Feed testing and sampling

Technical Note N22

Sampling and analysing feeds for their nutrient composition is an important first step to balancing dairy diets. Correct sampling is vital to obtain an accurate analysis of individual feeds, which in turn will help to ensure a balanced and productive dairy diet is formulated.

Taking an accurate feed sample

You will need a large, sealable plastic bag for each feed sample.

Take a representative sample, so that the feed analysed represents what the animal is eating, as the analysis could apply to several tonnes of feed.

Grazed pasture samples should be taken as pluck (grab) samples, down to grazing height to represent what the animal is eating. Several grab samples should be taken across the paddock, then combined.

Bulk grain or protein meal samples are best taken when the truck arrives, with handfuls taken throughout the unloading process, then combined.

Bagged grains, meals and pellets need to be randomly sampled from each bag, then combined.

Total mixed rations should be sampled when fresh and completely mixed. Handfuls should be taken throughout the feedout process, then combined.

Silage can be core sampled ahead of feedout. Take 10–20 core samples from each pit or round bale, then combine. If a core-sampling device in unavailable, a ‘grab’ sample should be taken across the face of the pit or from within the core of the bale. When taking a sample from the front of a silage pit, take a handful of fresh, moist feed from several different heights on the pit face.

Taking a grab sample of ryegrass pasture across the paddock to ensure a representative sample is analysed.

Labelling and storing feed samples

Immediately insert a label in the bag, with appropriate details for easy identification. Include your name, type of feed, paddock/pit number/grain delivery and date of sampling.

Seal the bag, with all excess air removed.

If the sample is not being analysed straight away, store in the freezer. Samples should not be left in the sun or in a hot vehicle, as they will deteriorate rapidly.

Size of sample

The crucial factor is to have a representative sample. A feed sample should generally weigh 0.5–1.0 kg wet weight.

Always put a label in the sample bag to allow for accurate identification of the sample by the feed testing lab.

When to take a feed sample

Feed analyses can take up to three weeks, so send feed samples well ahead of feeding out.

Sample grains and protein meals when a new load is delivered.

The quality of pastures is harder to keep track of due to the number of factors that can affect quality. However, consider taking pasture samples for analysis at different times of the year, such as in the middle of each season.

Pit silage should be sampled and analysed on a monthly basis to account for changes in quality along the pit.

Because of potential nutrient losses, sample silage after the ensiling process.

Cost

Cost varies according to the type of analysis that is conducted and the laboratory that is used. Generally, it can cost between $40 to $150/sample depending on the analysis, which is a small cost to ensure a balanced ration that allows maximum production from your feed.

Cows grazing ryegrass pasture.

What will the analysis tell you?

Refer to Technical Note N05: Important nutrients, Technical Note N06: Balancing the ration and Technical Note N10: Conserved forage.

Dry matter (DM) %

The portion of feed that is not water; used to estimate intake.

Protein:

Reported as crude protein %, available protein %, adjustable crude protein %, acid-detergent insoluble protein or neutral detergent insoluble protein. Crude protein % is the important figure, as it includes protein and non-protein nitrogen.

Fibre

Acid detergent fibre (ADF) is a measure of cellulose and lignin; neutral detergent fibre (NDF) is a measure of cellulose, hemicellulose and lignin. These measures indicate digestibility of the feed and are an indication of the potential intake of that feed. (Refer to Technical Note N04: Factors affecting feed intake.)

Energy

The analysis will provide net energy lactation (NEL), net energy maintenance (NEM), net energy gain (NEG) or metabolisable energy (ME). ME is the most relevant, reflecting what is available for production.

Fat

Crude fat % is a measure of total lipids (fats, waxes, organic acids, alcohols and pigments). Fat will boost energy intake, but more than 5% fat in the total diet can affect rumen health.

Starch

An important non-fibrous carbohydrate energy source for milk production and milk protein %. Important sources are grain (wheat, corn, barley), seeds and roots (potatoes).

Round bale hay and silage.

Sugars

Another non-fibrous carbohydrate energy source. Important sources are molasses, fruit pulp, and some forages (sorghum, ryegrass, lush tropical grasses).

Minerals

Analysis will provide a measure of calcium (Ca), phosphorus (P), magnesium (Mg), potassium (K), sodium (Na), iron (Fe), zinc (Zn), copper (Cu), manganese (Mn), molybdenum (Mo), sulphur (S) and chloride (Cl), which will assist in the balancing of minerals within the diet.

Soybean meal.

Silage fermentation analysis results

Lactic acid

The acid that is most prominent in well made silage. Recommended lactic acid levels for corn silage are 4–7% DM. Lower lactic acid levels indicate high forage DM content or considerable aerobic exposure.

Acetic acid

Should be 1–3% DM in corn silage. Higher acetic acid levels indicate excessively wet silage, or aerobic exposure from loose compaction.

Butyric acid

Not often reported, as it should be 0. Concentrations >0.5% DM indicate very poor quality silage, with low energy and high ADF and NDF.

Pit silage

Further information

Contact the DAFF Customer Service Centre by
Phone 13 25 23, or
Email callweb@daff.qld.gov.au

More technical notes can be found at:
www.dairyinfo.biz

Protein Plu$ checkbook (Published 2006 by DPI&F Qld)

Feed Plu$ CD v4.0 (Published 2008 by DPI&F Qld)

Condition magician booklet (Published 2003 by DPI Vic)

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