

Improving dairy cow feed efficiency and farm profitability through genetic selection P2

Flexible Feeding Systems project update P3



Department of Agriculture and Food



# FEED THROUGH



Your Levy at Work

## FODDER BEET FOR LACTATING COWS: GATHERING INTEREST IN WA

By Rob La Grange  
WA Dairy Industry Development Specialist

We are always on the hunt for crops that promise a cost efficient, yet quality source of fodder.

Fodder Beet is an annual crop that can be strip grazed as well as growing a fleshy swollen root. It is a high energy feed source capable of high yields (30t DM/ha and more) under good management and the crop has shown promise as a source of summer/autumn feed under irrigation on WA dairy farms. Around five dairy farmers have put in a crop this season and these will be monitored for their yield and use. Two are under pivot irrigation, one under a drip system; one under flood on the Harvey scheme and the fifth one under the Wellington flood scheme. In NZ the crop is grown mainly as a source of winter feed and the use of beet in WA as a winter crop could be worth investigating.

### Nutritive Value of Fodder Beet

Fresh Leaves;	Value
Dry Matter (DM)	18%
Crude Protein (CP) (% of DM)	15-16
Crude Fibre (% of DM)	12-13
Metabolisable Energy (MJ ME/kg DM)	9
Roots;	Value
Dry Matter	16%
Crude Protein (% of DM)	6-7
Crude Fibre (% of DM)	5-6
Neutral Detergent Fibre (NDF) (% of DM)	13
Metabolisable Energy (MJ ME/kg DM)	12-12.5

### Establishing and Growing Fodder Beet

Fodder Beet is slow to germinate and will need around five months to achieve high yields. Getting the crop in as early as possible in spring will provide a reasonable stand ready for grazing by January. One source classifies Fodder Beet as a crop requiring 'arable expertise' and experience in Australia confirms this. Fertiliser requirements are high and pest control and crop monitoring is essential. Consultation with a local agronomist is advised.

### Grazing Fodder Beet

The high soluble carbohydrate content of the crop makes it a potential contributor to acidosis and so intakes need to be regulated. The overall ration starch and sugar levels need to be

within recommendations. When fed in summer in WA where grain is a significant portion of the diet, Fodder Beet in the ration should replace some of the grain for energy supply. With the lower CP content, the ration needs to be balanced for protein. Fodder levels need to be maintained to ensure that ration NDF and eNDF (effective NDF) levels are adequate. A 7-10 day rumen adaptation period is recommended when grazing Beet for the first time. Cows not previously exposed to the crop will not know how to graze the beets but holding them on the break will see them experimenting and once they get into the Beets, they will readily take them. Be aware of oxalate levels in the leaves as these could pose a risk but experience suggests that this is not a major issue.

### Use of Fodder Beet in Pasture Renovation

The crop could be used in pasture renovation programs where poor performing or kikuyu infested paddocks are sprayed out and sown to Fodder Beet. Following grazing through summer, the paddocks can be sprayed again if needed and sown down to pasture/oats for early feed in late autumn/winter. Under the pivot, Fodder Beet could be used in a crop rotation cycle. Fodder Beet can be sensitive to residual chemicals that have been used in other crops and so agronomist advice should be sought.



A two-month-old Fodder Beet crop showing active growth and bulk at Stuart Maughan's property. (Photo taken on January 6 this year).

For more information on this article and Fodder Beet crops in WA, contact Rob La Grange on [rob@westerndairy.com.au](mailto:rob@westerndairy.com.au) or 0448 939 344.

# IMPROVING DAIRY COW FEED EFFICIENCY AND FARM PROFITABILITY THROUGH GENETIC SELECTION

By Ruairi Mc Donnell - Dairy Research Officer DAFWA Bunbury

Increased feed efficiency is an obvious way for farmers to improve on-farm profitability. While the use of feed conversion efficiency (FCE; ratio of feed consumed to kilograms of milk produced) has been promoted by Dairy Australia as a useful management tool on dairy farms, is it possible to genetically select cows that are inherently more efficient converters of feed than others?

Residual feed intake (RFI) is a well-established selection tool in beef breeding programs around the world for a number of years now. Defined as the difference between an animal's actual feed intake and its expected feed intake based on mean growth and production, it is moderately heritable and also has the advantage over FCE of being genetically independent of cow size and production levels. Therefore its inclusion in breeding programs will not skew selection towards larger animals with higher maintenance requirements, unlike FCE. Dairy cows express a higher proportion of energy in milk than beef animals do in liveweight gain, meaning that the impact of selection for RFI in dairy cattle is less than in beef animals. However, in recent years research has focused on the possibility of including RFI as a selection trait in dairy breeding programs, as the magnitude of genetic variation in RFI between animals is believed to be large enough to merit its inclusion as a selection trait in future dairy breeding programs.

Variation within a given population of animals in feed intake and production is well documented. In simple terms, a group of cows of equal weight, age and stage of lactation producing the same amount of milk should theoretically be expected to have consumed identical amounts of feed to meet that level of production. However, due to variation in RFI, some cows will require more feed to meet this level of production, while others will require less. A difference of 1kg of DM per day between efficient and inefficient animals producing the same amounts of milk could result in a cost saving of approximately \$100 per cow in typical 305 day lactation at current feed prices. As RFI is moderately heritable, it should be possible to genetically select for cows that are inherently more efficient converters of feed, without affecting production. An additional benefit to this strategy is the potential reduction in methane emissions from cows of improved RFI. The problem with the use of RFI in both dairy and beef breeding programs is that is both expensive and time consuming to measure and identify which animals are efficient and inefficient, hence the rate of genetic gain is slow.

Our experiment measured feed intake and weight gain of 90 Limousin X Friesian growing heifers over a 90 day period on a high energy ad libitum diet. The aim of the study was twofold;

one to define the phenotypic variation in RFI that existed within the 90 animals, and secondly to establish whether the extremes of the group i.e. the most and least efficient animals had any inherent differences in methane production. Data from the 90 day trial period is outlined in table 1. There was a difference of 1.32 kg in average daily dry matter intake (DMI) between the 16 most efficient and 16 least efficient animals despite similar average daily gains and mean liveweight (LW) in each group.

**Table 1**

Traits	Mean	Inefficient RFI	Efficient RFI	P-value
No. of animals	90	16	16	
DMI, kg/d	6.82	7.48	6.16	<.0001
Metabolic mid-weight, kg0.75	63.81	63.75	63.64	0.953
ADG, kg/d	1.51	1.50	1.52	0.643
Final LW, kg	315.73	315.40	9	0.961
Residual feed intake, kg/d	-0.01	0.65c	-0.70d	<.0001

Numerous other studies have reported similar differences in RFI between efficient and inefficient dairy heifers. However when methane emissions were measured for both groups in this experiment across contrasting diet types, no difference in emissions was detected between the efficient and inefficient groups. Therefore we concluded that while selection for improved RFI will not result in animals that inherently produce less methane, the production benefits associated with consuming less feed while maintaining performance were significant and offer encouragement that RFI could be a viable selection trait in future dairy breeding programs.

From a dairy farmers perspective these results are highly relevant. Major research collaboration between dairy scientists in Victoria and New Zealand has focused on the possibility on using RFI as a selection trait in dairy breeding programs in both countries and the results are encouraging. Work is also targeting a clearer understanding of the reasons for this observed variation in RFI, and also quicker means of identification of efficient animals (including the use of genomics). This will greatly accelerate the rate of genetic improvement due to a much larger database of RFI efficient animals being generated in a much shorter timeframe.

**For more information on this subject contact  
Ruairi Mc Donnell, DAFWA Bunbury on (08) 9780 6261**

## DAIRY INNOVATION DAY 2015

### THURSDAY APRIL 30

10.30am to 4pm - Hortin's dairy, Torbay | 7.00pm - Dairy Industry Dinner, Motel La Grande, Albany

### FRIDAY MAY 1

Dairy tour options to Ravenhills and Houdens (north) or Hick's robotic dairy (for those travelling west)

**All are encouraged to arrange to stay in Albany overnight on April 30**

Call Motel La Grande on 9841 3600 to reserve your room and tell them you are part of Dairy Innovation Day for our special rate.

To register, call Esther Price at Western Dairy on 0418 931 983 or esther@westerndairy.com.au Or visit [www.westerndairy.com.au](http://www.westerndairy.com.au)

# Flexible Feeding Systems project update

By Dr Bronwyn Edmunds - Dairy Research Officer, DAFWA

The national Flexible Feeding Systems (FFS) project, funded by Dairy Australia, DAFWA and DEPI Victoria, was designed to improve the way concentrate is integrated into dairy cow rations. Phase 1 of FFS-WA compared farm production and profitability of two feeding systems; the all-grain-in-dairy system and the Partially Mixed Ration (PMR) system. It was expected that the PMR system would lead to higher production per cow and higher farm profitability however after 15 months intensive monitoring of 13 partner farms results failed to show any significant difference between the two systems. With that in mind this article will update you with findings from the controlled feeding trials completed at Ellinbank Centre (FFS-Vic) and explain progression to Phase 2 of FFS-WA.

In August 2013, FFS-Vic researchers Dr Bill Wales and Dr Martin Auldish visited WA to present results from feeding trials investigating various PMR rations. They reported that no production benefits were observed when feeding a simple PMR (pasture silage + barely grain) over the traditional method of feeding forage in the paddock and grain in the dairy. What they did find was that feeding a more complex PMR, including simple PMR components plus alfalfa (Lucerne) hay, maize silage and maize grain, increased energy corrected milk (ECM) by about 2 kg/cow at higher supplement intakes through maintenance of milk fat concentration (Figure 1). In another similar experiment the researchers went on to find that replacing a portion of crushed wheat with canola meal and alfalfa hay replaced grass silage, ECM sat at 3-5 kg above the control diet, in which all grain was fed in the dairy. This increased milk production was primarily driven by increased DM intake, which

is probably due to the improved ruminal conditions and decreased incidence of ruminal acidosis measured in these cows.

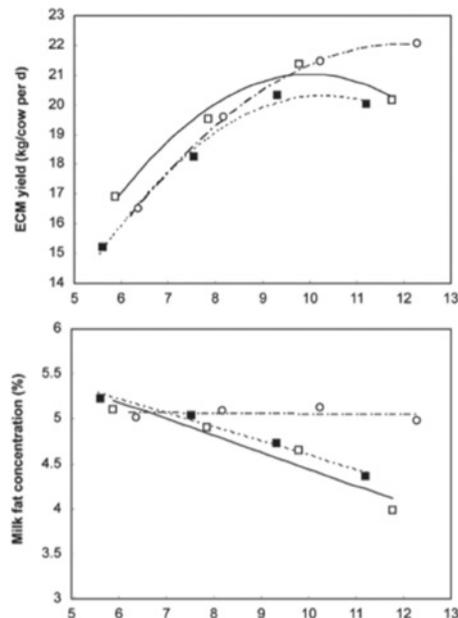


Figure 1. Mean daily energy corrected milk (ECM) and fat (%) for cows fed different amounts of supplements (75:25 concentrate: forage) for three feeding strategies – control (□, pasture silage in paddock + barley in dairy), simple PMR (○, pasture silage + barley), complex PMR (■, barley, maize grain, maize silage, alfalfa hay) (Auldish et al., 2013).

Based on FFS-Vic findings and as part of FFS-WA Phase 2, in April 2015 the dairy team will be running a feeding trial hosted by Scott and Michelle Weldon at Vasse Research Centre. The trial will compare two groups of early lactation cows each receiving 18 kg DM/day of a PMR containing traditional WA components: pasture silage, wheat and lupins. The treatment group will have added canola

meal and maize grain at the expense of some wheat. Both groups will have ad libitum access to high quality legume hay. You may already be questioning the use of maize grain as it is both expensive and relatively inaccessible in WA. This is true, but a necessary ingredient in this trial as we test FFS-Vic results. Depending on the trial outcome we will endeavour to find alternative sources to maize grain from the WA feedbase to ensure recommendations are cost effective and practical.

An additional objective of Phase 2 is to model two case study farms using the Dairy Directions approach. This involves modelling alternative future scenarios, including a status quo scenario, to gain a ten-year projection in terms of profit and risk associated with each modelled strategic management decision. Basically, we are trying to predict the future! But before you scoff, think about your own method of implementing management strategies. I think you'll find that you are also trying to predict the future but without the use of comprehensive current and historical data and equations. This approach is therefore a powerful tool and we hope the outcome will assist you to direct your business towards a profitable future. The chosen case study farms will represent a small-medium dryland farm using the all-grain-in-dairy feeding system and a large, dryland PMR farm (>500 milking cows). Strategies to be modelled will be revealed at a later date, but will include economics of conversion to a PMR feeding system.

**For further details on this information or about the FFS research please contact Bronwyn on 0468 456 755 or visit [www.agric.wa.gov.au](http://www.agric.wa.gov.au)**

## Seasonal Snippets

*Some important reminders to consider at this time of the year*

### For the paddock

- Pasture seed set: You can assess your paddocks for pasture seed set, check for the numbers and viability of ryegrass seed to help plan your seeding regime for 2015.
- Pasture seed requirements: information from rural suppliers indicates that pasture seed may be in short supply for 2015 due to the poor seasonal conditions for seed production in the eastern states so plan and order early.
- Soil Testing: It's a good time to analyse the soil to help determine lime and fertiliser requirements for this season.
- Summer Weeds: Even with minimal summer rain there's weeds like paddy and afghan melons in paddocks, spraying these reduces weed seed set and conserves soil moisture for winter crops.

### For the cow

- Keep cows cool: Provide plenty of clean and good quality water for drinking.
- Sprinklers are good: Sprinklers to wet cows down in yards and providing shade are ways to help cows manage the heat stress and maintain the milk production. Visit [www.coolcows.com.au](http://www.coolcows.com.au) for more tips on dealing with heat stress in Australian dairy herds.
- Revise the ration: With higher amounts of fodder and supplements being fed at this time of the year check the cows diet to make sure it is balanced for production. Why not try our Rumen8 by going to [www.westerndairy.com.au](http://www.westerndairy.com.au) and choosing the menu On-Farm Action and then select Rumen8. Call Tammy (see number at the bottom of this newsletter) if you'd like some assistance!

# 2014 NATIONAL DAIRY CHALLENGE TESTS PASTURE KNOWLEDGE

By Jessica Andony - WA Young Dairy Network coordinator

In December 2014 four young dairy farmers from Western Australia travelled to South Australia to compete in the inaugural National Dairy Challenge. Brad Fairbrass, Nicole Rose and Tahlia McSwain all from Busselton, and Jessica Andony from Harvey were WA's participants. There were seven teams from all around Australia competing against one another to prove they had the knowledge and skills to take out the National Dairy Challenge title.

The activities that the teams competed in looked at all aspects of farming from cattle judging, body condition scoring, milk quality and processing, cheese tasting, animal health, bull selection, ration formulation, plant identification and pasture assessment.

The pasture assessment side of the challenge involved identifying the tiller stage of a pasture, working out the approximate dry matter per hectare within the paddock and then working out how many grazings

could be achieved from this paddock given a certain number of cows. We were also asked to work out chemical rates for certain weeds and application methods whilst also demonstrating safe handling of the chemicals. The last section of the pasture challenge was identifying 12 different plant species, both desired and undesirable.

In the ration formulation section we worked with an actual herd scenario and teams were asked to calculate total energy, protein and fibre needs of the herd. Once this had been achieved they were then asked to balance a ration meeting these needs and a desired level of production. As a bonus question teams were asked to consider the margin over feed cost and manipulate the ration to achieve the best possible outcome for the farmer given a certain milk price and cost of supplements.

The event was both educational and fun and would be strongly recommended to anyone

looking to learn more about the industry and improve their current skills and knowledge.



The WA National Dairy Challenge Team for 2014: (from left) Bradley Fairbrass, Nicole Rose, Tahlia McSwain and Jessica Andony

**To be linked into news on all young dairy farmer activities in WA and to inquire about being part of the WA team for the 2015 National Dairy Challenge, contact Jessica Andony**  
E: [jessica@westerndairy.com.au](mailto:jessica@westerndairy.com.au) or  
M: 0435 174 719

## Grain prices to dairy farmers in 2015

By Alan Peggs - Alan Peggs Rural, Nedlands

The principle determinant of grain prices to dairy farmers in the South West is the grain trader Bunge and the prices they have on offer for wheat and feed barley at Bunbury. Grain growers now have a choice of storing their grain and either marketing it to Bunge or to dairy farmers. Bunge have two advantages over dairy farmers when it comes to purchasing grain:

- It is easier and quicker to unload grain at Bunge's Bunbury grain receival facility so transport companies are prepared to offer of freight discount of \$2-3/t compared to delivering to dairy farmers, and
- Payments for grain are received 14 days after the end of the week of delivery in contrast to payments from dairy farmers which are often received more than 30 days after delivery.

All grain is in tight supply. Wheat prices have eased slightly over the last four weeks but dairy farmers still face prices for ASW wheat (<5% screenings, <10.5% protein) at c.\$300/t + GST delivered. Bunge's current

price for ASW wheat delivered Bunbury is \$297/t + GST.

Feed barley prices have also eased marginally over the past month. The current price to dairy farmers is \$295/t + GST delivered. Triticale supplies are very tight and little is available. It is presently selling at similar levels to feed barley - \$295/t + GST delivered.

Low lignin oats, which are an excellent option for dry cows and heifers, are in extremely short supply. Consequently the price delivered Fremantle is \$300/t + GST – an unheard of price for oats!! Low lignin oats are currently priced at \$295/t + GST delivered to the South West.

On the basis of these prices ASW wheat appears to be the best bet for dairy farmers this year.

Lupins are almost unprocurable. Growers who are still holding stocks want between \$330-\$350/t ex GST on farm. This is translating into a landed price in the SW

of \$360-\$380/t ex GST. If you have not secured your lupin supply make sure you do it soon or your only option will be CBH at \$390/t + GST.

The table below outlines current prices for grain delivered to dairy farmers in the South West (current as of 15th January)

Wheat	Screenings	Bunge Bunbury	Landed SW
Grade	%	\$/t	\$/t
APW 2	<5	307	310
ASW	<5	297	300
Feed Barley		292	295
Triticale			295
Oats-Milling	Fremantle	300	295
Lupins			360

**For more information on current grain prices contact Alan on Peggs**  
Mobile: 0428-932-717

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Previous issues of the Feedtrough are available at [www.westerndairy.com.au](http://www.westerndairy.com.au)  
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