


Food Balance Sheets (FBS) - Module10

1. Module10

1.1 Welcome

Suggested data sources and imputation: Feed and seed



Food Balance Sheets (FBS)

Lesson 10
Suggested data sources and imputation:
Feed and seed

0% of %total51%

◀ Prev Next ▶

Notes:


1.2 Lesson objective

Suggested data sources and imputation: Feed and seed

Lesson objective

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

1. Different data sources for feed and seed;
2. Recommended approach for imputation and estimation of feed and seed.



0% of %totalSlide% Click NEXT to continue. < Prev Next >


Notes:

1.3 Outline

Suggested data sources and imputation: Feed and seed

Outline

- Official data sources for feed
- Alternative data sources for feed
- Imputation and estimation data sources for feed
- Official data sources for seed
- Alternative data sources for seed
- Imputation and estimation data sources for seed



0% of %totalSlide% Click NEXT to continue. < Prev Next >

Notes:

1.4 Official data sources

Suggested data sources and imputation: Feed and seed

Official data sources

Feed

Feed



Feed is defined as all quantities of commodities—both domestically produced and imported—that are available for feeding to livestock and poultry.

In order to improve the accuracy of feed estimations, FBS compilers should first research the characteristics of livestock rearing in their country. Both official data collection approaches and imputation strategies should take into account the structure of livestock production systems in order to more accurately estimate feed needs.

0% of %totalSlide% [Click NEXT to continue.](#) [◀ Prev](#) [Next ▶](#)

Notes:

1.5 Official data sources

Suggested data sources and imputation: Feed and seed


Official data sources

Feed

Official data collection efforts on feed are subject to a similar limitation as stock data, in that feed can be sourced from a variety of actors, so arriving at an accurate picture of aggregate feed production can require various types of surveys:

1. Questions can be added to farm-level surveys about own production reserved for feed,
2. Feed compounders can be surveyed as to their output,
3. Pasture resources can be estimated using a variety of methods.

If feed compounders are not surveyed, it may also be possible to derive an estimate of their output by consulting administrative records. If costs are an issue, then ad-hoc surveys on feed use could be utilized to measure feed demand periodically, which could help to parametrize a country-specific module of feed demand and utilization.



0% of %totalSlide% [Click NEXT to continue.](#) [◀ Prev](#) [Next ▶](#)

Notes:

1.6 Alternative data sources

Suggested data sources and imputation: Feed and seed

Alternative data sources

Feed

If official data is incomplete or not available, some unofficial data sources may also exist to help countries estimate feed use for certain commodities.

- 1 First, it is likely that commodity interest groups would either have some measurement or estimate of the quantity or proportion of their particular commodity that is being used as animal feed.
- 2 At the same time, livestock associations may publish data on feed usage, or may be able to at least provide some indication as to the composition of feed rations for certain animal groups. Regardless of whether or not these groups publish data on feed use, it is advised that FBS compilers consult these groups to gain a better understanding of the feed market in order to better inform their balance sheets.
- 3 Extension workers could also be consulted to glean information about herd sizes, most commonly-utilized feedstuffs, and local animal production systems.

0% of %totalSlide% Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.7 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

Feed



Imputation of missing feed data can pose a challenge to FBS compilers. The general approach suggested here is based on the reconciliation of total feed demand and available feed supply.

Three basic steps should be followed in this process:

- 1 Step 1: Understanding and estimating total feed demand
- 2 Step 2: Understanding feed supply
- 3 Step 3: Allocating feed supply

0% of %totalSlide% Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.8 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

1 Step 1: Understanding and estimating total feed demand

With respect to energy needs, total required feed demand, FD, is merely the product of the number of animals belonging to species i , N_i , multiplied by the amount of energy required per animal for that species, e_i , summed across all species, i , raised in the country, as in equation

$$FD = \sum_i N_i \times e_i$$

The amount of energy required per animal can vary widely even within species, depending upon both the characteristics of the animal (i.e., a lactating dairy cow's energy needs are much greater than a yearling calf's energy needs) and the type of the production system in which the animal is raised, such as grassland-based systems versus more intensive industrialized systems.

0% of %totalSlide% [Click NEXT to continue.](#) [◀ Prev](#) [Next ▶](#)

Notes:

1.9 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

1 Step 1: Understanding and estimating total feed demand

Food balance sheets cover only non-forage commodities, so this imputation method estimates feed demand only for non-forage commodities.

To underscore this point, consider that livestock raised in pastoralist production systems are almost universally fed a diet solely of forage, such that their feed needs would be excluded from food balance sheets.

The supply of forage crops are necessary for the calculation of total feed supply under this method. As such, countries are encouraged to compile data on production of forage crops (in addition to production of non-forage crops) to ensure that total feed supplies from all sources are adequately measured.



0% of %totalSlide% [Click NEXT to continue.](#) [◀ Prev](#) [Next ▶](#)

Notes:

1.10 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

1 Step 1: Understanding and estimating total feed demand

Suggestions to more accurately estimating total feed demand:

Understand the different livestock production systems in practice in the country for each species, including industrial, grassland-based, mixed, or backyard. With the assistance of farm surveys and censuses, attempt to estimate the number of animals for each animal species raised in the country (including farmed fish and poultry), and the number of animals raised under each identified production system.

Determine the "average" animal's feed requirements for each production system. If data on the number of animals raised under different production systems is of good quality, consider estimating the feed needs of animals raised under separate production systems as if they were a different species.

Sum the feed needs of all animal species, both in terms of energy and protein.

0% of %total5ld%

Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.11 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

2 Step 2: Understanding feed supply

Understanding feed supply begins with an inventory of all of the products that are potentially used for feed in the country. This should be accompanied by an analysis or ranking of which commodities are most likely to be used for feed demand.

Once all the commodities used as feed have been identified (potentially including forage, cereals, root crops, and processing byproducts, to name a few), their dietary values per unit should be recorded. These values are publicly available for nearly 1,400 feed products via the Feedipedia online resource library.

0% of %total5ld%

Click NEXT to continue. ◀ Prev Next ▶

Notes:

Feedipedia database is a collaboration between INRA, CIRAD, AFZ, and FAO, and can be accessed at: <http://www.feedipedia.org/>.

1.12 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

2 Step 2: Understanding feed supply

After all commodities used as feed have been identified, the work of allocating supplies to match with the feed demand calculated in Step 1 can begin.

First, any official data on feed use should be recorded appropriately, converted to their total energy/protein equivalents (by multiplying quantities reported in MT by their unit dietary values), and subtracted from the total feed demand estimated in Step 1.

After official feed use data has been accounted for, residual use (that is, production net of trade) of commodities only used for feed (including forages, bran, and pulps) should be considered. Again, these volumes should be converted to energy/protein equivalents and subtracted from the remaining total feed demand.

0% of %total\$ld%

Click NEXT to continue.

◀ Prev Next ▶

Notes:

1.13 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

3 Step 3: Allocating feed supply

The final step is to allocate the remaining feed demand to available commodities. The recommended approach of doing so is to assemble a technical working group to discuss the most likely feed commodities, and distribute feed demand amongst them accordingly.

Alternatively, FBS compilers can use whatever information is gathered in the initial feed inventory at the beginning of Step 2, and allocate feed demand accordingly based on the ranking of which commodities are most likely to be used as feed. As an additional option, analysts can consult the available literature on feed demand in their country for assistance in estimating feed utilization.

It should be emphasized, however, that regardless of how estimates of feed demand are derived, they should be validated by the technical working group once FBS have been compiled for all commodities.

0% of %total\$ld%

Click NEXT to continue.

◀ Prev Next ▶

Notes:


1.14 Official data sources

Suggested data sources and imputation: Feed and seed

Official data sources

Seed

Seed



Seed is defined as any quantity of a commodity set aside for reproductive purposes in the following year. This can include seed for sowing, plants for transplanting, eggs for hatching, and fish used as bait. This quantity should also take into account double or successive sowing.

0% of %totalSlide% Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.15 Official data sources

Suggested data sources and imputation: Feed and seed

Official data sources

Seed

Most official measurements of seed use data are sourced from agricultural surveys.

Most surveys will include questions on both purchases of improved seed and quantities of own reserved seed, but in the case that the survey excludes purchases of improved seed, it may be possible to access the sales records of commercial seed companies in order to obtain a full estimate of total seed use.

Trade data may also give some indications about seed quantities if most seed is imported.



0% of %totalSlide% Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.16 Alternative data sources

Suggested data sources and imputation: Feed and seed

Alternative data sources

Seed

Compilers could also investigate the possibility of whether or not there is available data regarding only seeding rates.

Information on either optimal or effective seeding rates may be available from a variety of sources. First, compilers can contact commercial seed companies to inquire about recommended seeding rates for major commodities for the varieties most commonly sold in their country. Additionally, agricultural research institutions and/or extension specialists may be able to provide some estimates as to common seeding rates in certain production regions. And in cases where governments have programs providing subsidized seed to growers, government administrative records will likely contain information on average seeding rates.

Some information on seeding rates for various commodities can also be found in the publication *Technical Conversion Factors for Agricultural Commodities*.

0% of %totalSlide% Click NEXT to continue. ◀ Prev Next ▶

Notes:

Technical Conversion Factors for Agricultural Commodities document is available here:
<http://www.fao.org/fileadmin/templates/ess/documents/methodology/tcf.pdf>.

1.17 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

Seed

Seed use in a given year t are a function of a seeding rate and a sown area in the following year, $t+1$,

$$\text{Seed use (MT)}_t = \text{Seeding rate} \left(\frac{\text{MT}}{\text{HA}} \right) \times \text{Sown area (HA)}_{t+1}$$

Given this identity, the process of deriving an imputed value for seed quantity is as follows:

Step 1: Calculate/estimate a seeding rate.

Step 2: If missing, impute a value for sown area in the following year.

Step 3: Multiply the two values together for an estimate of total seed use.

0% of %totalSlide% Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.18 Imputation and estimation data sources for seed

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources for seed

[Seed](#)

Step 1: Calculate/estimate a seeding rate.

If the country has previously planted the commodity in question, then seeding rate can be calculated using data from previous years.

$$\text{Seeding rate } \left(\frac{MT}{HA} \right) = \frac{\text{Seed use } (MT)_t}{\text{Sown area } (HA)_{t+1}}$$

This equation is then utilized on previous time periods for which seed use in one year and sown area in the following year have been reported.

0% of %totalSld% [Click NEXT to continue.](#) [◀ Prev](#) [Next ▶](#)

Notes:

1.19 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

[Seed](#)

Step 1: Calculate/estimate a seeding rate.

If seed use is being estimated for the first time or if FBS compilers wish to ensure that utilized seed rates are current (in other words, that they take into account any changes in technology or shifts in production area that could affect the overall seeding rate), compilers should consult agricultural experts who will most certainly be able to provide an estimate of an average seeding rate (keeping in mind that this average will need to reflect any differences in seeding rates by production system).

These experts could be extension agents, research scientists at public institutions, or even persons within seed companies, provided that most utilized seed is purchased every year and does not come from household reserves.

0% of %totalSld% [Click NEXT to continue.](#) [◀ Prev](#) [Next ▶](#)

Notes:

1.20 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

[Seed](#)

Step 2: Area Imputation

If an estimate for sown area in the following year is available, then FBS compilers should skip to Step 3, as only sown area and seeding rate are needed to derive an estimate of seed use.

If no estimate for sown area in the following year is available, then sown area must be imputed. This can be done through one of three approaches, depending upon the data available to the country-level compiler:

Approach 1: The Ratio Approach

Approach 2: Abandonment Adjustment

Approach 3: Using harvested area as an approximation for sown area

0% of 10 total slides Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.21 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

[Seed](#)

Step 2: Area Imputation

Approach 1: The Ratio Approach

Country-level FBS compilers simply need to calculate $RatioSH_t$, the ratio of $\frac{\text{Sown area}}{\text{Harvested area}}$, in each year for which there is a value for both variables, and then average those annual ratios, $RatioSH$.

Once $RatioSH$ has been calculated, then that value can be multiplied by harvested area in the following period, $t+1$, in order to arrive at an estimate for sown area in that same year, as below:

$$Sown\ area_{t+1} = (RatioSH) \times Harvested\ area_{t+1}$$

0% of 10 total slides Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.22 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

[Seed](#)

Step 2: Area Imputation

Approach 1: The Ratio Approach

Year	Sown area (HA) (A)	Harvested area (HA) (B)	RatioSH _t (C=A/B)
2010	400	388	400/388 = 1.03
2011	425	405	425/405 = 1.05
2012	420	395	420/395 = 1.06
2013	390	370	390/370 = 1.05
2014	?	385	RatioSH = $\frac{1.03+1.05+1.06+1.05}{4} = 1.05$

Example

Country A's FBS compilers have an estimate of harvested area of sunflowers for 2014 of 385 hectares, but no value for sown area for that year. They do, however, have historic data on sown area and harvested area for sunflowers for 2010-2013.

$$\text{Sown area}_{2014} = (\text{RatioSH}) * \text{Harvested area}_{2014}$$

$$\text{Sown area}_{2014} = 1.05 * 385$$

$$\text{Sown area}_{2014} = 404$$

If no estimate of harvested area in the following year is available, then country compilers can substitute the current year's harvested area as a stand-in until data on harvested area in the following year is available.

0% of %totalSlide% Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.23 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

[Seed](#)

Step 2: Area Imputation

Approach 2: Abandonment Adjustment

Example

If Country A harvested 95 hectares of wheat in 2015, and 5 percent of sown area is commonly abandoned before harvest in an average year:

$$\text{Sown area}_{2015} = \frac{95}{(1-0.05)}$$

$$\text{Sown area}_{2015} = 100$$

If there is no historical data from which RatioSH can be calculated but data on harvested area is available, sown area can instead be estimated using the harvested area data and an approximation of the amount of area that is sown but not harvested, which is referred to as the abandonment rate (abd).

$$\text{Sown area}_{t+1} = \frac{\text{Harvested area}_{t+1}}{(1 - abd)}$$

0% of %totalSlide% Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.24 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

[Seed](#)

Step 2: Area Imputation

Approach 3: Using harvested area as an approximation for sown area

If it is not possible to calculate a historical ratio of sown to harvested area and an estimate of land abandonment is not possible, but data on harvested area is available, then as a final option, country-level FBS compilers can use harvested area in the following year to approximate sown area in the following year.

It should be emphasized that this approach should only be used when either of the two options above are not possible, as no accounting for land abandonment will lead to chronic underestimating of seed use in the previous year.

0% of %total% Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.25 Imputation and estimation data sources

Suggested data sources and imputation: Feed and seed

Imputation and estimation data sources

[Seed](#)

Step 3: Multiply the two values

Once a seeding rate and sown area in $t+1$ have been estimated for the product in question, the two values are multiplied to arrive at the quantity of seed needed in year t .



0% of %total% Click NEXT to continue. ◀ Prev Next ▶

Notes:

1.26 Quiz 1

(Multiple Choice, 10 points, 1 attempt permitted)

Suggested data sources and imputation: Feed and seed

Quiz

Q 01

The amount of energy required per animal can vary widely even within species, depending upon both the characteristics of the animal (i.e., a lactating dairy cow's energy needs are much greater than a yearling calf's energy needs) *and* the type of the production system in which the animal is raised, such as grassland-based systems versus more intensive industrialized systems.

Select one that apply.

☒ True

☐ False

SUBMIT

0% of %totalSld%

◀ Prev Next ▶

1.27 Quiz 2

(Multiple Choice, 10 points, 1 attempt permitted)

Suggested data sources and imputation: Feed and seed

Quiz

Q 02

If country has previously planted a commodity, then seeding rate of this commodity can be calculated using data from previous years.

Select one that apply.

☒ True

☐ False

SUBMIT

0% of %totalSld%

◀ Prev Next ▶

1.28 Quiz 3

(Multiple Choice, 10 points, 1 attempt permitted)

Suggested data sources and imputation: Feed and seed

Quiz

Q 03 Once a seeding rate and sown area in $t+1$ have been estimated for the product in question, the two values are multiplied to arrive at the quantity of seed needed in year t .

Select one that apply.

☒ True

☐ False

SUBMIT

0% of %totalSld%

◀ Prev Next ▶

1.29 Quiz 4

(Multiple Response, 10 points, 2 attempts permitted)

Suggested data sources and imputation: Feed and seed

Quiz

Q 04 Imputation of missing feed data can pose a challenge to FBS compilers. The general approach suggested here is based on the reconciliation of total feed demand and available feed supply which involve 3 basic steps, those are:

Select all that apply.

☐ Estimating feed products prices

☒ Understanding and estimating total feed demand

☒ Understanding feed supply

☒ Allocating feed supply

SUBMIT

0% of %totalSld%

◀ Prev Next ▶

1.30 Quiz 5

(Multiple Response, 10 points, 2 attempts permitted)

Suggested data sources and imputation: Feed and seed

Quiz

Q 05 Imputation and estimation process of seed data involve the estimation of sown area. There are some approaches offered for estimating sown area in this lesson, those are:

Select all that apply.

- ☒ Ratio approach.
- ☐ Expert estimation approach.
- ☒ Abandonment adjustment approach.
- ☒ Using harvested area as an approximation for sown area.

SUBMIT

0% of %total%id%

◀ Prev Next ▶

1.31 Conclusion

Suggested data sources and imputation: Feed and seed

Conclusion

You have finished lesson 10.

In this lesson, we have discussed:

1. Different data sources for feed and seed component;
2. Recommended approach for imputation and estimation of feed and seed component.



Click NEXT to continue.

◀ Prev Next ▶

Notes:

1.32 Thank You

Suggested data sources and imputation: Feed and seed



Global Strategy

UNITED NATIONS
siap
Statistical Institute for Asia and the Pacific

Food Balance Sheets (FBS)

Thank You!

0% of 10 total slides

◀ Prev Next ▶

Notes: