

BIOPARAMETRICS SILAGE ANALYSIS PARAMETERS EXPLAINED

DM (%)

Dry Matter

Ash (%DM)

Ash

Active Fibre (%DM)

This describes the proportion of large particles (>3.18mm) predicted to be available in the rumen after mastication and contribute to the rumen raft. The original work was done by measuring the particle size of forages before and after chopping in an electric blender. It was found that the proportion of large particles after mastication was dependent primarily on the structural strength of the forage rather than the particle size as fed. This structural strength or Active Fibre level is predicted by the level of DM, ADF and NDF present in the forage, but in feeds it is always zero.

D value (%DM)

This is the digestibility of organic matter as predicted by gas production as the level of degraded material after 36 hours of incubation in the rumen.

Metabolizable Energy (MJ/kgDM)

Calculated from the D value of the silage (see above).

Fermentable ME (MJ/kgDM)

FME is the proportion of ME that is available in the rumen and is calculated by removing the energy content of the oil, VFA and lactic acid available in the silage from the total ME content.

FME/ME

Quickly Degraded Carbohydrate (g/kgDM)

Total quick carbohydrate fermented by the rumen microbes that includes all sugars, quick starch and quick NDF.

Quick rate (/h)

This describes the proportional rate of fermentation of all quickly fermented carbohydrate (sugar, quick starch and quick NDF), eg. 0.20/h means that 20% is fermented in the first hour.

Slowly Degraded Carbohydrate (g/kgDM)

In addition to quick NDF and quick starch, the slowly degraded carbohydrate fractions contains starch and NDF that is although not immediately degraded by rumen microbes it is fermented after a certain lag time necessary for colonisation and/or digestion of the protein matrix.

Slow Rate (/h)

This describes the proportional rate of fermentation of the slowly fermented starch and NDF and is always lower than the rate of fermentation of quick carbohydrate.

Lag (h)

Time taken for microbial colonisation and/or pre-digestion of the protein matrix before slow starch and slow NDF start to be digested.

Total Carbohydrate (g/kgDM)

Total available carbohydrate calculated by subtracting the protein, ash, oil, VFA and lactic acid from 1000.

Digestibility of Slowly Degradable Carbohydrate

Digestibility of the total available slowly degradable carbohydrate calculated by subtracting the available quickly degradable carbohydrate from Total Carbohydrate

ADF (%DM)

Total Acid Detergent Fibre (ADF)

NDF (%DM)

Total Neutral Detergent Fibre (NDF)

Quickly Degraded NDF (%DM)

NDF which is quickly degraded and makes no significant contribution to the rumen raft or structure of the ration

Sugar (%DM)

Water Soluble Carbohydrate content

Total Starch (%DM)

Total available starch measured by wet chemistry

Quickly Degraded Starch (g/kgDM)

Starch that is immediately fermented upon ingestion

Slowly Degraded Starch (g/kgDM)

Starch that is not immediately fermented upon ingestion but only after a certain lag time necessary for microbial colonisation and pre-fermentation of the protein matrix.

Fraction of Quickly Degraded Carbohydrate

Proportion of quickly degraded carbohydrate that is attributed to quickly degraded starch

Oil (%DM)

Total ether extract

CP (%DM)

Crude Protein measured using the Kjeldhal technique

Quick CP(prop of CP)

Quick Crude Protein is the total quick protein fermented by the rumen microbes

Quick CP rate (/h)

This describes the proportional rate of fermentation of all quickly fermented protein.

Slow CP (prop of CP)

Describes the quantity of protein that is not immediately degraded by rumen microbes and is only fermented after a certain lag time.

Slow C Rate (/h)

This describes the proportional rate of fermentation of the slowly fermented protein and is always lower than the rate of fermentation of quick protein.

Slow CP Lag (h)

Time taken for microbial colonisation before slow crude protein starts to be digested.

Ammonia (g/kgDM)

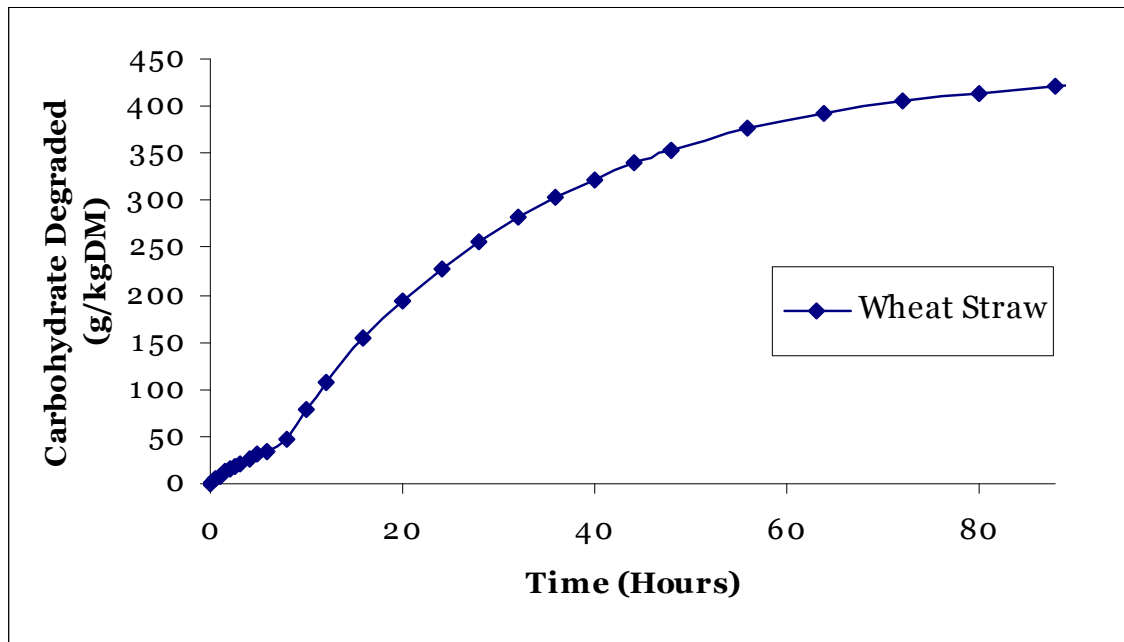
Lactic Acid (%DM)

Total VFA (%DM)

Total volatile fatty acids

pH

A typical carbohydrate degradation curve:



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