Western Dairy - DairyNote

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Business Improvement and Innovation (BII) – A case study in pasture management through the 2014 and 2015 winter spring season on a Brunswick dairy farm in WA.

Continually identifying opportunities and reviewing current practices to achieve greater profitability and sustainability is a key component of successful dairying. The business improvement and innovation process identifies key areas where gains can be made as well as management pathways to achieve these gains.

This case study data was recorded on a Brunswick dairy farm from the winter/spring season of 2014 and 2015. The farm was identified as having the potential to improve feeding efficiency.

Case Study: 2014

In the 2014 season increased focus was given to grazing annual ryegrass at the three-leaf stage and to making adjustments to grain allocation in response to pasture dry matter (DM) allocations. Monitoring DM intake through the autumn/winter season is important as pasture growth rates change, and availability of pasture increases. The average cost of a kilogram of pasture DM can be up to 4 times lower than a kilogram of grain DM, depending on the type of grain used. Therefore reducing grain intakes as more pasture becomes available will increase margin over feed costs at a time of the season when milk prices are lower.

A quick way to evaluate the cost of your ration is to calculate a margin over feed cost (MOFC). To calculate a MOFC you subtract the average daily cost of your feed per cow from your milk income per cow.

- **Milk income = litres/cow/day x price per litres in cents.**
- **Av. Daily cost of feed = sum cost of all daily feed ingredients/cow (pasture, grain, silage, hay, etc).**

The aim is to get the largest difference as possible between the cost/cow and income/cow.

The following tables show the MOFC for this farm's analysis:

Table 1. MOFC of high grain ration.

Av. Daily milk yield	25 litres/cow
Av. Daily grain fed	7.5kg wet/cow
Cost of grain	$530/t wet
Est. pasture eaten	12.5kg DM/cow
Cost of pasture	$130/t DM
Av. Daily feed cost	$5.60/cow/day
Milk income @43c/l	$10.75/cow/day
MOFC	$5.15/cow/day

Table 2. MOFC of low grain ration.

Av. Daily milk yield	25 litres/cow
Av. Daily grain fed	5.5kg wet/cow
Cost of grain	$530/t wet
Est. pasture eaten	14.5kg DM/cow
Cost of pasture	$130/t DM
Av. Daily feed cost	$4.80/cow/day
Milk income @43c/l	$10.75/cow/day
MOFC	$5.95/cow/day

This represents a 16% increase in daily MOFC and for 100 cows over a 3 months would see an extra return of $7,200.

Case Study: 2015

In 2015 the decision was made to assess pasture dry matter accumulation in 4 paddocks to get an idea of the relative performance of the paddocks.

In this study a poorly performing irrigated paddock (PI), a poorly performing dryland paddock (PD), a better performing irrigated paddock (BI) and a better performing dryland paddock (BD) were plate metered approximately every 10 days from early June to early October. In addition ryegrass leaf stage was assessed and from that, leaf emergence rates were calculated. The better performing dryland paddock (BD) was pasture sampled at three intervals through the season. The relative paddock performance was based on the farmer's judgment.

Of the four paddocks BI and BD were sown with SF Speedyl annual ryegrass, PI was drilled with SF Speedyl and was water logged for most of the winter and PD was sown to perennial ryegrass but also drilled with SF Speedyl. Paddock PD appeared to be affected by soil compaction.

A basic rising plate meter was used to determine pasture mass. Pastures mass was calculated using equations based on annual ryegrass formulated at the Vasse Research Centre. The equation reflects the changing nature of the ryegrass plant at stages in its seasonal growth pattern. There is a reasonable

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margin of error when using a rising plate meter, approximately 200kg DM/ha as reported by scientific literature, but it is a good indicator of pasture biomass and a widely accepted method of measuring pasture dry matter.

The plate meter data for the 4 paddocks is show below in table 3.

Table 3. Pasture Biomass in the 4 paddocks (t DM/ha)

	July	August	September	October (10 days)	Total
BI	0.67	0.98	1.35	0.10	3.10
PI	0.47	0.87	1.18	0.26	2.77
BD	1.65	2.30	3.10	0.67	7.71
PD	0.84	1.95	1.46	0.78	5.03

Grazing at or near the three-leaf stage for annual ryegrass maximises dry matter accumulation and is vital to optimise financial returns of feed in the winter/spring seasons. The quality of annual ryegrass typically found in late winter and early spring when supply exceeds demand is such that a reduction in grain feeding, coupled with increased pasture allocation will generally not have a negative effect on milk production. The exception here is when feeding high yielding cows in early lactation, and farmers should discuss rations for these high yielding cows with their nutritionist.

Annual ryegrass in late winter, early spring and mid spring has crude protein (CP) levels well in excess of animal requirements and farmers should look at feeding grain supplements with lower crude protein concentrations. Lactating dairy cows typically require 16-18% CP in the diet, and early and mid-season annual ryegrass can often contain CP levels over 30% (see Table 4).

Table 4. Pasture test results from the better performing dryland paddock (BD).

	15/07/2015	14/08/2015	7/10/2015
DM %	10.4	8.7	16.7
ME (MJ/kg DM)	12.8	11.0	11.7
CP %	31.5	27.4	22.9
NDF %	42.6	48.7	48.4

Therefore when annual ryegrass constitutes the majority of the diet, it's highly unlikely that dietary protein levels will be limiting milk production.

As ryegrass matures, CP levels drop and fibre levels increase, so there may be merit in introducing a CP based grain later in the season. Regular testing of pasture will help inform this decision. Limiting the use of CP based grains should improve MOFC as these are generally cheaper supplements.

Identifying poor performing paddocks and renovating these to addressing the constraints of poor growth is important. Increasing dry matter yields of paddocks should justify the cost of renovating. Irrigated paddocks do appear to have some issues that impact on pasture growth in the winter and spring months, as seen in this case study, and there is a tendency for these paddocks to be waterlogged over winter and early spring.

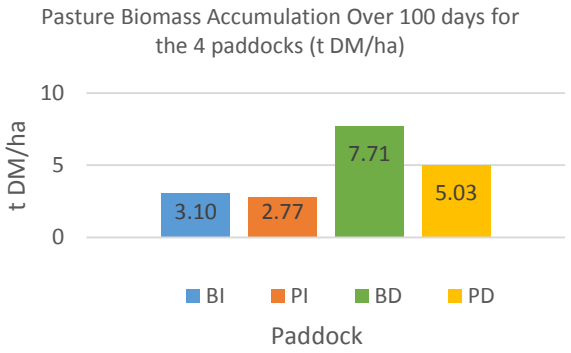

Figure 1. Pasture Biomass Accumulation over 100 across the 4 paddocks (t DM/ha)

This study revealed that a reduction in grain during the winter-spring months when more pasture DM was available would not negatively affect milk production, as pasture CP is high at this time of year and, reducing the amount of grain fed will also increase the MOFC for the ration. It also showed that dryland paddocks produced more pasture biomass over the winter spring season in comparison to irrigated paddocks (see figure 1.)

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