



SIDDC

South Island Dairying
Development Centre

Partners Networking
To Advance South
Island Dairying



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University**

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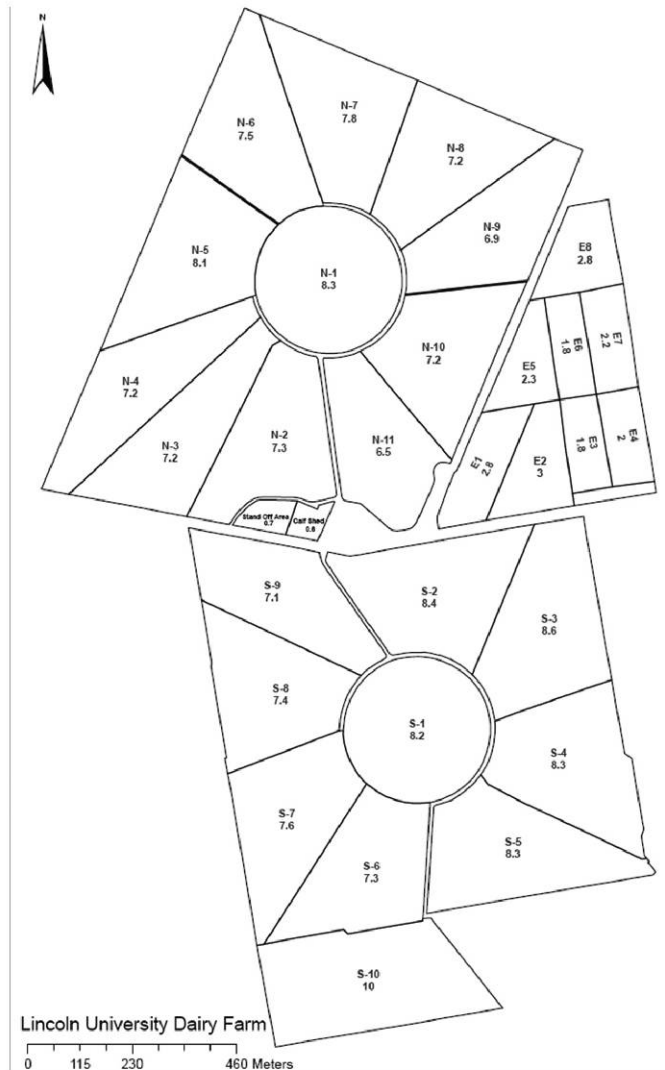
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Lincoln University Dairy Farm Focus Day – 6 May 2010



Staff

Peter Hancox – Farm Manager Andre Scholtz – Herd Manager
Brad Turner – Farm Assistant Kenny Oluvoyede – Farm Assistant

LUDF Hazards Notification

1. Children are the responsibility of their parent or guardian
2. Normal hazards associated with a dairy farm
3. Other vehicle traffic on farm roads and races
4. Crossing public roads
5. Underpass may be slippery

Please follow instructions given by event organisers or farm staff

Introduction

The 186 hectare irrigated property, of which 159 hectares is the milking platform, is a former university sheep farm. The spray irrigation system includes two centre pivots, small hand shifted lateral sprinklers, and k-lines. The different soil types on the farm represent most of the common soil types in Canterbury.

Key objectives

1. To develop and demonstrate world-best practice in dairy farm systems and to transfer them to dairy farms throughout the South Island.
2. To operate as a joint development centre with SIDDC partners, where the practical application of new technologies can be developed and refined.
3. To use the best environmental monitoring systems to achieve best management practices under irrigation, which ensures that the industry's annual profit from productivity target is achieved in a sustainable way and that the wider environment is protected.
4. To continue the environmental monitoring programme and demonstrate technologies that will ensure that the 3-year rolling average concentration on nitrate-N in drainage water from below the plant root zone remains below the critical value [16 mg N/L] that is specified in ECan's proposed regional rule as requiring reduction [Rule WQL18].
5. To operate an efficient and well organised business unit.
6. To provide a commercial return exceeding the average weighted cost of capital on annual capital evaluations to Lincoln University.
7. To create and maintain an effective team environment at policy, management and operational levels.
8. To assist Lincoln University to attract top quality domestic and international students into the New Zealand dairy industry.
9. To actively seek labour productivity gains through adoption of technologies and practices that reduce labour requirements or make the work environment more satisfying.
10. To use Environmental Best Practices [including 'eco-n' nitrification inhibitors] to protect the environment, while enhancing profitability.

Specific objectives for the season 2009/10

1. To deliver a Dairy Operating Profit of \$2,022/ha and Return on Dairy Assets of approximately 4.8% from a \$4.55 payout - with budgeted milksolids production of 277,630 kg with Cash Farm Working Expenses of \$3.23/kgMS.
2. To improve water use efficiency for better integrating the technologies currently existing on the farm by ensuring useable decision making data is accessible to the farm management in a timely manner.
3. To increase the land area that effluent is applied to so that nutrients are better distributed and there is an increased range of contingency plan options. Also, ensure that nitrate losses are not greater on effluent areas than on non-effluent areas, and that there is no significant microbial contamination of the shallow aquifers.
4. To manage pastures and grazing so milkers consume / harvest as much metabolisable energy [ME] as practicable, with a target of 200 GJ/ha ME. For example, this could be achieved by consuming/harvesting 16t DM/ha with average ME 12.5.
5. To optimize the use of the farm automation system [Protrack] and demonstrate / document improved efficiencies and subsequent effect on the business.
6. To achieve an in-calf rate of no less than 88% [i.e. 12% empty] after 12 weeks mating. i.e. 9 weeks of AB mating plus 3 of natural mating. All AB matings to result in crossbred replacements including replacements from yearlings.
7. To continue to document and measure LUDF's influence on changes to defined management practices on other dairy farms.
8. To ensure specific training is adequate and appropriate to enable staff members to contribute effectively in meeting the objectives of the farm.

Ongoing research

- The effect of fertilisers & other farm inputs on groundwater. 10 groundwater monitoring wells sunk to monitor and manage the effect of fertiliser, grazing, irrigation and effluent inputs over a variety of contrasting soil types.
- Effects of eco-n on nitrate leaching and pasture production.
- Pasture growth rates, pests and weeds monitoring.
- The role of nutrition in lameness in Canterbury.
- Resource Inventory and Greenhouse Gas Footprint

Climate

Men Annual Maximum Temperature	32 °C
Mean Annual Minimum Temperature	4 °C
Average Days of Screen Frost	36 Days per annum
Mean Average Bright Sunshine	2040 Hours per annum
Average Annual Rainfall	666 mm

Farm area

Milking Platform	159 ha
Runoff [East Block]	14 ha



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Soil

Soil types

% Milking Platform

Free-draining shallow stony soils (Eyre soils)	5
Deep sandy soils (Paparua and Templeton soils)	45
Imperfectly drained soils (Wakanui soils)	30
Heavy, poorly-drained soils (Temuka soils)	20

Soil test results

Date	pH	P	K	S	Ca	Mg	Na
Dec – 01	5.8	30	11	34	8	23	12
Jul – 02	5.8	31	14	35	9	22	12
Oct – 02	5.9	35	8	29	8	21	12
Jun – 03	6.1	37	12	7	9	23	9
Jun – 04	6.4	37	13	11	9	22	10
Jun – 05	6.1	35	13	10	9	22	8
Jun – 06	6.3	33	15	9	10	27	11
Jun – 07	6.3	39	16	17	10	29	13
Jun – 08	6.1	36	12.4	9	10	29	12
Jun – 09	6.1	32	11	11	9	30	9
Target Soil Test	5.8 – 6.2	30 – 40	5 – 8	10 – 12	4 – 5	20+	5 – 50
Soil Reserve K = 4.5 (Target = 0.8 – 1.2)							

Fertiliser history

Date	Dressing	N	P	K	S	Mg	Ca
Season 2001/02		200	168	-	130	-	94
Season 2002/03		200	45	-	2	-	90
Season 2003/04		200	45	-	64	-	46
Season 2004/05		200	46	-	47	-	57
Season 2005/06	Non-Effluent	200	48	-	76	-	107
Season 2005/06	Effluent	0	30	-	53	-	67
Season 2006/07	Non-Effluent	200	49	-	89	-	110
Season 2006/07	Effluent	0	20	-	52	-	45
Season 2007/08	Non-effluent	200	44	-	73	-	96
Season 2007/08	North Effluent	12	22	-	37	-	48
Season 2008/09	Non-Effluent	245	53	-	88	-	115
Season 2008/09	North Effluent	0	22	-	37	-	48
Season 2009/10	Non-Effluent	-	45	-	47	-	20
Season 2009/10	Effluent	-	5	-	47	-	20

Pasture

- The milking platform was sown at conversion [March 2001] in a mix of 50/50 Bronsyn/Impact ryegrasses with Aran & Sustain white clovers, and 1kg/ha of Timothy.
- Individual paddocks are monitored, & seven [7] [33% of area] have been renovated to maintain pasture performance.
 - 2 paddocks of Arrow plus Alto perennial ryegrasses (all with Kotare/Sustain white clovers & Timothy)
 - 3 paddocks of Bealey, and
 - 2 paddocks of Alto perennial ryegrasses (all with Kotare/Sustain white clovers & Timothy)
- Pasture consumption for 04/05 season calculated at 15.9t DM/ha, & for 05/06 at 16.1t DM/ha & for 06/07 at 16.4t DM/ha.

Irrigation and effluent system

Centre-pivots	127 ha
Long Laterals	24 ha
K-Lines	10 ha
Hard Hose Gun	14 ha
Total irrigated	175 ha
Irrigation System Capacity	5.5 mm/day
Length of basic pivot	402
Well depth	90m

Statistics

- A full rotation completed in 20.8 hours for 5.5 mm [at 100% of maximum speed].
- Average Annual Rainfall = 666 mm. Average irrigation input applies an additional 450 mm. Average Evapotranspiration for Lincoln is 870 mm/year.

Effluent

- Dairy shed effluent is held in sump capable of holding 33,000 litres and a 300,000 litre enviro saucer.
- 100 mm PVC pipe to base of North Block centre pivot, distribution through pot spray applicators.
- System being developed to also apply effluent on to the South Block and outside the pivot.



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Mating programme 2009

7 weeks DNA Kiwicross and DNA Friesian sires followed by 3 weeks natural mating. Aim is to retain cows that calve to the first 10 weeks of mating. Yearlings to be naturally mated starting two weeks before PSM for main herd.

Herd details

Breeding Worth (rel%) / Production Worth (rel%)	119/46	137/55
Average weight / cow (dec) – [30] cows monitored	490 kg	
Calving start date	8 August 2009	
Mid calving date	17 August 2009 (9 days)	
Mating start date	30 October 2009	
Empty rate (nil induction policy) after 10 weeks mating	19% 2008 [14% after 12 weeks 2007]	

	03/04 Season	04/05 Season	05/06 Season	06/07 Season	07/08 Season	08/09 Season
Milkers - ave/max/wintered	635/644/660	649/651/675	646/651/672	/680/706	/680/704	/684/704
Total kg/MS	271,971	277,634	286,115	274,965	281,670	261138
Total kg/MS/cow	422	427	440	410	414	385
Total kg/MS/ha	1684	1719	1772	1703	1744	1645
Farm Working Expenses/kgMS	\$2.64	\$2.64	\$2.63	\$2.80	\$3.37	\$3.95
Dairy Operating Profit/ha	\$2008	\$2768	\$2357	\$3002	\$8284	\$2004
Payout [excl. levy] \$/kg	\$4.22	\$4.56	\$4.07	\$4.47	\$7.87	\$5.20
Return on Assets	5.6%	6.9%	5.5%	6.7%	14.6	4.8%

Stock numbers

		2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
1 July cow numbers		631	660	675	664	702	704	704	683
Max. cows milked		604	644	651	651	670	680	683	660
No. Yearlings grazed	On/Off	0/118	0/139	0/140	0/175	0/172	0/171	0/200	0/160
No. Calves grazed	On/Off	0/141	0/143	0/162	0/170	0/175	0/200	0/170	0/160
Cows wintered off	No. cows	500	520	500	500	540	546	547	
	Weeks off	8	7	8	8	8	9	7	9
Stocking rate	Cow equiv. / ha	3.75	4.0	4.0	4.0	4.2	4.2	4.3	4.15
	Kg liveweight / ha	1,838	1,960	1,960	1,960	1,974	2,058	2,107	-
	Kg liveweight / tDM	76	79	83	77	87	83	89	-
Supplement - fed - Purchased	[kg/cow]	550	385	300	315	266	415	342	-
- Made on dairy/platform	[kg/cow]	0	98	220	365	93	95	64	-

Staffing & management

Roster System – 8 days on 2 off 8 days on 3 off

Milking Times – Morning: cups on 5.00 am
– Afternoon: cups on 2.30 pm



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SEASONAL UPDATE – MAY 2010

Summary for the Season

- Estimated Operating Profit / ha for the season is \$ 4,980/ha
- Estimated Farm Working Expenses = \$3.35/kgMS
- Estimated Operating Expenses S = \$3.75 /kg MS
- Production estimate for the Season is 1,722 kg MS and 415kg MS/cow
- Per cow milk production peaked at 2.09 kg MS/cow and 8.53 kg MS/cow. This was earlier and more sustain than in previous years.
- Cows were milked OAD from calving until day 21 post calving when they were milked (TAD). The strategy reverted to only milking colostrums OAD on the 1st September
- Silage Fed to Date 227,040Kg DM (344 kg DM/cow)
- Silage made to date from the milking platform 95,253 kg DM.
- The estimate bought in feed until the end of the season is 275 Kg DM/cow
- Nitrogen use for the season to date is 216 kg N/ha (in non- effluent area)
- Eco-n was applied as normal this season as we expect to get financial returns as well as environmental gains
- Pasture Eaten / ha was estimated between 16 and 17 t DM/ha
- 660 cows peak milked from 688 wintered
- AB Mating for 6 weeks followed by 4 weeks with Bulls - 87 cows not in calf at 10 weeks

SEASON UPDATE

At the beginning of the season (June-August) growth rates were similar or lower than the last previous seasons. However, the good weather conditions made calving easier and good pasture utilization could be achieved. For the rest of the season except for December and February the average monthly growth rates have been lower than previous years and below the 4 years average.

As in every season the key remark about the weekly growth rates is the variability. As can be seen in the graph on page 9, growth dropped 30 kg DM/ha/day from the 8th of November to the 15th of November. The same drop was seen from the 13th of December to the 27th of December

Rainfall to end of April in the 2009/10 season was 390 mm. This compares to the 2008/09 season of 675 mm at the end of April. May last year recorded a further 194 mm taking the annual total to 869 mm.





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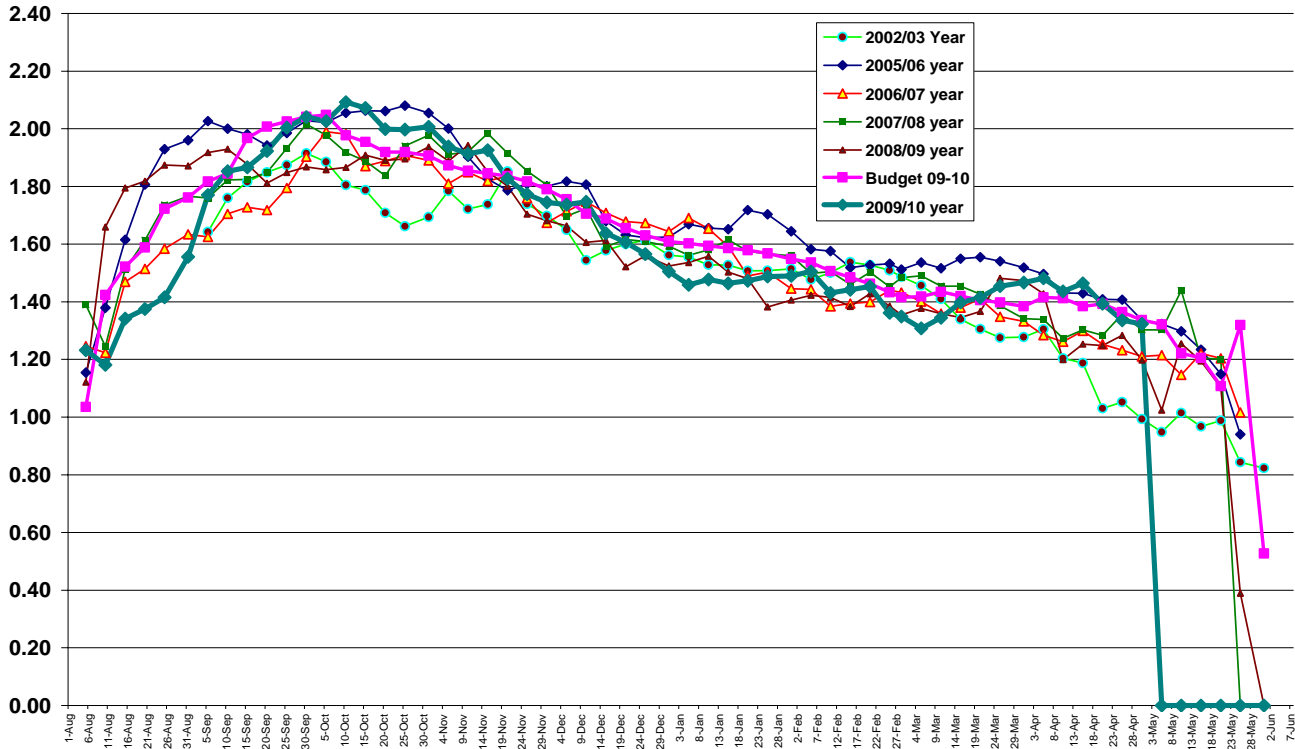




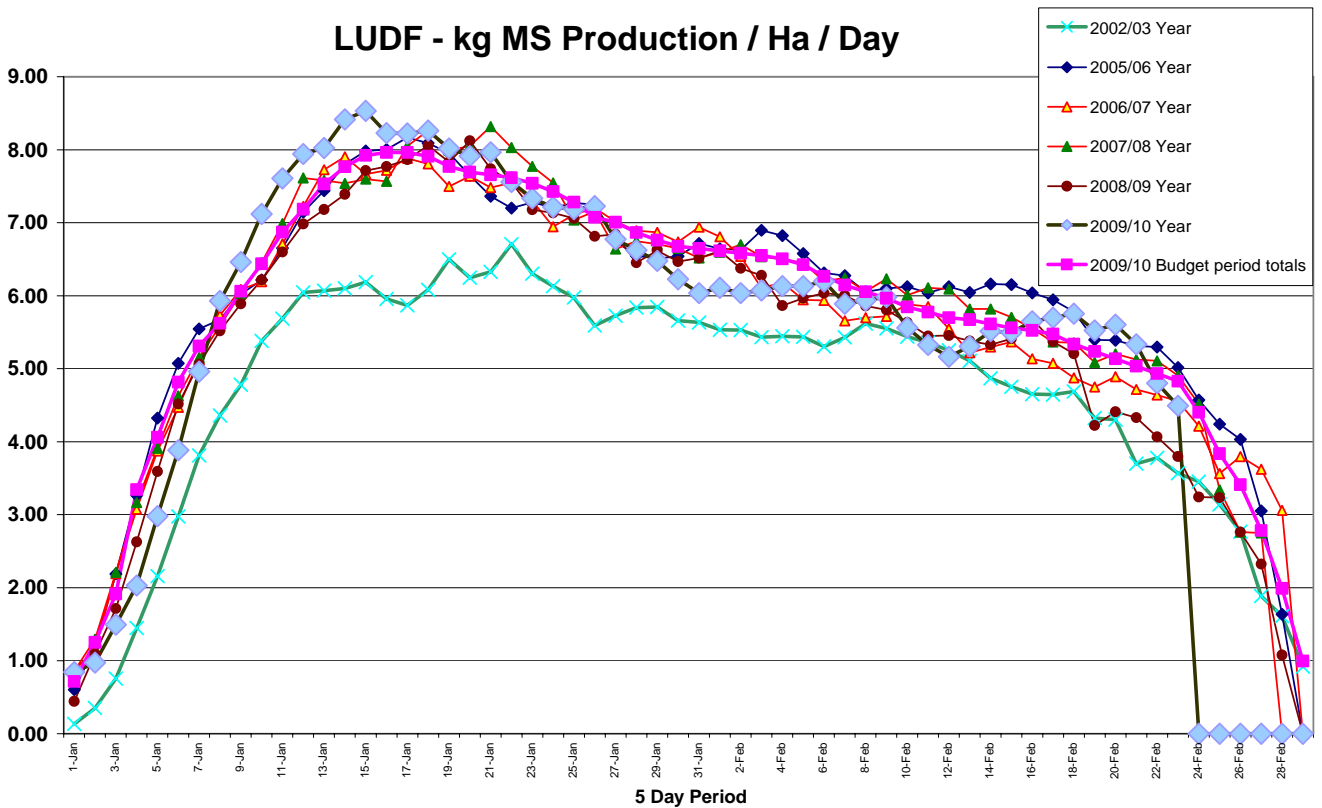




LUDF Kg MS Production / Cow / Day



LUDF - kg MS Production / Ha / Day





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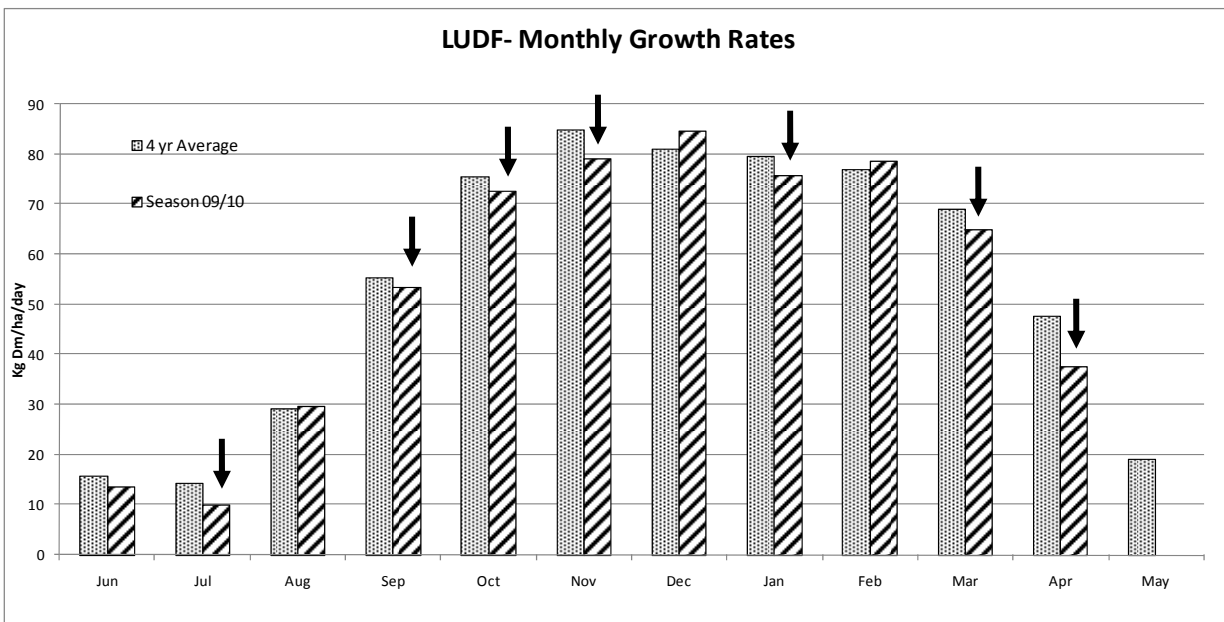
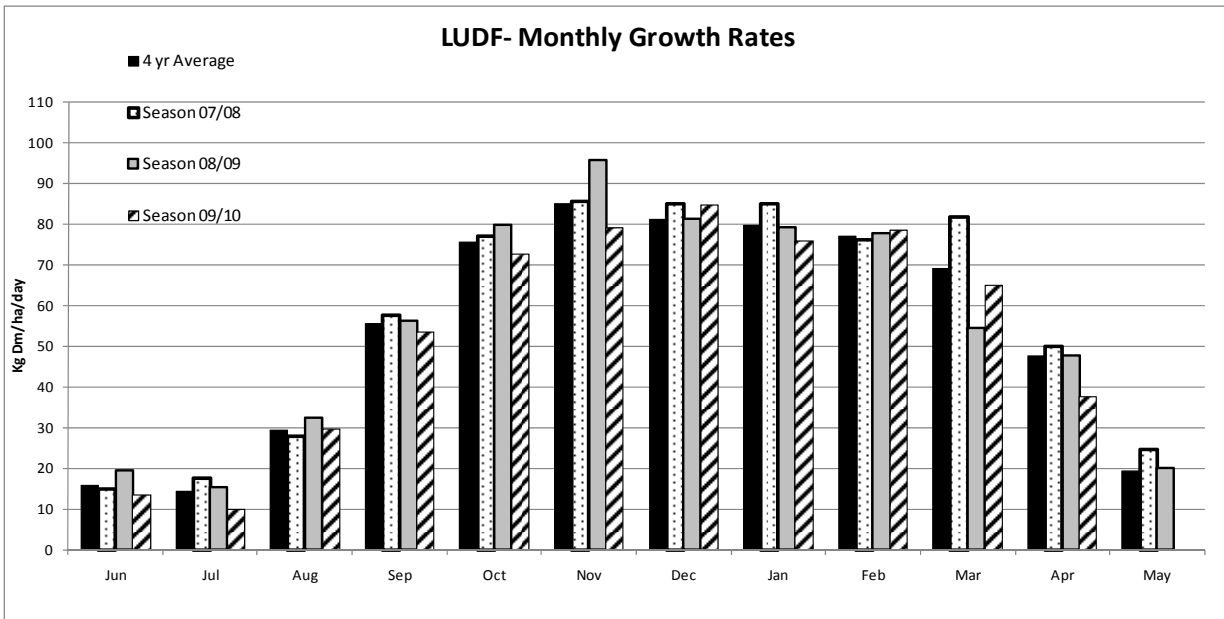








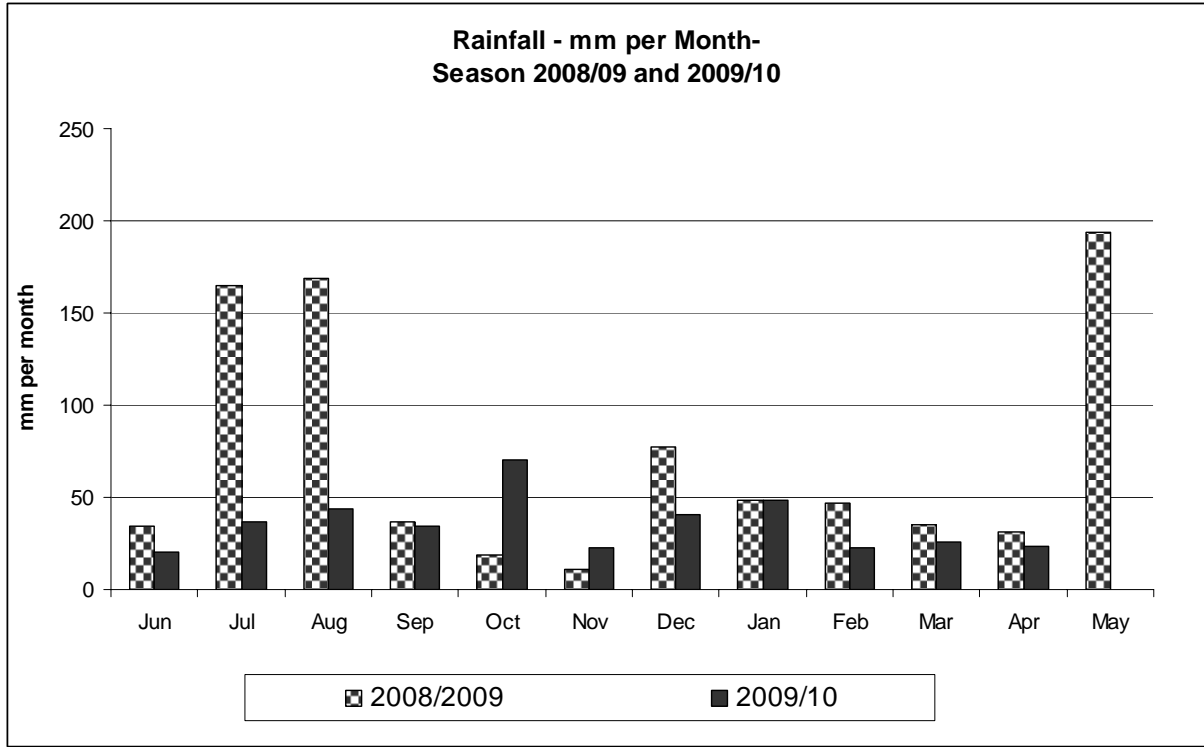
LUDF Monthly Growth Rates – last 4 seasons



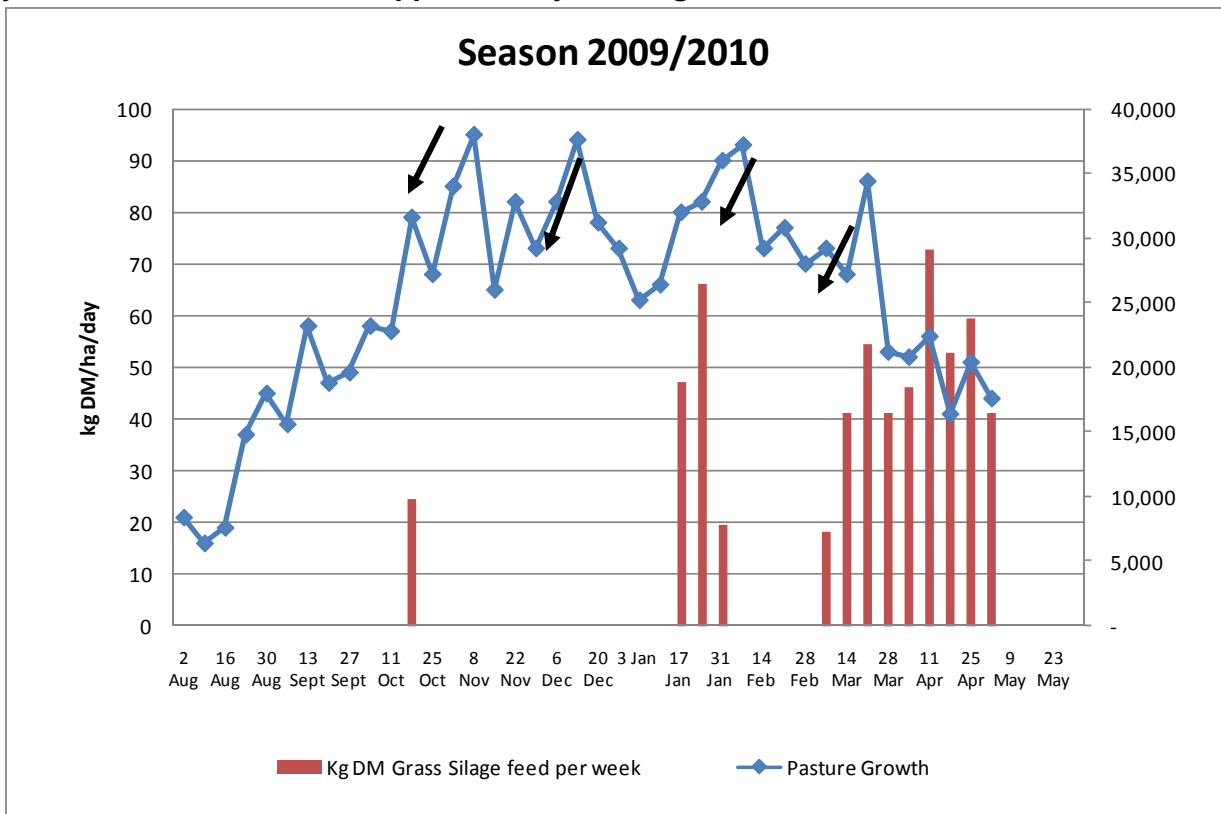
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Weekly Pasture Growth Rates / Supplementary Feeding



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No silage was feed to the milkers until the 20th of October where we fed 9.8 tonnes over 3 days. Then we fed silage again in January 53 tonnes DM for 3 weeks. The January feed deficit was a result of a cold cloudy month. Our policy is to feed supplements to maintain residuals at 1480 kg DM/ha and to protect round length (above 19-20 days).

We started the autumn supplement on the first week of March after growth rates have been dropping for a few weeks. At that point we had the plan to feed in the autumn 265 kg DM/cow (120 kg DM bought in and 145 cut from the milking platform). We went into this autumn with fewer supplements than previous seasons because we reduced the bought in supplement when the \$4.55 payout was announced. In mid April we made the decision of bringing 50TDM of extra feed otherwise we would have had to dry more cows off earlier or milk them OAD.

See expected return on supplement (page 12-13)

Summary of supplement feed and made last 4 seasons

	2009 /2010	2008/2009	2007/2008	2006/2007
Peak cows numbers	660	680	680	680
Kg DM supplement feed /yr	227,040*	276,760	341,360	226,420
Kg DM Silage made on farm /yr	95,253	44,736	64,923	59,270
Bought in Supplement /yr (feed-made)	131,787*	232,024	276,437	167,148
Kg DM bought in supplement fed /cow/yr	200*	341	407	246

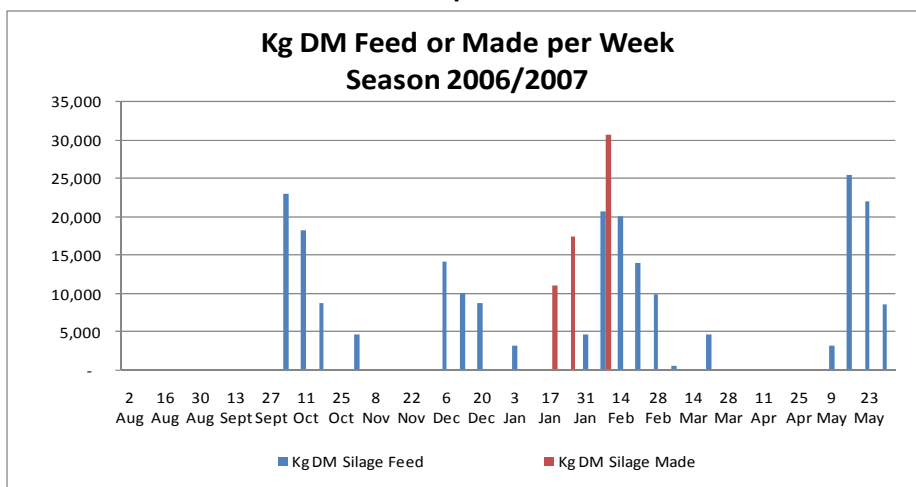
*For the current season numbers are to 4th of May

To the 4th of May we had fed 344 kg DM/cow (200kg DM of bought in feed). An extra 50 TDM will give a total supplement use for the season of 419 kg DM/cow or 275 kg DM bought in silage.

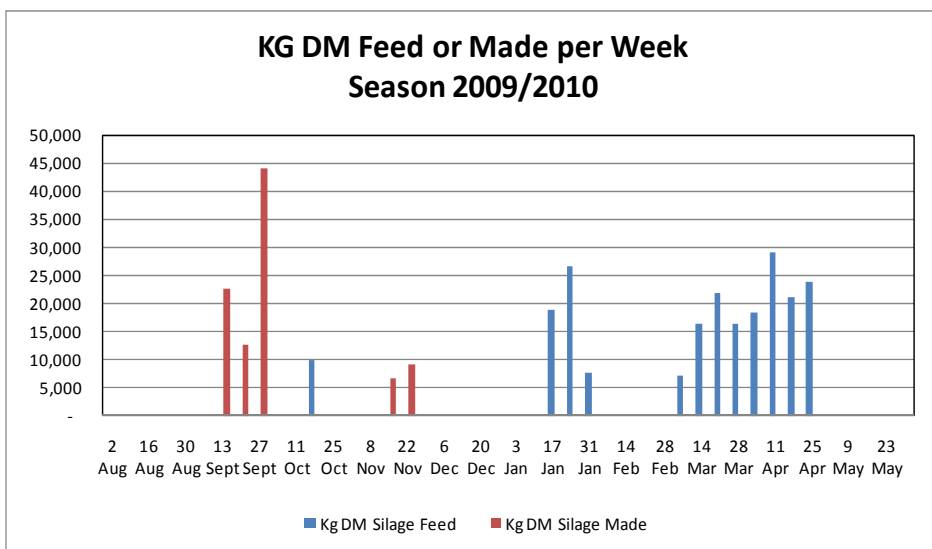
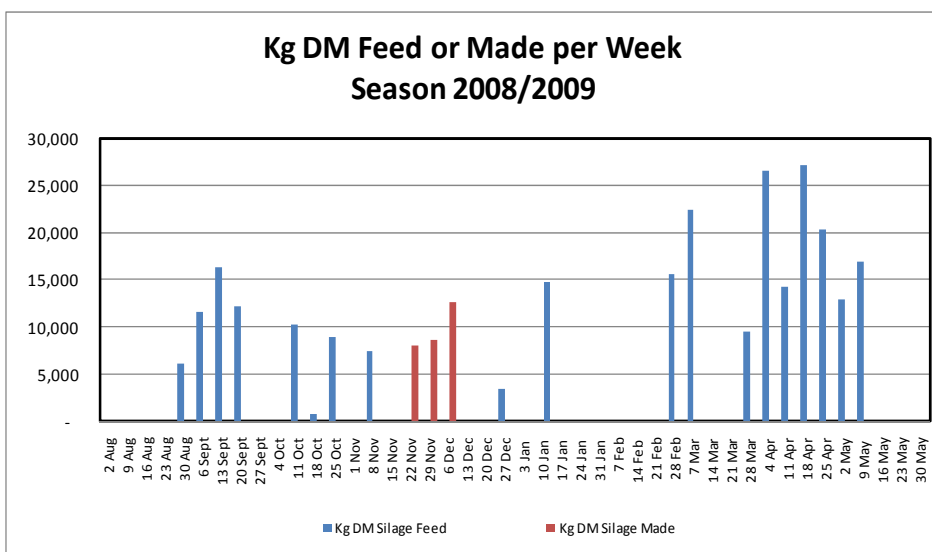
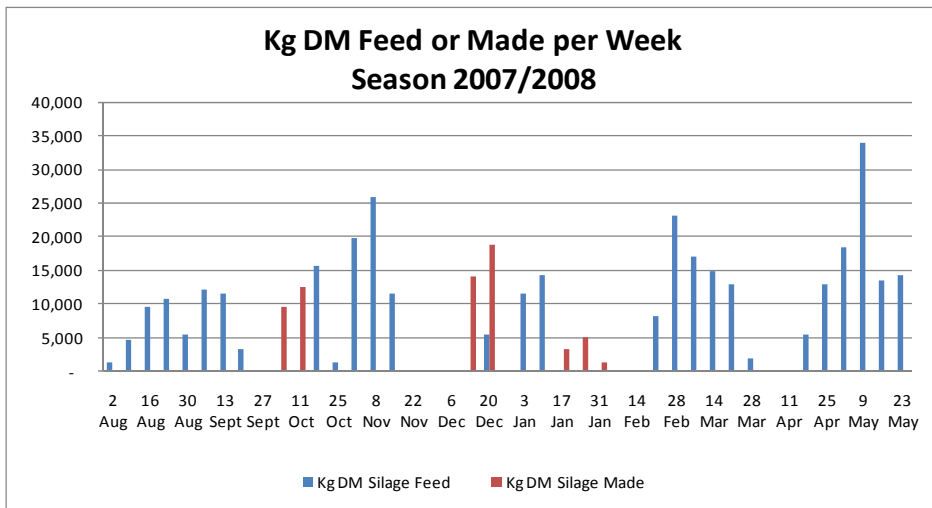
Silage Made

The farm has the policy of cutting silage as soon as is evident in the feed wedge and this decision occasionally means that we are cutting the silage and then feeding it out again in the following week (as occurred in January 2006, October and December 2007). This season we cut the silage to deal with the surplus but didn't need to feed the silage afterwards.

SUMMARY OF SILAGE FEED AND MADE – TOTAL KG DM per WEEK



SUMMARY OF SILAGE FEED AND MADE – TOTAL KG DM per WEEK



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Profitability of Purchasing Feed to Extend Lactation

WorkSheet 1 - Extra Milksolids from Purchased Feed

Wastage

Silage

Storage & Stack Management

Excellent (inoculant, bunker, no loose silage at face)	5%	
Average (well compacted & covered, no loose silage at face)	10-15%	
Poor	20-40%	

Feeding Out Silage Paddocks

Excellent (dry conditions grass silage)	10%	5%
Excellent (dry conditions maize silage, side delivery)	15%	
Average (good conditions minimal spillage loading wagon)	20-25%	
Poor (wet conditions, losses loading wagon, dumped in padk)	40%	

Feeding Out Silage Bins

Very good (attention to detail no silage left in bins)	5-10%	
Poor (Spillage/overfilled, 2 ^o fermentation, silage left in bins)	25%	

Palm Kernel (PKE)

Storage & Stack Management

Average (concrete & covered; minimal wastage loading)	10-15%	
Poor (not in proper bunker)	20%	

Feeding Out PKE Paddocks

Average (dry conditions fed on top of other feed)	25-30%	
Poor (wet conditions fed onto pasture)	50%	

Feeding Out PKE Bins

Very good (bins not overfilled)	10%	
Poor (Spillage/overfilled, trailers)	25%	

Concentrates

Storage

Average (fresh feed, good facilities)	5%	
Poor	15%	

Feeding Out Concentrates In Shed

Very good (all conc. eaten each feed good facilities)	5%	0%
Poor (spillage, small grain, whole grain)	25%	

Other

Total Wastage

5%

Milksolids Response From Supplement

Total Supplement Purchased kg wet

Kg wet A 50,000

Dry Matter % (Maize silage bought on DM basis use 100%; PKE 90%)

B 100%

Total Supplement Purchased kg DM

A X B = C 50000

Kg Milksolids from Supplement Purchased

Refer to Table 1 FarmFact 1-56

g MS/kg DM D 80

- Based on above wastage and grazing management

Extra Milksolids kg MS

C X D/1000 = E 4000

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Profitability of Purchasing Feed to Extend Lactation

Worksheet 2 - Return from Purchased Supplement

Extra Milksolids kg MS (from Worksheet 1) E

Extra Income

Milksolids payout F

Extra Income Extra MS X Payout $E \times F = G$

Costs

Supplement H

Electricity & Shed Expenses I

(approx 0.15 cents/cow/day)

Feeding out costs

Extra Labour (include extra relief milking) J

Tractor running costs K

(2-3 cents/kg DM silage; 1-2 cent PKE)

R&M - tractor/feedout wagon/bins etc L

(incl mishaps; wear & tear races etc)

Depreciation - tractor/feedout wagon/bins etc M

(2-3 cents/kg DM silage; 1 cent PKE/in shed feeding)

Interest on Additional Shares

Extra Shares a

Cost/Share b

Interest Rate c

$a \times b \times c = N$

Other (impact on capacity adjustmt charge 09/10) O

Total Costs $\text{Sum H...O} = P$

RETURN FROM SUPPLEMENT $I - P$

Other Considerations

Will the cows have sufficient time to reach the target condition at calving - allow 1/2 CS gain per month

Will feed cover be high enough to sustain milking on & reach target cover at calving - need to slow the rotation

Impact on cashflow of milking on

Staff, time to feedout, other jobs, holidays

Milk quality

If extra shares need to be purchased consider cashflow and benefits of extra shares

Risk to achieve milksolids response - wet autumn/wastage of supplement; skill; attention to detail



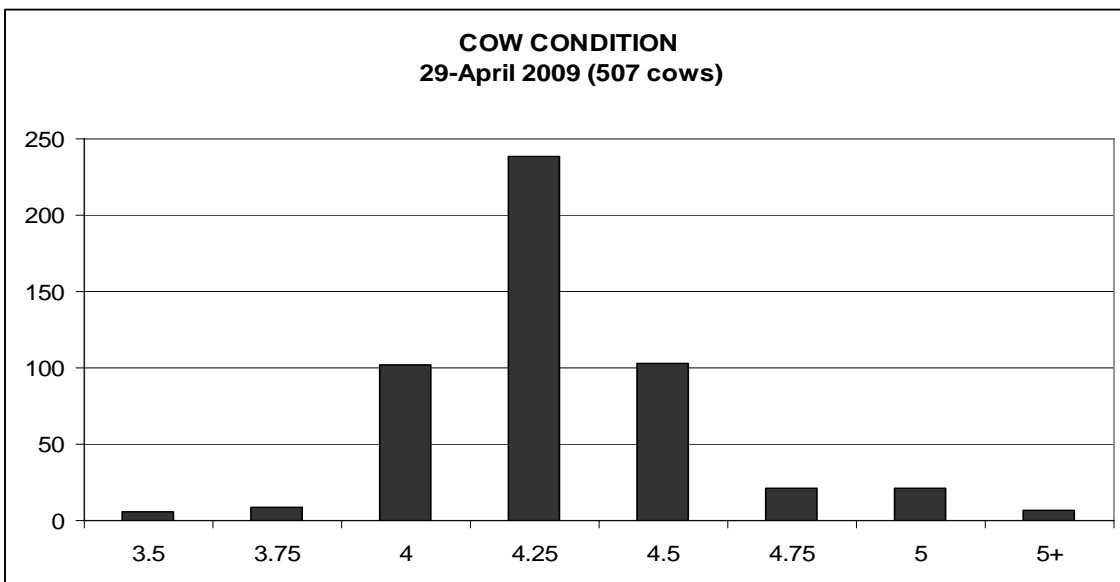
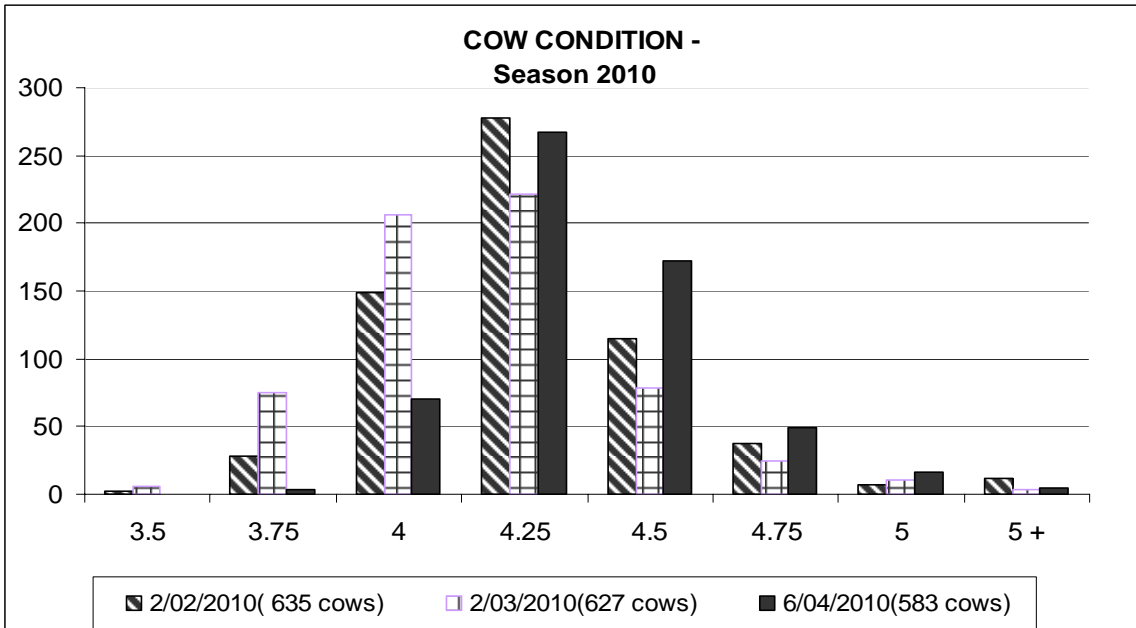
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COW CONDITION – REVIEW FOR the SEASON

The team was very pleased with the condition of the herd at calving with only a few cows below Condition Score 5. Emphasis was put on Condition Score at Drying off and during winter and the efforts paid off because the targets for cows and heifers were achieved.

At this end of the season also cows are in much better shape than last year. We have been doing monthly cow condition scoring of all cows in the shed this season. As the results are showing in the graphs below at the beginning of April there were about 60-70 cows below CS 4. Comparing to the previous season that on the 29th of April we had more than a 100 cows CS 4.



On the 30th of April we dried 32 cows on condition that are calving before the 25th on August. We will condition the cows again and any cows that are early calvers (calving before the 25th of August) will be dried off. We should not have any early calving cow that are CS 4.

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ANIMAL HEALTH AND COW WASTAGE – REVIEW OF THE SEASON

KEY SUMMARY POINTS

- Total deaths for the season to date is 1% of cows wintered
- From 1st June to end of December 4.4% of cows were lost due to death or early culling
- This season we had 128 cows identified as lame which represents 19% of the cows (128/660)
- On average these cows were counted as lame for 26 days compared to 15 days in the previous season
- 41% of the lame cases were White Lane followed by Sole Penetration (26%) and Footroot (25%)
- Following the use of teat seal, there were only 2 cases of Mastitis at calving for first calvers (out of 187 heifers).
- The incidence of Mastitis at calving of the mixed age cows that were only treated with Dry cow antibiotics at drying off but not treated with teatseal was surprisingly high given the dry and warm conditions during the calving period
- Out of the 660 cows peak milked this season we have had a total of 99 mastitis cases to date which represents 15% of the herd (99/660 cows)
- Of the 187 heifers 6 had mastitis to date which represents 3% of heifers (6/187)
- Of the 186 cows that were treated with Dry Cow antibiotics and teat sealed, 13 cows had mastitis this season to date which represents 2% of the total herd (13/660) or 7% of the teat sealed cows (13/186)
- Of the rest of the herd of 287 cows that only received Dry Cow Therapy, 80 have had mastitis to date representing 12% (80/660) of the herd or 28% (80/287) of this groups of cows





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Summary of Cow Wastage – Deaths

Month		Season 09/10	Season 08/09	Season 07/08
June	Heart Failure	0	0	1
July	Other	1		
August	Accidental	0	1	0
	Bloat	0	0	0
	Other	1	1	2
	Milk Fever	1	2	1
September	Liver Problems	0	2	0
	Bloat	0	0	0
	Milk Fever	1	0	1
October	Bloat	0	1	0
	Milk fever	0	0	1
	Johnnes	0	0	1
November to May	Bloat	1	0	0
	Unknown	1	0	1
	Broken Back (mating)	1	0	1
	Johnnes	1	1	2
Total		8	8	11

Summary of Cow Wastage – Cull cows

	Season 09/10	Season 08/09
June	0	0
July	5	0
August	8	4
September	4	5
October	0	3
November	1	3
December	5	3
Total	23	18

Summary of cows lost (Cull & Dead)

	Season 09/10	Season 08/09
Cows on 1 st June	688	704
Death to the end December	7	8
Culls to end of December	23	18
Cows at 31 st December	658	678
% lost	4.4 %	3.7%
Total cows lost from 1 st June to end December	30	26



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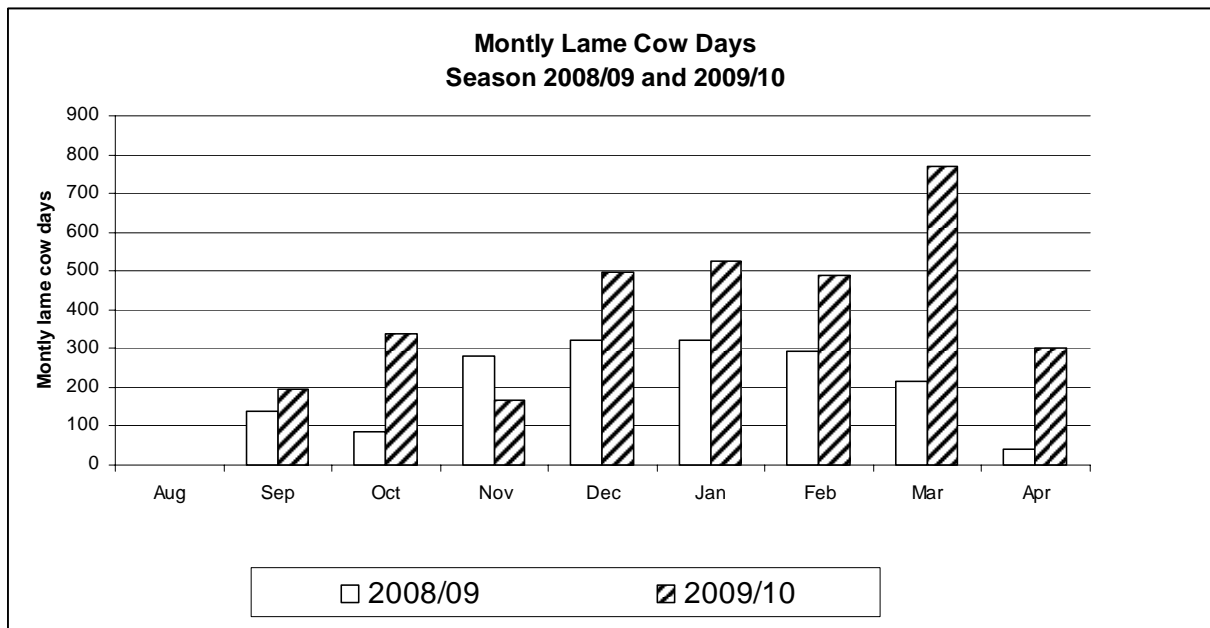
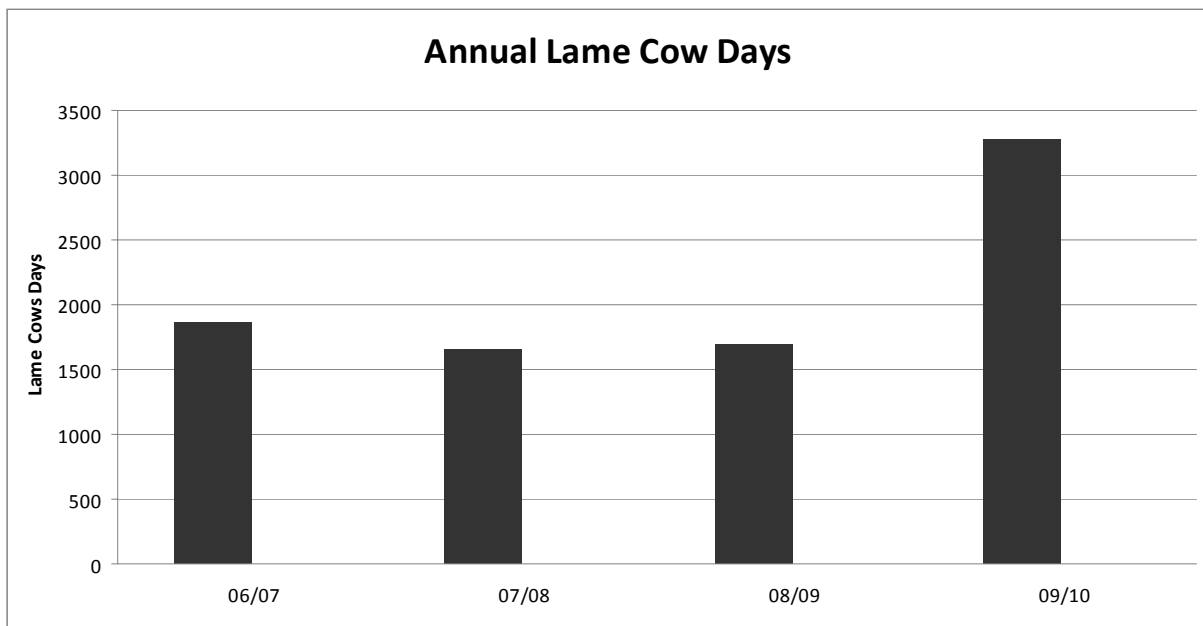




LAMENESS – Review of the Season

This season we had 128 cows identified as lame which represents 19% of the cows (128/660). This number is higher than the 102 cows we had lame last year which represents 15% of the peak cows milk (102/680).

Comparing the annual lame cow days for both seasons, the time the cows were registered as lame cows last season (2008/2009) was 1,701 days (17 days /102 cows) compared to 3,283days (26 days /128 cows) for this season (2009/10). The annual lame cows days is calculated by adding the average number of cows in the lame mob every week multiplied by 7. This number would count cows that have been lame more than once.





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Analysis of the Data - 2009/10 Season

- 19% of the cows were lame (128 /660 cows)
- 105 cows were lame once
- 19 were lame twice
- 4 were lame three times
- Which Foot?
 - 12% were lame on Front Left
 - 7% Front Right
 - 44% Back Left
 - 37% Back Right
 - 5 cows were lame in both back feet
- What did they have?
 - 41% WHITE LINE
 - 5% BRUISING
 - 2% INTERDIGITAL LESSION
 - 26% SOLE PENETRATION
 - 25% FOOTROOT
- How were the cows treated?
 - 116 cows were Trimmed
 - 40 cows had Excenel
 - 2 Cows Depocillin
 - 13 Shoe fitted

POSSIBLE CAUSES OF LAMENESS AT LUDF

- The high incidence of white line suggests that cows are under pressure either in the yard or at any point in the race or entrance to the dairy shed.
- The sharp hand right turn from the underpass to the yard has been identified as an issue that will require capital investment to change
- Cowflow on underpass
- Dampness of underpass at some times of the year (could explain high incidence of Footroot)
- The state of the South Lane
- Cows pressure in the yard

REASONS FOR ADDITIONAL LAMENESS THIS SEASON

- Really we don't know
- But the main difference between this season and last season is the time cows spent in the lame mob
- Many farmers have reported higher levels of lameness this season
- We haven't changed anything other than the on-farm staff, who have been trained as in previous years.
- The South lane has been a problem in the past but it has been much worse this season

STRATEGY FOR NEXT SEASON

- Recap south lane
- Change layout of the underpass to avoid sharp corner to the yard
- Earlier identification of lame cows
- More staff training to prevent, identify and treat lame cows
- Review of treatment policy to reduce time cows take to recover



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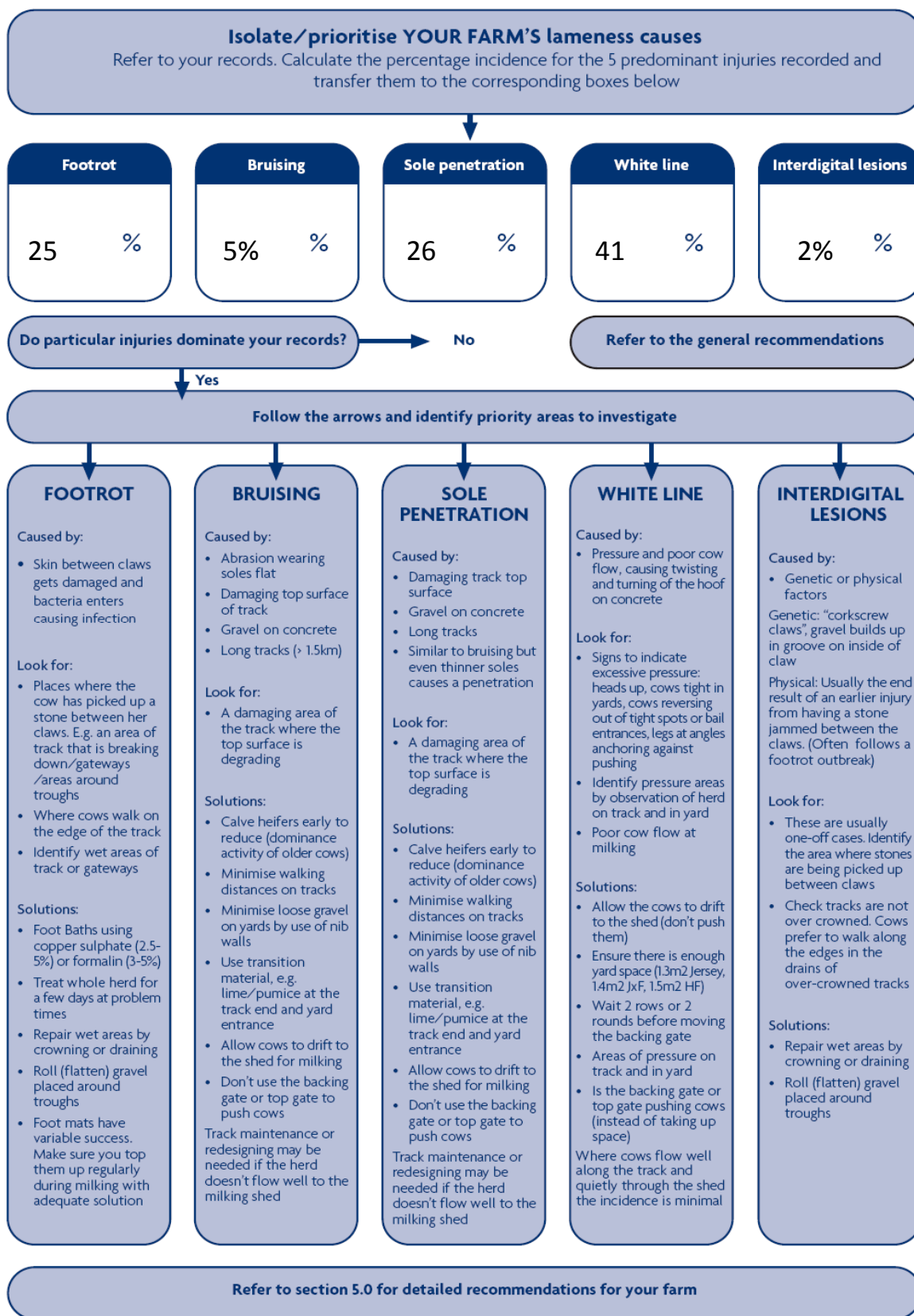
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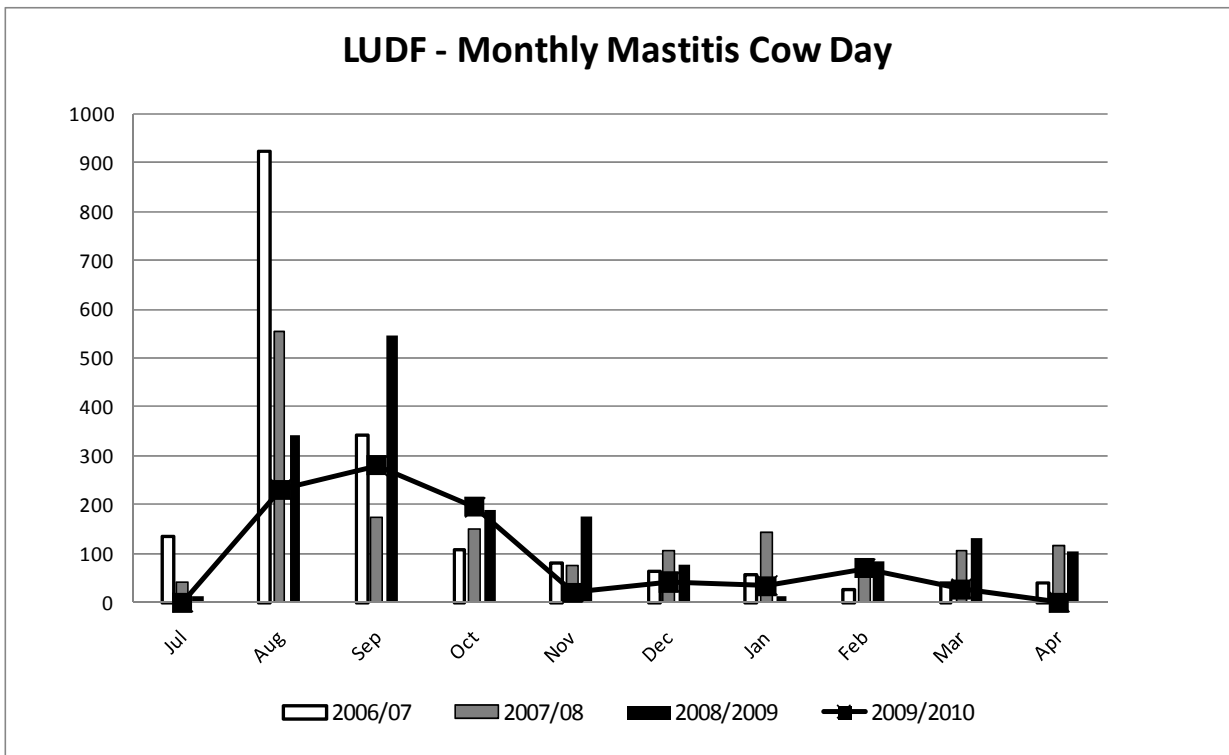
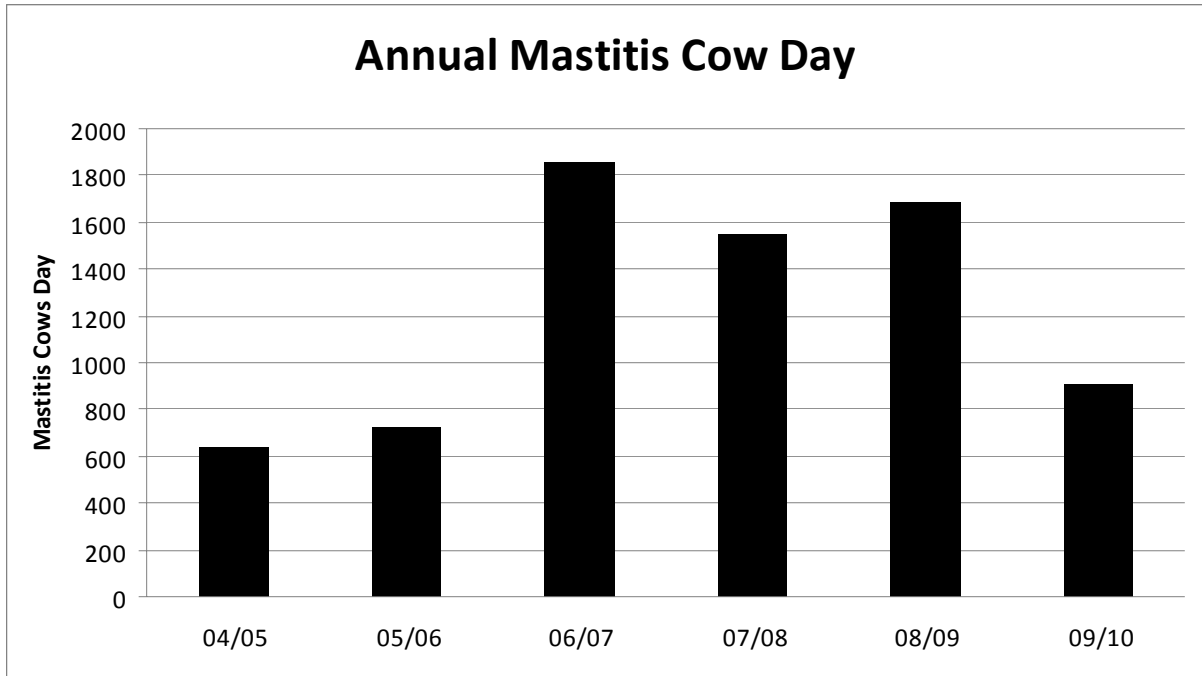
LUDF – Type of Lameness Recorded

Healthy Hoof - Recording Sheet



MASTITIS

As can be seen in the graphs below mastitis has been lower this season than the last 3 seasons. However, the level is still not as low as seasons 2004/05 and 2005/06. The lower incidence of mastitis is particularly noticeable in spring and in autumn (March and April). Dry conditions in spring no doubt are a factor contributing to this result and also the use of teat seal in heifers and part of the cows.



- Out of 660 cows this season we had a total of 99 mastitis cases which is 15% of the herd
- 187 R2s of which 6 had mastitis = 1% out of 660 or 6% of R2s
- 186 cows were dry cowed and teat sealed of which 13 cows had mastitis this season = 2% out of 660 or 7% of teat sealed cows
- Rest of the cows only received dry cow = 12% out of the 660 or 28% of the rest of the cows

Table 4: Production Losses due to Mastitis

	04/05	05/06	06/07	07/08	08/09	09/10
Cows milking day lost *	639	723	1854	1550	1680	903
Average MS lost / day	1.5	1.5	1.5	1.5	1.5	1.5
Total MS lost	959	1085	2781	2325	2520	1355

*a cow milking day is every full day that a cow is in the treatment mob and its milk is being withheld from factory supply.

STRATEGY FOR NEXT YEAR

- R2 Heifers will be teatseal before calving . The process takes about 6 hours and we need about 6 people to do it.
- All mixed age cows will be Blank Dry Cow Therapy. Cows that haven't exceeded SCC of 150,000 at any herd test will be treated with a short acting antibiotics (DrycloxDC). Cows that have exceeded this level at any herd test will be treated with a long acting antibiotic (Dryclox xtra) . For heifers the threshold will be SCC of 120,000. (This policy follows the SAMM plan)
- All mixed age cows will be teatseal.

Summary of cost of the Strategy

Treatment	Cost (excluding GST)
Teat seal	165 Heifers x 9.6 \$/heifer = \$ 1,584 522 cows x 9.6 \$/cow = \$ 5,011
Short Acting AB	243 cows X 6.4 \$/cow = \$ 1,555
Long Acting AB	217 cows x 9.8 \$/cow = \$2,126
TOTAL COST	\$10,277 = 15 \$/cow

Teatseal all Mixed Age Cows – what can we expect?

Assuming that the direct cost of mastitis for a cow is \$116 per cow (lost production = 1.8 kg MS/cow/day* 8 days*\$6/kgM = \$86 + Antibiotics treatment = \$30 = Total cost \$116 per infection). This will be the minimum cost since there are other losses such as direct milk loss during current lactation, subsequent infections causing loss of a quarter, early culling etc. With these numbers in mind a reduction of 43 infections for the season will break even with the cost of the teatseal for all mixed age cows.

Based on this season results we should expect to have 100 less infections by teat sealing all the mixed aged cows.



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REPRODUCTIVE PERFORMANCE

LUDF - Progress to Date in Calving and Mating

SEASON	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10
Days to mid Point * (all herd)		22	23	14	12	16	15	9**
Days to mid Point* (MA cows)		22	23	22	16	22	18	15
4 week calving rate	64	63	61	69	72	66	70	81
% Cows still to calve 1 month PSM	14	17	12	12.6	9	7	6.3	3.6
% Cows treated as Anoestrus		36.7	24.3	14.5	17	8	23	0
Mating Period (weeks) Cows				15	16	15	10	10
AB Period (weeks) cows				10	8	6	10	6
Mating Period (weeks) Heifer				8.5	10	8	8	8
AB Period (days) Heifers				3	3	3	3	0
Heifer synchrony	yes	Yes	yes	yes	yes	yes	yes	No
6-Weeks In calf rate (%)				65	67	66	67	74%
% EMPTY Cows	16	17	20.5	16	14	14	20	13
% EMPTY R2					6	2	5	14

*Days to mid point is to Plan Start of Calving of the main herd

** Days to mid point for the whole herd is 9 days since heifers started calving 14 days before the cows

SUMMARY SEASON 2009 / 2010

1. CALVING: The mature cows and heifers had a very compact calving this season with the heifers starting 2 weeks before the main herd. The Plan Start of Calving (PSC) of the main herd was the 8th of August (5 days later than the previous season).
2. Mating Period for cows was 10 weeks (6 weeks of AB and 4 weeks of Bulls)
3. Heifers were Bull mated for 8 weeks.
4. Heifers were not synchronised this year as the DNA genetics required was not available. The AB semen that was available was not better that using bulls in terms of BW. Also it was a cost saving strategy.
5. We used 16 Bulls with the heifers for the first 3 weeks and then 10 of them were removed and rested and used with cows. We had all 16 Bulls with the 180 cows that were left to mate with the bulls
6. We had plenty of bull power and they were rotated and well rested
7. Heat Detection was done using tail paint and Peter (Farm Manager) in the Platform every morning.
8. Bulls used were well grown 2 years old Jersey bulls
9. Heifers were well grown and were in good condition at the start of mating
10. The poor performance of the heifer mating appears to be related to the performance of the Bulls



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MATING CALENDAR

Mating Calendar Season 2009/2010 - **TOTAL COWS IN THE HERD 660**

Date	What happened	Comments
26 th September	Tail Paint applied to cows	
5 th October	Cows were Metro-checked.	6 cows with Metritis infectious were treated with Metricure
5 th October	Blood samples were taken from 10 cows to check mineral status	
9 th October	Bulls were put with the heifers	16 bulls with 160 heifers
16 th October	The herd has been vaccinated against BVD this week after receiving a test result from bulk milk that indicated the disease is being spread in the herd	
23 rd October	Last Cow CALVED	
30 th October	MATING BEGAN - 90% of the cows have had a recorded cycle before the start of Mating	Of the 60 cows left to cycle only 16 have been calved for more than 42 days.
3 rd November	Ten of the non cycling cows that the walk-over weighing recorded as losing weight have been put on once a day milking and run separately from main herd.	
10 th November	We have 37 cows left to cycle . 6 of the light non-cycling cows are still being milked OAD.	Of these 37 cows, 24 have been calved for more than 42 days.
17 November	We have 21 cows left to cycle . 6 of the light non-cycling cows are still being milked OAD.	Of these 21 cows, 19 have been calved for more than 42 days
21 st November	596 cows have been mated in 3 weeks achieving the industry target of 90% Submission Rate in 3 weeks.	No CIDR's have been used to date.
24 th November	We have 30 cows left to cycle and mate . Six of the light non-cycling cows are still being milked OAD.	
28 th November	634 cows were mated after 4 weeks 96%	
10 th December	Six weeks of AB mating finish Bulls are now running with the herd. We had 180 cows still to be mated with the Bulls at this point NRR at 3 weeks 65%	We had 16 bulls and 8 are with the herd on a rotational basis. The bulls spend a day with the herd and are then rested for a day.
7 th January	Bulls removed from the herd	
15 th January	526 cows (80%) judged pregnant at 6 weeks post-mating, of 660 peak cows milked. This is the number on the day given by Vet But the Fertility Focus Report correct this number with the Mating records 74% in calf-rate from the Fertility Focus Report	See FFR on this Handout
19 February	Pregnancy test found 87% of cows in calf.	So there are 13% of cows to do re-checks.



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28 February	87 cows rechecked were found to be MT So final MT rate is $(87 / 660) = 13\%$	
11 th February	14% Heifers were found MT	

POSSIBLE STRATEGIES FOR NEXT SEASON

- We will do Heifer Synchrony this coming spring
- We will mate the heifers for 8 weeks
- We will aim to calve the heifers 12 days before the main herd is due to start calving
- Calving pattern is critical so if cows are not cycling to target we will use CIDRs' with cows that have been calved for more than 42 days
- No inductions
- BVD Vaccination:
 - 166 R2 heifers will be vaccinated pre-Mating (about \$8/heifer)
 - Mixed aged cows will get a booster before Mating (about \$4/cow)
 - Bulls will be vaccinated (about \$8/Bull)
 - We will be doing a Bulk Milk Test any day now which it will tell us if there is a PI animal still in the herd. If the test says that it is still present we will have to decide if we will be looking for the PIs with blood testing, which is quite expensive.
- We will own the bulls earlier in the season so we can have better control on them and vaccinate them earlier
- We will consider doing an intensive fertility check of the bulls
- We will do 10 Weeks of Mating with the cows (6 week AB and 4 weeks of Bulls)





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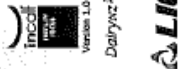


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Behind Your Detailed Fertility Focus Report

Report date: 05/05/10
 PFR: BQCY
 Herd Code: 6714
 Calving up to this date requested for analysis: 05/05/10
 No. of cows included: 664
 These cows calved between: 22/06/09 and 28/12/09
 Mating start & stop dates (pre-mating period): 30/10/09 - 12/01/10

Report period: Cows calved between 22/06/09 and 28/12/09. This was the most recent period with sufficient herd records that enabled an analysis to be completed.

Calving system: Seasonal
 Your herd has been identified as seasonally calving because more calvings occurred in a single 10-week period than in any other 10-week period.

Level of analysis: Detailed
 Your herd record keeping process is detailed and analysis was possible for your herd.

Part A) Herd records cross check

Check that the herd records in the table are complete and correct.

	2009/10	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
No. of calvings		12	379	448	24									672
No. of AI matings					60	713	100							873
No. of signed prog tests										572	87			659
No. of nonsigned prog tests												24	1	25
No. of cows culled or died		7	2	7	5	4	3	3				1	24	46
														132

Part B) Notes on the calculations

Use the following notes to see how your results were calculated.

1 Overall herd reproductive performance

6-week in-calf rate
 Your report has been based on the mating and pregnancy test results for your herd. The ACTUAL 6 week in-calf rate is shown for your herd.

Energy rate
 The energy rate reported was based on the results of pregnancy testing. The range provided are the lowest and highest likely values.

2 Drivers of the 6-week in-calf rate

3-week submission rate
 662 cows had calving dates in the required range and 50% of these were submitted during the first 3 days of mating.

Non-return rate (1-24 days)
 Non-return rate is not calculated when pregnancy test results provide an accurate estimate of conception rate.

Conception rate
 669 eligible inseminations were used in calculating your herd's conception rate.

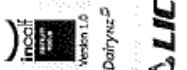
Pre-mating heats
 657 cows had calving dates in the required range and 50% of these had a pre-mating heat recorded.

Non-cycling cows
 No cows were identified as being non-cycling. If you did record non-cycling cows, please supply records to ensure these cows are identified.

Performance after week 6
 Your herd's performance after week 6 of pregnancy testing is shown. This is used to determine the success of your herd's mating program after the first six weeks. If bulls were used after week 6 of mating, this gives an assessment of how well they fit your cows in calf.

Induced cows
 No cows were identified as having induced calving. If you did induce cows, please ensure that they are identified.

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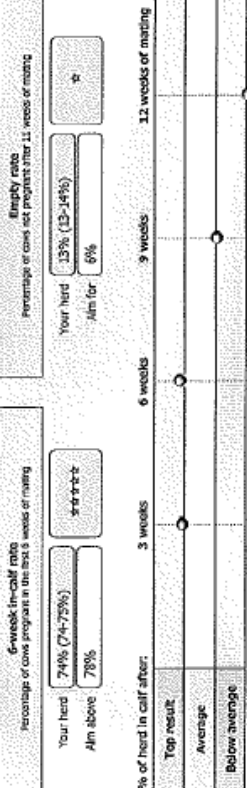


Fertility Focus 2009: Seasonal

Report date: 05/05/10
 PFR: BQCY
 Herd Code: 6714
 No. of cows included: 664
 These cows calved between: 22/06/09 and 28/12/09
 Mating start & stop dates (pre-mating period): 30/10/09 - 12/01/10
 Mated start of calving: 08/08/10

Lincoln University
 C/O The Manager (University Dairy Fa)
 PO Box 94
 Lincoln University Lincoln 7647

1 Overall herd reproductive performance



2 Drivers of the 6-week in-calf rate

3-week submission rate
 % of cows that were inseminated in the first 3 weeks of mating
 Your herd: 90%
 Aim above: 90%

Non-return rate
 % of inseminations that were not followed by a return to heat
 Your herd:
 Aim above:

Conception rate
 % of non-mated cows that resulted in a confirmed pregnancy
 Your herd: 57%
 Aim above: 60%

3 Key indicators to areas for improvement

Calving pattern of first calvers
 Has management actions for quality and care
 Calved by Week 3: 92%
 Your herd: 92%
 Aim above: 92%

Calving pattern of whole herd
 Did late calvers reduce in-calf rates?
 Calved by Week 3: 68%
 Your herd: 68%
 Aim above: 68%

Heat detection
 A high % of early-cycling cows should be inseminated in the first 3 weeks of mating.
 Your herd: 69%
 Aim above: 69%

3-week submission rate of first calvers
 Your herd: 93%
 Aim above: 90%

Pre-mating heats
 A high % of well-mated cows will occur before the start of mating.
 Your herd: 90%
 Aim above: 85%

Non-cycling cows
 Treated By PSM: 0%
 Your herd: 0%
 Aim above: 0%

Performance after week 6
 If you can't see how week 6 of pregnancy testing affects herd performance.
 Your herd: 13%
 Aim above: 13%

What should I see?

Ranking	What does it tell me?
Top result	Best - keep up the good work
Average	Getting there - focus on getting the details right
Below average	Plenty of room to improve - seek professional advice
No result	Not enough information provided - seek help with records

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LUDF Budget vs Forecast to Year End

Lincoln University Dairy Farm

Budget for 2009 - 2010

Forecast 09 - 10

Estimate @ early May 2010

Year ending May 31	159.1ha	Budget	2009 - 10	Forecast 09 - 10	Difference	
Milk production	Milksolids	\$4.55/kgms	1,745/ha	277,630	274,000	
Cows	Peak number & prodn	660cows	4.15/ha	421/cow	3,630 kgms	
Staff	3.70 FTE's	178cows/FTE		75,035ms/FTE		
Income			c/kgMS	c/kgMS	\$ change	
Milksolids	93%	1,263,214	4.55	6.10	1,671,400	
Dividend				0.30	83,400	
Surplus dairy stock	2%	29,100	0.10	0.08	22,000	
Other stock sales	0.043532379	58,818	0.21	0.24	64,500	
	0%		-	0.00	0	
	0%				0	
	100%	1,351,132	4.87	6.72	1,841,300	
Stock Purchases		22,400			20,800	
Gross Farm Revenue		1,328,732	8,352/ha	1,820,500	491,768	
					37%	
Expenses			2009 - 10	2009 - 10	Forecast	
			\$/cow	c/kgMS	\$	
					\$ change in	
					% change in	
Administration		27,250	41.3	0.10	0.08	21,000
Animal Health		40,054	60.7	0.14	0.17	47,000
Breeding Expenses		28,793	43.6	0.10	0.12	32,500
Electricity-farm		14,500	22.0	0.05	0.06	17,500
Employment		203,132	307.8	0.73	0.70	192,000
Grass silage purchased	200 kgDM/cow	26,219	39.7	0.09	0.21	56,550
Silage making & delivery		40,943	62.0	0.15	0.04	12,192
Replacement grazing & meal		106,509	161.4	0.38	0.41	113,600
Winter grazing - Herd		123,346	186.9	0.44	0.52	141,500
Nitrogen and EcoN		69,853	105.8	0.25	0.23	62,000
Fertiliser & Lime		38,990	59.1	0.14	0.13	35,000
Freight & Cartage		800	1.2	0.00	0.00	200
Irrigation - All Costs		57,751	87.5	0.21	0.24	65,000
Rates & Insurance		15,864	24.0	0.06	0.06	15,863
Cropping		-	0.0	-	0.00	-
Regrassing		5,810	8.8	0.02	0.06	15,125
Repairs & Maintenance		47,500	72.0	0.17	0.15	41,500
Shed Expenses excld power		8,200	12.4	0.03	0.03	7,800
Vehicle Expenses		18,300	27.7	0.07	0.08	21,200
Weed & Pest		1,400	2.1	0.01	0.00	600
Accommodation allowance 3 houses		20,000	30.3	0.07	0.07	20,000
Cash Farm Working Expenses		895,215	-	3.22	3.35	918,130
Depreciation est		110,000		0.40	0.40	110,000
Total Operating Expenses		1,005,215		3.62	3.75	1,028,130
Dairy Operating Profit		323,517	490	1.17	2.89	792,370
DOP		2,033/ha				4,980/ha
Cash Operating Surplus		433,517		1.56	3.29	902,370
		2,725/ha				5,587/ha





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LUDF Financial comment May 2010

The year began with an income expectation of \$4.55 per kg of Milksolids and the subsequent additional caution with expenditure strategies. The budget included 200kg DM as purchased supplementary feed for lactation, one full time staff member less, 5% regrassing (one paddock), the possibility that full maintenance fertiliser may not be available from the budget, reduced cost at mating especially CIDR's, minimum AB semen and very tight control on R & M.

This included a plan to hold the total spend on running the farm to \$895,000 (compared to over \$1million the previous season)

It is likely that the total expenditure for the year will be \$23,000 more than budgeted.

During the year the prediction for milk income has lifted significantly and as a result two key decisions were taken

To re-grass an additional paddock	\$8,100
Purchase additional supplementary feed for lactation	\$9,000
Also separately the decision around BVD was made	
Vaccination of the herd for BVD	\$5,090
Total	\$22,190

We had thought that grazing fees for young stock off farm would have reduced in value during the year but the revitalisation of milk value has not seen this eventuate.

We were able to achieve full maintenance fertiliser from the budgeted amount by changing to DAP13S in the spring and eco-n reduced in cost a little from the budget expectation.

Substantial resurfacing of the South Lane was budgeted but major repairs to the North Block irrigation well and to the dairy rotary platform caused us to postpone that expenditure.




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Strategic use of reduced milking frequency

Jane Kay, Agustin Rius, Claire Phyn, & John Roche



Objectives

- Define response to short term OAD:
 - a) At the very start of lactation (3 or 6 weeks)
 - b) In well fed (500kg MS) and average fed cows (360 kg MS)
 - c) When severely restricted




Waikato experiment 2009/10

- One herd of cows on TAD
- One herd of cows on OAD for 1st 3 weeks
- One herd of cows on OAD for 1st 6 weeks
- Diet: Pasture + 4kg DM concentrates
- Pre-grazing height (clicks)

OAD = 16.9
TAD = 17.0
- Post-grazing residuals (clicks):

OAD = 9.1
TAD = 8.3


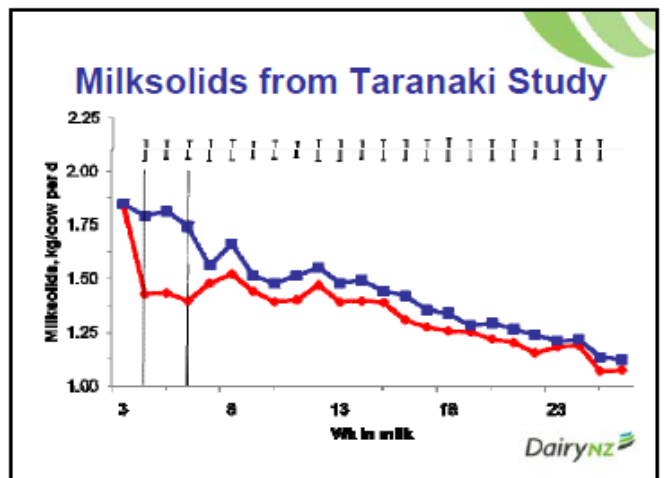
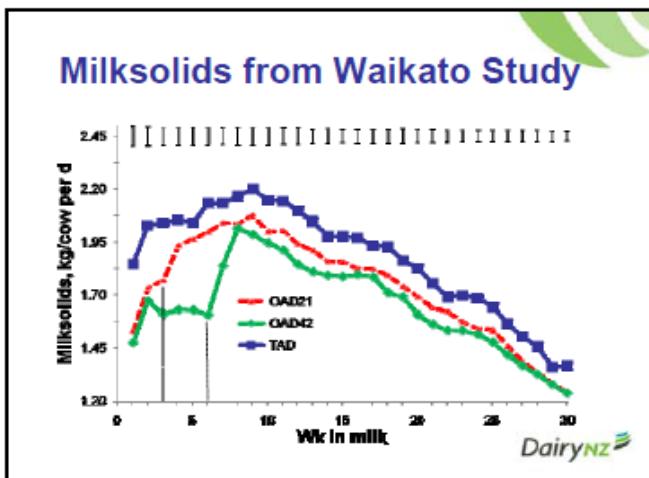


Taranaki experiment 2009/10

- One herd of cows on TAD
- One herd of cows on OAD for 3 weeks
- Week 3 to 6 of lactation
- Diet: Pasture only
- Pre-grazing height (clicks):

OAD = 14.5
TAD = 14.0
- Post-grazing residuals (clicks):

OAD = 8.0
TAD = 7.9

Cum. Milksolids - Waikato (270 days - extrapolated)

	OAD21	OAD42	TAD
MS, kg	489	444	507
Difference, kg	37	62	
Revenue, \$	2,863	2,711	3,090
Difference, \$	227	379	

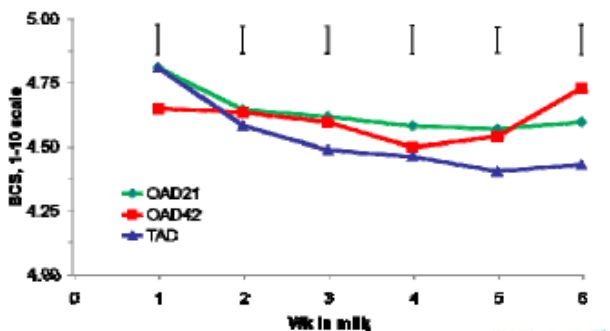


Cum. Milksolids - Taranaki (200 days)

	OAD21	TAD
MS, kg	211	230
Difference, kg	19	
Revenue, \$	1,290	1,406
Difference, \$	116	



Body condition score - Waikato



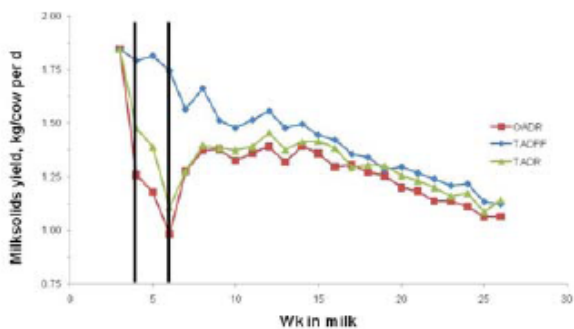
Note: exaggerated scale. Not significant



Taranaki experiment 2009/10

- One herd of cows on TAD and fed well
- One herd of cows on TAD and restricted } 3 weeks
- One herd of cows on OAD and restricted
- Diet: Pasture only
- Post-grazing residuals (clicks):
 - TAD_{ff} = 7.6
 - TAD_r = 4.6
 - OAD_r = 4.5
- Est. pasture DMI (kg DM/d):
 - TAD_{ff} = 14.0
 - TAD_r = 8.4
 - OAD_r = 8.2

Milksolids from Taranaki Study

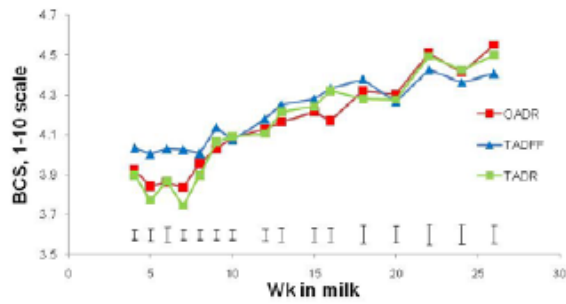


OAD during a restriction (Cum milksolids 200 days)

	OAD _r	TAD _{ff}	TAD _r
Milksolids, kg	200	230	209
	30		21
Revenue, \$	1220	1405	1278
	185		127



Body condition score - Taranaki



Note: exaggerated scale. Not significant

Summary

Season production losses from OAD milking

- Early lactation well fed cows
 - 3 wks - 7%
 - 6 wks - 12%
- Average spring feeding
 - Wks 3-6 - 8%
- 50% feed restriction
 - Wks 3-6 - 13%

TAD plus 50% feed restriction wks 3-6 - 9%

Conclusions

- Magnitude of milk production loss with early lactation OAD milking is dependent on
 - Amount of time on OAD
 - Nutrition during the OAD period
- However, short durations of OAD milking reduce milk production for the remainder of lactation (by approx. 7-8% for 3 weeks)



Once a Day milking at LUDF in early lactation

In the 2009/10 season early calving heifers and cows were milked once a day (OAD) for 3 weeks. The farm usually has the policy of milking colostrum cows OAD (for 4 days) but this was the first season we have milked a large number of cows OAD for 3 weeks. Early calving heifers are usually milked OAD for about 10 days until there are enough in one mob to milk twice a day (TAD).

This spring, cows were milked OAD from calving until day 21 post calving when they were milked (TAD). The strategy reverted to only milking colostrums OAD on the 1st September due to excellent pasture growing conditions and pasture utilisation.

From start of calving until the 1st of September about

- **140 cows and 90 heifers** were milked OAD **for 3 weeks**
- **113 cows** were milked OAD for approximately **2 weeks**
- **160 cows** were milked OAD for approximately **1 week**.

A TAD herd started on the 20th of August with cows that had been calved for more than 3 weeks. TAD cows were separated via Protrack each morning and given a separate paddock until afternoon milking. Following the afternoon milking TAD cows were returned to the same paddock as OAD cows enabling one herd to be brought in for each morning milking. The TAD mob increased in numbers each day as cows moved past 21 days post calving. Feed was allocated to both OAD and TAD herds on the basis of the spring rotation planner and cows were moved once residuals were achieved. The intent was to offer the same level of feeding to milking cows, irrespective of milking frequency.

Background of the OAD Strategy at the LUDF

What was the situation at the start of the 2009/2010 season?

- A forecast payout of \$4.55/kg MS.
- LUDF management team cut costs by slightly reducing the stocking rate (23 less cows, 0.15cows /ha), reducing bought-in supplement use, limiting CIDR use, and reducing staff numbers.
- Average Pasture Covers (APC) at the start of calving was 150 kg DM /ha below the farm target of 2,450 kg DM/ha.
- The low APC meant pasture allocations were lower than target therefore OAD milking provided an option that may reduce the stress on the cow.

Usually:

The LUDF can be a very wet farm and we do not have, apart from the yard, an area that can be used to stand cows off for any length of time. We have to avoid damaging the pastures at all cost due to the effect on subsequent production and to do so we need to stand cows off if it is wet, restricting cow intake. As the only supplement we have available is Baleage the wastage is quite high in wet conditions.





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Extending OAD milking past the 4 days for colostrums could help manage the spring workload without incurring additional labour cost or exhausting farm staff, thus enabling staff to focus on calving cows, calf rearing, checking mastitis and all other animal health issues. Healthy, live cows and careful feed and pasture management generate profit as well as milk in the silo.

What did we know about OAD milking in early lactation at the time of making this decision in Winter 2009?

- Research suggesting losses in milk production during the period of OAD milking of about 20% and a carry over effect for the whole lactation with loss of production of up to 9% compared to cows milked TAD.
- The longer the cows are on OAD milking the bigger the effect in total production for the season. OAD for 3 weeks was likely to have a smaller effect than OAD milking for 6 or 10 weeks. So we considered that 3 weeks was the maximum time we were prepared to milk cows OAD.
- Cows milked OAD for 3 weeks after calving are likely to have a similar (or only slightly lower) intake than cows milked TAD
- Therefore cows milked OAD in early lactation are likely to have a better energy balance, therefore they are likely to start putting condition sooner.
- It is difficult to prevent cows losing condition in the first 6 weeks of lactation, however previous research has shown OAD cows start gaining condition earlier than cows milked TAD. There have been some suggestions of a positive effect of OAD milking in early lactation on reproductive performance but it had not been confirmed by science under New Zealand conditions.
- Anecdotal positive results had been reported by farmers already using this strategy
- In choosing the 3 week OAD option we weighed up the potential lost milk production against the available opportunities heading into spring 2009.
- Spring is a stressful and busy time of the year for large herd teams. LUDF has a history of trailing methods to reduce stress on cows and people where similar or better outcomes can be achieved e.g: feeding calves OAD, milking colostrum cows OAD.

So what happen?

- Milking cows once a day helped reduce the workload of the team which had 2 fewer staff members for 4 weeks compared with spring 2008/09. Employing casual staff at this time of the year was considered a risky option.
- It is impossible to make any relevant comment on the effect of OAD milking in relation to production, reproduction or animal health since we did not have a control herd to compare with.
- Milk production remains on the budget target for 1720 kg MS/ha and 415 kg MS/cow
- We acknowledge that very good growing conditions in the spring may have contributed to this seasons total production. We do not have a comparative herd to be certain how much seasonal production loss occurred as a result of the use of OAD this season.
- Reproductive performance has improved: probably a consequence of a combinations of factors;
 - strong emphasis on wintering to achieve cow condition targets,
 - ongoing emphasis of mating performance for many years,
 - the favourable spring ground conditions and feed supply,
- With hind sight and the growth rates and good pasture utilization achieved this spring the change to TAD for the whole herd should probably have occurred 7-10 days earlier.



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Cost analysis of OAD milking in early lactation according to Research information available

Cows fed to produce 425 kg MS/cow

Herd 660 cows

Loss of potential production for the season

Cows milked OAD 3 weeks = 7%* (29 kg MS/cow)

Cows milked OAD 2 weeks = 5%** (20 kg MS/cow)

Cows milked OAD 1 weeks = 3%** (13 kg MS/cow)

* Indicative based on latest research in the Waikato

** Estimate based on current knowledge

Number of Cows	Gross Cost of lost Production
230 OAD 3 weeks	29 kg MS/cow x 230 cows x \$ 6.10 = \$40,687
113 OAD 2 weeks	20 kg MS/cow x 113 cows x \$ 6.10 = \$13,786
160 OAD 1 week	13 kg MS/cow x 160 cows x \$ 6.10 = \$12,688
POTENTIAL TOTAL LOSS	\$ 67,161= \$422/ha

Potentially the herd could have lost \$67,161 in Gross Income (11,010 kg MS at \$6.10/kg MS) or produced an additional 69 kg MS/ha or 17 kg MS/cow. However we find difficult to believe that the farm would have produced nearly 1,800 kg MS/ha or 442 kg MS/cow considering how the rest of the season has been.

At a \$4.55/kg MS payout the potential loss in gross income would have been \$50,095/kg MS.

Will we do it again?

- Under the current farm set up – Yes - in extreme conditions (eg very wet, sudden reduction in staff etc). We would be likely to only milk OAD for as short a period of time as possible to reduce the production loss. (eg only 2 weeks instead of 3).
- If cows can be feed adequately and stand off safely they will be milked TAD
- Cows will continue to be milked OAD for 4 days during the colostrum period for ease of management, the effect on the cows, less milk fever and because we have not seen any increase in mastitis levels.
- The decision to use OAD milking will be made based on a cost benefit analysis of this strategy compared to other available options such as, extra grazing, feeding supplements accepting higher wastage. Seriously damaging pasture and soils will not be an option.



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Productivity: What's next?

Chris Glassey, Farm Systems Specialist, DairyNZ, Hamilton

Future Productivity Gains for LUDF: Squeezing More Juice from the Orange

How will LUDF become more efficient?

Why does it need to? It's already quite profitable.

Increased Profit relies on efficiency (productivity) gains.

If the price of MS and Inputs remain constant the only way to increase profit is to improve efficiency. Need more from the same or less inputs

If efficiency remains constant the only way to improve profitability is if MS price increases, or input costs go down. The last few years should have taught us not to rely on that.

What is Productivity?

- 1) Productivity:
$$= \frac{\text{Physical Outputs}}{\text{Physical Inputs}} = \frac{\text{Production}}{\text{Resources Used}}$$
- 2) Productivity measures on-farm Efficiency and Performance
- 3) There are many efficiency and performance measures on a dairy farm and they include

Kg MS/ha, kg MS/cow, Kg MS/kg LW, Kg MS/t DM, kg MS/mm water applied, Kg MS/kg Phosphate applied, Return on assets (measure of capital use efficiency)

- 4) Why is **Productivity** different to **Profitability**?

To an extent Productivity can be controlled by the farmer, where Profitability is often related to increases/decreases in world prices for outputs (MS price) and inputs (cost of fuel, capital etc) that the individual farmer has little control over.

Farmers will sacrifice efficiency to maximise short term profit by increasing inputs at a faster rate than outputs.

Increasing Productivity Requires:

- More from less -
- More from the same-
- Way more from much more –





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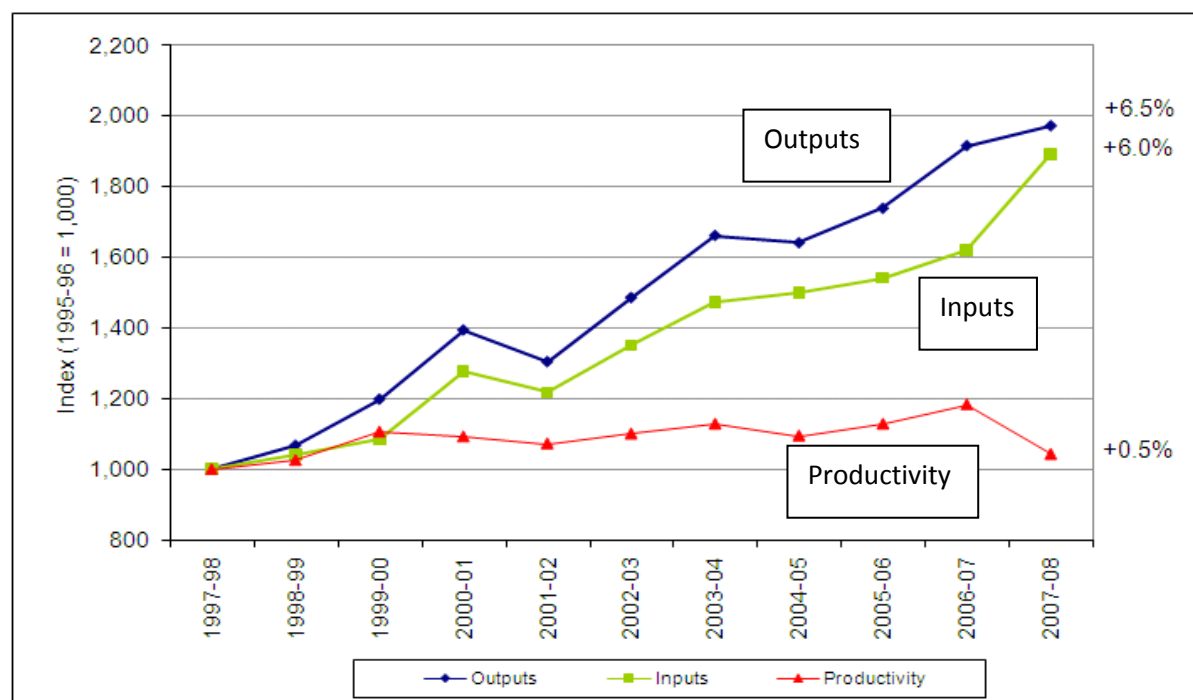








NZ Dairy Farm Output, Input and Productivity Movements: 1997-2008



The decade up to June 2008 saw milk production double on the average NZ dairy farm. The majority of this extra production came from an increase in inputs such as land, cows and farm working inputs, and only a small proportion from more efficient utilisation of resources.

How has LUDF been tracking?

How much has productivity gain contributed to extra profit at LUDF in the past 7 seasons?

The following table is a Profit from Productivity (PFP) calculation for LUDF

	2003-2003	2003-2004	2009-2010est	Profit from Productivity Gains since 2002-2003	Profit from Productivity Gains since 2003-2004
Kg MS/ha	1411	1684	1720	1411	1684
Gross Farm Revenue \$/kg MS	4.25	4.47	6.35	6.35	6.35
Operating Expenses \$/kg MS	3.67	3.10	3.75	4.44*	3.75#
Operating Profit \$ per kg MS	0.58	1.37	2.60	1.91	2.60
Operating profit \$ per ha	\$818	\$2307	\$4472	\$2694	\$4377
Profit from Productivity Gain				\$1778	\$95

*opex from 2002-2003 adjusted for inflation, # Opex for 2004-2004 adjusted for inflation

(source : Matthew Newman , Dairy NZ, Economist)

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Conclusion from the Table above:

- Most of LUDF efficiency and performance gains were made in the 2003-2004 season by increasing production and reducing costs compared with 2002-2003.
- \$1778/ha of this years estimated operating profit of \$4472/ha can be attributed to improved efficiency, i.e. more MS and less input compared with 2002-2003. (operating profit would only be \$2694/ha if production and inputs were the same as 2002-2003)
- Only \$95/ha of this years operating profit/ha of \$4472/ha can be attributed to productivity gains made since 2003-2004. (operating profit would be \$4377 if production and inputs were the same as 2004-2004).
- LUDF squeezed a lot of the juice from the orange in 2003-2004 and since then most of the changes in efficiency have occurred because of seasonal conditions.
- LUDF has succeeded in keeping the OPEX (inputs) at no greater than the rate of inflation, but production has not changed hugely.

Where to look for productivity gains on the farm?

Feed Efficiency,(pasture eaten per ha and total feed use), Cow efficiency, Feed Conversion Efficiency, Labour Efficiency, Water Use Efficiency, Nutrient Efficiency, Energy use efficiency

Examples of efficiency and performance measures from some high performing farms, including LUDF, are in the following table. Generally LUDF performs at a high level. It appears to be lagging behind others in feed conversion efficiency and cow efficiency. It needs to make the 05/06 performance in these categories more repeatable in other years.

Efficiency and performance comparisons for top performing NZ farms

	LUDF 05/06	LUDF 08/09	Roadley 08/09	Top Performing Commercial Waikato Farm 05/06
Kg MS/ha	1772	1644	1544	2300
Kg MS/total ha used	1552	1462	1310	1570
Feed Conversion efficiency kg MS/t DM eaten	90	82	85	91
Cow efficiency kg MS /kg Lwt	0.90	0.82	0.88	0.97
Labour efficiency kg MS/labour unit	71463	70655	59365	70875
Feed Use Total feed eaten t DM/ha	19.6	20.1	18.3	27.1
Pasture eaten/ha	16.2	17.2	14.4	17.6

Increased variation in pasture supply between seasons has been measured in the Waikato. Is it / will it become a feature of Canterbury as well?



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Effluent System Upgrade – LUDF Winter 2009

Introduction:

LUDF was set up with a 28 ha effluent area (4ha per 100 cows = capacity for 700 cows), with effluent applied daily via a separate line underneath the pivot on the North Block. In spite of differential fertiliser application on this area, potassium levels in particular were increasing on the effluent block. Aside from the potassium loading the system worked well, was automated and applied effluent with little 'system' risk of non-compliance. Use of the pivot in this manner did however increase the creation of pivot ruts and added to the maintenance costs for the North Pivot as the pivot would run irrespective of the need to apply irrigation water.

The decision was made to increase the consented effluent area, enabling distribution of the nutrient value of the effluent across a larger part of the farm. Initially when the application was lodged, LUDF was leasing its own 'heifer block' and this area was included in the proposed effluent area. Consent was granted in April 2009 after various proposed changes were incorporated, including aspects of the new Research Dairy Farm which now covers part of the land formerly used as the 'heifer block'. The new consent was applied for and granted as a single consent for both LUDF and the research farm.

The new consent required infrastructure changes in accordance with current requirements which amongst other aspects included the need for a minimum of 3 days storage.

Considerations for effluent system upgrade at LUDF

1. Firstly and most important – maximise use of the effluent and therefore, low risk of effluent noncompliance.
2. Affordable. LUDF must demonstrate best practice commercial farming – but had neither the funds, nor the desire to implement a 'Rolls Royce System'.
3. Minimal staff input.
4. Add to the current system (under the pivot), not replace it.
5. Adaptable to changes in regulatory requirements, farm system / infrastructure changes (eg a stand-off pad), or technology developments.
6. Applicable to areas under and outside the pivot areas.
7. Travelling irrigators do not mix well with pivots
8. The choice of application system would impact on the amount of storage required and the need (or not) for 'filtered effluent' or separation of solids. Equipment with low application rates should require less storage than high application rates.
9. Application of fresh effluent on a daily basis should maximise the farms ability to use the nutrient content of effluent for pasture production. Nitrogen in particular is lost to the atmosphere as Nitrous Oxide from most effluent storage systems.
10. Neither mechanical separation of solids, nor use of 'weeping wall' systems gave confidence of their ability to provide long term reliable separation with minimal input.
11. Storage ponds inevitably retain some effluent, and accumulate effluent / rainfall over the winter – leading into calving, so never provide the full amount of storage to a farm.





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12. Whichever system was employed, the farm would be investing in a combination of storage, mainline and application equipment to enable effluent application to the new effluent area.

The decision appeared to hinge on either having enough storage to avoid application of effluent to wet soils, or have the ability to apply low rates of effluent so that even in wet conditions, the application rate would be within the soils ability to absorb the nutrient loading. Some of the soil moisture data at LUDF indicated that if using 'normal effluent application rates' the farm would require sufficient storage for 4-6 weeks effluent in some seasons, and not use it at all in other years.

Technology options are developing continuously in this area, with significant changes in the ability of travelling irrigators to apply effluent at rates at less than 5 mm / hour. Redesigned and entirely new systems are also continually appearing, from elaborate weeping walls to South American designed biological treatments stations that use UV to further reduce fecal bacteria.

Decision:

LUDF has installed a 300 m³ enviro-saucer to provide 6-7 days storage. This has been sited on the opposite side of the road to the cowshed. The site remains close to the shed but is out of site and is in an area that could accommodate a dedicated stand-off facility should this be developed at LUDF. The saucer provides an insurance buffer against mechanical problems restricting application. In wet seasons, such as spring 2008, the available storage volume will not be enough to avoid the need for any effluent application during wet weather.

A pond stirrer and in line filter 12x20mm mesh filter has been added to the current wedge at the cowshed (a separate stirrer is also in place in the saucer). The increased consistency resulting from the stirrer and filter at the cowshed has proved invaluable in reducing blockages of effluent through the existing pivot system.

The storage decision was the result of seeing the opportunity to apply low rates of unfiltered fresh effluent through technology such as the LARALL Smart Hydrant. This unit typically has 6 sprinkler units operating from a central manifold that switches an individual sprinkler on for a predetermined period of time, and then rests that area while the next sprinkler operates. Typically a sprinkler operates for 10 minutes then waits a further 50 minutes while the other sprinklers are individually operated. Individual sprinklers have 16 or 18 mm nozzles and cover an area of 2000 - 2500m², allowing application of unfiltered effluent with minimal risk of blockages. The sprinklers typically apply effluent at a rate of approximately 9 mm/hr; therefore operating for 10 minutes per sprinkler gives an effective application depth of about 1.5 mm of effluent. At this rate, soils will normally absorb the effluent, resulting in minimal risk of ponding or runoff, even in wet soils.





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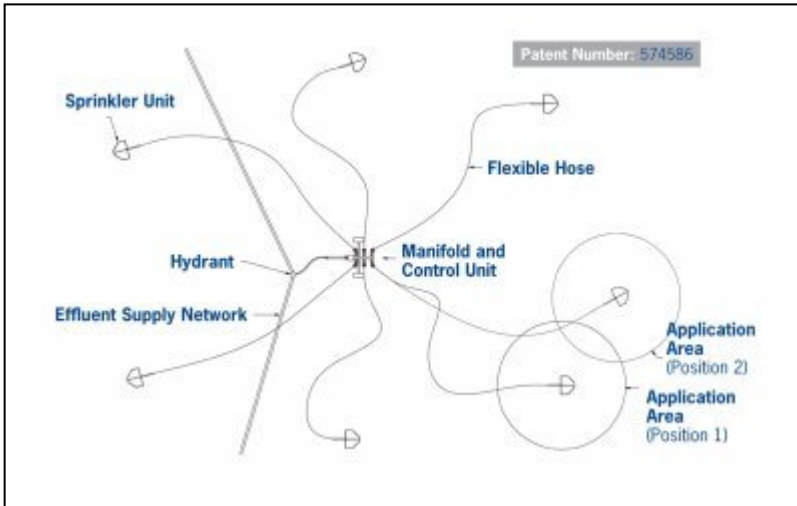






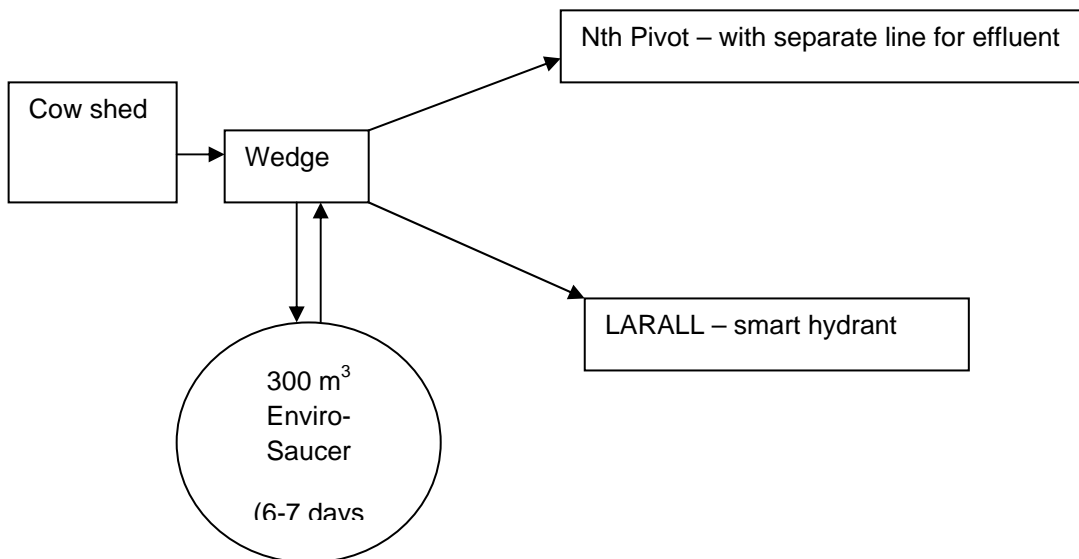


Overview of the LARALL Smart Hydrant



To further enhance the ability of the LARALL system at LUDF to apply low rates of fresh effluent – and minimise the labour input (and need to move the sprinklers regularly), the standard unit with 6 sprinklers has had a further 3 added. Thus the return interval to any one sprinkler with this system at LUDF is 80 minutes not 50, further enabling the soil’s ability to absorb effluent in wet conditions.

Schematic diagram of the current effluent system at LUDF



Verdict:

The saucer provides greater capacity than required for the consent, and in the relatively dry conditions of this spring has not had much use. Smell is potentially an issue with this if effluent is left in it for some time. Options to minimise this effect include more frequent stirring and possibly some new developments in additives to minimise odour. With its likely limited use, this is not seen as a major issue.

The current capacity and set-up of the wedge and pump etc at the cowshed results in the effluent pump running 3-4 times during any single milking (ie it starts when enough volume is in the wedge, typically pumps for 30 minutes, shuts off again for about 15 minutes, runs again for 30 minutes, shuts off for 15 etc, with the final pumping period lasting up to 50 minutes during wash-down. This results in the pivot or LARALL system starting and stopping frequently during an individual milking. It works well for the pivot, but the LARALL appears more suited to less frequent but continuous pumping sessions – such as from a large holding pond. Battery life on the LARALL has not met expectations as the frequent starting and stopping drains the batteries.

The concept of applying effluent through a single sprinkler (with a large orifice to reduce risk of blockages) for a short period of time, then allowing time for infiltration before returning to that same spot for another short application period appears to work very well in distributing the effluent without significant risk of ponding or runoff.

Moving the sprinklers however occupies more time than desired, in spite of using the farms GPS system for identifying sprinkler placement. A redesigned unit for moving the sprinklers and hoses, and refinement of the method of moving this equipment may help this aspect. Care is required to avoid minor ponding when moving the Smart Hydrant manifold as effluent remains in the hoses and can seep into a single area if operators are not anticipating this.

Flow meters and pressure sensors are being developed as refinements to the current system to provide more information to the operator and / or automatically shut down the unit if tolerances are exceeded. This was anticipated at delivery of the unit and will be welcomed when available by the staff at LUDF.

Compared to the pivot, which requires no additional on-ground equipment in the paddock, the Smart Hydrant increases the need for staff vigilance when in the paddock. With 9 sprinklers coming off the central manifold, there is up to 36, 50 metre lengths of effluent hose spread across the paddock – a potential issue for staff on motorbikes.



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Conclusion

The farm now has consent to apply effluent to a greater land area than is currently milked on and for more cows than are currently milked. LUDF has effluent storage for 6-7 days providing greater tolerance should ground conditions, staff workload or mechanical breakdowns prevent daily application of effluent. The LARALL Smart Hydrant allows effluent to be applied to areas inside or outside of the pivot area, the only limitation is the mainline / hose required to cover the entire effluent area.

Recommendations for farms considering effluent system changes:

Consent applications – future proof farm system changes by keeping the application as broad as possible – in terms of number of cows, land area, milking frequency etc.

Design – future proof operational aspects such as piping and electrical cables.

Technology – pressure monitoring to detect open pipes, blocked sprinklers etc. Hard wire timers into pumps – eg pumps for travelling irrigators can be wired to switch off after 2 hours pumping – requiring staff member to reset – and thus monitor rather than set and forget.

Code of Practice – A working group comprising Irrigation New Zealand, the New Zealand Milking and Pumping Trade Association, Fonterra and DairyNZ have recently developed standards and an effluent design code of practice to assist the development of better effluent systems. Anyone considering changes to their effluent system will soon be able to access this material and ensure those advising / providing effluent upgrades meet the appropriate criteria and council requirements.



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Lincoln University Dairy Farm - Farm Walk notes

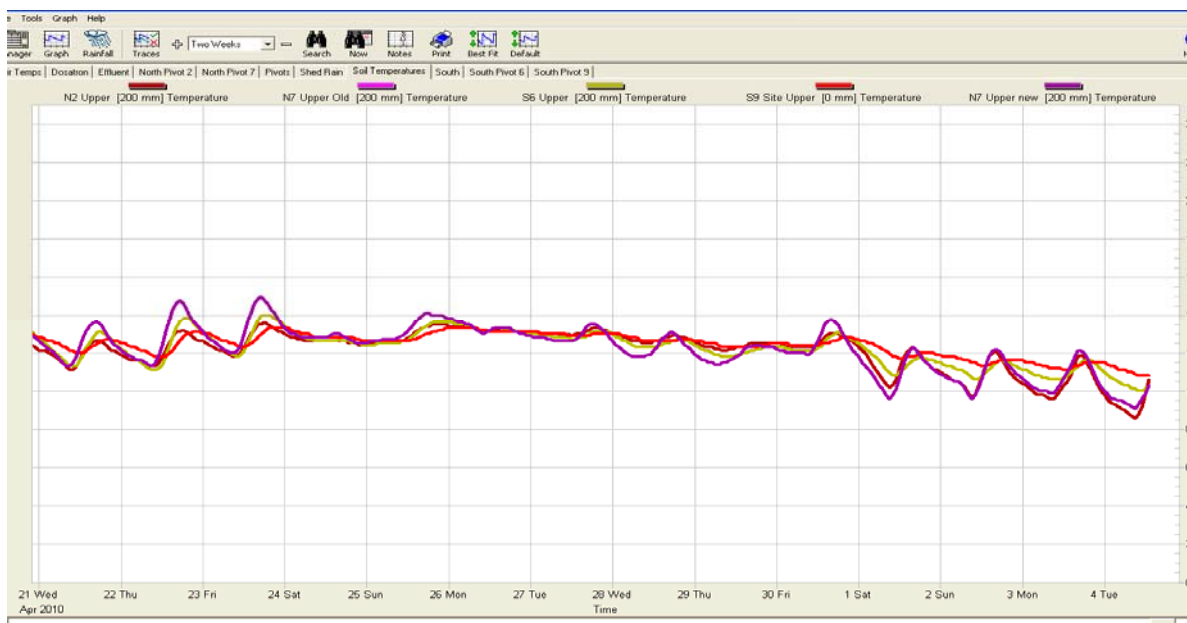
Tuesday, 4th May 2010

CRITICAL ISSUES FOR THE SHORT TERM

1. **Maintain pasture quality by regular monitoring and making necessary changes**
2. **Keep grazing residuals to the desired 7 clicks**
3. **Closely observe milking cows for mastitis**
4. **Monitor cow condition to identify light cows that may need differential treatment in coming weeks**
5. **Round length is increasing according to targets**
6. **Monitor winter feed availability - Yields are under threat due to very dry conditions.**

Summary of Key Factors affecting Grazing Management & Animal Performance

7. Soil temperature this week was 11.5°, similar to last weeks 11.3°C.



8. We had 0.4 mm of rain over the last week, we did not irrigate last week.
9. PASTURE GROWTH this week was 44 kg DM/ha, slightly higher than the 41 kg DM/ha grown last week. Average Pasture Cover this week 2262 kg/DM/ha (similar to 2,245 kg/DM/ha last week). Pasture grazing residuals have been maintained at 7 rising plate meter "clicks".
10. Last week the herd grazed on average 4.3 ha per day. Round length of 37 days, up from 33 days the week before.
11. Grass silage fed last week at 2kg DM/cow/day (total 8.4 DM fed for the week). Also 2kgDM/cow maize silage (total 8.1t fed for the week). Total DM fed 344 kg DM/cow so far this season.
12. Nitrogen application has continued at rate of 30 kg N. This was applied to 24 ha this week. 216 kg per ha used to date on the non effluent area



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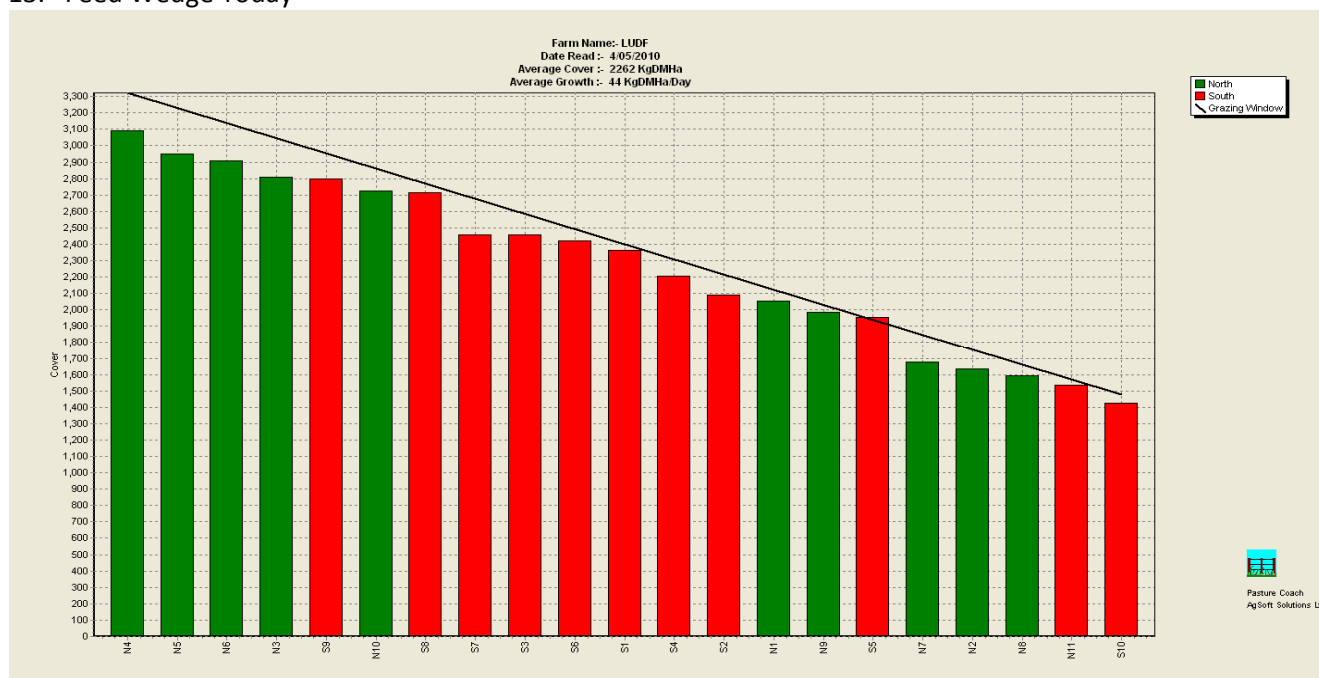






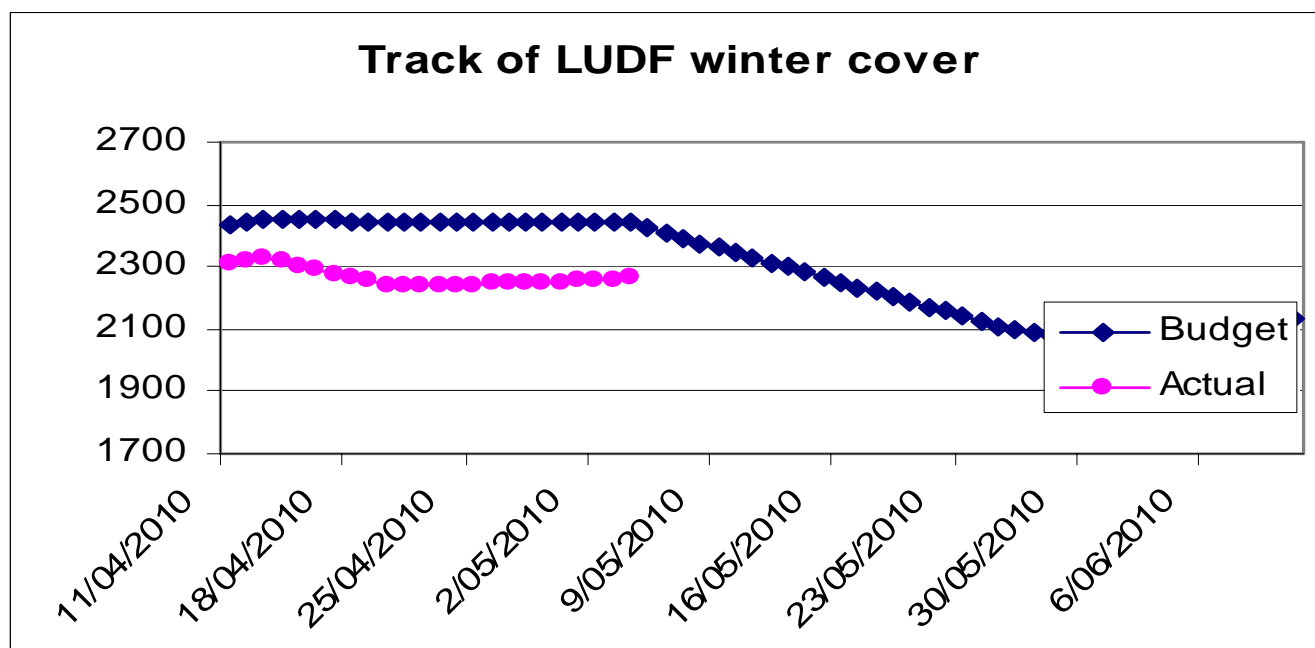


13. Feed Wedge Today



The target line in the wedge reflects the pre-grazing target of 3322 kg DM/ha and a post grazing of 1,480 kg DM/ha, which is the pre-grazing needed to feed the cows considering the stocking rate of 3.4 cows/ha (540 cows/159 ha), cows eating 16 kg DM/cow/day of feed (which comes from pasture and silage) and a rotation length of 32 days (which is the round length we want to be this week). The feed wedge has a deficit of 19.3t DM. This deficit will be made up by feeding pasture balage.

14. The feed budget done for the remainder of the season has a target average pasture cover as shown in the graphic below, the principle being to increase cover until mid-April and then hold that until early-May. After that cover will be allowed to decline slowly toward the targeted end-of-May average pasture cover of 2,050kgDM/ha. This plan will see pre grazing levels of 3,400 kg DM/ha at a grazing interval of 32 - 33 days. Building cover provides an opportunity to milk more days in May.



15. Key management decisions to think about this week:

- Use of Nitrogen going forward. Have now finished our round of 30kg N and will be applying another half round of Nitrogen at about 30 kg N/ha.
- Drying off Plan: The main focus is to achieve the cow condition targets at calving next season. We are confident we can put 0.5 of a condition score (on most cows) during winter so cows need to be at 4.5 CS at the end of May. 32 cows were dried off during the week that are condition score 4 (including a handful of cows below 4) that have expected calving dates before 25th August. We will assess the condition of the remaining cows next week again and re-assess our decisions.
- When and how to extend the round: We have achieved a 33 day round length and will stay on it until the end of the season. The maximum round length we will be happy to sustain is about 33 days, when the high pre-grazing pasture levels required would compromise grass quality.
- A decision was made today to discontinue using the maize silage because of the level of wastage and pasture spoilage occurring. The additional 50t silage to be fed this season will be made up from grass silage instead.
- The drying off decision will continue to be made based on cow condition score and ground conditions.

16. SOIL MOISTURE is just in the margin. Now that we are in the autumn evapo-transpiration rates have dropped and persistent high rates are not likely to occur. Our plan is to now allow soil moisture levels to drop to the lower end of the soil moisture availability. This is to allow more space for autumn rain. We will also aim to keep the sub soil (the lower line) as low as possible

17. Cows will continue to be offered enough grass to achieve their potential intake and will be moved on when grazing residual targets are achieved.

18. We had no new cases of mastitis this week. SCC has been between 178,000 - 191, 000.

19. We had 2 new lame cows this week.

20. 540 cows are milking into the silo. Cows are producing 1.32 kg MS/cow/day (1.34 last week) and 4.49 kg MS/ha/day (4.83 last week).

21. The district is experiencing very dry conditions. This has seriously affected growth of non- irrigated crops and pastures. We are monitoring these with our various winter feed suppliers and developing a flexible plan.

22. The eco-n for the autumn has been started and has been applied to 102.9 Ha.

Next farm walk will be on **Tuesday, 11th May 2010, at 9.00 am.**

Farmers or their managers and staff are always welcome to walk with us. Please call to notify us of your intention and bring your plate meter. Phone SIDDC – 03 325 3629

Management Group

Peter Hancox (Farm Manager), George Reveley (for SIDDC), Virginia Serra (DairyNZ).





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LUDF Weekly Data Sheet

Date (Totals at end of period)	6-Apr-10	13-Apr-10	20-Apr-10	27-Apr-10
Total Cows Wintered (July 1st Total)	683	683	683	683
Farm grazing ha (available to milkers)	159	159	159	159
Dry Cows on farm / East blk / other	0/13/0	3/13/0	3/13/1	3/13/0
Culls (Includes culls put down & empties)	8	0	8	31
Culls total to date	49	49	57	88
Deaths (Includes cows put down)	0	0	0	0
Deaths total to date	8	8	8	8
Calved Cows available (Peak Number 660...)	612	609	601	570
Treatment / Sick mob total	1	0	0	1
<i>lame, mastitis, other, colostrum</i>	19/1/0/0	13/0/0/0	11/0/0/0	9/1/0/0
Milking twice a day into vat	592	596	590	560
Milking once a day into vat	19	13	11	9
Total Cows Milked into vat	611	609	601	569
Days in Milk actual cow days/Peak Cows	227	234	240	246
MS/cow/day (Actual kg / Cows into vat only)	1.5	1.4	1.43	1.33
MS/cow to date (total kgs / Peak Cows 660)	366	375	384	392
MS/ha/day (total kgs / Total ha used - eg 161.5ha)	5.8	5.5	5.4	4.7
MS/ha to date (total kg / Total ha used)	1519	1558	1595	1628
Herd Average Cond'n Score		4.4		
Whole herd LW (kgs)	488	487	490	488
Soil Temp Tues 10.00am 10cm	14.0	11.6	11.3	12.2
Growth Rate (kgDM/ha/day)	52	56	41	51
Plate meter height - ave half-cms	12.5	13.0	12.4	12.4
Ave Pasture Cover (x140 + 500)	2251	2330	2241	2245
Pre Grazing cover (ave for week)	3037	3120	3100	3081
Post Grazing cover (ave for week)	1480	1480	1480	1480
highest pregrazing cover	3125	3400	3300	3188
Area grazed / day (ave for week)	5.70	4.80	5.50	4.80
Grazing Interval	28	33	29	33
Pasture ME (pre grazing sample)		12.3		
Pasture % Protein		22.6		
Pasture % DM		17.2		
Pasture % NDF		32.0		
Supplements Type	Grass Silage	Grass Silage	Grass Silage	Grass Silage / Maize silage
Supplements fed kg DM/cow/day in pdk	4.3	6.8	5.0	5.9
Supplements fed to date kg per cow (660 peak)	227	271	303	339
Supplements Made Kg DM / ha cumulative	598.7	598.7	598.7	598.7
Units N applied/ha and % of farm	40units,25%	30units,22%	30units,30%	0
Kgs/ha N to Date (on the NON-effluent area 133ha)	192	199	211	211
Rainfall (mm)	2	0	13	8.4
ET Weekly Soil & Science readings (mm)	16.4	13.6	14.2	11.2
days irrigated each week	2	4	0	0
Irrigation mm applied per week	11.6	23.2	0	0
Stock Water Consumed litres / cow / day	35	45	40	34



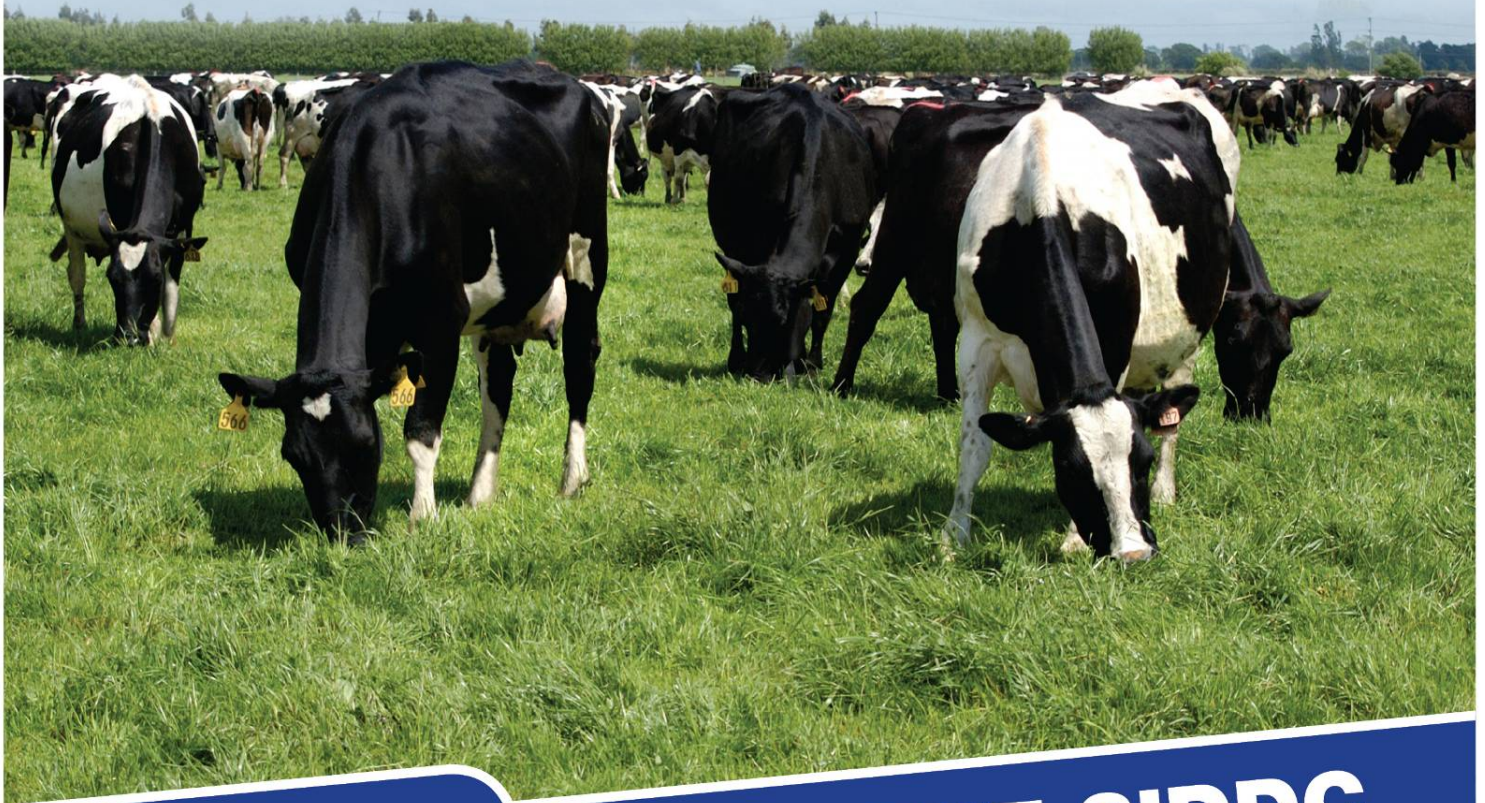
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SIDDC ONLINE

Check out the SIDDC website to find out how your farm compares to best practice, see the latest farm walk notes as well as:

- Research
- Maps
- News and events
- Focus days
- Demo farm information
- and much more



VISIT THE SIDDC WEBSITE AT WWW.SIDDC.ORG.NZ



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LUDF Focus Day – Feedback - 6th May 2010

Focus Day Purpose: To provide timely, accurate and challenging information to aid better on-farm decision-making

1. To what extent will this day aid your decision making? (Circle one)

Not at All	Partially			Totally	
1	2	3	4	5	

2. Please rate the value of each of today's sessions

Session	Nil	Med			High
	1	2	3	4	5
Season Update					
Milking frequency in early lactation					
Productivity improvement opportunities					
Effluent options					
Overall value of the day					

3. What topics / information would you most like at future LUDF focus days?

4. What is your role on the farm? (please circle)

Farm owner Including equity investor	Equity Managing	Sharemilker	Farm Manager	Other (Specify)
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5. How many LUDF focus days have you attended? (please circle)

Only this one	2- 5	6-10	11 or more
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SIDDC would like to thank you for your time and feedback



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LUDF PRODUCTIVITY – WHAT IS NEXT?

This is your chance to help us identify the next step(s) to increase Productivity at the Lincoln University Dairy Farm

1. If the LUDF was your farm –

What are the main three things you would change to improve productivity?

- _____
- _____
- _____

2. What is your role on the farm?

Farm owner /Operator	Investing Equity Partner	Managing Equity	Sharemilker	Farm Manager	Other (Specify) _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. How many years of experience do you have in the dairy industry?

< 2	2-5	6-10	11 or more
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thank you for contributing to the ongoing development of LUDF – and the advancement of South Island Dairying!

Lincoln University
Te Whare Wānanga o Lincoln

Dairynz

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