

**Statistical Working System**

**Project**

**Statistics Division**

Towards a new Food Balance Sheet

19 December 2013

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision History** | | | |
| **Version** | **Author** | **Date** | **Comments** |
| 0.0 | Adam Prakash | 19/12/2013 | Initial draft created, with assistance from Valentina Ramaschiello and Veronica Gianfaldoni |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

|  |
| --- |
| **Comments** |
|  |

1. **Introduction**

With the Central Product Classification (CPC) scheme for classifying agricultural production having been formally adopted in FAO (specifically, CPC 2.1 expanded), an essential need arises to reclassify the Food Balance Sheet (FBS) currently compiled in the FAO Commodity List (FCL) format. However, a profound opportunity is also presented to fundamentally review the structure, content, data requirements and the aggregation (standardization) methods presently employed in FBS with the objective to make the product of higher quality while respecting current and new user needs. In spite of periodic review, the FCL-based FBS has been left largely unaltered for almost three decades, which has rendered the unfortunate consequence of ignoring changes in food baskets including processed food products, developments in international classification schemes that also reflect changing structures in the production, trade and utilization of commodities, and importantly, user requirements.

The principles adopted to date in innovations governing production, trade and utilization methodologies, are also extended here, in that data availability is respected, unfounded assumptions are discarded and methods that introduce further error into the data or create data without foundation are avoided. The approach of the paper is to posit a series of queries that challenge the very foundations of FBS construction, questions that have not been put forward to date, but arguably, should have been asked frequently from the very conception of the product.

The paper begins by looking at the structures of CPC and the Harmonized Commodity Description and Coding System (HS) with relevance to the classification of food commodities. As trade affects food security by the addition (subtraction) to food availabilities through imports (exports), mapping of HS into CPC is required. It is seen, however, that problems between matching items in HS with CPC prevail. Section 3 of the paper, in delving deeper into the problems of compiling FBS, attempts to assess the potential for error in wrongly mapped trade and in this context questions the merits of current approach to standardization. With severely depleted user numbers of FBS data, as measured by FAOSTAT web activity, moving to a new approach is strongly validated. Finally, section 4 proposes a coherent framework that contrasts a multitude of benefits against the costs of the approach.

Briefly, this framework considerably simplifies the present FBS construct and abandons assumptions and processes that are highly likely to introduce error into FBS statistics. An FBS standardized into, and consequently represented by caloric food groups is the major feature of the proposed approach. With the complications of standardizing processed foodstuffs including composite products, their caloric values are simply added to the parent food groups under a categorization that permits a unique one-to-mapping between HS and CPC. The approach would lead to significant human resource savings; improved timeliness in dissemination; circumvention of the need for extraction rates, shares, conversion factors and ultimately commodity trees; and easier estimation of livestock feed utilization, losses and industrial use. With no ostensible loss to user needs, the disadvantages of the approach are minimal.

1. **Classifications and FBS**

**Characteristics of HS and CPC**

The HS is intended to provide an exhaustive nomenclature of internationally traded commodities classified according to raw versus basic material, the degree of processing, by use or function and according to economic activities. These principles are maintained in all subsequent revisions of the nomenclature. Likewise, the CPC classifies products into categories based on the physical properties and the intrinsic nature of the products as well as the principle of industrial origin. In constructing the CPC, subclasses are typically defined as the equivalents of one, the aggregations or the rearrangements of several headings or subheadings of the HS. As a result, it is possible to explicitly map both classification schemes, with a schedule of correspondences provided by the United Nations Statistics Division (UNSD).

**Table 1. CPC classes relevant for foodstuffs**

**0 - Agriculture, forestry and fishery products**

01 - Products of agriculture, horticulture and market gardening

02 - Live animals and animal products (excluding meat)

03 - Forestry and logging products

04 - Fish and other fishing products

**2 - Food products, beverages and tobacco; textiles, apparel and leather products**

21 - Meat, fish, fruit, vegetables, oils and fats

22 - Dairy products and egg products

23 - Grain mill products, starches and starch products; other food products

24 - Beverages

**3 - Other transportable goods, except metal products, machinery and equipment**

35 - Other chemical products; man-made fibres

<http://unstats.un.org/unsd/cr/registry/regot.asp?Lg=1>

The structure and list of items in the first versions of the CPC lacked the necessary detail to be relevant for agricultural statistics, until CPC Ver.2 was endorsed at the 37th United Nations Statistical Commission in 2006, a revision in which FAO participated. The new version 2.1 will become effective in 2014. In addition the FAO Statistics Division (ESS) has developed a supplementary list of codes for agriculture (crops and livestock). This structure, called the “CPC expanded for agricultural statistics” (CPC expanded), added detail at the lower level of the standard CPC at five digits (Figure 1 below).

**Figure 1. Structure of the CPC expanded for agricultural statistics**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **standard CPC (5 digits)** | | | | |  | | |
| **CPC expanded for agriculture (7 digits)** | | | | | | | |
| **0** | **0** | **0** | **0** | **0** | **.** | **0** | **0** |
|  |  |  |  |  |  |  |  |
| section |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| division | |  |  |  |  |  |  |
|  | |  |  |  |  |  |  |
| group | | |  |  |  |  |  |
|  | | |  |  |  |  |  |
| class | | | |  |  |  |  |
|  | | | |  |  |  |  |
| sub-class | | | | |  |  |  |

For classifying goods, HS utilizes a six-digit code system, which can be broken down into three parts. The first two digits (HS-2) identify the chapter the goods are classified, the next two digits (HS-4) identify groupings within that chapter and the next two digits provide product specifics. Up to the HS-6 digit level, different countries classification codes are identical. Beyond this, countries are free to introduce national distinctions for tariffs by adding more digits to make the HS classification of products even more specific.

**Table 2. HS-UNSD Chapters Relevant for foodstuffs.**

**SECTION I LIVE ANIMALS; ANIMAL PRODUCTS**

1 Live animals.

2 Meat and edible meat offal.

3 Fish and crustaceans, molluscs and other aquatic invertebrates.

4 Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included.

5 Products of animal origin, not elsewhere specified or included.

**SECTION II VEGETABLE PRODUCTS**

7 Edible vegetables and certain roots and tubers.

8 Edible fruit and nuts; peel of citrus fruit or melons.

9 Coffee, tea, maté and spices.

10 Cereals.

11 Products of the milling industry; malt; starches; inulin; wheat gluten.

12 Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder.

13 Lac; gums, resins and other vegetable saps and extracts.

**SECTION III ANIMAL OR VEGETABLE FATS AND OILS AND THEIR CLEAVAGE PRODUCTS; PREPARED EDIBLE FATS; ANIMAL OR VEGETABLE WAXES**

15 Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes.

**SECTION IV PREPARED FOODSTUFFS; BEVERAGES, SPIRITS AND VINEGAR; TOBACCO AND MANUFACTURED TOBACCO SUBSTITUTES**

16 Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates.

17 Sugars and sugar confectionery.

18 Cocoa and cocoa preparations.

19 Preparations of cereals, flour, starch or milk; pastry cooks' products.

20 Preparations of vegetables, fruit, nuts or other parts of plants.

21 Miscellaneous edible preparations.

22 Beverages, spirits and vinegar.

23 Residues and waste from the food industries; prepared animal fodder.

**SECTION VI PRODUCTS OF THE CHEMICAL OR ALLIED INDUSTRIES**

35 Albuminoidal substances; modified starches; glues; enzymes.

[http://www.wcoomd.org/en/topics/nomenclature/instrument-and tools/hs\_nomenclature\_2012/hs\_nomenclature\_table\_2012.aspx](http://www.wcoomd.org/en/topics/nomenclature/instrument-and%20tools/hs_nomenclature_2012/hs_nomenclature_table_2012.aspx)

The HS Nomenclature 2012 Edition, “HS 2012”, made significant inroads into the more detailed representation of agriculture in trade, while the current HS review (HS 2017) is expected to produce a nomenclature in keeping with the detail of CPC 2.1 expanded.

Given the progress made in the integration of agricultural products in the CPC and in the increased harmonization between the CPC and HS 2012 FAO decided to implement the CPC expanded for agriculture as the central classification for agricultural products. By implementing a common global classification backed up with common and standardized item names, titles, definitions, descriptions and data groups, FAO aims to decrease the reporting burden for countries, facilitate and enhance the comparability of statistical data over time and across countries, and increase the harmonization of official statistics at the global level. Furthermore, the CPC expanded provides a flexible tool, not only for FAO, but also for countries with the new possibility to increase granularity at the lower level, including local species and varieties, while maintaining comparability across countries at the higher level.

**HS-CPC Mapping**

The FBS is predicated on establishing total food supplies[[1]](#footnote-1) from official or reliable data on production, imports and exports, which necessitates the mapping of HS trade volumes with production data in CPC format. In the first instance, correspondences between CPC and HS codes are required for mapping.

With CPC 2.1 expanded constituting the FAO standard, and with countries employing different variants of HS, an onerous process ensued. Firstly, as CPC 2.1 nor CPC 2.1 expanded have yet to become internationally operational (2014 for the former), the correspondence table between CPC 2 and HS 2007 supplied by the UNSD was used as a first step[[2]](#footnote-2). In a second step, correlation tables between HS 2007and HS 2012[[3]](#footnote-3) were employed. Then, a provisional correspondence between CPC 2.1 expanded and HS2012 was applied. The last step enabled the full mapping between CPC 2.1 expanded and both HS 2007 and HS 2012.

However, a further complication arose from the fact that the source from which trade data are automatically gathered, namely COMTRADE of the UNSD, employs a hybrid HS scheme - or combined nomenclatures, adopting codes from much earlier HS versions[[4]](#footnote-4). To make the HS-CPC mapping operational, the HS-UNSD scheme was nevertheless required to be defined and mapped. For matching pre-HS 2007 identified codes, a strategy of non-automated and automated verification combined with script-based validation ensured that the HS-UNSD - CPC 2.1 expanded mapping remained intact.

To keep the task manageable, pre-identified food commodities or food by-products were selected in CPC. Exhaustive checks were done to ensure no redundancy or omission. A combined total of 795 five-digit and expanded commodities (456 at the five-digit level) were earmarked. Whereas for trade, around 615 HS-UNSD foodstuffs or similar products were identified for mapping.

The full results of the mapping, between CPC 2.1 expanded and the three HS variants are provided in Annex 1, but a snapshot of them - using cereals – is shown in Table 4.

**How well does HS-UNSD communicate with CPC 2.1 expanded?**

There is an obvious, *a priori*, mismatch between commodity coverage in the variants of (older) HS and (newer) CPC employed. If HS 2012 were universally adopted by all countries, and reported so by the UNSD, the level of communicability would be significantly better. As such, the results of relatively low level of one-to-one and one-to-many compared to the higher many-to-one and many-to-many matches are somewhat discouraging. Table 3 provides an analysis of the degree and type of match for different levels of aggregation, beginning with the core five-digit classification of CPC against six-digits of HS-UNSD.

**Table 3. Degree of match between HS-UNSD and CPC**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Conversion** | **No. of Pairings** | **No. CPC 2.1 exp. Classes** | **No. UNSD HS Chapters** | **One-to-One** | **Many-to-One** | **One-to-many** | **Many-to-Many** |
| UNSD HS-6 to CPC-5 | 878 | 456 | 615 | 149 | 35 | 314 | 117 |
| UNSD HS-4 to CPC-4 | 272 | 171 | 166 | 15 | 12 | 97 | 42 |
| UNSD HS-2 to CPC-3 | 75 | 42 | 21 | 0 | 4 | 2 | 15 |

That said, the communicability shown in Table 3 exceeds that of FCL-HS for the commodities under question.

Given these mapping problems, a question arises on the importance of FBS calories derived from trade. If it were small, especially for the mismatched commodities, does it really matter? Conversely, if there is high proportion of imported calories, is there a potential for high error?

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 4. Cereal mapping (excerpt from Annex 1)** | | | | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  | **GROUP** | **CLASS** | **SUB-CLASS** | ***TITLE/Expansion*** | ***Expansion Title*** | **HS07 CODES~TITLES** | **HS12 CODES~TITLES** | **UNSD CODES~TITLES** |
| **Section 0** | **Agriculture, forestry and fishery products** | | | |  |  |  |  |  |
|  | **Division 01** | **Products of agriculture, horticulture and market gardening** | | | |  |  |  |  |
|  |  | **011** | **Cereals** |  |  |  |  |  |  |
|  |  |  | **0111** | Wheat |  |  |  |  |  |
|  |  |  |  | 01111 | *Wheat, seed* |  | x1001.10~Wheat and meslin.-- Durum wheat;x1001.90~Wheat and meslin.-- Other | x1001.11~Wheat and meslin.-Durum wheat :--Seed;x1001.91~Wheat and meslin.-Other :--Seed | x1001.10~Durum wheat;x1001.90~Wheat except durum wheat, and meslin |
|  |  |  |  | 01112 | *Wheat, other* |  | x1001.10~Wheat and meslin.-- Durum wheat;x1001.90~Wheat and meslin.-- Other | x1001.19~Wheat and meslin.-Durum wheat :--Other;x1001.99~Wheat and meslin.-Other :--Other | x1001.10~Durum wheat;x1001.90~Wheat except durum wheat, and meslin |
|  |  |  | **0112** | Maize (corn) |  |  |  |  |  |
|  |  |  |  | 01121 | *Maize (corn), seed* |  | x1005.10~Maize (corn).-- Seed | x1005.10~Maize (corn).-Seed | x1005.10~Maize (corn) seed |
|  |  |  |  | 01122 | *Maize (corn), other* |  | x1005.90~Maize (corn).-- Other | x1005.90~Maize (corn).-Other | x1005.90~Maize except seed corn |
|  |  |  | **0113** | Rice |  |  |  |  |  |
|  |  |  |  | 01131 | *Rice, seed* |  | x1006.10~Rice.-- Rice in the husk (paddy or rough) | x1006.10\*~Rice.-Rice in the husk (paddy or rough) | x1006.10~Rice in the husk (paddy or rough) |
|  |  |  |  | 01132 | *Rice paddy, other (not husked)* |  | x1006.10~Rice.-- Rice in the husk (paddy or rough) | x1006.10\*~Rice.-Rice in the husk (paddy or rough) | x1006.10~Rice in the husk (paddy or rough) |
|  |  |  | **0114** | Sorghum |  |  |  |  |  |
|  |  |  |  | 01141 | *Sorghum, seed* |  | x1007.00~Grain sorghum.-Grain sorghum. | x1007.10~Grain sorghum.-Seed | x1007.00~Grain sorghum |
|  |  |  |  | 01142 | *Sorghum, other* |  | x1007.00~Grain sorghum.-Grain sorghum. | x1007.90~Grain sorghum.-Other | x1007.00~Grain sorghum |
|  |  |  | **0115** | Barley |  |  |  |  |  |
|  |  |  |  | 01151 | *Barley, seed* |  | x1003.00~Barley.-Barley. | x1003.10~Barley.-Seed | x1003.00~Barley |
|  |  |  |  | 01152 | *Barley, other* |  | x1003.00~Barley.-Barley. | x1003.90~Barley.-Other | x1003.00~Barley |
|  |  |  | **0116** | Rye |  |  |  |  |  |
|  |  |  |  | 01161 | *Rye, seed* |  | x1002.00~Rye.-Rye. | x1002.10~Rye.-Seed | x1002.00~Rye |
|  |  |  |  | 01162 | *Rye, other* |  | x1002.00~Rye.-Rye. | x1002.90~Rye.-Other | x1002.00~Rye |
|  |  |  | **0117** | Oats |  |  |  |  |  |
|  |  |  |  | 01171 | *Oats, seed* |  | x1004.00~Oats.-Oats. | x1004.10~Oats.-Seed | x1004.00~Oats |
|  |  |  |  | 01172 | *Oats, other* |  | x1004.00~Oats.-Oats. | x1004.90~Oats.-Other | x1004.00~Oats |
|  |  |  | **0118** | Millet |  |  |  |  |  |
|  |  |  |  | 01181 | *Millet, seed* |  | x1008.20~Buckwheat, millet and canary seed; other cereals.-- Millet | x1008.21~Buckwheat, millet and canary seeds; other cereals.-Millet :--Seed | x1008.20~Millet |
|  |  | **GROUP** | **CLASS** | **SUB-CLASS** | ***TITLE/Expansion*** | ***Expansion Title*** | **HS07 CODES~TITLES** | **HS12 CODES~TITLES** | **UNSD CODES~TITLES** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | 01182 | *Millet, other* |  | x1008.20~Buckwheat, millet and canary seed; other cereals.-- Millet | x1008.29~Buckwheat, millet and canary seeds; other cereals.-Millet :--Other | x1008.20~Millet |
|  |  |  | **0119** | Other cereals |  |  |  |  |  |
|  |  |  |  | 01191 | *Triticale* |  | x1008.90~Buckwheat, millet and canary seed; other cereals.-- Other cereals | x1008.60~Buckwheat, millet and canary seeds; other cereals.-Triticale | x1008.90~Cereals unmilled nes |
|  |  |  |  | 01192 | *Buckwheat* |  | x1008.10~Buckwheat, millet and canary seed; other cereals.-- Buckwheat | x1008.10~Buckwheat, millet and canary seeds; other cereals.-Buckwheat | x1008.10~Buckwheat |
|  |  |  |  | 01193 | *Fonio* |  | x1008.90~Buckwheat, millet and canary seed; other cereals.-- Other cereals | x1008.40~Buckwheat, millet and canary seeds; other cereals.-Fonio (Digitaria spp.) | x1008.90~Cereals unmilled nes |
|  |  |  |  | 01194 | *Quinoa* |  | x1008.90~Buckwheat, millet and canary seed; other cereals.-- Other cereals | x1008.50~Buckwheat, millet and canary seeds; other cereals.-Quinoa (Chenopodium quinoa) | x1008.90~Cereals unmilled nes |
|  |  |  |  | 01195 | *Canary seed* |  | x1008.30~Buckwheat, millet and canary seed; other cereals.-- Canary seed | x1008.30~Buckwheat, millet and canary seeds; other cereals.-Canary seeds | x1008.30~Canary seed |
|  |  |  |  | 01199 | *Other cereals* |  | x1008.90~Buckwheat, millet and canary seed; other cereals.-- Other cereals | x1008.90~Buckwheat, millet and canary seeds; other cereals.-Other cereals | x1008.90~Cereals unmilled nes |
|  |  |  |  |  | *01199.01* | *Mixed grain* |  |  |  |
|  |  |  |  |  | *01199.02* | *Teff (Eragrostis abyssinica)* | |  |  |
|  |  |  |  |  | *01199.90* | *Other cereals n.e.c.* | |  |  |

1. **Issues in compiling FBS**

**Is trade that important for meeting dietary needs?**

The “Composition of Foods Raw, Processed, Prepared USDA National Nutrient Database for

Standard Reference, Release 26”[[5]](#footnote-5) constitutes the international benchmark for information on nutritional properties of foodstuffs, including primary, generic and processed products. Release 26 (SR26), contains data on over 8000 food items and up to 150 food components. Although targeted for US products, the scope of products contained in the database appears to cover almost every processed food type conceivable – both generic and branded – as well as primary products. Recent work by the Nutrition Division of FAO, involved the mapping of the HS classification (HS 2007) into the nutrient database. Alongside energy provision, measured by calories, the database reports over 50 other nutritional dimensions, including edible/refuse factors, all of which can be retrieved for subsequent analysis.

Using the USDA database, imported quantities for each UNSD- HS item were converted into caloric equivalence. Often, multiple food products were designated to a single HS code (many-to-one), and in such cases, the median caloric value was used. Table 4 provides some striking evidence on the role of imports in dietary energy supplies, showing by region the share of imported calories for of primary products, “first line processed” e.g. wheat flour, sugar and soybean oil, and “multiple processed” in which it is impossible to discern the parent commodity or parent commodities, e.g. food preparations, and communion wafers, rice paper, bakers wares nes. These products are typically confined to Section IV of HS (see table 2). The data supporting table 5 are provided in Annex 2, but for the purposes of exposition a sample is provided in table 6.

The share of primary products in DES is very likely over-estimated for developed regions, given the significance of imported raw ingredients for non-food use, e.g. feed grains for intensified livestock sectors, oilseeds that are crushed for industrial use, and so on. The problem here is that there is no requirement at national customs office to record or classify the end use of the traded product. However, it is difficult to conceive that processed foodstuffs, first-line or multiple, could be used for anything other than human consumption. Focusing on these products, roughly a quarter of DES at the world level is derived from imported processed foodstuffs. The numbers for developed regions are more telling, with almost 14 percent of imported calories being derived from multiple parent commodities. Such shares decline significantly for lesser developed regions, e.g. standing at near 1.5 percent for the SOFI group of countries (in which the number of hungry stand the highest) But in all instances, first line processed imports are highly important for caloric needs.

**Table 5. Imported calories as a share of DES by product type. See Annex 2 for the underlying data.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **WLD** | **DVD** | **DVG** | **SOFI TOP** | **LDC** | **SSA** |
|  | **Total kcal/cap/day** | **2831** | **3363** | **2465** | **2650** | **2365** | **2386** |
| % of imported calories | Total imported calories | 46.76 | 82.09 | 40.19 | 25.96 | 22.20 | 24.14 |
| Primary (P) | 22.99 | 34.51 | 21.61 | 13.52 | 7.24 | 8.17 |
| First-line processed (D1) | 18.79 | 33.91 | 15.85 | 11.01 | 13.10 | 13.85 |
| Multiple processed (D2) | 4.98 | 13.67 | 2.72 | 1.42 | 1.86 | 2.11 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 6 Import significance – quantities and calories (excerpt from Annex 2)** | | | | | | | | | | | | | |  |
| **HS UNSD Code** | **Primary/Derived** | **HS UNSD Name** | **WLD (tonnes)** | **DVD (tonnes)** | **DVG (tonnes)** | **SOFI (tonnes)** | **LDC (tonnes)** | **SSA (tonnes)** | **WLD (k/c/d)** | **DVD (k/c/d)** | **DVG (k/c/d)** | **SOFI (k/c/d)** | **LDC (k/c/d)** | **SSA (k/c/d)** |
| x1901.10 | D2 | Infant foods of cereals, flour, starch or milk, retail | 1,004,114 | 457,082 | 547,032 | 202,948 | 34,347 | 44,190 | 0.836 | 2.021 | 0.561 | 0.304 | 0.231 | 0.323 |
| x1901.20 | D2 | Mixes and doughs for bread, pastry, biscuits, etc. | 1,430,951 | 1,136,885 | 294,066 | 63,815 | 8,961 | 13,888 | 2.360 | 9.966 | 0.598 | 0.189 | 0.120 | 0.201 |
| x1901.90 | D2 | Malt extract & limited cocoa pastrycooks products nes | 2,758,325 | 1,364,731 | 1,393,594 | 491,367 | 366,894 | 427,291 | 1.858 | 4.886 | 1.156 | 0.596 | 2.001 | 2.529 |
| x1902.11 | D2 | Uncooked egg pasta not stuffed or prepared | 234,121 | 192,536 | 41,586 | 9,172 | 6,726 | 3,311 | 0.341 | 1.491 | 0.075 | 0.024 | 0.079 | 0.042 |
| x1902.19 | D2 | Uncooked pasta, not stuffed or prepared, without eggs | 3,203,019 | 2,118,023 | 1,084,997 | 153,604 | 348,195 | 387,905 | 4.455 | 15.656 | 1.859 | 0.385 | 3.920 | 4.739 |
| x1902.20 | D2 | Stuffed pasta | 414,034 | 355,213 | 58,821 | 10,468 | 6,749 | 11,810 | 0.210 | 0.957 | 0.037 | 0.010 | 0.028 | 0.053 |
| x1902.30 | D2 | Pasta except uncooked or stuffed | 1,347,879 | 813,420 | 534,459 | 130,751 | 89,933 | 53,604 | 0.538 | 1.727 | 0.263 | 0.094 | 0.291 | 0.188 |
| x1902.40 | D1 | Couscous | 84,173 | 70,791 | 13,382 | 726 | 5,857 | 7,604 | 0.076 | 0.338 | 0.015 | 0.001 | 0.043 | 0.060 |
| x1903.00 | D1 | Tapioca and tapioca substitutes | 86,718 | 45,870 | 40,848 | 20,130 | 5,908 | 4,624 | 0.119 | 0.335 | 0.069 | 0.050 | 0.066 | 0.056 |
| x1904.10 | D2 | Cereal foods obtained by swelling, roasting of cereal | 1,266,682 | 974,694 | 291,988 | 48,598 | 12,437 | 20,736 | 1.846 | 7.550 | 0.524 | 0.128 | 0.147 | 0.265 |
| x1904.20 | D2 | Prep foods from unroaste | 217,210 | 159,934 | 57,276 | 18,477 | 4,324 | 7,312 | 0.302 | 1.180 | 0.098 | 0.046 | 0.049 | 0.089 |
| x1904.90 | D2 | Cereals, except maize grain, prepared nes | 550,829 | 336,095 | 214,734 | 46,635 | 17,984 | 19,088 | 0.811 | 2.631 | 0.390 | 0.124 | 0.214 | 0.247 |
| x1905.10 | D2 | Crispbread | 110,866 | 85,283 | 25,583 | 9,675 | 14,034 | 2,117 | 0.146 | 0.598 | 0.042 | 0.023 | 0.150 | 0.025 |
| x1905.20 | D2 | Gingerbread and the like | 76,308 | 65,950 | 10,358 | 1,082 | 789 | 827 | 0.129 | 0.595 | 0.022 | 0.003 | 0.011 | 0.012 |
| x1905.30 | D2 | Sweet biscuits, waffles and wafers | 3,134,945 | 2,044,900 | 1,090,045 | 287,684 | 209,399 | 200,327 | 5.307 | 18.396 | 2.273 | 0.877 | 2.869 | 2.979 |
| x1905.40 | D2 | Rusks, toasted bread and similar toasted products | 222,126 | 184,007 | 38,119 | 14,213 | 2,773 | 5,010 | 0.297 | 1.309 | 0.063 | 0.034 | 0.030 | 0.059 |
| x1905.90 | D2 | Communion wafers, rice paper, bakers wares nes | 5,742,905 | 4,674,722 | 1,068,183 | 180,600 | 87,665 | 74,997 | 6.156 | 26.630 | 1.410 | 0.348 | 0.761 | 0.706 |

**What are the implications for compiling FBS?**

At this early stage the implications are profound. The evidence from tables 3 and 5 clearly point to significant problems in accounting for trade in food availabilities, whether imported or exported calories. Several substantive issues arise:

* At the CPC 5-digit level, which is consistent in disaggregation to UNSD-HS-6 digits, there are severe problems in matching the “one-to-many” and “many-to-many” types of food commodities. We simply do not know the shares or splits between these commodities and their designations. “Tariff line” data, i.e. more than 6 digits may assist in providing more detail, but countries are not legally obliged to report or maintain consistency with other partners at these higher levels of detail.
* What is more, CPC and HS are founded on the division between primary and processed goods. Neither classification scheme attempts to make connection between these two divisions, e.g. durum wheat and pasta. In this example, as pasta production is generally not known, the extraction rate of wheat to flour is needed followed by the transformation of flour to pasta, to accurately accommodate pasta in food availabilities. However, these technical coefficients are rarely observed and rest on judgement as well as being bounded by physiological limits of extraction/transformation of the commodity in question.

**Are these new problems? How does the current FBS framework deal with them?**

FBS are currently compiled in standardized format, in other words aggregated, by showing only primary commodities in order to deal with the large number of processed foodstuffs and their complexity that are traded. The method of standardizing trade involves converting back processed foods into their originating primary commodity equivalent as constructed and represented in Supply Utilization Accounts (SUAs). Generally, SUAs are constructed for primary crops, livestock and fish commodities up to the first stage of processing in the case of crops (e.g. sugar, oils, fats and alcoholic beverages) and to the additional stages of processing in the case of livestock and fish products. The reason for this restriction on the higher stages of processing is that besides trade, it is difficult to obtain data for all the forms of processed products and even more difficult, even impossible, to trace the components of processed composite products.

Strictly speaking, HS data are first mapped into FCL; often using arbitrary assumptions about product composition (see the example on bread below). Then calories and nutrients from traded products, processed or otherwise, are simply added to the calorie and nutrient values of the primary commodity. As for their quantities, conversion is needed in the case of processed foods, which is governed through extraction rates and technical factors (as well as shares for composite foodstuffs). This is done through “commodity trees” through which primary commodities serve as inputs to artificially create supplies of processed products to ensure non-negative utilization. For example, given exports of bread, sufficient quantities of (created) wheat flour should be allocated to produce the bread that is exported. Default values for all conversion factors (calories, nutrients and transformations) are applied throughout, but in some cases these are replaced with country-specific information.

While this procedure was thought to “greatly facilitate the analysis of FBS with no loss of pertinent information”[[6]](#footnote-6), there are nevertheless inherent problems with this approach similar to those outlined in the preceding section. Notably, the accuracy of standardizing quantities requires sound data on the relevant conversion factors, especially extraction rates, but as mentioned before rarely are such data collected or even observed. The default rates employed being static, whose origins are unknown, are unreflective of changing processing technologies and more generally dynamic agro-industrial development. Converting traded composite products is also troublesome, in that overly strong assumptions are made on the product mix in question. For instance, the six-digit HS codes falling under the group “*Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa; communion wafers, empty cachets of a kind suitable for pharmaceutical use, sealing wafers, rice paper and similar products*” make no mention of the type of cereal used in manufacture, nor for that matter other commodities involved, e.g. cocoa, sugar, fats and oils. Nevertheless, FCL assumes that many of these codes relate purely to “bread”, which are then assumed to enter only the wheat commodity tree. Incidentally, FCL “pastry” is also mapped into the HS code used by FCL bread, but whether split ratios are employed is not clear.

The potential for errors to be introduced and then compounded when data are processed poses serious questions about the overall integrity of the approach. The over-simplifying assumption of one-to-one between mapping of FCL and HS stands as a major entry point for errors, as does the neglect to balance trade before embarking on standardization. The arbitrariness of assigning processed products, including composite products, to static commodity tress as well as the resulting derived products, is yet another source of error. For example, cassava is increasingly being transformed to pellets for exporting to industrial sectors, and is also being used for making beer, but the commodity trees fail to account for these products. A review of the assumed extraction rates and technical conversion factors, in some cases show implausibility. For example, the quantity of flour extracted from certain cereals in certain countries is beyond the realms of physiological possibility. In other cases, countries are assumed to be wasting significant quantities of grains through implausibly low extraction rates.

**Evidence of a why a complete reassessment of the current FBS approach is needed**

As data are almost exclusively accessed from the web nowadays, a telling metric that sheds light on global usage of FBS data (including in-house), and hence relevance, is given by the level of FAOSTAT web activity and trends in activity over time. Here, the self-evident hypothesis is that relatively low usage suggests either the importance of the subject matter is in decline, the data on the subject matter are suspect, or both. Another reason might be the low awareness of FAOSTAT.

To set this stage, the FAOSTAT domains that disseminate data related to food supplies other than FBS are first described below:

* **Food Supply**: covers food commodities that have been converted back into primary equivalents: Quantity; Dietary Energy; Proteins; Fats; Totals and per Capita. In the landing page, FAOSTAT states that this domain houses “*the most important data in FAOSTAT. In fact, this data is for the basis for estimation of global and national undernourishment assessment, when it is combined with parameters and other data sets. This data has been the foundation of food balance sheets ever since they were first constructed. The data is accessed by both business and governments for economic analysis and policy setting, as well as being used by the academic community*.”
* **Commodity Balances**: “*show balances of food and agricultural commodities in a standardized form. The scope of standardization is to present these data in a less detailed form for a selected number of commodities without causing any significant loss of the basic variables monitoring the agricultural sector. The selected commodities include the equivalents of their derived products falling in the same commodity group, but exclude the equivalents of by-products and derived commodities, which through processing, change their nature and become part of different commodity groups*.”

Some telling statistics are provided in figure 1. Total FAOSTAT web activity (the number of hits) dwarfs the domains involving the construction of FBS as well as FBS itself. For instance, FAOSTAT activity as a whole outmatched the commodity balance domain by 1:918 in late 2013. That is to say, for every 918 hits in the entire FAOSTAT only one was recorded in the commodity balance domain. Not just in relative terms, but in absolute terms is the performance of the domains in question, in that numbers have been on a downward spiral since the probable “SOFI peak” of October 2012, and have reached either record lows or near-record lows in recent months. Taking again the commodity balance domain, around 244 hits worldwide were recorded in September 2013, i.e. on average eight per day. “Unique events”, essentially unique users, are likely to make the picture even bleaker.

A review of the number of scholarly articles published in recent times or the number of contemporary policy white papers drafted employing FBS statistics would also serve as a useful acid test. Yet another indicator would be the inclusion of FBS data by global data disseminators hosting development data. Arguably, of the most renowned stands the World Bank. Needless to say, the World Bank in spite of hosting many FAO data sets, including the Prevalence of Undernourishment, the underlying data in question (national food supplies, DES, nutrient intake, etc.) do not appear.

**Figure 1 Number of monthly web events for total FAOSTAT versus FBS, commodity balance and food supply domains: 2012-2103**

Suspect data quality and for that matter the lack of quality assurance, data that persist with a 4 to 5-year lag that bear no relation to current trends, *prima facie* point to a negative image of FBS data. But these negative traits will only become apparent to the user after accessing the domains. The domains have been in existence for decades when FAOSTAT was made available on line, and earlier through statistical publications. Lack of awareness about FAOSTAT is easily dismissed given its authority as a leading source of food and agricultural data. Most compelling is that trends in low usage have come at a time when the importance of food and nutrition security is being expounded by almost all major development agencies, when global development processes are taking stock of the issue (e.g. Zero Hunger Challenge, SDGs) and when food security policies are being instituted by governments throughout the world.

The evidence presented above, as well as the methodological shortcomings appear to necessitate a radical reconsideration on the compilation FBS. Clearly, any rethink needs to begin with important questions regarding fundamental uses of FBS, including what level of information suffices in meeting requirements, and importantly, how to better target the end product towards these uses.

**What have been the traditional uses of FBS data? What are the data requirements?**

Jacobs and Sumner (2002)[[7]](#footnote-7) provide an evaluation of how the FBS has been used in recent years and by whom.They endorse the FAO view, under the qualification of data quality that FBS are useful to:

* observe a country’s food supply and its trends,
* compare food supply to nutritional requirements for healthy diets,
* estimate supply/shortage measures,
* evaluate food and nutrition policies,
* measure the degree of chronic undernutrition,
* examine changes in diet patterns,
* investigate relationships between food supplies, famine, and malnutrition,
* calculate self-sufficiency and import-dependency ratios,
* set goals for trade and production, and project future supply and demand

The authors also cite uses in the published literature, which include:

* food availability, food shortfalls, and identification of countries below recommended food/nutrient intakes;
* comparisons of food/nutrient intakes or production among countries or over time;
* constructing measurements of undernourishment;
* evaluating food security; and
* epidemiological research.

A striking feature in all of the above applications is that precision on commodity detail is redundant. Requirements appear to rest on total DES, DES from major commodity groups and their accompanying macro nutrients and possibly micro nutrients. For example, knowledge of supplies of cereal food is the overriding metric rather than knowing what the constituents of the cereal group are, even though much information can be drawn from the domains of production and trade to understand composition. Restricting the FBS to major food groups can shed light on changes in the composition of food baskets and dietary trends. Also, the need for quantity data (kg, tonnes) seems superfluous. A standardized FBS in calories, by food group would appear to suffice in meeting FBS uses.

1. **A valid way forward.**

Taking stock of the issues in the preceding sections, the appropriate way forward would be to considerably simplify the FBS construct and to abandon assumptions and processes that are highly likely to introduce further error into FBS statistics. A FBS standardized into, and consequently represented by caloric food groups would be an ideal solution.

Food groups can be established from theory, e.g. seperability in preferences, two-stage budgeting and the composite commodity theorem. Alternatively, such groups can be drawn from those that have been established by national authorities in monitoring and guiding nutritional choices for the population, e.g. ChooseMyPlate.gov –of the USDA, or by way of food pyramids, e.g. the Balanced Diet Pagoda of China. In addition, WHO in conjunction with FAO, published tabulated guidelines in 2002 for safeguarding nutrition in daily diets and are shown in table 7.

**Table 7. WHO-FAO nutritional guidelines**

|  |  |
| --- | --- |
| **Dietary factor** | **2002 Joint WHO/FAO Expert Consultation recommendations** |
| Total fat | 15 – 30% |
| Saturated fatty acids (SFAs) | <10% |
| Polyunsaturated fatty acids (PUFAs) | 6–10% |
| n-6 PUFAs | 5–8% |
| n-3 PUFAs | 1–2% |
| Trans fatty acids | <1% |
| Monounsaturated fatty acids (MUFAs) | By difference |
| Total carbohydrate | 55–75% |
| Free sugars | <10% |
| Complex carbohydrate | No recommendation |
| Protein | 10–15% |
| Cholesterol | <300 mg/da |
| Sodium chloride (Sodium) | <5 g/day (<2 g/day) |
| Fruits and vegetables | ≥400g/day |
| Pulses, nuts and seeds |  |
| Total dietary fibre | From foods |
| NSP | From foods |

To give an example of a food-grouped FBS, table 7 below shows such a FBS categorized by nine food groups, in which the 3-digit CPC class and HS-chapter levels suffice in depicting these broad groups. Notice that the construct is very similar to the aggregate item groups represented in the current FBS. The table also shows the required adjustments to CPC and HS, highlighted in red, which are then decomposed further in tables 8 and 9.

**Table 7. Food-grouped FBS example**

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | **Commodity Group** | **CPC-2.1 Expanded Class** | **UNSD-HS Chapter** |
| F01 | Cereals | 011,231,232,234,237,243 | 10,11,19 |
| F02 | Roots and Tubers | 015,213 | 07,11,19 |
| F03 | Vegetables (inc. melons) | 012,213 | 07,08,20 |
| F04 | Fruit and Nuts | 013,032,236 | 08,12,20 |
| F05 | Pulses | 017 | 07 |
| F06 | Stimulants and Spices | 016,239 | 09,12 |
| F07 | Sugar | 012,029,232,235,236,244 | 04,12,17,22 |
| F08 | Meat and Fish | 029,042,043,044,045,049,211,212 | 02,03,16 |
| F09 | Dairy and Eggs | 022,023,221,222,223,354 | 04,35 |
| F10 | Vegetable Oils and Animal Fats | 215,216,217 | 02,12,15 |
| F11 | Alcoholic beverages | 241,242 | 022 |

Importantly, tables 8 and 9 show that subsequent adjustments at the CPC-5 and HS 6-digit level, a one-to-one mapping is achieved.

The idea would be then to convert into calories all foodstuffs falling under each group that enter trade (processed or otherwise) and production, as well as utilization. In other words the FBS would be constructed in standardized caloric format.

**What are the benefits?**

The benefits of this approach are manifold:

* **Human resource savings**: the approach circumvents the need to maintain processed accounts as the calories from processed trade are simply added to the parent food group
* **Timeliness**: the simplified construct would result in the far more timely compilation of FBS, with a significantly lower time lag than the 4 to 5 year lag at present.
* **Perfect communicability between HS and CPC**: at an aggregated level, and after adjustments to both CPC and HS, a one-to-one mapping is achieved, thereby delivering gains to accuracy
* **Circumvent the need for extraction rates, shares, conversion factors and ultimately commodity trees**: however, for first-line processed foodstuffs depicted in the FBS, such as sugar and vegetable oils, extraction rates will be required
* **Easier estimation of livestock feed utilization, losses and industrial use:** the livestock feed estimation model calculates net energy demand by animal numbers but faces a considerable task in allocating energy demand to individual cereal crops, as these data are not observed. However, by using a cereal aggregate this problem is negated. Similarly, biofuel demand from energy crops will be easier to estimate for countries possessing a basket of competing (cereal) crops. Losses have also been calculated at a fairly aggregated commodity level and the model can easily be implemented at the food group level.
* **Statistical properties**: disaggregated data are known to be far more noisy than their aggregate counterparts. This property suggests there will be gains to precision under the new approach.
* **No loss to apparent user needs**: the new approach preserves information requirements for users, in that FBS will still be able to depict trends in food and nutrition security, dietary changes, etc
* **Can we still say anything on quantities?** Yes. As calorie conversion factors are applied at the crop/product level, we can simply divide through by calories to arrive at the quantity equivalent for each of the food groups

**What about the costs?**

* **Standardized SUAs for individual crops will no longer be maintained**. However, this needs to be contrasted against the long-term decline in FAOSTAT usage rates of these data. Also, the Trade and Markets Division maintains commodity balances for a large number of crops and products that account for around 75% of global calories.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Table 9 Accompanying adjustments to CPC for the food-grouped FBS** | | | | |  |  |
| **FBS class** | **FBS class title** | **CPC class** | **CPC sub class/expansion** | **CPC title** | **UNSD-HS equivalent** | **Inclusion/Exclusion** |
| F01 | **Cereals** | 232 | 23210 | Glucose and glucose syrup; fructose and fructose syrup; lactose and lactose syrup; invert sugar; sugars and sugar syrups n.e.c.; artificial honey; caramel | x1702.11~Lactose & syrup,99% lact;x1702.19~Lactose and lactose syru;x1702.30~Glucose, glucose syrup < 20% fructose;x1702.40~Glucose including syrup of 20%-50% dry weight fructose;x1702.50~Fructose, chemically pure;x1702.60~Fructose, syrup > 50% fructose, not pure fructose;x1702.90~Sugar nes, invert sugar, caramel and artificial honey | Exclude |
| 243 | 2432 | Malt, whether or not roasted | x1107.10~Malt, not roasted;x1107.20~Malt, roasted | Include |
| F02 | **Roots and Tubers** | 213 | 21313 | Potatoes, frozen | x0710.10~Potatoes, frozen, uncooked steamed or boiled | Include |
| F03 | **Vegetables (inc. melons)** | 213 | 21313 | Potatoes, frozen | x0710.10~Potatoes, frozen, uncooked steamed or boiled | Exclude |
| F04 | **Fruit and Nuts** | 236 | 23670.02 | Fruit, Nuts, Peel, Sugar Preserved | x2006.00~Fruits, nuts, fruit-peel, etc preserved by sugar | Include |
| F06 | **Stimulants and Spices** | 239 | 2391 | Coffee and tea | x0901.12~Coffee, not roasted, decaffeinated;x0901.21~Coffee, roasted, not decaffeinated;x0901.22~Coffee, roasted, decaffeinated;x0901.90~Coffee husks and skins,;x2101.11~Coffee extracts, essence;x2101.12~Coffee prep. of extracts;x2101.30~Chicory & other coffee substitutes, roasted & products;x0902.10~Tea, green (unfermented) in packages < 3 kg;x0902.30~Tea, black (fermented or partly) in packages < 3 kg;x2101.20~Tea and mate extracts, essences and concentrates | Include |
| 2392 | Spices and aromatics, processed | x0904.12~Pepper of the genus Piper, crushed or ground;x0904.20~Capsicum or Pimenta, dried, crushed or ground;x0908.10~Nutmeg;x0908.20~Mace;x0908.30~Cardamoms;x0909.20~Coriander seeds;x0909.30~Cumin seeds;x0909.10~Anise or badian seeds;x0906.20~Cinnamon and cinnamon-tree flowers crushed or ground;x0907.00~Cloves (whole fruit, cloves and stems);x0910.10~Ginger;x0905.00~Vanilla beans | Include |
| F07 | **Sugar** | 029 | 02910 | Natural honey | x0409.00~Honey, natural | Include |
| 236 | 23610 | Cocoa paste, whether or not defatted | x1803.10~Cocoa paste not defatted;x1803.20~Cocoa paste wholly or partly defatted | Exclude |
| 23620 | Cocoa butter, fat and oil | x1804.00~Cocoa butter, fat, oil | Exclude |
| 232 | 2322 | Starches; inulin; wheat gluten; dextrins and other modified starches | x1108.11~Wheat, starch;x1108.12~Maize (corn) starch;x1108.13~Potato starch;x1108.14~Manioc (cassava) starch;x1108.19~Starches except wheat, maize, potato, manioc;x1108.20~Inulin;x1109.00~Wheat gluten | Exclude |
| 232 | 2323 | Tapioca and substitutes therefor prepared from starch, in the form of flakes, grains, siftings or similar forms | x1903.00~Tapioca and tapioca substitutes | Exclude |
| 244 | 24490.92 | Other non-alcoholic caloric beverages n.e.c | x2202.90~Non-alcoholic beverages nes, except fruit, veg juices;x2202.10~Beverage waters, sweetened or flavoured | Include |
| F08 | **Meat and Fish** | 029 | 02910 | Natural honey | x0409.00~Honey, natural | Exclude |

**Table 10. Accompanying adjustments to HS for the food-grouped FBS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FBS class** | **FBS class title** | **CPC class** | **UNSD-HS equivalent** | **Inclusion/Exclusion** |
| F01 | Cereals | 11 | x1105.10~Potato flour or meal;x1105.20~Potato flakes, granules and pellets;x1106.10~Flour or meal of dried legumes;x1106.20~Flour or meal of sago, starchy roots or tubers;x1106.30~Flour, meal, powder of fruit/nut, citrus or melon peel;x1108.13~Potato starch;x1108.14~Manioc (cassava) starch | Exclude |
| 19 | x1903.00~Tapioca and tapioca substitutes | Exclude |
| F02 | Roots and Tubers | 07 | x0710.10~Potatoes, frozen, uncooked steamed or boiled;x0714.10~Manioc (cassava), fresh or dried;x0714.20~Sweet potatoes, fresh or dried;x0714.90~Arrowroot, salep, etc fresh or dried and sago pith | Include |
| 11 | x1105.10~Potato flour or meal;x1105.20~Potato flakes, granules and pellets;x1106.10~Flour or meal of dried legumes;x1106.20~Flour or meal of sago, starchy roots or tubers;x1106.30~Flour, meal, powder of fruit/nut, citrus or melon peel;x1108.13~Potato starch;x1108.14~Manioc (cassava) starch | Include |
| 19 | x1903.00~Tapioca and tapioca substitutes | Include |
| F03 | Vegetables (inc. melons) | 07 | x0710.10~Potatoes, frozen, uncooked steamed or boiled;x0714.10~Manioc (cassava), fresh or dried;x0714.20~Sweet potatoes, fresh or dried;x0714.90~Arrowroot, salep, etc fresh or dried and sago pith | Exclude |
| 07 | x0713.10~Peas dried, shelled;x0713.20~Chickpeas, dried, shelled;x0713.31~Urd,mung,black or green gram beans dried shelled;x0713.32~Beans, small red (Adzuki) dried, shelled;x0713.33~Kidney beans and white pea beans dried shelled;x0713.39~Beans dried, shelled, nes;x0713.40~Lentils dried, shelled;x0713.50~Broad beans and horse beans dried, shelled;x0713.90~Leguminous vegetables dried, shelled | Exclude |
| 08 | x0807.11~Watermelons, fresh;x0807.19~Melons, fresh | Include |
| 20 | x2004.10~Potatoes, prepared, frozen;x2005.20~Potatoes, prepared or preserved, not frozen/vinegar;x2005.70~Olives, prepared or preserved, not frozen/vinegar | Exclude |
| 20 | x2006.00~Fruits, nuts, fruit-peel, etc preserved by sugar;x2007.10~Homogenised jams, jellies, etc;x2007.91~Citrus based jams jellies marmalade, etc.;x2007.99~Jams, fruit jellies, purees and pastes, except citrus;x2008.11~Ground-nuts otherwise prepared or preserved;x2008.19~Nuts, seeds & mixes, otherwise prepared or preserved;x2008.20~Pineapples, otherwise prepared or preserved;x2008.30~Citrus fruits, otherwise prepared or preserved;x2008.50~Apricots, otherwise prepared or preserved;x2008.60~Cherries, otherwise prepared or preserved;x2008.70~Peaches, otherwise prepared or preserved;x2008.80~Strawberries, otherwise prepared or preserved;x2008.91~Palm hearts, otherwise prepared or preserved;x2008.92~Fruit mixtures, otherwise prepared or preserved;x2008.99~Fruit, edible plants nes otherwise prepared/preserved;x2009.11~Orange juice, frozen, not fermented or spirited;x2009.19~Orange juice, not fermented, spirited, or frozen;x2009.20~Grapefruit juice, not fermented or spirited;x2009.30~Citrus juice nes (one fruit) not fermented or spirited;x2009.40~Pineapple juice, not fermented or spirited;x2009.50~Tomato juice not fermented or spirited;x2009.60~Grape juice or must not fermented or spirited;x2009.70~Apple juice not fermented or spirited;x2009.80~Single fruit, veg juice nes, not fermented or spirited;x2009.90~Mixtures of juices not fermented or spirited | Exclude |
| F04 | Fruit and Nuts | 20 | x2001.10~Cucumbers,gherkins, prepared or preserved by vinegar;x2001.20~Onions prepared or preserved by vinegar;x2001.90~Veg, fruit, nuts nes prepared or preserved by vinegar;x2002.10~Tomatoes, whole/pieces, prepared/preserved, no vinegar;x2002.90~Tomatoes nes, prepared or preserved, not in vinegar;x2003.10~Mushrooms, prepared or preserved, not in vinegar;x2003.20~Truffles, prepared or preserved, not in vinegar;x2004.90~Vegetables nes and mixtures, prepared, frozen;x2005.10~Homogenized vegetable preparations, not frozen/vinegar;x2005.40~Peas, prepared or preserved, not frozen/vinegar;x2005.51~Beans, shelled, prepared/preserved, not frozen/vinegar;x2005.59~Beans nes, prepared or preserved, not frozen/vinegar;x2005.60~Asparagus, prepared or preserved, not frozen/vinegar;x2005.70~Olives, prepared or preserved, not frozen/vinegar;x2005.80~Sweet corn, prepared or preserved, not frozen/vinegar;x2005.90~Veg nes, mixes, prepared/preserved, not frozen/vinegar | Exclude |
| 08 | x0807.11~Watermelons, fresh;x0807.19~Melons, fresh | Exclude |
| F05 | Sugar | 07 | x0713.10~Peas dried, shelled;x0713.20~Chickpeas, dried, shelled;x0713.31~Urd,mung,black or green gram beans dried shelled;x0713.32~Beans, small red (Adzuki) dried, shelled;x0713.33~Kidney beans and white pea beans dried shelled;x0713.39~Beans dried, shelled, nes;x0713.40~Lentils dried, shelled;x0713.50~Broad beans and horse beans dried, shelled;x0713.90~Leguminous vegetables dried, shelled | Include |
| F07 | Pulses | 12 | x1212.91~Sugar beet;x1212.92~Sugar cane | Include |
| F09 | Dairy and Eggs | 04 | x0409.00~Honey, natural;x0410.00~Edible products of animal origin nes | Exclude |
| F10 | Vegetable Oils and Animal Fats | 02 | x0209.00~Pig and poultry fat, unrendered | Exclude |

1. Stock availabilities (opening stocks) are also an important component in supply [↑](#footnote-ref-1)
2. <http://unstats.un.org/unsd/cr/registry/regso.asp?Ci=64> [↑](#footnote-ref-2)
3. <http://www.wcoomd.org/en/topics/nomenclature/instrument-and-tools/hs_nomenclature_2012/correlations-tables.aspx> [↑](#footnote-ref-3)
4. <http://comtrade.un.org/ws/refs/getCommodityList.aspx> [↑](#footnote-ref-4)
5. <http://ndb.nal.usda.gov/ndb/help/index> [↑](#footnote-ref-5)
6. Food Balance Sheets – A Handbook (FAO, 2001) <http://www.fao.org/docrep/003/x9892e/X9892E00.htm#TopOfPage> [↑](#footnote-ref-6)
7. Jacobs, K and D Sumner, 2002. “The Food Balance Sheets of the Food and Agriculture Organization:A Review of Potential Ways to Broaden the Appropriate Uses of the Data” (<http://182.160.112.236/agridrupal/sites/default/files/FBS_Review_of_Potential_Ways_to_Broaden_the_Uses_of_Data.pdf>) [↑](#footnote-ref-7)