

## A.3 Conceptual background information

### Introduction

This section provides a basic description of concepts and methods used by *agri benchmark*. For details please refer to our website or contact us directly.

### Cow-calf and beef finishing

We compare both cow-calf (suckler-cow) and beef finishing production systems. The data base consists of **typical** farms (see below).

The **cow-calf** enterprise starts with the birth of the calf and ends with the day of weaning. The output of the cow-calf enterprise is measured in total live weight sold and comprises weaner calves, cull animals and breeding animals.

The **beef finishing** enterprise (also called finishing enterprise) starts

- when dairy or weaner calves or feeder cattle (backgrounder, stores) are **bought** from outside the farm,
- when dairy or weaner calves or adult animals are **transferred** from the dairy or cow-calf enterprise to the beef finishing enterprise in the same farm.

The output of the beef finishing enterprise is measured in carcass weight sold and comprises all animals which are **exclusively** reared **for slaughter**: bulls, steers, heifers, calves or cows. It does **not** include cull animals from a dairy or a cow-calf enterprise on the same farm.

Which animal categories are compared in the beef finishing comparison?

The following types of animals are compared:

- Animals finished for meat **export**, animals which can potentially be exported in the future or animals from which the meat is a domestic substitute for beef imports from other countries.
- **Final products**, i.e., finished animals that go to slaughter (not backgrounders).
- **Heavy male animals** (bulls or steers), as these categories can be better compared than males with females or even with calves.

In the future, with more farms and more production systems, **subgroups** could be formed for a comparison of specific meat products like heifer meat.

### How do we define a typical farm?

A **typical farm** is defined as

- being an existing farm or a data set describing a farm,
- being in a specific region which represents a major share of output for the product considered,
- running the prevailing production system for the product considered,
- reflecting the prevailing combination of enterprises as well as land and capital resources,
- as well as the prevailing type of labour organisation.

The typical farms are never averages of survey data because averages do not provide consistent production system data sets. They are the result of a **panel** meeting with 4-6 farmers and an advisor, where each figure is obtained in a consensus **or** are based on individual farms which were '**typified**' by replacing farm individual particularities by prevailing characteristics, figures, technologies and procedures.

### How is the typical farm data collected?

A **Standard Operating Procedure** (SOP) is used to define typical farms in different countries and regions. Basically, the following procedure is applied:

- Select regions and locations
- Identify the prevailing production systems
- Identify the relevant farm population
- Define the size and management level of the typical farms
- Collect, cross-check and update data

Farm data are always collected on **whole farm** level and overhead costs are assigned (allocated) to the enterprises. A paper on the SOP as well as a description of each farm is available on our website.

### Collection of data on whole-farm level

All data of typical farms are collected on **whole farm** level and for **all enterprises** present. Thus, our data sets provide much more than just enterprise budgets. Examples are:

- A combination of **cash crop** production and **beef finishing** (like in many European countries)
- A combination of **cow-calf** production and **finishing** (like in Argentina and Brazil)
- A combination of **cash crops, dairy** and **beef finishing** (like in the Ukraine)

## How do we calculate cost of production?

Once data are collected they are processed with the Excel spreadsheet tools available. As data are collected on the whole farm level, they are broken down into **enterprise** and **animal level** when performing a unit cost analysis (for example cost per kilogram beef produced).

Some costs can be collected on a per animal or per ha basis (for example variable costs per animal or per ha). Other costs are typically available and collected on the whole farm level and need subsequently be **allocated (assigned)** to the enterprises analysed. These are machines and buildings, labour (hired and family labour), land (rented and own) and overhead costs.

## Allocation of whole farm cost to enterprises

At present, all whole farm items that can not be allocated 100 percent to the cow-calf and beef finishing enterprise or other enterprises are allocated by the **share** of the respective **enterprise in total returns** (if used by all enterprises) or in **livestock returns** (if used by livestock).

The following table shows the **allocation codes** and resulting **return shares** presently used. The subsequent examples consider the beef finishing enterprise as example. The cow-calf procedure is equivalent.

### Allocation codes and allocation factors

<b>1</b> = Item used for all enterprises	
	Share of beef finishing in total farm returns
<b>2</b> = Crop and forage production	
<b>3</b> = Livestock production general	
<b>5</b> = Forage production only	
	Share of beef finishing in total livestock returns
	* share of livestock in total farm returns
<b>4</b> = Cash crop production only	0 % to beef finishing
<b>6</b> = Dairy only	0 % to beef finishing
<b>7</b> = Cow-calf only	0 % to beef finishing
<b>8</b> = Beef finishing only	100 % to beef finishing

Examples for **items** that go **100 percent** to the beef finishing enterprise:

- Variable cost of land only used by the beef finishing enterprise (e.g., corn for silage)
- Buildings exclusively used by the beef finishing enterprise (e.g., stables for bulls)
- Staff wages exclusively used by the beef finishing enterprise (e.g., cattlemen)

Examples for **items** that are **allocated** by share in returns:

- All overhead costs on the whole farm level (e.g., accounting, office expenses, fees, farm taxes)
- Machinery maintenance and depreciation used for all livestock enterprises (e.g., grass mower)
- Maintenance and depreciation for buildings / installations used for all enterprises (e.g., machinery hall)
- Staff wages used for all enterprises (e.g., farm manager)

Labour (per worker's group), land (per crop), machines (per machine) and buildings (per building) can be allocated by inserting the allocation codes shown on the left hand side.

The following presents an example of calculating machinery depreciation for the beef finishing enterprise, using enterprise codes and obtaining return shares as allocation factors.

<b>Total depreciation machinery:</b> USD 10,000	<b>Depreciation matrix (% of total depreciation):</b>
	All enterprises <b>35 %</b>
	Crop and forage production <b>20 %</b>
	Livestock in general <b>30 %</b>
	Beef finishing only <b>10 %</b>
	Cow-calf only <b>5 %</b>
<b>Share of beef finishing</b>	
in total returns <b>50 %</b>	
in livestock returns <b>70 %</b>	
<b>Machinery depreciation of the beef finishing enterprise</b>	
All enterprises	USD 10,000 * <b>35 %</b> * <b>50 %</b> = USD 1,750
Crop and forage production	USD 10,000 * <b>20 %</b> * <b>50 %</b> = USD 1,000
Livestock in general	USD 10,000 * <b>30 %</b> * <b>70 %</b> = USD 2,100
Beef finishing only	USD 10,000 * <b>10 %</b> = USD 1,000
Cow-calf only	USD 10,000 * <b>5 %</b> * <b>0 %</b> = USD 0
<b>Total</b>	<b>= USD 5,850</b>

## From enterprise level to groups

Once the whole farm costs are allocated to the cow-calf and beef finishing enterprise, further allocation is required. The herd simulation in cow-calf can cover two different groups (mobs) with separate, individual parameters for each. In beef finishing, up to five finishing groups can be simulated. Any combination of finishing groups and cow-calf mobs can be selected for cost and income analysis. If, for example, a farm has three groups with steers and two with heifers for finishing, the steer groups are selected for comparison.

The costs are treated as follows:

- Whole-farm costs are allocated to each mob / group by share in total weight produced per year. Alternatively, the share in animal numbers or the return shares of each mob / group can be used as allocation factors.
- Annual and lot-wise cost figures are recalculated in daily figures and multiplied with the number of days/year each group stays on the farm.