


Food Balance Sheets (FBS) - Module11

1. Module11

1.1 Welcome

Suggested data sources and imputation: Tourist food, ROU, and additional parameters



Food Balance Sheets (FBS)

Lesson 11
Suggested data sources and imputation:
Tourist food, ROU, and additional parameters

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Notes:


1.2 Lesson objective

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Lesson objective

In this lesson we will learn about the Food Balance Sheet (FBS) with respect to:

1. Different data sources for tourist food;
2. Recommended approach for imputation and estimation of tourist food;
3. Residual and other uses component;
4. Recommendation for additional parameters.



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Notes:

1.3 Outline

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Outline

- Official data sources for tourist food
- Alternative data sources for tourist food
- Imputation and estimation data sources for tourist food
- Residual and other uses
- Additional parameters



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Notes:

1.4 Official data sources

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Official data sources

Tourist food

TOURIST FOOD



Tourist food refers to food that is available for consumption by non-resident visitors to a given country during the course of their stay. This variable covers food availability for *all* non-residents, including tourists, business travellers, or non-resident migrants in instances where they are not counted in the country's population.

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Notes:

1.5 Official data sources

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Official data sources

Tourist food

While data on arrivals and departures may be collected by immigration authorities, it is likely that national tourism offices in each country will be the entity that publishes the most detailed information available on visitor arrivals and departures. This data should be differentiated by country of origin, and include numbers of both day visitors and overnight visitors, as well as the average length of stay for overnight visitors.

Through surveys, tourism boards may also publish figures on tourist food consumption patterns, which would certainly aid FBS compilers in estimating tourist food within the balance sheets.



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Notes:

1.6 Alternative data sources


Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Alternative data sources

Tourist food

If FBS compilers do not have ready access to their country's data on visitor arrivals, they may instead consult reports from the UN World Tourism Organization (UNWTO).

This organization compiles and publishes member country-provided data on the number of visitors, average length of stay, and country of origin, as well as estimates on outbound tourism. Although no data on tourist food consumption is included, as above, the number of arrivals is a useful starting point for estimating tourist food.



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Notes:

1.7 Alternative data sources

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Alternative data sources

Tourist food

It is possible that industry groups may have more detailed data about actual visitor food consumption—possibly including how tourist consumption patterns differ from the local population, or even the quantities of certain foods consumed by tourists.

If such information is not available from industry groups, it is possible that for countries where tourism is clustered mostly into resort areas, sales or tax records from those establishments could be used as a first-level approximation of tourist food and then extrapolated to the entire tourist population using the appropriate weights.



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Notes:

1.8 Imputation and estimation data sources

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Imputation and estimation data sources

Tourist food

The estimation of tourist food begins with a simple calculation of the number of visitor days, N , for travellers originating from country I and visiting country j (N_{Ij}).

Visitors to country j include both day visitors and overnight visitors, and these visits must be standardized to give us a total number of visitor days. To do so, the number of day visitors from I to j , N_{DIj} , is added to the number of overnight visitors from I to j , N_{OIj} , multiplied by the average number of days an overnight visitor stayed, \bar{D} .

$$N_{Ij} = N_{DIj} + N_{OIj} * \bar{D}$$

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Notes:

1.9 Imputation and estimation data sources

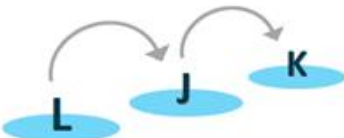
Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Imputation and estimation data sources

Tourist food

Consider that the goal is to estimate net tourist food for country j . Every year, thousands of visitors travel from I visit country j .

At the same time, hundreds of country j 's residents travel abroad as well to visit country k .



In this three-country scenario, for any individual commodity i , net tourist food for country j ($NetTF_{ij}$) can be represented as the amount of food (in MT) that is available for consumption in country j by incoming visitors from I to j , $Food_{Ij}$, minus the amount of food available for consumption by residents of country j that are instead visiting country k , $Food_{jk}$.

$$NetTF_{ij} = Food_{Ij} - Food_{jk}$$

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Notes:

1.10 Imputation and estimation data sources

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Imputation and estimation data sources

Tourist food

Keeping in mind the number of visitors, the dietary pattern in the destination country, the level of food availability in the origin country, and the amount of calories per MT, total food availability in MT of commodity i for visitors from country i to country j , $Food_{ij}$, can be written as:

$$Food_{ij} = \frac{\left[N_{ij} * \left(f_{ij} * \frac{\sum_i f_{il}}{\sum_i f_{ij}} \right) \right]}{\frac{cal_i}{MT}}$$

Where N_{ij} is the number of visitor-days for visitors traveling from country i to country j , f_{ij} represents the amount of calories of commodity i available for consumption in country j , the term $\frac{\sum_i f_{il}}{\sum_i f_{ij}}$ is the relative amount of total historical caloric availability in country i compared to country j , and $\frac{cal_i}{MT}$ is the number of calories contained in one MT of commodity i .

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Notes:

Country-level analysts should define for themselves what “historical caloric availability” means, but two suggests are 1) level of caloric availability in the previous year, or 2) average caloric availability over the previous three years.

1.11 Imputation and estimation data sources

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Imputation and estimation data sources

Tourist food

Example

FBS compilers in country j are estimating inbound tourist consumption of beer of barley. Let's assume that country j is the relatively poorer country with daily DES of 2,000 kcal/cap/day (so, total daily caloric availability f for commodity i , summed over all commodities, or $\sum_i f_{ij}$), and country i is the wealthy country where DES ($\sum_i f_{il}$) is 3,500 kcal/cap/day. Tourists from country i spend 50,000 tourist-days in country j in the reference period. In addition, in country j , daily food availability of beer of barley, f , is 25 kcal/cap/day, and consulting a calorie conversion table, they find that there are approximately 430 calories per kilogram of beer of barley—equivalent to 430,000 calories per MT of beer of barley. Using this information, daily calories of beer of barley available for consumption by visitors from country i to country j can be imputed by performing the following calculation,

$$Food_{beerij} = \frac{\left[N_{ij} * \left(f_{beerj} * \frac{\sum_i f_{il}}{\sum_i f_{ij}} \right) \right]}{\frac{cal_{beer}}{MT}}$$

$$Food_{beerij} = \frac{\left[50,000 * \left(25 * \frac{3500}{2000} \right) \right] \text{ calories}}{430,000 \frac{\text{calories}}{MT}}$$

$$Food_{beerij} = 5.09 \text{ MT}$$

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Notes:

1.12 Imputation and estimation data sources

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Imputation and estimation data sources

Tourist food

If countries are unable to access information on total food availability for visitors differentiated by country in order to calculate food as above, then a simplification can be substituted. The simplification here is that the scaling term can be dropped, and compilers can assume that visitors consume the same amount of the commodity as do residents.

$$Food_{ijk} = \frac{(N_{jk} * f_{ij})}{\frac{cal_i}{MT}}$$

For outbound travelers the amount of calories of commodity i available for consumption per day in country j , f_{ij} , is simply multiplied by the number of visitor-days for travelers leaving country j , N_{jk} , and this number of total calories is then converted into a quantity in MT by dividing by the relevant nutrient factor, $\frac{cal_i}{MT}$, represented below

$$Food_{ijk} = \frac{(N_{jk} * f_{ij})}{\frac{cal_i}{MT}}$$

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Notes:

1.13 Imputation and estimation data sources

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Imputation and estimation data sources

Tourist food

This simplified illustration hopefully aids in the understanding of how tourist food is calculated for visitors from a single country. However, in reality, we know that visitors are flowing into country j from many countries. In fact, they are potentially coming from every country in the world, except country j itself.

At the same time country j is also potentially sending visitors out to these same countries. So in comprehensively representing net tourism, country-level FBS compilers must account for multiple inbound visitor flows (orange arrows), and multiple outbound traveler flows (green arrows),

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Notes:

1.14 Imputation and estimation data sources

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Imputation and estimation data sources

Tourist food

We can represent this aggregation using summation notation:

$$NetTC_{ij} = \underbrace{\frac{\sum_{l=1, l \neq j}^x N_{lj} * \left(f_{ij} * \frac{\sum_l f_{il}}{\sum_l f_{ij}} \right)}{\frac{cal_i}{MT}}}_{\text{Food consumed by incoming visitors}} - \underbrace{\frac{(\sum_{k=1, k \neq j}^x N_{jk}) * f_{ij}}{\frac{cal_i}{MT}}}_{\text{Food consumed by outgoing visitors}}$$

The only additions to this notation are the country summation terms, $\sum_{l=1, l \neq j}^x []$ and $\sum_{k=1, k \neq j}^x []$, indicating that the calculation should be performed for all countries in set x (in this case, the world) beginning with country l but excluding country j in the first case, and beginning with country k and excluding country j in the second case.

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Notes:

1.15 Residual and other uses

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Residual and other uses

RESIDUAL AND OTHER USES

Production + imports – Exports - ΔStocks = Food + Feed + Seed + Tourist Food + Industrial Use + Loss + **Residual Use**

Residual and other uses (ROU) can, in most cases, be defined as the combined imbalance and accumulated error in the supply equals utilization equation. As such, this category is computed ex-post as a balancing item and is not independently estimated

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Notes:

1.16 Residual and other uses

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Residual and other uses

Residual and other uses is a unique balance sheet element, in that its purpose and calculation will vary depending upon the needs of the country in question.

First of all, this category can be calculated ex-post as a balancing item at the SUA level. As such, it would be estimated in a manner similar to that of the “imbalance” in the supply = utilization identity, after quantities have been estimated for each of the other variables. However, as elaborated in earlier sections, this strategy should only be utilized when the imbalances in the equation are small.

It is possible that there are additional uses for certain commodities in certain countries that country-level FBS compilers will want to account for separately (food available for consumption by refugees is one possibility). In this case, no specific data sources or imputation methods can be recommended, but users are encouraged to consult experts on the commodity supply chain in question.

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Notes:

1.17 Additional parameters

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Additional parameters

ADDITIONAL PARAMETERS

1. Population
2. Nutrient estimates
3. Extraction rates
4. Processing shares

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Notes:

1.18 Additional parameters


Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Additional parameters

Population

In the calculation of country-level FBS, compilers have the option of using either domestically-produced or internationally-standardized population estimates from UNPD. Domestically-produced estimates and the UNPD estimates may diverge if certain groups are counted in domestically-produced figures, but are excluded from UNPD figures (or vice versa). As such, it is up to the compiling country to come to a decision on which population estimate they should use for the purposes of FBS compilation.

It is important to recognize that the choice of population data will directly impact the final DES figures, so the rationale for choosing one figure over the other should be discussed and documented by an FBS technical working group. This decision should be based upon which figure better captures the full picture of a country's resident population (counting undocumented workers, refugees, etc.). In many instances, national population data may better account for these resident groups.



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Notes:

1.19 Additional parameters

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Additional parameters

Population

Countries may find that using UNPD population data instead has its own advantages. UNPD data are produced according to a standardized, internationally-recognized methodology, which facilitates comparison between countries. Furthermore, the estimates from UNPD are used as a common denominator for deriving per capita estimates under global development initiatives, including the recently-concluded Millennium Development Goals and the now-underway Sustainable Development Goals. If compilers choose to use this data, it is publicly-available and can be easily accessed from the following site:
<https://esa.un.org/unpd/wpp/>.

If there are large differences between nationally-produced population estimates and UNPD figures, countries are encouraged to clarify the underlying explanation behind the discrepancies with UNPD to hopefully better reconcile the two estimates.

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Notes:

1.20 Additional parameters

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Additional parameters

Nutrient estimates

It is recommended that country-level FBS compilers first check to see whether or not such a nationally-produced conversion table exists before using another source table. This is because the nutrient content of products may vary slightly depending upon the characteristics of the variety of the product that is consumed. As such, if no national estimates are available, it is recommended that countries first consult tables from their own region or neighboring countries before using an international reference table.

Countries should note whether their reference nutrient tables are done on the basis of gross or net product weight.

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Notes:

1.21 Additional parameters

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Additional parameters

Nutrient estimates

The relevant nutrient estimates that are at present commonly covered in FBS composition are energy (expressed in kcal), protein (expressed in g), and fat (also expressed in g).

Data on nutrient content are available from various sources, but two international sources should be noted for their relevance to the process of FBS compilation:

1. FAO and the International Network of Food Data Systems (INFOODS) publishes an international food composition table and database directory, here: <http://www.fao.org/infoods/infoods/tables-and-databases/en/>
2. FAO publishes the conversion table that its Statistics Division uses in the composition of FBS here: http://www.fao.org/fileadmin/templates/ess/ess_test_folder/Food_security/Excel_sheets/Nutritive_Factors.xls

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Notes:

1.22 Additional parameters

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Additional parameters

Extraction rates

Compilers are encouraged to hold extraction rates fixed in their FBS calculations. This simplification is recommended because:

- Only in a few rare instances in developed countries are both the inputted quantity of raw material and the outputted quantity of processed product actually measured, which would be the necessary condition for the endogenous calculation of an extraction rate. Additionally, very few countries separately publish/update their average extraction rates annually.
- There is observed tendency to overestimate quantities assigned to food processing while simultaneously underestimating (or leaving out altogether) other uses of a product.
- The usage of fixed extraction rates is recommended is to aid the standardization process, such that the parameter used to convert derived products back to primary equivalents remains unchanged from year to year.

Countries are encouraged to periodically review their extraction rates to ensure their accuracy.

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Notes:

1.23 Additional parameters

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Additional parameters

Extraction rates

In sourcing extraction rates, countries are encouraged to speak directly to domestic processors to either collect data on or more accurately estimate national extraction rates. More structured supply chain studies (potentially including research student theses or dissertations) may also be a useful source of information, provided that they are sufficiently representative. Focus group discussions including industry experts and researchers could also be a useful source of extraction rate data.

As a last resort, FBS compilers can consult the handbook on average technical conversion factors that is publicly available on FAO's website, here:
<http://www.fao.org/fileadmin/templates/ess/documents/methodology/tcf.pdf> However, FBS compilers should note that this document was produced in 1999, in some cases based on data that may already have been more than a decade old, and thus this document does not capture any recent innovations in food processing technologies.

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Notes:

1.24 Additional parameters

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Additional parameters

Processing shares

Processing shares are extremely dependent upon the structure of each country's particular product supply chains (as laid out in country-specific commodity trees). As such, there are no international sources that can be consulted in the search for processing shares data.

It is recommended that country-level FBS compilers consult any available supply chain analysis investigations as possible data sources. Industry experts may be also be consulted, as they may be able to provide certain insights into the supply chain that would assist FBS compilers in estimating likely processing shares.

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Notes:

1.25 Quiz 1

(Multiple Choice, 10 points, 1 attempt permitted)

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Quiz

Q 01

Net tourist food for country j can be represented as the amount of food that is available for consumption in country j by incoming visitors to j , minus the amount of food available for consumption by residents of country j that are instead visiting to other country.

Select one that apply.

☒ True

☐ False

SUBMIT

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Feedback when correct:

1.26 Quiz 2

(Multiple Choice, 10 points, 1 attempt permitted)

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Quiz

Q 02 Residual and other uses component can be calculated as a single balancing item at SUA level without considering the size of imbalances in the equation.

Select one that apply.

☐ True

☒ False

SUBMIT

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1.27 Quiz 3

(Multiple Choice, 10 points, 1 attempt permitted)

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Quiz

Q 03 *Tourist food* refers to food that is available for consumption by non-resident visitors (not including business travellers) to a given country during the course of their stay.

Select one that apply.

☐ True

☒ False

SUBMIT

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1.28 Quiz 4

(Multiple Response, 10 points, 2 attempts permitted)

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Quiz

Q 04 Nutrient estimates that are commonly at present covered in FBS composition are:

Select all that apply.

- ☒ Energy/calorie
- ☒ Protein
- ☐ Vitamin
- ☒ Fat

SUBMIT

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1.29 Quiz 5

(Multiple Response, 10 points, 2 attempts permitted)

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Quiz

Q 05 There are several additional parameters involved in the compilation of FBS that we have discussed in this lesson. Please select those parameters below:

Select all that apply.

- ☒ Population.
- ☒ Nutrient estimates.
- ☒ Extraction rate.
- ☒ Processing share.
- ☐ Food processing.

SUBMIT

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1.30 Conclusion

Suggested data sources and imputation: Tourist food, ROU, and additional parameters

Conclusion

You have finished lesson 11.

In this lesson, we have discussed:

1. Different data sources for tourist food;
2. Recommended approach for imputation and estimation of tourist food;
3. Residual and other uses component;
4. Recommendation for additional parameters.

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Notes:

1.31 Thank You

Suggested data sources and imputation: Tourist food, ROU, and additional parameters



Food Balance Sheets (FBS)

Thank You!

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Notes: