



Tactics for Tight Times

Dealing with lower quality forages over summer

Wet winter and spring conditions across south-eastern Australia have presented additional challenges this summer. Sustaining milk production on diets with low quality forages may be difficult. This fact sheet explores these challenges and how to deal with them.

Due to the seasonal conditions many farmers have stocks of silage and hay made from mature pastures with lower nutritional value than desired. This affects forage nutritive value and intake.

Designing a diet to support moderate to high milk production over the summer, with the forages harvested during the spring, may be challenging. In the poorer quality forages, the limiting factors will be the low level of metabolisable energy (ME) and crude protein (CP) and the high level of neutral detergent fibre (NDF) and undigestible neutral detergent fibre (uNDF). Importantly, not only is the crude protein low, but the quality of the protein is low and the NDF and the uNDF are high.

Forage quality is likely to be reduced due to seasonal conditions, reducing cow dry matter and nutrient intakes

To maintain milk production

- › understand what quality feeds you have on hand
- › identify complementary feeds; consider high energy and high protein supplement
- › explore options to achieve your production targets with the most favourable margin over feed costs

Use feed tests to determine quality of feeds

Use a feed budget tool to determine a nutritionally balanced cow diet and develop a month-to-month feed plan for the herd.

Table 1 Values for key nutritional parameters. These can vary widely between good, average and poor quality pasture silages.

Nutrient	Example of Good quality pasture silage	Example of Average quality pasture silage	Example of Poor quality pasture silage
Metabolisable Energy (MJ/kgDM)	10.60	9.40	8.70
Crude Protein (%DM)	16.50	15.20	13.10
ADICP (%CP)	5.30	6.00	12.90
NDF (%DM)	46.30	54.30	65.20
NDF Digestibility (after 30 hours) (%NDF)	76.40	68.20	62.50
uNDF (after 30 hours) (%NDF)	23.60	31.80	37.50
ADF (%DM)	29.20	33.70	38.90
Lignin (%DM)	2.16	3.40	4.43
Non Fibre Carbohydrates (%DM)	24.10	18.80	14.50

Detailed feed analysis reports provide further insights into a feeds quality and its milking potential. In Table 1 note that compared to the two better quality silages, the poor quality pasture silage has:

A lower NDF digestibility and conversely, a higher level of NDF remaining undigested. In forages conserved from mature plants, the NDF will be higher as will the undigestible NDF.

This is expected, as not only is there more NDF in mature forage but the digestibility of that NDF declines with plant maturity (more stem to leaf, more lignin which is indigestible by the rumen microbes). (Note that two feeds with the same total NDF value can have very different NDF Digestibility values, so NDF Digestibility and uNDF are very useful figures to have, especially when choosing between otherwise similar feeds to buy).

A much higher ADICP value (Acid Detergent Insoluble Crude Protein)

This is the protein fraction that is undigestible in the rumen and intestine and therefore unavailable to the cow. This season not only are total protein levels down, but the high level of ADICP in a feed indicates that its protein is of poor quality.

What are the consequences for the cow?

The higher NDF and the lower digestibility of that NDF slows down the rate of passage of a feed and has a filling effect that limits the cow's daily feed intake. Fewer kilograms of feed dry matter eaten, each containing fewer megajoules of energy, results in reduced energy intake and lower milk yield.

Lower Crude Protein levels, with a higher proportion of that Crude Protein being unavailable to the cow (high ADICP), limit the amount of microbial protein produced in the rumen and flowing to the intestines to be digested, absorbed and used to support milk production. If the supply of rumen fermentable energy in the diet is limited, this will further reduce production of ruminal microbial protein.

While the nutritional quality and feed intake potential of forages fed this summer may be lower than desired in the months ahead, what remains constant is your cows' daily nutritional requirements for a given liveweight, level of activity, liveweight change, milk production level and stage of pregnancy.

Cows do the maths on whatever diet they are offered (its energy, fibre, protein and mineral content and intake potential) and drop milk production and / or body condition if it doesn't stack up. This can see cows' post peak persistence slide rapidly as we move through summer, especially if compounded by the effects of heat stress i.e. a further reduction in feed intake, an increase in cow maintenance energy requirements and an increased risk of ruminal acidosis.

So what steps can you take to meet these challenges?

Step 1. Understand the forages you have on hand (quantity and quality)

Do a thorough stocktake of your feed inventory. Gather some hard numbers on how many dry matter tonnes of silages, hays and other feeds you have on hand.

Feed test all your main feeds, as the energy, protein and NDF values of many feeds this year could be vastly different to 'book values'.

Given that the variability in nutritional quality within given parcels of hay and silage may be much greater this year, make an extra effort when collecting samples to ensure they are truly representative of your stocks. (If not, what is the point?). This may mean submitting a few extra samples.

The general rule of thumb when sampling silages and hays is to sample at least 10% of a particular parcel e.g. 10 out of every 100 bales of a given parcel of wrapper silage or hay, using a hay corer.

Use these detailed feed analysis reports to compare their value per unit dry matter, energy and protein and their intake potential based on NDF level.

Step 2. Identify suitable complementary feeds

Consider energy supplements which can help you make up for the lower energy values of your forages. Use high energy grains or concentrates with a low NDF content e.g. wheat. This year, energy supplements that have highly fermentable ME will help offset the reduced fermentability of the forages fed. This is important in sustaining milk protein test and yield.

Consider protein sources such as canola meal to help make up for the lower protein values of your forages. Recognise that this summer is likely a time when non protein nitrogen (NPN) feed options can be used economically with success to help offset low protein forages. However, be cautious with your selection of NPN sources and feed inclusion rates. As a rule of thumb, around 0.5-1% urea in your grain mix or pellets is safe.

Step 3. Explore options to achieve your production targets with the most favorable margin over feed costs (MOFC)

Use a nutrition model to explore how best to construct a nutritionally balanced milker diet which enables you to achieve your production targets with the most favourable daily margin over feed cost (MOFC). Test various combinations of your home-grown forages and complimentary feeds.

Alternatively, develop a month-by-month feed plan for the whole herd using the new Dairy Australia / DEDJTR Feed Planner tool, which is driven by a nutrition model (Rumen8). This tool is accessible at feedtools.com.au.

This easy-to-use web-tool has the following features:

- › It balances diets for Metabolisable Energy (ME) and Metabolisable Protein (MP) within a cow's feed intake limit.
- › It enables you to design diets with commonly used and unusual feeds.
- › It provides greater confidence that your feed plan is based on realistic quantities of pasture and other grazed forages on a monthly basis.
- › It helps you make realistic allowances for wastage during feed-out for different feed out methods.
- › It provides printable reports for the person responsible for buying feed, and for those on farm responsible for implementing the feeding plan.

For help with this step, contact a nutrition advisor.

Glossary

- NDF** neutral detergent fibre - percentage of dry matter that is fibre – suggested level for a high production milker diet is 30 – 35%
- ADF** acid detergent fibre – percentage of cell wall portions – as ADF increases digestibility of the forage decreases
- NDF digestibility** – percentage of NDF that is digestible – poorer quality forage will have a lower NDF digestibility.
- uNDF** percentage of NDF that is undigestible – a poorer quality forage will have a higher value
- CP** crude protein – A feed's nitrogen content multiplied by 6.25. Protein requirements vary according to stage of lactation; 16-18% in early lactation and 12-14% during the dry period.
- MP** Metabolisable protein is the microbial crude protein and digestible undegraded protein digested in the cows' small intestine and absorbed into the bloodstream where they can be utilised for metabolic purposes
- ADICP** Acid detergent insoluble crude protein – protein fraction that is indigestible in the rumen and intestine and therefore unavailable to the cow. High level indicates poor quality protein in a forage.

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