



Cattle Producer's Handbook

Nutrition Section

310

Ration Balancing

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Feed costs are a large part of the total operating expenses for most cattle operations. A balanced ration is necessary for the beef producer to achieve both low feed costs and optimum production levels, therefore, feeding a ration that meets, but does not exceed, animal requirements is economically beneficial.

The term “balanced ration” refers to a ration that supplies the proper amount and proportion of nutrients to meet an animal’s needs for maintenance and growth. This requires determining the nutrient composition of feedstuffs and knowing the animal’s nutrient requirements. Some terms commonly used in cattle nutrition include:

Ration: The amount of feed an animal receives in a 24-hour period.

Feedstuff: An ingredient used in the formulation of a ration.

As-fed: The moisture and nutrient content of feedstuffs as they are normally fed to animals. Actual moisture content can vary greatly. That is why this value must be corrected to account for moisture content (determine the amount of dry matter) when balancing rations.

Dry matter: The portion of feed that remains after all the water has been removed. It contains the nutrients.

Nutrients: The substances found in feedstuffs that can be used for the maintenance, production, and health of animals. The chief classes of nutrients are carbohydrates, fats, proteins, minerals, vitamins, and water.

Nutrient requirement: The amount of a specific nutrient that is required to meet an animal’s minimum need for maintenance, growth, reproduction, lactation, and work. Nutritional requirements are dependent on the type, size, and physiological status (e.g., stage of pregnancy or level of milk production) of the animal.

TDN: Total Digestible Nutrients, a measure of the energy content of feed.

CP: Crude Protein, a measure of the protein content of feed; it includes both protein and non-protein nitrogen.

Nutritionists and cattle producers use mathematical computations to balance nutrient intake with nutrient requirements. These computations can be done either by hand or with a computer program. A ration’s appropriateness is directly related to the quality of information collected to balance the ration—“garbage in” will equal “garbage out.” It is essential to know the expected performance of the animal(s), the associated nutrient requirements, and the nutrient composition of the feedstuffs available before attempting to balance a ration.

Nutrient Requirements of Beef Cattle

Years of research have provided nutritionists with accurate estimates of the energy, protein, vitamin, mineral, and other nutritional requirements of beef cattle. For growing cattle, these values are listed by animal weight, sex, frame size, and expected rate of gain. Nutritional requirements for breeding cattle are listed by production stage, weight, rate of gain, and milking ability. See 300, or contact your county extension office, for a listing of these requirements. *Nutrient Requirements of Beef Cattle* (1996) explains how these values are determined and how they can be applied. This publication is a useful resource for all commercial beef producers.

Nutrient Composition of Feedstuffs

To accurately prepare rations, samples of the available feedstuffs should be sent to an analytical laboratory to determine nutrient composition and content. Fact sheet 305, *Common Sense Feed Analysis and Interpreting Forage Analysis*, explains how to obtain and interpret feed analyses. If actual analyses cannot be obtained, there are feed composition tables available that list average nutrient values of feedstuffs. Contact your county extension office for a table of average values.

However, table values for feedstuffs should be used only if laboratory analyses are not available. **There is no substitute for analyses of feedstuffs.**