

FEED TROUGH

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Your Levy at Work

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Concentrate Supplementation to Grazing Dairy Cows

By Ruairi McDonnell, Western Dairy Research Scientist

Maximising the milk yield (MY) response when concentrate supplements are fed is a crucial component of profitable dairying. Starch based concentrates such as wheat and barley are the most commonly used supplements in WA during the grazing season, as protein levels in grazed pasture are usually adequate, particularly from the onset of grazing to September.

A large variation in MY responses to starch-based concentrates have been reported in numerous research experiments. In theory, feeding a cow an extra 1kg (DM) of a typical grain concentrate with an ME content of 12-13 MJ/kg DM, could increase MY by 2.4 L. This is due to an old theory based on the energy content of one litre of milk being ~5 MJ. In reality, this kind of response virtually never happens, and hence this assumption is incorrect and should be ignored! **A good rule of thumb is that 1 kg of milk can be generated for each kg of concentrate fed to grazing dairy cows, up to ~6 kg of concentrate DM/cow.** This may be slightly higher if the concentrate is provided as part of a TMR with a conserved forage.

Research has consistently shown marginal responses to supplementary concentrates by grazing dairy cows are linear to ~5-6 kg of concentrate DM, before diminishing significantly beyond this point. Many factors affect this reduction at higher supplement levels. One reason is a negative effect on NDF digestion in the rumen, caused by the large amount of fermentable starch. For grazing cows,

an even bigger factor is substitution of pasture, where cows start to eat less grass when fed more concentrates, hence pushing up the cost of the total diet and also increasing the risk of milk fat depression. As the amount of concentrate increases, substitution effects mean you are essentially replacing a cheaper feed (grass) with a more expensive feed (concentrate) without increasing DMI or getting an adequate MY response. This is why post-grazing pasture residuals often increase when grazing cows are supplemented with larger amounts of supplements.

Aim to add supplement to just below the level where the cost of the extra feed equals the extra revenue produced by the increased MY. Based on the large volume of research done in this area I would suggest that this level is ~5-6 kg DM/day of concentrate (grazing cows). Feeding concentrates beyond this level to grazing cows is less likely to be profitable. Starch sources of a slower rumen degradation rate (maize grain or Maximize) may allow this threshold to be pushed slightly upwards. These concentrates are more expensive than wheat or barley, and thus a greater marginal MY response will be required to justify their use. It is assumed that the pasture is always grazed according to best management practices (2.5-3 leaves at grazing and optimum post grazing residuals).

Numerous models are used to predict MY responses to supplements, including Rumen8 which is gaining in popularity

as a farmer-friendly decision support tool. These models usually incorporate linear predictions of MY responses to concentrates regardless of the amount fed. As outlined above this is incorrect, as the cow will eventually become biologically limited in her milk production capacity by factors such as cow breed, pasture quality, stage of lactation, efficiency of rumen function and the energy used grazing and ruminating.

Dairy scientists in Victoria have published a study where the results of 24 experiments investigating MY responses to concentrate supplementation (grazing cows) were combined into a powerful dataset (Janna Heard et al., 2016). This generated updated, non-linear equations to predict MY responses to grazing dairy cows supplemented with concentrates. These equations were developed in an attempt to account for the diminishing response to concentrates as intake increases, and account for factors such as initial MY, body condition score, week of lactation, pasture DMI, concentrate intake, season and liveweight.

An aim of the WD research team is to incorporate these new prediction equations into Rumen8, thus improving its capacity to accurately predict MY at higher concentrate intake levels.

For more information contact Ruairi at ruairi.mcdonnell@westernmilk.com.au

Grazing Management in Spring

By Tammy Negus, Agronomist

At a glance...

1. Get the most out of your pastures
2. What is your LER and rotation length
3. Focus on feed quality
4. Always fully feed your cows

When looking at historical data for WA dairy pastures, it seems the last week in July is where the pasture growth rate (PGR) really starts moving. When managing pasture based systems you must know your rotation length to be able to manage your pastures well and get the most out of grazing and utilising the standing feed for your cows. Grazing management goes hand in hand with addressing agronomic factors so make sure fertiliser and pest control have been addressed.

Farming these days doesn't just consist of hard work, it's the ability to work smarter. How you plan and make decisions year round impacts on the farms success. Being able to make good decisions regarding grazing management and fodder conservation is highly valuable.

Measure the leaf emergence rate (LER) by checking the leaf stage of plants in the same paddock over time. This will enable you to calculate how many days it takes

for a full leaf to grow. It will vary between farms and measurement is important to get it correct. A calculation can be used to estimate the LER, however this is based on perennial ryegrass and has limitations.

LER = 20 - (max temperature + min temperature / 2) x 0.55.

As an example if the min temp. is 7°C and the max temp. is 16°C the approximate LER is 13.7 days.

Depending on your stocking rate and concentrate fed, the increasing PGR and LER will start to push out surplus pasture in front of the cows. Managing this surplus is critical to optimise pasture utilisation, maintaining residuals and the three leaf grazing principle.

WHAT TO DO WITH THE SURPLUS PASTURE?

Generally, the surplus will become conserved feed harvested into silage or hay. Some paddocks may be opened up again for grazing if the season cuts off early. Farmers will manage this differently and paddocks will vary depending on management factors and conditions such as water logging, nutrient levels and pasture maturity.

Initially the surplus will be easier to manage and the odd paddock can be shut up as the herd goes around. But as the LER speeds up driving the speed of the rotation and increasing the daily area

allocated, it is important to be on top of the rotation. Whilst the three leaf stage and residuals should still be our target we might need to graze at the 2.5 leaf stage.

WA dairy consultant Glenys Hough recommends, "stay on top of your residuals. If you wait until you see excess feed in front of the herd you will have already compromised the quality of your pasture."

Maintaining pasture quality is essential. Feed test your pastures throughout the season to assess the feed quality and to make sure your using realistic feed values to balance the ration.

Consider the true cost of making silage before you decide to allocate a grazing paddock for cutting and conserving. Two important things to consider are;

1. **Cows should never be underfed just to ensure the pit is full or a certain number of bales of silage is made.**
2. **It costs nearly twice as much per tonne of dry matter to produce and feed back the silage compared with direct grazing of that same pasture.**

The cheapest forage is usually grazed in the paddock. Conserved forage is often only valuable when there is a feed gap that cannot be filled by producing pasture.

The Rotation Right Tool can be found at www.dairyaustralia.com or for a decision making guide www.grdc.com.au/FarmDecisionMaking.

Feeding and Nutrition Tips for Spring

Many dairy farmers fail to address these basic feeding tips. Planning coming into spring is very important as the next few months move quickly with the spring flush;

- Utilise the grass available to the maximum when pastures are plentiful at this time
- Keep the diet balanced. See the flexible feeding systems fact sheet - Getting the Diet Right *
- Feed test your pastures so that you get some true values of feed quality and can adjust the ration accordingly.
- High pasture protein % is common June - Sept so check you're not overfeeding protein via supplements. Use 16-18% in early lactation, 13-14% in late lactation and 12% during the early dry period.
- Take care when feeding high starch levels and balance with fibre. Dietary NDF levels for early lactation cows should be around 30% of total DM. (< 28% is a high risk for ruminal acidosis) For late lactation cows aim for 32-34% NDF in the diet. See Facts on Fibre Sources *
- Fully feed your cows in spring, don't sacrifice cow nutrition for fodder or silage production!

- Feed budget - calculate your feed demand, assess what you have on hand and what you need to produce in terms of fodder (quality and quantity). Be realistic about what you can produce and work out what you require.
- Purchasing grain or hay - discuss forecast requirements with suppliers, develop relationships with grain growers and hay producers and remember to check and test for quality. If good cropping conditions continue there will be a good supply of cheap grain at harvest.
- Measure feed, calibrate feeding equipment and try to minimise wastage.
- Spring calvers should be on a transition diet 28 days off calving. Check DCAD levels (Dietary cation-anion difference).
- Feed calves and young stock to meet the recommended targets for live weight gain. See the books 'Rearing Healthy Calves' and 'Heifer Rearing'.

For more information, speak to your nutritionist. Use Rumen8 to check the balance of your ration for the milkers - www.rumen8.com.au * Fact sheets mentioned above are available from www.dairyaustralia.com.au

Spring Agronomy Reminders

By Tammy Negus, Agronomist

Get your pens out to tick off these critical points so you don't get caught unprepared.

- **Pasture nutrition** - plant test for potassium and trace elements well before spring and flowering. Apply fertiliser on hay and silage paddocks - particularly N, K and S at least 4 weeks before cutting. Consider split applications and post-cutting fertiliser strategies. Using liquid rather than granular fertiliser can save a pass if mixed with pesticides and can be more effective for plant nutrient uptake. Don't forget plant test perennials before summer.
- **Pasture management** - see the silage and grazing management articles. Assess poor-performing paddocks and make improvements for 2017.
- **Weed control** - apply herbicide before the weeds become too big and prior to canopy closure. Consider spray-topping to control the seed set of certain grass weeds. www.dairyfertility.com.au/hgf/BarleyGrassTechNote.pdf
- **Disease control** - oats and ryegrass can be susceptible to foliar diseases which may be controlled by a fungicide. Check the

registration, WHP and identify the disease or virus correctly. www.rirdc.infoservices.com.au

- **Insect control** - use residual protection against red legged earth mite (RLEM) and lucerne flea, CAUTION - rotate your chemistry to avoid selecting for resistant populations and test the resistance status. Timerite can be used as a good control method for RLEM. Visit www.timerite.com. For ALL PESTICIDES use the correct label rates for the targeted species and amount of pasture present and adhere to pesticide WHP for grazing and for harvest.
- **Summer crop** - use varieties suited to your grazing system. Source and order seed early. Use a good herbicide knockdown to control weed competition and use cultivation as required. Monitor soil temperature to help determine when to seed. Use the shoulders of the season to maximise the moisture for the perennials, increasing water-use efficiency for those with irrigation.

For more speak to your local agronomist or fertiliser specialist for specific product advice and rates.

Silage Preparation

By John Lucey, John Lucey Consulting

Careful planning together with care and attention at growing, harvesting, storage and feedout has the potential to produce high quality silage with 11 MJ ME/kg DM (dry matter) with low (10%) DM losses. The higher your silage quality and lower the DM losses the less expensive grain you will need to purchase to supplement your herd over summer.

Machinery: plan any service, maintenance or repair before the start of harvest. Some parts may need to be ordered in and this may take weeks not days. Be proactive and replace suspect items now, to avoid being let down in the middle of harvest.

Contractors: start talking to your contractor as soon as possible so that he can forward plan who to get to and when, weather permitting, to ensure they are ready when your silage is ready.

Cutting stage: cut ryegrass at 5% to 10% ear emergence for a balance between quality and quantity. Ideally, the pasture would be ensiled at the stage of being grazed, or very soon after, which means the paddock is back into rotation in the same round, or early in the next round.

Mowing: Start in the morning after the dew has evaporated off the pasture. The advantage of a full day's wilting will generally outweigh gains from waiting for plant sugar levels to peak mid-afternoon in the WA climate.

Wilting: only cut sufficient pastures, leaving the swath wide so you can wilt as quickly as possible to target dry matter ideally within 24 hours, but at least less than 48 hours. Aim for 30% - 35% DM for pit/stack silage and 40% - 45% DM for baled silage.

Silage inoculants: they are particularly useful for mown material that is still slightly too wet after two to three days wilting and where rain may be threatening.

Sealing pit: ideally cover the stack during harvest with a plastic sheet to slow down the plant respiration and microbial bacteria activity cycle which causes DM and quality losses. Finally cover the stack as soon as rolling is completed even if late at night.

Wrapping bales: wrap bales with 4 layers of plastic at 55% stretch with no underlapping as soon as practicable after

balancing to minimise plant respiration and bacteria activity and never leave them unwrapped overnight.

Opening stack/bales: ideally wait at least 6 to 8 weeks for the whole stack to ferment (if compacted tightly and sealed airtight within hours after harvest is completed). Bales can be opened anytime as long as the bale is consumed within the day. Fermentation won't be complete, but that won't matter, but by day two it will be heating and starting to go mouldy.

Silage analysis: stacks can be sampled for analyses after about 5 to 6 weeks in a well preserved stack or up to 8 to 10 weeks in poorly preserved stacks. Bales can be tested after about 3 to 4 weeks.

Feedout: silage is expensive to make so invest in a feedout system that minimizes losses in both quality and quantity, which can vary from 15% up to 50%. High intake is achieved through high quality.

For Further reading see the TopFodder 'Successful Silage' manual at www.dairyaustralia.com.au

Getting Quality Silage

By Frank Mickan, pasture and fodder conservation specialist DEPI, Ellinbank

WHY MAKE HIGH QUALITY SILAGE?

High quality silage will allow your cows to maintain and possibly even increase levels of milk production at any time in the lactation, not just at mid-late lactation. If high quality silage (10MJ metabolisable energy/kg dry matter) is fed during the dry period, less is required than if your feeding poor quality silage. Feeding quality silage (8.5-10 ME) should maintain or slightly increase milk production but poor quality silage (<8.5 ME) won't maintain it.

Always aim to make good quality silage because there are so many influences which cause you to end up with average to poor quality silage. See the article in this Feed Trough - silage checklist for factors that can reduce quality and that are in your control.

For farms that use silage in the daily ration, profitability is substantially affected by silage quality and losses from ensiling and feed out.

LOSSES %	INCREASE IN QUALITY (MJ M/KG DM)	
	9.3	10.3
25	\$0	\$5,625
10	\$10,463	\$17,213

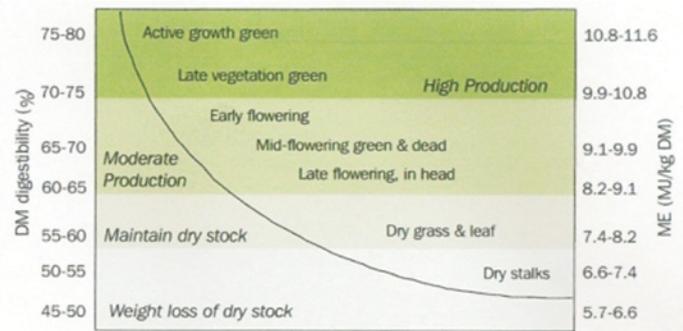
Source www.topfodder.com.au

The table shows the impact of improved quality and reduced losses on the additional value of milk production, in terms of a marginal response, from 200t DM silage when milk is valued at \$0.30c/L and the conversion of energy in silage to milk is 8 MJ ME/L milk.

HOW TO GET HIGH QUALITY SILAGE?

The single most important determinant of high quality silage is the stage of growth at cutting. The timing and length of shut up, prevailing weather conditions, harvesting, storage and feed out management are also big influencers of quality. The more vegetative (leafier) the crop and the closer to the correct grazing stage (2.5 to 3 green leaves) it is at cutting, the closer the silage will be to the original pasture being ensiled. Grown and managed well, this silage should be well over 10.5 MJ ME.

Length of closure is most detrimental to pasture and silage quality if the closure is near when the ryegrass plants are approaching their reproductive stage. Once ryegrass enters its reproductive stage it can change from vegetative to full ear within 10 - 14 days, and correspondingly, decline in quality very quickly. The curve below shows how as temperate grasses mature, forage DM digestibility and energy levels decline. (Source: Bell 2000, TopFodder)



QUALITY VERSUS QUANTITY

There must be some compromise in both silage yield and quality. Many farmers and contractors simply look at the extra silage from a longer or later cut and this may be satisfactory for a maintenance or low production diet. However, many factors should be considered in the whole farming picture. Consider quality of earlier/lighter crops versus later heavier cuts, quality and quantity of the regrowth, the effect of early closure on grazing pressure for the remainder of the farm.

Knowing your silage quality allows the ration to be adjusted accordingly and informs you of what needs to be done next season to improve its quality. Assess the silage by the visual appearance, smell, "eyeballing" the pasture before cutting but most importantly get it analysed by an accredited laboratory.

For more information on producing quality silage visit www.topfodder.com.au or www.agriculture.vic.gov.au/agriculture/dairy

A Note from Neil...

Neil Moss is the SBSibus consultant that led the project of farm business development for the Hortin family at dairy innovation day in 2015. A key message from the project was the strong focus for dairy farmers to concentrate on silage quality as one of the key management priorities.

Neil recommends a classification system of silage as its cut. It is important that it is easy for staff to know where the better silage

is as it as you can draw on the high quality silage when there is no grass in the diet. As silage is made, grade it based on the proportion of leaf and the pasture quality as they were cut. Stack silage in lines and class as either A (high quality), B (average type silage) or C (low quality with higher proportion of stem and low leaf). Follow this up with comprehensive feed testing to enable you and your nutritionist to plan the best use for this fodder.

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