

NATIONAL  
**ANIMAL**  
**NUTRITION**  
PROGRAM

# FEED COMPOSITION

## Percent

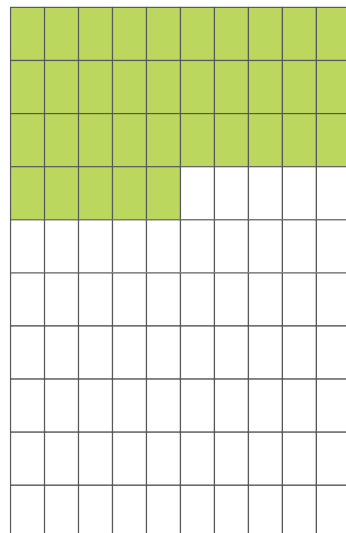
### Feed ingredients contain nutrients that can support animal requirements.

- Diets are created with ingredients to deliver nutrients and energy required by animals.  
Knowledge of feed nutrient composition informs how much ingredient to include in animal diets.  
Nutrient composition may be expressed in concentrations such as a percent.
- **Percent (noun):** one part per one hundred parts; accompanies a specific number; indicated as percent or the symbol %.
- **Percentage (noun):** unit of proportion; fraction of a whole.
- Percent may be expressed as a fraction, decimal or number.

$$\frac{35 \text{ g crude protein}}{100 \text{ g ingredient}} = 0.35 = 35\% \text{ crude protein}$$

When thinking about the concept of percent, we can visualize 100 boxes as representing our total ingredient. In this example, 35 of those 100 boxes, or 35%, would correspond to the amount of crude protein in the ingredient. Thus, crude protein represents 35% of the total ingredient, with the remainder of the space (65%) represented by other nutrients.

 = Crude protein



## A part or amount in relation to a whole

Sugarbeet pulp, dry is composed of 40.84% neutral detergent fiber (NDF) (NANP, 2021).

When a percent is multiplied with another value, “the operation produces a result that equals the percent of the original value.”

$$22.68 \text{ kg sugarbeet pulp, dry} \times 40.84\% \text{ NDF} =$$

$$22.68 \text{ kg sugarbeet pulp, dry} \times \frac{40.84 \text{ kg NDF}}{100 \text{ kg sugarbeet pulp, dry}} =$$

$$22.68 \text{ kg sugarbeet pulp, dry} \times 0.4084 = 9.26 \text{ kg of NDF in 22.68 kg of sugarbeet pulp}$$

## Other operations with percent

### Other applications of percent in animal nutrition

“A part or amount in relation to a whole”

#### Animal Feeding

##### Nutrient amount in relation to animal's requirement

- A 500-kg body mass horse at maintenance, with an average level of activity, requires 630 g of crude protein daily.
- Intake of 11 kg of coastal bermudagrass hay (9.1% crude protein, as-fed) delivers 1,000 g of crude protein daily.
- Crude protein consumed is 159% or  $1,000/630 \times 100$  of the required amount.
- Daily feeding of coastal bermudagrass hay to meet the crude protein requirement is  $630 \text{ g}/9.1\% = 630 \text{ g}/0.091 = 6923 \text{ g}$  coast bermudagrass hay.

#### Feed Manufacturing

##### Ingredient amount in relation to whole batch

- A manufacturer will produce two-tons (4,000 lbs) of a formula that includes 28% sugarbeet pulp, dry.
- $4,000 \text{ lbs} \times 0.28 = 1,120 \text{ lbs}$  sugarbeet pulp.
- The formula requires addition of 1,120 lbs sugarbeet pulp, dry.



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