



Food Balance Sheets (FBS)

**Producing analytical data sets for monitoring
and analysing food security and food policies**





Viewing the domestic food supply and demand situation through FBS allows countries to examine conditions in a holistic way, aiding food supply analysis and facilitating food policy formulation

What is a Food Balance Sheet?

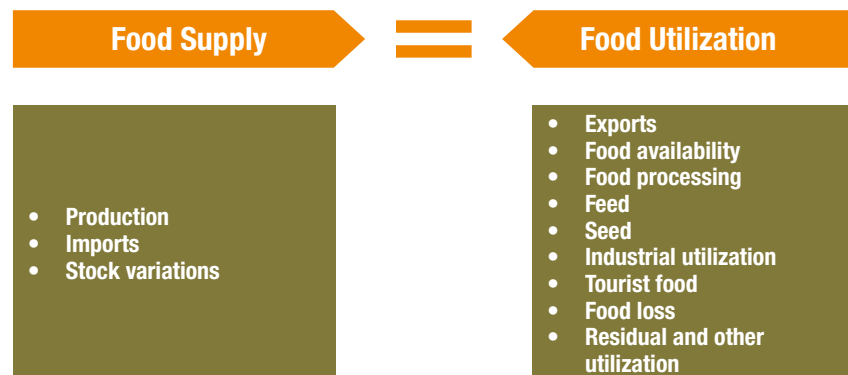
A **Food Balance Sheet (FBS)** is an aggregated and analytical data set that presents a comprehensive picture of the pattern of a country's food supply and utilization during a specified reference period.

FBS are built on the premise that within a given country in a given year, the sum of all aspects of the supply of a given food product must be equal to the sum of utilizations of that product.

This balance is compiled for every food item (estimated on a primary-commodity-equivalent basis) consumed within a country. All primary-commodity-equivalent balances are then combined into a single overall FBS.

FBS provide estimates for every food item of per capita food available for human consumption in terms of **quantity, calories, protein and fat**.

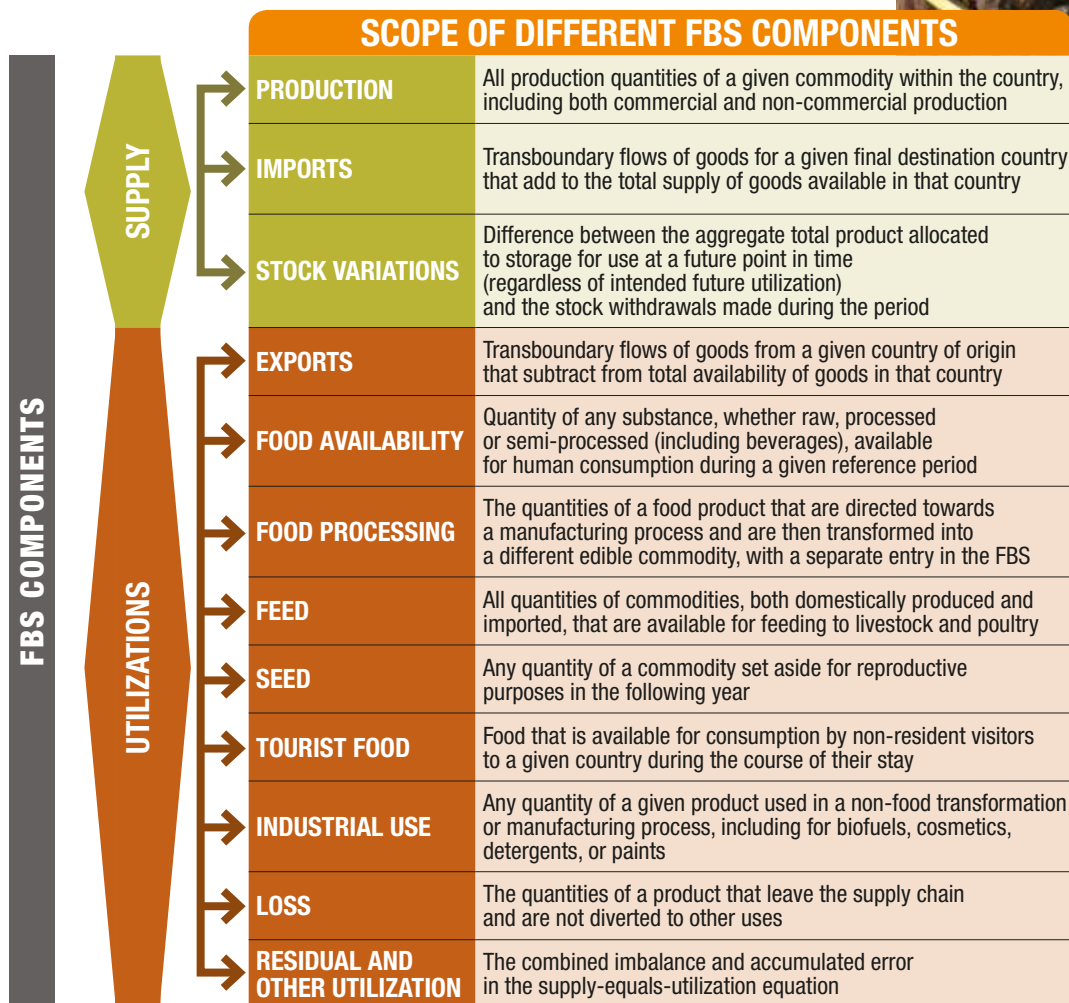
BASIC FBS EQUATION



FBS components

For a given commodity, FBS compilers should collect data for each FBS component

For each food product of the FBS, **food supply must be equal to food utilization**



The potential uses of FBS

FBS data can be used in numerous applications (including econometric studies, trend analyses, investigations of dietary content, and nutritional adequacy analyses).

1

MEASURING AND ANALYSING OVERALL FOOD SUPPLY

- Estimation of country's Dietary Energy Supply (DES)
- Estimation of country's protein and fat availability

2

FOOD SUPPLY ASSESSMENT: CALCULATION OF INDICATORS

- Prevalence of Undernourishment (PoU)
- Self-Sufficiency Ratio (SSR)
- Import Dependency Ratio (IDR)

3

BENCHMARKING AND MARKET ANALYSIS

- Compare food availability from one country to another on both aggregate and product-specific levels

4

COMPARING FOOD AVAILABILITY OVER TIME

- Track changes in food supply over time, including estimated total caloric availability, growth of consumption of new products, and general changes in dietary composition

POTENTIAL FBS USERS

- **POLICY-MAKERS**
Food policy analysis and food situation assessment
- **FIRMS**
Market analysis to seek new opportunities
- **ACADEMICS**
Input in econometric models

Within the Sustainable Development Goal (SDG) framework, FBS contribute to the calculation of the **Prevalence of Undernourishment (PoU)** under SDG 2 (No Hunger) and the **Global Food Loss Index** under SDG 12 (Responsible consumption and production)



IMPROVING NATIONAL STATISTICAL INTEGRATION

- FBS provide a framework for reconciling data, as total supply must equal total utilization
- By bringing together all relevant stakeholders, problems or inconsistencies in data collection and estimation can be identified and a country's overall agricultural statistical program can be improved



INPUT FOR NATIONAL ACCOUNTS

- Fundamentally, FBS are an accounting framework specific to food and agricultural products; as such, FBS are naturally complementary to the estimation of national accounts



PROVIDING INPUT FOR ECONOMIC MODELS

- FBS data can be used by several models that are structured using the supply-use format of national accounts data
- Most partial equilibrium models for agriculture utilize commodity balances in their data structures

Data sources for FBS compilation

FBS data come from different sources that are often specific to the FBS components (production, trade data, food processing, etc.).

In the improved methodology for FBS compilation, the Food and Agriculture Organization of the United Nations (FAO) has provided recommendations for the data sources of each component.



It is recommended to create a technical working group to better leverage the use of the various data sources and facilitate the validation of the final output



International classification and FBS

Within FBS, two classifications are used:

- The UN Central Product Classification (CPC) for production data
- The Harmonized Commodity Description and Coding System (HS) of the World Customs Organization (WCO)

The mapping between these two classifications facilitate the comparison of production and trade data within the FBS context.

What if data are missing?

If data are missing for a given component for a commodity, FBS compilers may perform **estimations and imputations**.

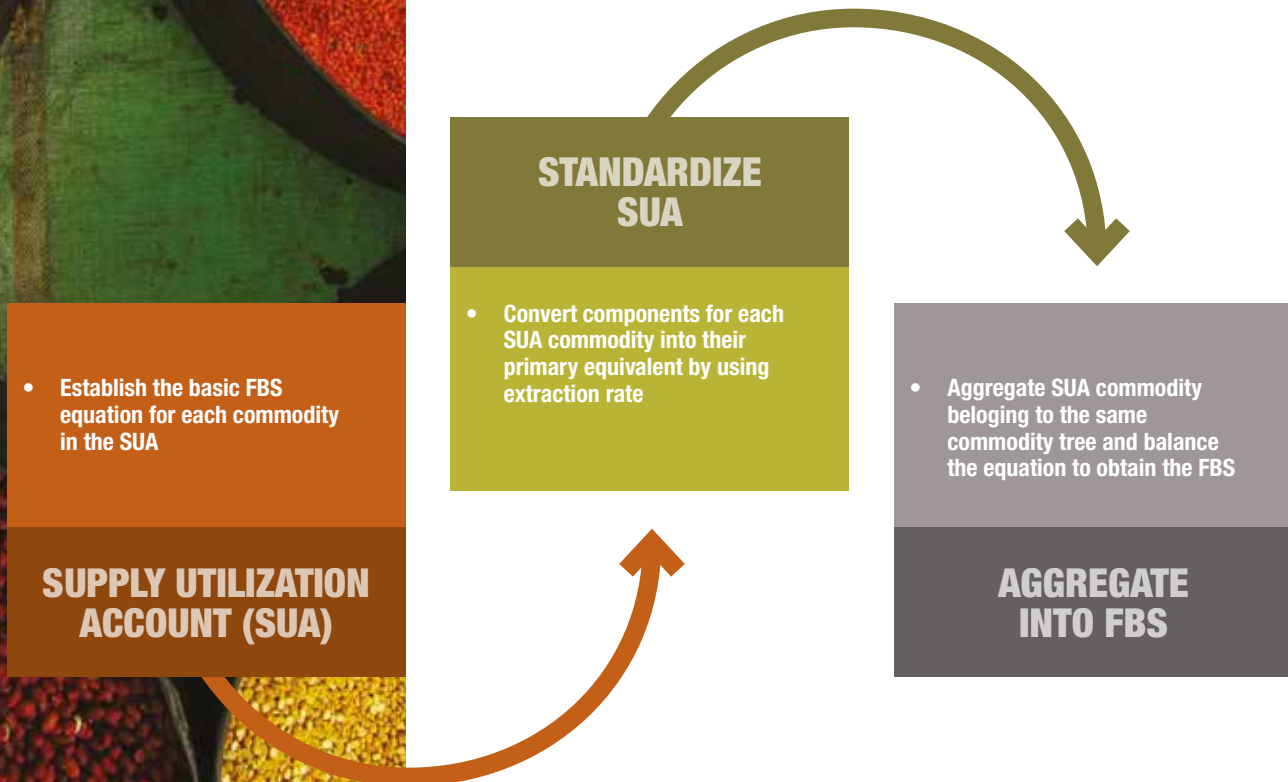
In the new methodology for FBS compilation, FAO has recommended methods to derive national-level FBS estimations for each component.

POTENTIAL DATA PROVIDERS

Steps for compiling FBS and estimating macronutrients

COMPILING FBS

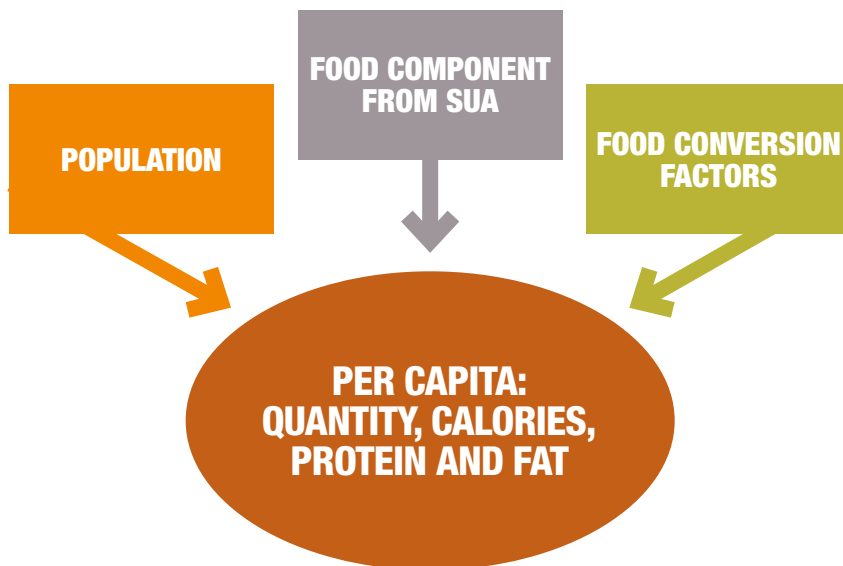
The most important step in compiling FBS is the establishment of Supply Utilization Accounts (SUA) for all edible commodities in a country. Once established, the SUA is standardized into their primary equivalent and aggregated into an overall FBS.



MACRONUTRIENT ESTIMATES

Population data and nutrient data are combined with the food component of each SUA commodity to derive the per capita daily supplies of energy, protein and fat of each food item.

When the lines for all commodities have been included, the per capita daily supplies of energy, protein and fat for the individual commodities can then be added together up to calculate total daily supplies.



DIETARY ENERGY SUPPLY (DES) ESTIMATES

The per capita estimates of caloric value for individual food products are then added together to obtain a country's total daily per capita DES.

FBS tools at country level

FAO, in partnership with the Global Strategy to improve Agricultural and Rural Statistics, has developed an **FBS tool** with R software and its Shiny package for FBS compilation at country level.

The FBS tool was tested in:

- a national training workshop in Colombo, Sri Lanka
- a regional workshop for African French-speaking countries in Dakar, Senegal
- a regional workshop for Asia-Pacific countries, in Daejeon, Republic of Korea

Within the framework of the Global Strategy's technical assistance plan, the FBS tool is also used at country level in:

- **AFRICA**
 - ▶ Benin
 - ▶ Cameroon
 - ▶ Guinea
 - ▶ Madagascar
 - ▶ Mali
- **ASIA PACIFIC**
 - ▶ Cambodia
 - ▶ China
 - ▶ Sri Lanka
 - ▶ Viet Nam

IMPORTANT TO KNOW

FBS are presented in a primary equivalent format. For example, all derived products of wheat are standardized and aggregated up to one primary equivalent line in the FBS layout entitled “Wheat and products”.

To better conceptualize the primary/derived product relationships and better organize the standardization work, primary commodities and their derived products are organized into **commodity trees**.

An **extraction rate** is a technical conversion factor linking a food item to its derived products.

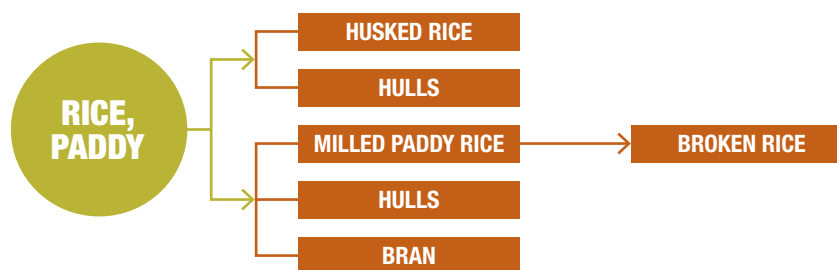
Commodity trees and extraction rates may be found in the document **Technical Conversion Factors for Agricultural Commodities**:

<http://www.fao.org/fileadmin/templates/ess/documents/methodology/tcf.pdf>

Examples of commodity tree, SUA and FBS layout

EXAMPLE OF COMMODITY TREE AND CORRESPONDING SUA

► Commodity tree for rice



This is a sample commodity tree and SUA table, in that not all products are produced from paddy rice in every country. Also, additional products may be produced from paddy rice, including rice bran oil, starch, beer, breakfast cereals, rice-based fermented beverages and cereal preparations not elsewhere specified (not elsewhere specified).

► Corresponding SUA of the commodity tree

Product	Production	Imports	Exports	Stock change	Food	Food processing	Feed	Seed	Net Tourist Food	Industrial Use	Loss	ROU
Paddy rice	-	-	-	-	-	-	-	-	-	-	-	-
Husked rice	-	-	-	-	-	-	-	-	-	-	-	-
Milled paddy rice	-	-	-	-	-	-	-	-	-	-	-	-
Rice bran	-	-	-	-	-	-	-	-	-	-	-	-
Broken rice	-	-	-	-	-	-	-	-	-	-	-	-
Rice flour	-	-	-	-	-	-	-	-	-	-	-	-

► Corresponding FBS line of primary equivalent after balancing and standardization

Product	Production	Imports	Exports	Stock change	Food	Food processing	Feed	Seed	Net Tourist Food	Industrial Use	Loss	ROU
Rice(milled equivalent)	-	-	-	-	-	-	-	-	-	-	-	-

AN EXAMPLE OF FBS LAYOUT

This example shows FBS of cereals but the complete FBS layout includes products of starchy roots, vegetables, fruits, sugar crops, meat, fish and sea food, etc.

2013 Philippines												Population		20 316.0	
PRODUCTS	DOMESTIC SUPPLY (1 000 MT)					DOMESTIC UTILIZATION (1 000 MT)						PER CAPITA SUPPLY			
	1 000 Metric Tons											Total		Protein	Fat
	Prod.	Impo.	Stock var.	Exp.	Total	Food	Food manu.	Feed	Seed	Waste	Other uses	Kg/Yr	Kcal/day	Gr/day	Gr/day
Grand total													2 684	75	57
Vegetable products													2 307	39	33
Animal products													377	36	24
Cerals-excl. beer	19 677	6 208	398	148	26 135	16 678	2 683	5 038	280	811	1 142	170	1 552	32	9
Wheat	0	2 875	0	119	2 756	2 756	326	0	0	0	0	28	233	4	7
Maize	7 377	354	-8	1	7 722	2 413	-229	5 013	54	0	643	25	188	4	1
Rice (milled eq.)	12 299	319	406	2	13 022	11 485	0	0	227	811	499	117	1 130	24	2
Barley	0	139	0	26	113	0	113	0	0	0	0	0	0	0	0
Rye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oats	0	22	0	0	22	16	0	6	0	0	0	0	1	0	0
Millet	0	4	0	0	4	0	0	4	0	0	0	0	0	0	0
Sorghum	1	13	0	0	14	0	0	14	0	0	0	0	0	0	0



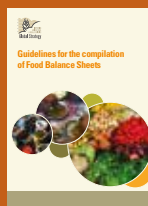
To leverage the use of FBS in decision-making, FBS data and related metadata and analytical reports should be disseminated on the websites of NSOs or ministries of agriculture and in annual agricultural statistical abstracts



Statistics Division (ESS)
Food and Agriculture Organization of the United Nations
Viale delle Terme di Caracalla, 00153 Rome, Italy

www.gsars.org

Guidelines for the compilation
of Food Balance Sheets (EN-FR)



Training Course on Food Balance Sheets – English
<http://gsars.org/en/training-course-on-food-balance-sheets-english/>

Training Course on Food Balance Sheets – French
<http://gsars.org/en/training-course-on-food-balance-sheets-french/>

Handbook on Food Balance Sheets
<http://www.fao.org/docrep/003/x9892e/x9892e00.htm>

National FBS compilation Users' Guide

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