| Yemen | 57 | -0.23 |  | 48,080,012 | (10,897,816) |
| Zambia | 48 | 0.00 |  | - | - |
| Zimbabwe | 58 | 0.00 |  | - | - |
| **Grand Total** | **10713** |  |  | **7,482,519,303** | **-430,928,166,971** |
|  |  |  |  |  |  |
| Total potential kcals/capita/day as modeled by Kim et al. | | | | | 404,800 |
| Total global pop in 2050 (Ref 2) | |  |  |  | 6,968,688,547 |
| Total potential kcal/day globally as modeled by Kim et al. | | | | | 2,820,925,123,825,600 |
|  |  |  |  |  |  |
| **% kcal/day not reflected in PD Plant-Rich Demand** | | | |  | **-0.0153%** |