

UNDERSTANDING YOUR LARGE RUMINANT FORAGE REPORT

Key forage results for CNCPS 6.5 Report

Moisture – The amount of water in the forage sample.

Dry Matter – The amount of actual material in the feed. Drier silage will have a higher dry matter, whereas wetter silage will have a lower dry matter.

PROTEIN VALUES:

Crude protein – The most commonly evaluated protein value. The total amount of protein in a forage, based on its nitrogen content. This includes both true protein and non-protein nitrogen.

AD-ICP (Acid Detergent Insoluble Crude Protein), ND-ICP (Neutral Detergent Insoluble Crude Protein) represent the amount of protein in forage that is bound to fiber and is less digestible in the rumen and intestines, and is therefore less available to the animal.

Protein Sol (Solubility) is a measure of the availability of the protein and quantifies how much of the protein is bound to fiber.

Lysine, Methionine, Isoleucine, Leucine, and Histidine are amino acids: important building blocks of protein. These amino acids are critical for milk and component production, a healthy immune system, and growth.

FIBER VALUES:

ADF (Acid Detergent Fiber), **aNDF** (Neutral Detergent Fiber), and **aNDFom** (Neutral Detergent Fiber determined on an ash-free or organic mineral basis) all measure the amount of fiber in a forage. The most important number is aNDFom, which is the amount of digestible fiber corrected to not include ash. High quality grass silage will be 45-55% aNDFom, high quality legumes will be 35-45%, and corn silage will be 35-40%.

Lignin is the part of the plant that gives it structure, and is least digestible to a ruminant.

NDFD (Neutral Detergent Fiber Digestibility) and **uNDFom** (Undigestible Neutral Detergent Fiber on an ash free or organic mineral basis) numbers are measuring the speed at which the fiber will digest under ideal conditions.

The values have numbers listed after them, which indicate the time point. For example, NDFD30 is the amount of NDF digested in 30 hours, and the uNDF240 is the amount of undigested forage after 240 hours. Higher numbers are better for NDFD (ie: more digestible fiber) and lower numbers are better for uNDF (ie: less undigested fiber).

OTHER CARBOHYDRATES:

Sugar can be measured as **ESC** (Ethanol Soluble Carbohydrates) or **WSC** (Water Soluble Carbohydrates). ESC sugars are short, simple sugars like glucose and sucrose. WSC sugar includes the ESC sugar, plus additional sugars like fructans and simple carbohydrates that digest like sugar.

Wetter silage will be lower in sugar because the fermentation process will have turned the sugar into fermentation acids. Silage that is drier, or dry hay, will be high in sugar.

Starch is a main energy source found in corn silage, but will be very low in hay crop silages. The digestibility of the starch is measured by the IVSD7-o. Corn silage that has not been fermented will be in the upper 60s, and totally fermented corn silage will be in the high 70s or low 80s. In corn silage, this starch digestibility is only the theoretical digestibility based on the kernel chemistry, and does not include the impact of processing during harvest.

FAT:

EE (Ether Extract) is the traditional way of measuring fat in forages, but it is compounded by the amount of pigment in the forage. Recently, forage labs developed means to measure the TFA, or total fatty acids, which is a more accurate measure of the fat in a forage.

The individual fatty acids listed below (palmitic, stearic, oleic, and linolenic) are the most impactful in a dairy cow's diet.

MINERALS:

Ash is the summary of minerals, plus the contamination of inorganic material (ie. dirt) in a forage. In hay or haylage, the ash level should be less than 10%. In corn silage, it should be less than 4%.

Calcium, phosphorus, magnesium, potassium and sulfur are the common minerals found in forages in the Northeast. They are impacted by soil fertility and type, maturity of the plant at harvest, and variety of the plant.

FERMENTATION ACIDS:

Only listed for silages, the primary fermentation acids are **lactic, acetic and propionic acid**. Lactic is typically 1.5-2x the level of acetic. The higher these acids are, the more stable the silage will be during feed out. Butyric acid is a result of wetter silages with a less than ideal fermentation, and can cause palatability and performance issues when higher butyric forages are included at high levels in the diet.

CALCULATIONS:

A variety of calculations are listed and used for different applications for comparing quality of forages or for research. A good way to compare two forages of the same variety is to compare the **Milk per Ton or Beef per Ton** value – this is an estimation of the amount of milk or beef an animal could make after consuming a ton (2000 lbs) of this forage.

Contact your Poulin Grain Nutritionist to discuss your forage sample results and how they impact your animal's diet.

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