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## What is a balanced diet?

It is common to feed farm animals using available resources and rely on the experience and knowledge passed through generations. Some common [feeding strategies](#) supplement grazing animals with commercial concentrates, crop by-products (molasses, straws, oilcakes...), lucerne and grass hay in winter, tree pods, prickly pear... in most cases combined with the use of licks to meet the mineral requirements of the animals.

However, these feeds/fodder are rarely analysed in advance by a laboratory and then corrected (balanced) to meet animals' requirements, often leading to a **nutrient imbalance**. This means that the feed contains **either more or [less nutrients](#) than the quantities required** by the animals which has **negative effects** on growth, [reproduction](#), milk production, etc...

It is usually thought that feeding above the requirements is less negative than feeding below them. Actually some farmers are convinced that feeding above the requirements could be used as a strategy to ensure that the minimum requirements of the animals are met. However, this is not true!

When **feeding extra nutrients, animals need to use part of the energy of the feed to excrete the excess**. Therefore, energy that should be used for growth, fattening or milk production is instead used for the excretion of this excess of nutrients. In addition, the excess of nutrients ends up in the faeces leading to [environmental pollution](#), especially if these are runoff with the water.

Therefore, **balancing the rations** is crucial to optimize the feed resources available on the farm. How can we balance a ration?

## **Key elements for a balanced diet**

The first step consists in **understanding** the **nutrient requirements** of the animals. What do animals need?

**Proteins:** proteins are the building blocks for body tissues (e.g. muscles, nerves, blood cells). Their lack not only hampers the growth of animals but proteins are essential for production and maintenance. Unfortunately they cannot be replaced by other nutrients in the feed. Oilcakes (e.g. soybean meal, cottonseed cake...) as well as some tree pods such as camel thorn pods are excellent sources of proteins.

**Carbohydrates:** there are three types of carbohydrates: sugars, starches and fibre. The first two are digestible by the animal itself. Fibre, on the other hand, is not [digestible by the animals](#) but it can be utilized by the microorganisms that live in symbiosis in the hindgut or in the rumen (only ruminants) (e.g. roughages).

Sugars and starches are important sources of energy. Animals need energy to carry out major vital activities, like: breathing, moving, growing, etc. These two carbohydrate, when “burned”, provide the energy needed by the body. Readily available sugars are indeed immediate source of energy (e.g. molasses). Starches (corn, barley, wheat) can instead be only used when broken down into simple sugars.

**Minerals and vitamins** are substances that the animals need in small quantities but are essential for carrying out vital functions. Minerals are commonly found in salts and can be added in the feed or given as a lick.

Vitamins can either be added to the feed or injected.