Food Balance Sheets (FBS)

Data for FBS compilation: data assessment and other preliminary considerations

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Outline

1. Introduction
2. Data comparability
3. Data quality, measurement errors and flags
4. Data search and assessment
5. Conclusion

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Introduction

1. Introduction

Data assessment is the **crucial first step** in the FBS compilation, as it helps compilers to ensure data comparability.

What to do

- Prepare an inventory of potential data sources (for all the relevant variables for each commodity)
- Assess the quality of the data
- Document all the data sources used

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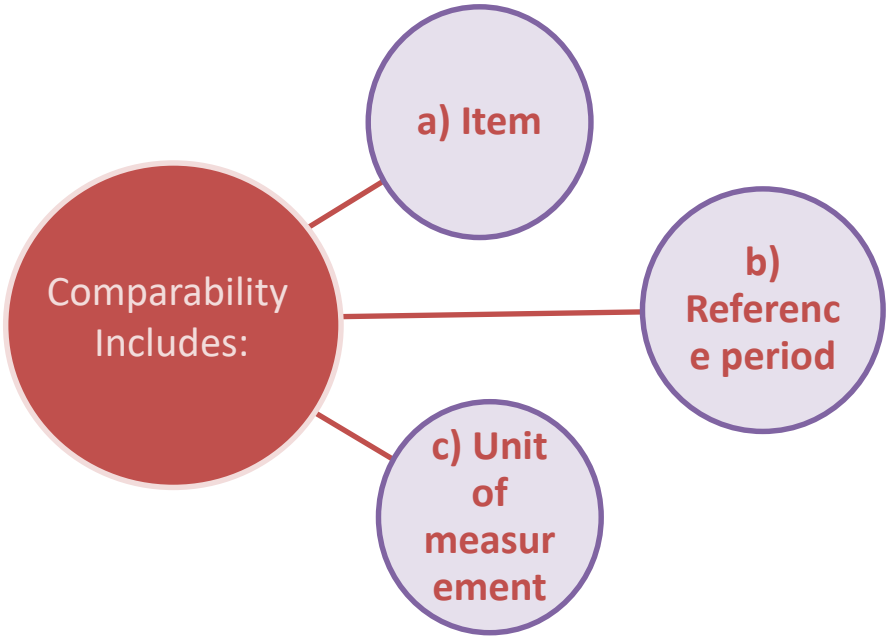
Data comparability

2. Data comparability: Introduction

Data need to be fully comparable



1. Data comparability:

a) The use of statistical classification

Ensure that the products being compared are actually the same.

Example: production of rice:

- Production is recorded on a paddy basis
- Food is recorded on a milled basis (roughly 67% paddy equiv.)

How to avoid these kinds of errors?

Using **international statistical classification:**

- comparability of **products within a balance sheet** framework
- comparability of data **between countries**

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1. Data comparability:

a) The use of statistical classification

UN Central Product Classification (CPC), Version 2.1

- is maintained by the UN Statistics Division (UNSD)
- organizes products into a five-level hierarchical structure
- is mapped to the HS classification for international trade

FAO developed the **CPC ver.2.1 expanded** for agriculture, an annex on agricultural statistics

- expanded adding two more digits at the lower level

1. Data comparability:

a) The use of statistical classification

Although data in the SUA/FBS are reported in CPC, data on trade are usually reported in HS.

Harmonized Commodity Description and Coding System (HS)

- Classification developed by the World Customs Organization
- Most widely utilized classification in the context of international trade
  - used by more than 200 countries and covers 98 percent of international merchandise trade
- Hierarchical structure
  - Organized in 97 chapters, includes 5,000 six-digit product groups

1. Data comparability:

a) The use of statistical classification

The use of the HS for trade data within the FBS context is recommended:

- **data comparability** purposes
- ease of **concordance with the CPC**

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1. Data comparability:

a) The use of statistical classification

Some supporting material:

Guidelines on International Classifications for Agricultural Statistics
http://gsars.org/en/guidelines-on-international-classifications-for-agricultural-statistics/

CPC Version 2.1
http://unstats.un.org/unsd/cr/downloads/CPCv2.1_complete%28PDF%29_English.pdf

Correspondence table FCL/CPC/HS
http://www.fao.org/economic/ess/ess-standards/commodity/en/FAOSTAT

Definition and classification of commodities
http://www.fao.org/waicent/faoinfo/economic/faodef/faodefe.htm

1. Data comparability:

b) Common units

Ensure that product values are reported in common units

e.g. agricultural products can be reported in MT, in 1,000 MT, in quintales, etc.
e.g. most trade data is reported in MT
e.g. most calories conversion tables are in cal. Per kilograms

→ Need to unify these units

It is recommended that countries elaborate balance sheets in MT

1. Data comparability:

c) Reference period

Two common reference periods are:

1. **marketing year** (or crop year, or agricultural year)

   begins in the month when the bulk of the crop in question is harvested

2. **calendar year**

   begins in the first month of the calendar (Jan./Dec.)

2. **fiscal year**

   Time defined by governments for accounting purposes

   Difficult to understand conceptually

   Comparison not easy because fiscal year from country to country

It is recommended that countries compile their FBS on a calendar year basis

1. Data comparability:

c) Reference period

	MARKETING YEAR	CALENDAR YEAR
Advantages	It closely follows the cycle of each season	(i) provide "neutral" reference period (ii) is the default reporting periods for trade data
Limitations	**(i)** for crops harvested at different points in the year **(ii)** for countries that experience multiple harvest **(iii)** trade data is often by default aggregated into calendar years	It can be difficult to understand conceptually → production should be assigned to the calendar year in which most of the crop will be consumed

Data quality, measurement errors and flags

2. Data quality, measurement errors and flags

When compiling FBS, data are extracted from a **variety of different sources**.

→ Different **degrees of quality**

e.g. official sources are usually more transparent, and the methodology on data collection is available

e.g. non-official sources may be less transparent

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2. Data quality, measurement errors and flags:

a) Hierarchy of data sources

Official data

- are **always preferred** for expected values
- if **multiple agencies** publish data relating to agricultural output (e.g. NSI and Min. of Agriculture) → Reconciliation of estimates between different official sources is recommended

Semi-official data

- include: industry groups, trade publications, specialized sectorial publications, investigations conducted by product value chain experts, etc.
- are used when official data are not available

2. Data quality, measurement errors and flags:

a) Hierarchy of data sources

Estimation

- is the **lowest quality** level of source data
- is different from imputation: it relies not on a model, but instead on **expert judgment**

Imputation of missing data

- are used when no official or semi-official sources can be found
- **relies on a historical data series**
- separate imputation approaches are recommended for different variables in the balance sheet

2. Data quality, measurement errors and flags:

b) Flags to denote data source

As data are taken from different sources, with **different quality**, it is recommended to publish a flag denoting the data source.

Flags help users to:

Understand which data are more reliable than others

Assign *a priori* tolerance intervals to be used in the balancing process

Example of flags denoting data source

Source	Flag
Official	
Semi-official	T
Estimated	E
Imputed	I

2. Data quality, measurement errors and flags

Confidence and tolerance intervals

For the balancing phase it is necessary to assign an ***a priori*** **tolerance interval**.

- **How** to assign ***a priori*** **tolerance interval** ?

The tolerance intervals should be assigned by variable. At the same time, the sources of the data should influence the a priori tolerance interval value assigned to each variable, with the lowest tolerance intervals assigned to those variables for which official data are most likely

2. Data quality, measurement errors and flags:

Confidence and tolerance intervals

Sample confidence and tolerance intervals given *a priori* knowledge of variables

Variable	Confidence	Tolerance interval
Production	1.0	± 0 %
Trade	1.0	± 0 %
Stocks	1.0	± 0%
Food	0.90	± 10%
Food processing	1.0	± 0 %
Feed	0.75	± 25%
Seed	0.90	± 10%
Tourist Food	0.75	± 25%
Industrial Use	0.75	± 25%
Loss	0.75	± 25%

2. Data quality, measurement errors and flags

Confidence and tolerance intervals

Production

Usually measured through agricultural surveys there should be high confidence in the production estimate.

Trade

Most countries should have official data on imports and exports → high confidence.

- In case where sizeable quantity are not registered in official trade data, compilers may assign some degree of measurement error.

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2. Data quality, measurement errors and flags

Confidence and tolerance intervals

Stock

- By their very nature they may fluctuate wildly from year to year
- Most estimates on stocks are based on expert judgement (few countries measure stock)

→ **the confidence is likely to be lower than estimates for other variables**

Food availability

Although it is not typically measured by countries, food consumption is not likely to fluctuate greatly → **the confidence in the food estimate should be quite high.**

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2. Data quality, measurement errors and flags

Confidence and tolerance intervals

Food processing

In most cases this variable is dropped from the FBS (in order to avoid double-counting) → **not need to assign a tolerance interval.**

Feed

Depending upon how the feed estimate is derived, it may have a larger or smaller implied tolerance interval.

Seed

Quantities of seed needed for the following year are solely a function of planted area and seeding rates (remain stable) → **confidence interval should be fairly low.**

2. Data quality, measurement errors and flags

Confidence and tolerance intervals

Tourist food

As it is not based on any measurements, the confidence in this variable should likely be lower.

Industrial Use

Usually only limited data is available → **the measurement error will be fairly low.**

Loss

- data on loss is very limited;
- the quantity lost may vary greatly from year to year (due to crop size, constraints in storage, weather, etc.) → the confidence interval is likely to be high.

Data search and assessment

3. Data search and assessment

1st steps in compiling FBS:

1. **Search all possible available data sources**

2. **Assess each data sources for both data comparability and data quality**
   - Note the frequency with which the data is produced, the classification system used, the unit, reference period and the data quality or flag

3. **Document all these information in order to transparency and institutional memory**

3. Data search and assessment

Sample data assessment grid

Variables	Sources	Release date/ frequency	Classification	Unit	Reference Period	Quality/Flag
Production						
Trade						
Stocks						
Food						
Etc.						

Conclusion

Conclusion

It is really important to ensure the **comparability** when compiling a FBS

- The SUA/FBS is in CPC. Use the HS for trade data (then converted is CPC)
- It is recommended that countries elaborate FBS in MT
- The calendar year is recommended for the reference period

- For data quality, the preferred **hierarchy of data sources** is: official data, semi-official data, data imputation and data estimation.

- It is important to give **flags** to the data.

- **Measurement error** based on variables is helpful during the balancing phase.

References

- *Guidelines for the compilation of Food Balance Sheets (FAO, 2017), chapter 3 (Global Strategy & FBS Team)*

- *The FAO source book for the compilation of Food Balance Sheets (FAO, 2016) (Global Strategy & FBS Team)*

THANK YOU!

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