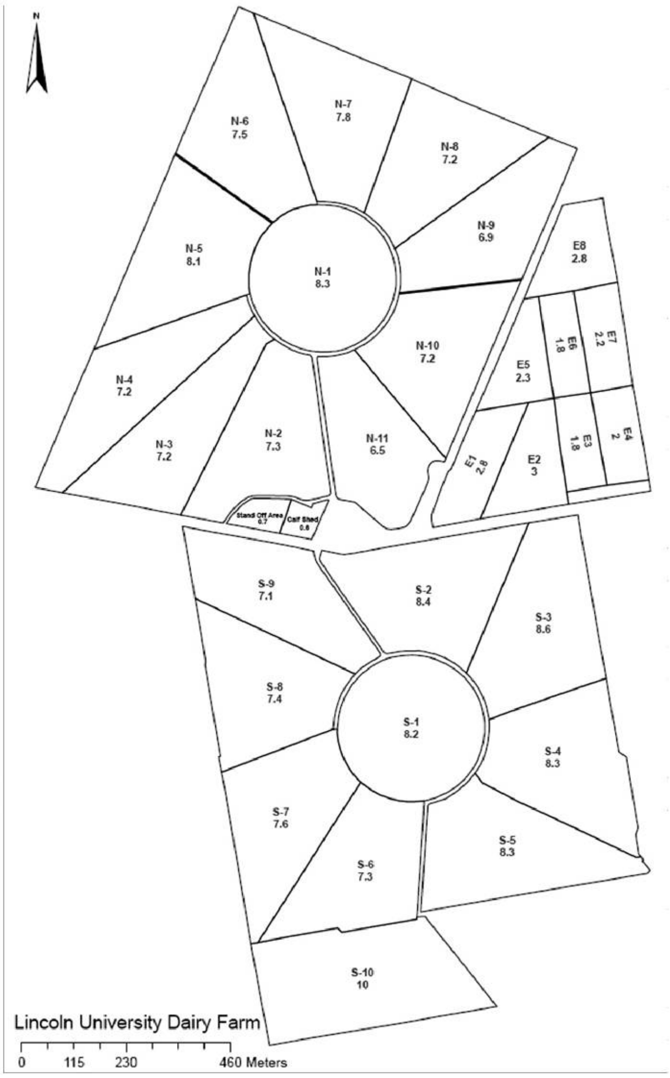
SIDDC

South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying

Lincoln University Dairy Farm Focus Day 7 July 2011



Staff

Peter Hancox – Farm Manager
Richard O'Brien – Farm Assistant
Anshul Madan – Farm Assistant
Joshua Grant – 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

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Introduction

The 186 hectare irrigated property, of which 160 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 pasture based dairy farming systems and to transfer them to dairy farms throughout the South Island.
2. To operate 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 of 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 use Environmental Best Practices [including 'eco-n' nitrification inhibitors] to protect the environment, while enhancing profitability.
6. To operate an efficient and well organised business unit.
7. To provide a commercial return exceeding the average weighted cost of capital on annual capital evaluations to Lincoln University.
8. To create and maintain an effective team environment at policy, management and operational levels.
9. To actively seek labour productivity gains through adoption of technologies and practices that reduces labour requirements or makes the work environment more satisfying.
10. To assist Lincoln University to attract top quality domestic and international students into the New Zealand dairy industry.

Specific objectives for the season 2010/11

1. To deliver a Dairy Operating Profit of $6,800/ha and Return on Dairy Assets of approximately 7.9% from a $6.93 payout – [milk price plus dividend] - with budgeted milk solids production of 288,000 kg and Cash Farm Working Expenses of $3.35/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 a 6 week in-calf rate of 79% and 10 week in calf rate greater than 89% ie empty rate of less than 11%.
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	160 ha
Runoff [East Block]	14 ha

Soil types

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
Jun - 10	6.0	32	10	6	10	32	10
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	225	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 weekly, & 12 paddocks [57% of area] have been renovated to maintain pasture performance. Pasture mixes on farm now include: 2 paddocks of Arrow plus Alto perennial ryegrasses, 5 paddocks of Bealey, 2 paddocks of Alto perennial ryegrass and 1 paddock Trojan - all with Kotare/Sustain white clovers.
- Annual Pasture consumption for 04/05 season calculated at 15.9t DM/ha,05/06 -16.1t DM/ha, and 06/07 - 16.4t DM/ha,
- Pasture and Crop Eaten (calculated via DairyBase) - 07/08 – 17.9 tDM/ha, 08/09 – 17.2 tDM/ha, 09/10 – 16.2 tDM/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

- 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.

Mating programme - Spring 2010

1,000 straws DNA proven Kiwicross [including heifers]. Expecting to rear 200 heifers [5 straws per heifer]. Likely six weeks AB, may use one week short gestation Jersey then follow with Jersey bulls. 10 weeks total mating [herd].

Herd details - February 2011

Breeding Worth (rel%) / Production Worth (rel%)	92 / 49% / 117 / 70%
Average weight / cow (Dec) – Herd monitored walk over weighing	458 kg
Calving start date	8 August 2010
Mid calving date	17 August 2010 (9 days)
Mating start date	25 October 2010
Empty rate (nil induction policy) after 10 weeks mating	13% 2009 [6 weeks in-calf rate 74%]

	2002/03	Average 03/04 - 06/07	2007/08	2008/09	2009/10	2010/11
Total kg/MS supplied	228,420	277,204	278,560	261,423	273,605	
Average kg/MS/cow	381	425	409	384	415	
Average kg/MS/ha	1414	1720	1744	1634	1710	
Farm Working Expenses / kgMS	$2.98	$2.68	$3.37	$3.88	$3.38	
Dairy Operating Profit/ha	$1,164	$2,534	$8284	$2004	$4696	
Payout [excl. levy] $/kg	$4.10	$4.33	$7.87	$5.25	$6.37	
Return on Assets	4.4%	6.18%	14.6	4.8%	7%	

Stock numbers	2002/03	Average 03/04 - 06/07	2007/08	2008/09	2009/10	2010/11
1 July cow numbers	631	675	704	704	685	694
Max. cows milked	604	654	680	683	660	669
Days in milk			263	254	266	
Stocking rate Cow equiv. / ha	3.75	4.05	4.2	4.3	4.13	4.18
Stocking rate Kg liveweight / ha	1,838	1964	2,058	2,107	1,941	1914
Cows wintered off No. Cows / Weeks	500 / 8	515 / 7.8	546 / 9	547 / 7	570 / 9	652 / 8.4
No. Yearlings grazed On / Off	0/118	0/157	0/171	0/200	0/160	0/166
No. Calves grazed On / Off	0/141	0/163	0/200	0/170	0/160	0/194
Est. Pasture Eaten (Dairybase) (tDM/ha)			17.9	17.2	16.2	
Purch. Suppl - fed [kgDM/cow]	550	317	415	342	259	
Made on dairy/platform [kgDM/cow]	0	194	95	64	144	
Applied N / 160 eff. ha			164	200	185	

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

Contents

LUDF Seasonal Update July 2011

Seasonal comment

An extremely wet winter followed by a very wet spring. The remainder of the season was somewhat variable in its conditions as well. There were numerous earthquakes. Accumulated damage in the farm dairy on the platform and in many places around the yard is very easily seen.

For the majority of the season pastures were devoid of clover as a result of Clover root weevil and damage from root zone saturation for 3½ months over the winter.

Winter 2010

In spite of the wet winter (last year) the planning and supervision of herd feeding resulted in an even and well-conditioned herd. Pasture cover at the beginning of August was slightly above target at 2532kgDM/ha.

Spring 2010

Wet followed by wet. The situation was very difficult to manage. Some pastures were damaged and 41ha not budgeted for repair was over sown with mixed success but enough to encourage that this be a budgeted and planned activity. Plan is to use a contractor with a 125mm spaced Drill rather than broadcasting.

The loss of body condition on the herd was very significant with the average herd condition score at 4.15 in late November.

Mating

Results are detailed in the May Focus Day notes and report 72% recorded as in calf at 6 weeks and 87% of the herd IC at 10 weeks. Very similar to last season, though note mating for 10 weeks only. Final number of cows empty by the end of May was 95 - this is 14.2% of the 670 cow herd present at the start of mating. Key difference in the seasons being 12 additional empty cows found in the May pregnancy test this year compared to only 3 last year.

Summer

The early summer period was noted by many for the extended period of seed head production in the ryegrass. LUDF struggled to keep milk production from declining rapidly in the period from peak till Christmas.

Mastitis

This was much more easily managed in the early season with very few infections at calving. A total of 85 infections for the season against 101 last year. A struggle with SCC and ongoing infections during the season has left us a little perplexed (see May Focus day notes). The herd will start next year with fewer cows with recurring high SCC at herd test (16 culled), a state of the art cup removal system, and every cow with teat seal.

Lameness

Also reported in May Focus day notes. Great success at reducing both lameness incidence but also lame days i.e. down from 152 cows to 76 cows and lame days down from 3,183days to 1079 days. Successful changes were the top gate motor controller enabling ¼ speed coming forward, wider less cluttered south entrance to the yard, recapping the south lane with much softer rock, determination in the team to treat early and to use more shoes.

Drying off

Drying off was completed by 26 May, by that date the milking herd was down to 400 with the lighter conditioned cows dried off in mid May, based on both condition and expected feed available. Cows had been milked Once a Day from 16 April to achieve both cow condition and to continue to milk through May.

The herd had gained condition very slowly during the April/May period. 234MA cows with calving dates before August 20th had 15% (35) not yet at 4.5BCS. 199 MA cows calving later had an average score of 4.3 with 50% of these at or just below BCS 4.0 The target for these was to be 4.3.

There was a period of rapid pasture growth and almost spring conditions in May resulting in pasture DM at 12% on May 10th.

Pasture cover was 2088kgDM/ha at June 1st against the target of 2050kgDM/ha.

Wintering plan

The principles we follow are aimed at having all cows at (BCS) 5.0 by their calving date, and to have the work required for the farm staff manageable in a way that allows time to catch up on maintenance and introduce any new staff thoroughly to the systems and procedures at LUDF.

Principles

1. The cows most at risk will be fed pasture to 7 clicks and moved when they achieve that residual. The aim is that they will eat 11 - 12kg DM/day and rapidly gain body condition.
2. R2's grazed on pasture if possible.
3. The use of kale to be reserved for mixed age cows already in reasonable condition and, if possible, have a runoff with some fresh pasture available each day. Other support feed to be higher quality than straw.
4. Cows separated by calving date and condition within that grouping if necessary.
5. Herd sizes around 200 cows or less.

The wintering herds this year:

1. **55 early calving cows in lighter condition** on the platform in June, they have gained condition rapidly and will continue on the platform grazing to 7 clicks. At June 30th BCS 4.7
2. **179 August calving cows** have been grazing kale with a good pasture runoff next door, and are currently on pasture near Springston. They also have added significant body condition during June and are a pleasure to look at. They average 4.75 BCS.
3. **91 cows dried off early because they were light.** These cows have been on rape and grass (mostly grass) since they were dried off. They are able to leave residuals above 1500 and are supported with baleage. This feed is at Yaldhurst. BCS 4.8
4. **199 later calvers also at Yaldhurst** The late calvers are more mixed in condition and are being fed in a similar way to the others there. BCS 4.6.
5. **The 141 R2's** had been grazing grass and rape also at Yaldhurst and were moved to the platform June 29th where they will remain. They were given teat seal on 30th June BCS 5.25.

Platform feed management

Winter has been slow in coming with an average growth rate through June of 24kgDM/ha/day for the first 21 days compared to 13 – 18kgDM/ha/day normal range.

Pasture cover at June 21st was already above target for July 31st. It was anticipated that the R2's would be home at the East block during July but given this situation they will remain on the platform provided it does not become too wet. We expect that the 179 cows at Springston will also be back with us around 20th July. A feedflo budget for this situation indicates that so long as the herds can stay on the platform the feed situation will not get too far above target levels. We expect that most of the feed on the 13ha East Block and the 10ha lease bock will be made into baleage in late August or early September. At that time we expect it will still be of adequate quality to be used to support milk production next autumn. Balage should not be needed until the second round (Sept 15th), if at all.

LUDF – Farm Comparison - 2010/11 Season

Comparing LUDF to 4 high performing farms

Over the last 3 season we have compared LUDF physical and financial performance with high performing farms in Canterbury to identify opportunities for improvements. As a consequence of this a new system is being proposed for the farm that is described in full in another session of this handout. [Pages 26-28]

A comparison of the LUDF's performance will be repeated against the same 4 farms this season. These farms are geographically spread and located in Culverden, Te Pirita, Hinds and Winchester.

Every farm has different resources that explain the variability in performance, however this mini-comparison helps us put the performance achieved by LUDF during the 2010/11 season in perspective.

Since the financial accounts were not finalised for the season 2010/11 the latest updated cash flow was used. Please keep in mind that there may be small changes in some income and costs but these changes are not likely to represent significant change in Operating Profit. For the physical analysis we used the DairyBase reports so the information is comparable for all farms.

Season 2010/11 – Key Characteristics

- From the beginning of the season the outlook for milk price was good and the forecasted milk price got better throughout the season.
- In winter and spring the wet and cold weather represented a big challenge on many farms for pasture, feed utilization and pasture damage.
- In many farms production was below last year despite spending more money on feed.

How are the details calculated?

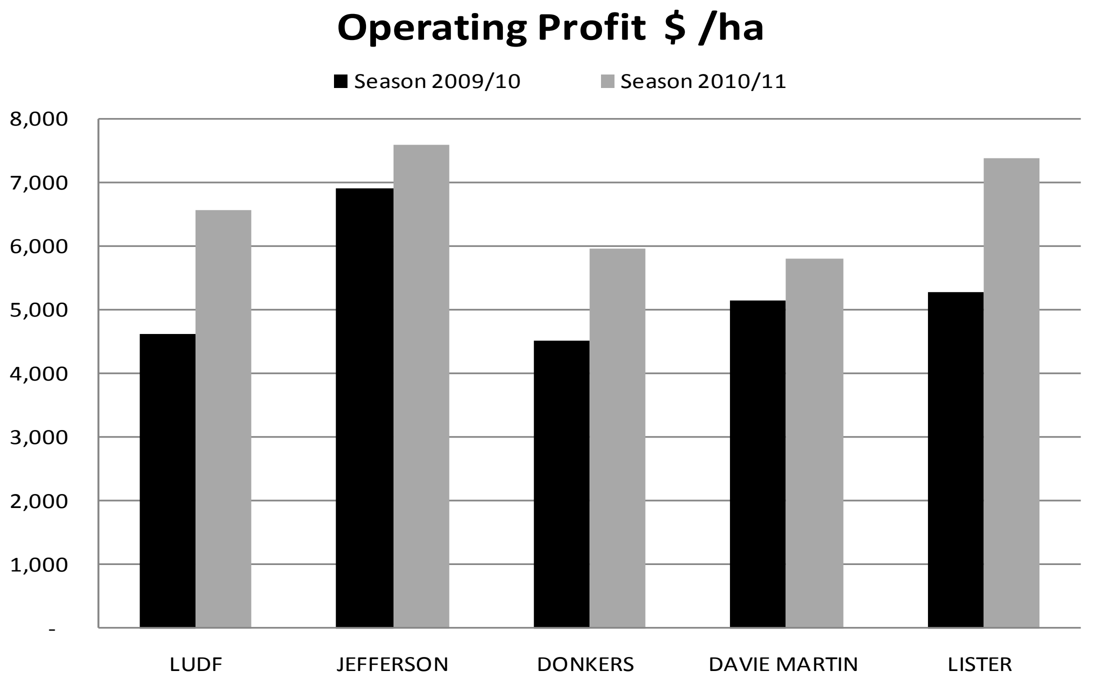
- Milk Income: Kg MS produced for the season x milk price ($7.50/ kg MS)
- Stock Income: Sales - Purchase +/- Stock Adjustment
- Stock Adjustment= (Stock Number at Closing – Stock Number at Opening)* set value per head (R1 =$ 1,035 / R2 = $1,494 / Mixed Age cows= $1,766
- Change in Feed Inventory was valued at $270/t DM
- When there is non-paid labour an adjustment is included ($58,700 up to 400 cows + 33 $/cow above that)
- Depreciation was estimated from last years' accounts so final value may have small changes to the value used here
- Supplement bought-in and eaten is bought in less made on milking platform

What did we find?

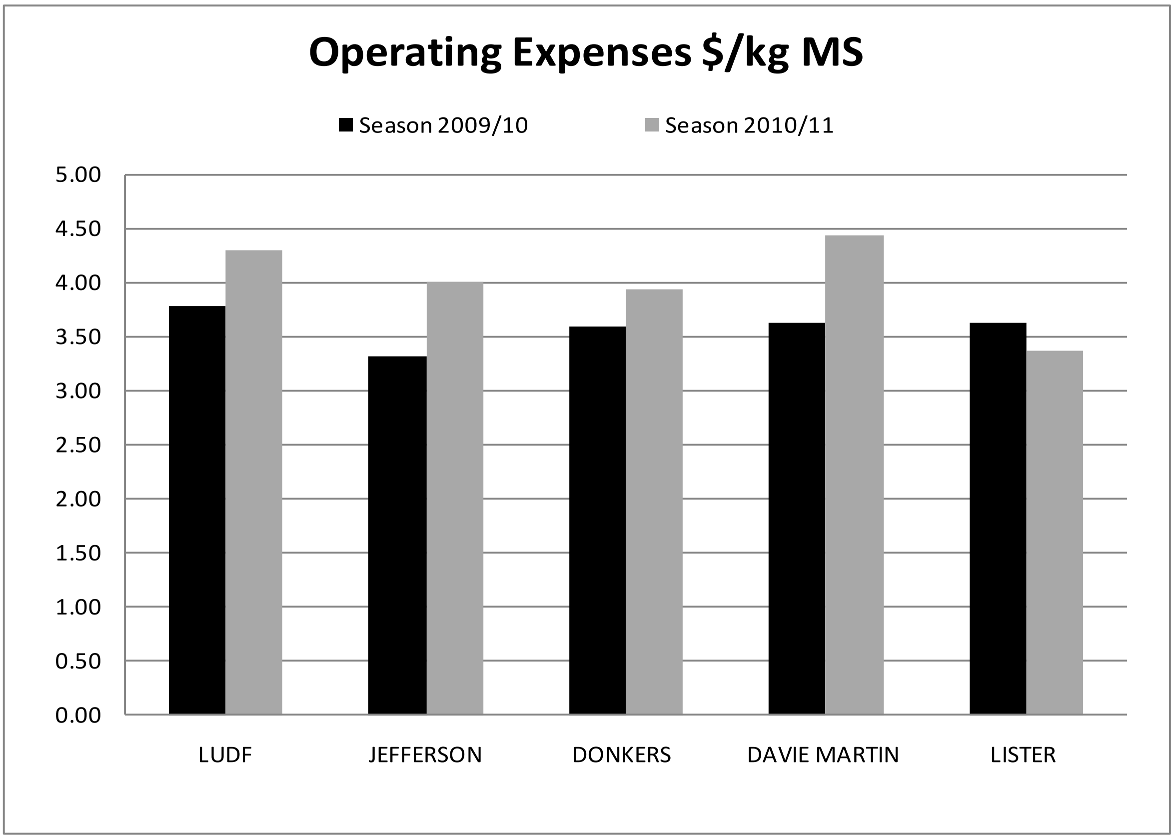
Table 1: Financial Performance (Season 2010/11)

INCOME (Season 2010/11)	LUDF	JEFFERSON	DONKERS	DAVIE MARTIN	LISTER	Average
Milk Income	7.50	7.50	7.50	7.50	7.50	7.50
Stock Sales	0.87	0.38	0.33	0.42	0.25	0.41
Stock Purchased	0.09	0.09	0.07	0.00	0.14	0.08
Stock Adjustment	0.00	0.00	0.15	0.07	0.00	0.04
Net Stock Income	0.78	0.29	0.41	0.48	0.11	0.38
Other Income	0.00	0.02	0.14	0.00	0.00	0.03
Total Income	**8.28**	**7.80**	**8.04**	**7.99**	**7.61**	7.91
EXPENSES (Season 2010/11)	**LUDF**	**JEFFERSON**	**DONKERS**	**DAVIE MARTIN**	**LISTER**	**Average**
Wages	0.79	0.44	0.68	0.58	0.70	0.64
Labour Adjustment	0.00	0.25	0.00	0.26	0.00	0.10
Animal Health	0.23	0.24	0.11	0.26	0.11	0.19
Breeding/testing	0.19	0.14	0.07	0.04	0.10	0.11
Shed Expenses	0.02	0.04	0.04	0.05	0.05	0.04
Electricity	0.23	0.15	0.41	0.22	0.20	0.24
Feed (made +purchased)	0.29	0.69	0.51	0.56	0.41	0.49
Feed Inventory Adjustment	0.00	0.05	0.00	0.01	0.00	0.01
Dry cows /Young stock grazing	0.99	0.85	0.90	0.90	0.78	0.88
Run Off Adjustment /lease	0.00	0.01	0.00	0.00	0.00	0.00
Fertilizers (inc N)	0.50	0.31	0.42	0.48	0.34	0.41
Weeds and Pests	0.01	0.03	0.01	0.00	0.00	0.01
Regrassing	0.08	0.06	0.03	0.05	0.03	0.05
R&M	0.31	0.32	0.19	0.36	0.16	0.26
Vehicle Expenses	0.08	0.06	0.04	0.14	0.02	0.07
Freight General	0.03	0.01	0.00	0.01	0.08	0.03
Administration	0.08	0.06	0.11	0.13	0.01	0.08
Rates and Insurance	0.06	0.11	0.10	0.06	0.05	0.08
Depreciation	0.40	0.20	0.31	0.32	0.33	0.31
Operating Expenses	4.30	4.01	3.93	4.43	3.36	4.01
Operating Profit	3.98	3.79	4.12	3.56	4.25	3.91
Operating Profit /ha	6,558	7,590	5,942	5,805	7,361	6,595

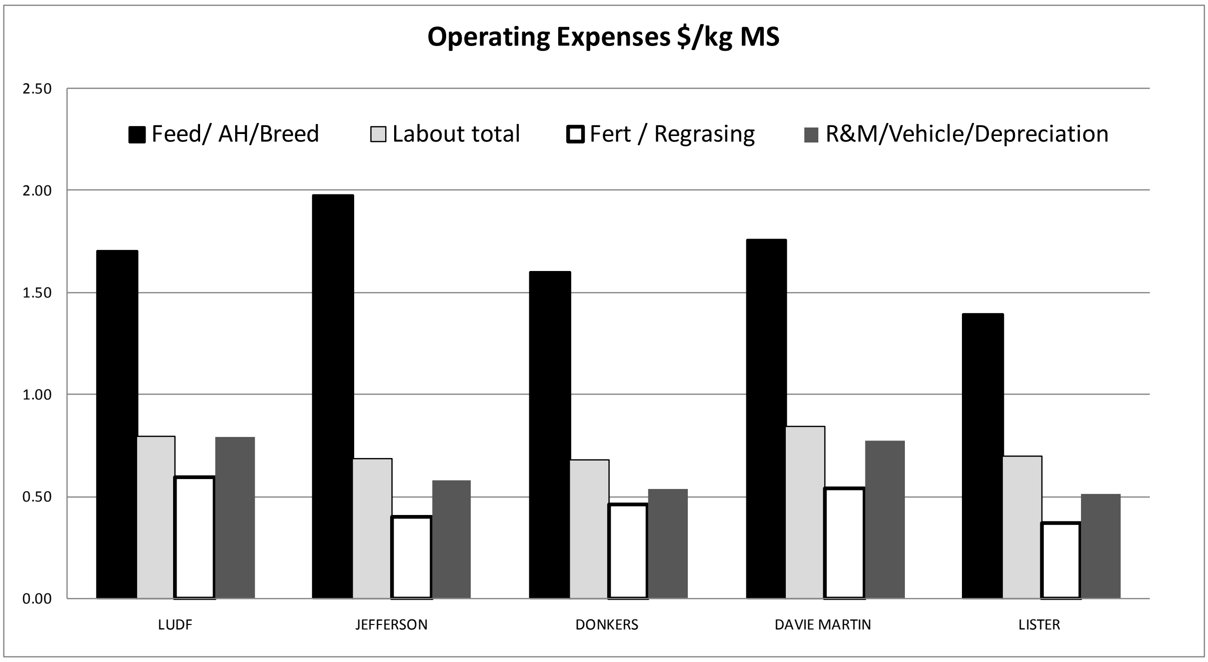
Graph 1: Operating Profit



Graph 2: Operating Expenses



Graph 3: Main Operating Expenses



COMMENTS FINANCIALS:

- This season LUDF had the highest Gross Farm Income per kg MS of this group at $ 8.28 /kg MS compared to the average of the group at $7.95 /kg MS. The main difference was in Stock income (LUDF = 78 cents /kg MS compared to the average of the group at 41 cents/kg MS.
- LUDF had the second highest Operating Expenses / kg MS in the group. The lowest operating expenses for the group was $3.36 /kg MS, the average for the group was $4.01 /kg MS and LUDF was $4.30 /kg MS (last season $3.79 / kg MS).
- Comparing the operating expenses (LUDF & average of the group) the main difference in costs were:

	LUDF	**Group average**
Breeding	19 cents /kg MS	11 cents /kg MS
Winter and young Stock grazing	99 cents /kg MS	88 cents /kg MS
Fertilizer	50 cents /kg MS	41 cents /kg MS
Depreciation	40 cents /kg MS	31 cents /kg MS

- LUDF has the lowest cost of feed / kg DM ($ 0.29/ kg MS & $ 0.49 /KGMS).

Table 2: Physical Performance

SEASON 2010/2011	LUDF	JEFFERSON	DONKERS	DAVIE MARTIN	LISTER
Effective ha (MP)	**159.1**	140	306	141	143
Run Off	**0**	6	0	0	**0**
Cows	**667**	590	1,069	505	554
BW/reliability	**98/49**	92/	84/47	68/49	54/46
PW/ reliability	**130/68**	112/95	115/63	91/73	71/66
Cows /ha	**4.20**	4.20	3.49	3.58	3.90
Kg LW /cow	**465**	512	460	480	460
Kg LW/ha	**1,953**	2,158	1,605	1,718	1,794
MILK PRODUCTION AND EFFICIENCY					
Kg MS	**262,113**	280,150	441,775	229,808	247,435
KG MS/Cow	**393**	475	413	455	447
Kg MS /ha	**1647**	2,001	**1444**	**1630**	**1730**
% MS	9.21%	8.70%	8.90%	8.76%	8.83%
Fat /Protein	**1.32**	1.28	1.28	1.31	1.29
Kg MS as % LW	**85%**	93%	90%	95%	97%
Peak Production kgMS/cow/day	**2.07**	2.25	2.0	2.15	1.98
Montly Drop from MP to end Dec	**12%**	8.1%	8.9%	7.2%	7%
DIM/cow	**271**	261	265	260	269
FEEDING AND NITROGEN					
kg N/ha	**261**	280	270	320	280
kg supplem imported t DM eaten /ha	**1.1**	3.4	2.2	1.8	1.4
Grazing off t DM eaten /ha	**2.7**	3.8	2.6	2.8	3.5
Pasture & Crop Eaten /ha	**16.9**	16.3	12.7	15	15.3
Total Feed Eaten	**20.7**	23.5	17.5	19.6	20.2
Main Supplement Type	**Baleage**	Baleage/Maize silage/ Grain	Baleage/Grain	PKE/ Grass Silage	Grain/PKE/ Grass Silage
Area harvested for silage (%)	**35%**	36%	0%	43%	70%
Topping	**no**	yes	yes	yes	no
ANIMAL HEALTH AND REPRODUCTION					
6 weeks in calf (%)	**67%A**	72%A	65% (E)	60%	NA
Mt Rate (%)	**14%**	9%	8%	12%	13
Weeks Mating	**10**	12	15	12	14
% Inductions	**0**	10%	10%	0	5%
% hormonal intervention	**0**	8%	0%	19%	0%
% Cows Treated Lameness	**12%**	3%	20%	13%	3%
% Cows Mastitis (1-6 weeks)	**3%**	NA	12%	9%	NA
Av SCC for season	**222,000**	175,000	290,000	212,000	218,000
STOCK WASTAGE					
% Heifers on the herd	**24%**	20%	24%	23%	NA
% Hfrs still on herd at end of season	**91%**	91%	81%	88%	NA
% cows 1 Dec as % wint cows	**96%**	95%	96%	94%	NA
LABOUR PRODUCTIVITY					
Cow Shed	**R50**	R54	R50	H 40	R50
Total FTE	**3.4**	3.2	6.6	3	3
Cups/FTE	**14.6**	16.7	7.6	13.2	16.7
Cows/FTE	**196**	184	162	168	185
Kg MS/FTE	**77,092**	87,548	66,936	76,603	82,478

COMMENTS PHYSICAL PERFORMANCE:

- LUDF has the cows with the highest BW and PW of this group.
- LUDF has the second highest stocking rate in kg Live Weight /ha.
- LUDF had the lowest production per cow - 393 kg MS/cow & 437 kg MS/cow average for the group.
- LUDF had the highest monthly drop from peak production to the end of December at 12%.
- Also kg MS/kg Live Weight was the lowest at LUDF at 0. 85, the average was 0.92, and 0.97 kg MS/kg LW was the highest in the group.
- LUDF had the highest % of MS and the higher fat/protein ratio at 9.2% and 1.32 respectively.
- LUDF had the highest average days in milk per cow for the season at 271 days / cow compared to the average at 265 days/cow.
- LUDF had the highest pasture and crop eaten /ha (16.9 t DM/ha & 15.3 t DM/ha average for the group). Also, LUDF imported less supplement / ha than all the farms in the group.
- Similar to last year Nitrogen used at the LUDF was the lowest of the group at 261 kg N/ha compared to 282 kg N/ha average for the group.
- LUDF had the lowest wastage of cows from winter to the end of December.

NUTRIENT MANAGEMENT PLANS

Sonya Perkin, Ravensdown

A Nutrient Management Plan is a useful farm management tool (and record) which allows farmers to ensure on-farm nutrients are used most efficiently and effectively, while complying with environmental, social and regional council requirements.

Nutrient Management Plans allow you to:

- show farm goals, and mitigation options, either potential options, and/or current measures in place.
- adjust fertiliser nutrient inputs, accounting for nutrients provided by supplementary feed, effluent etc. In some cases considerable savings in fertiliser can be made.
- identify potential nutrient losses in your system in particular N and P
- indicates where mitigation options are required to reduce nutrient losses to the environment: e.g., increase size of effluent area, use eco n
- adoption of the plan can improve farm performance.
- shows soil fertility trends.
- provides the fertiliser plan.

Nutrient Efficiencies identified at LUDF, as a result of Nutrient Management Plan

- Differential fertiliser applications between effluent and non-effluent areas.
- Use of nitrification inhibitor eco-n
- Accumulation of K on effluent block has been identified and mitigation options are:
- Increasing size of effluent area
- Making supplement on effluent area and feeding out on other parts of the farm.
- Use of nutrient budget as a tool to investigate the impact of various scenarios
  - Increasing/decreasing N use
  - Increasing/decreasing P use
  - Timing of N Increasing/decreasing supplement use
  - Maintaining the Olsen P level to within the optimum economic range
- Meet compliance requirements related to nutrient management activities
- Take all practicable steps to maintain or enhance the quality of the property's water resource.

USE IT OR LOSE IT: PUT THOSE NUTRIENTS TO WORK

Jessie Chan, Dairy NZ

Why should I use my nutrients more efficiently?

Increased Profitability

- More efficient use of fertiliser inputs
- More effective use of effluent as a nutrient source
- Improved farm performance
- Impact on land value
- Strategic growth of the business

Environmental protection

- Be a responsible steward of the land
- Reduce nutrient loads to waterways
- Protect groundwater drinking water quality
- Leave the farm in good shape for future generations

What is the industry vision?

The NZ dairy industry has expanded rapidly over the past few decades. Cow numbers and production have increased, and general trends show us that environmental footprint has also increased, especially when talking about N loss. The NZ dairy industry has a challenge ahead. On one hand we want to grow milk production and improve farm profitability, while on the other hand we want to reduce or maintain our environmental footprint. One way to do that is through improving nutrient use efficiency. That is, using N and P inputs productively to grow feed and produce milk while minimising losses from the system.

Why are Nitrogen (N) and Phosphorus (P) important?

The addition of nutrients and healthy, fertile soil is important to maintain or improve farm productivity. However the mismanagement of nutrients can have adverse affects, both on farm profitability and the environment. Nitrogen and phosphorus are the basis for discussion in this paper because they are nutrients that are essential for plant growth and function, as well as being the subject of much attention when it comes to water quality. It is important to note that other nutrients such as potassium, sulphur, and trace elements are also important for plant growth.

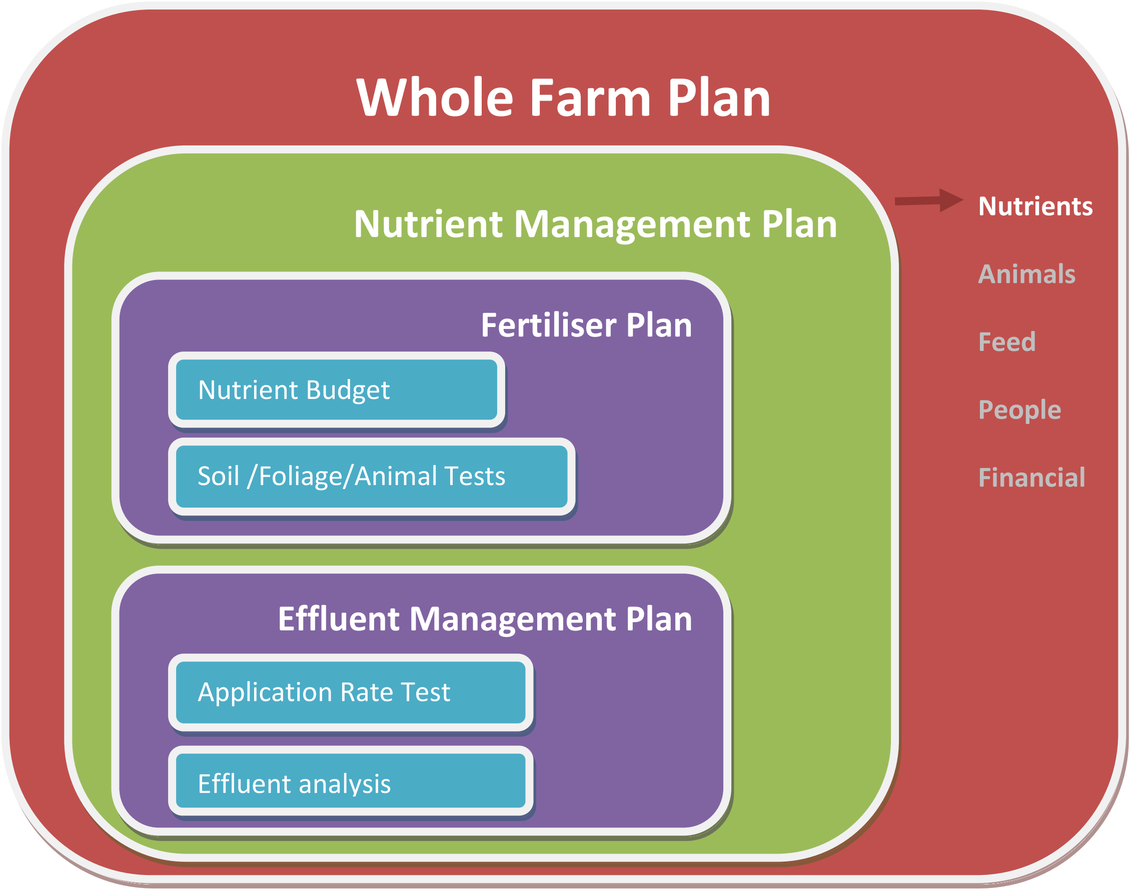
A proportion of the N entering soils from dairy farms may end up leaching through the soil into ground water. An increase in N concentration in groundwater generally happens slowly and may not be noticed for some time, but once groundwater is polluted it is very difficult to clean up. In soil, P behaves very differently to N. Almost all the P that does not go off the farm in product is held by the soil. P doesn't readily leach into ground water, but when soil is washed into streams and rivers it carries with it precious P supplies via soil erosion and surface runoff.

The loss of P and N into waterways will support weed and algae growth, effecting stream life and making water unpleasant for drinking and swimming.

What is an NMP and how would a farmer use it to improve nutrient use efficiency?

What is an NMP?

A nutrient management plan identifies current farm nutrient management practice, outlines goals for the future and sets out an action plan for reaching these goals. The nutrient budget within the nutrient management plan outlines total nutrient inputs such as fertiliser and supplements brought onto a farm, and total nutrient outputs via milk produced and leaching losses. This helps assess the environmental impact of nutrient use on the farm and assists with decisions such as timing of fertiliser applications, effluent management, and potential mitigation actions to reduce nutrient losses.



Where do I get one?

Your fertiliser representative or farm advisor should be able to provide you with an NMP.

How do I go about understanding and using it?

In the same way that a cash flow budget will not solve money problems, the NMP itself will not make your farm more efficient. It is only a tool to help you make decisions. It is the decision making processes and acting on this information that will provide the most value. Without your thought and action the NMP is useless.

There are some simple pieces of information that may be useful in assisting your thought processes and actions to become more efficient. These include soil test trends over time, effluent block information and a fertiliser plan.

Indicators of nutrient use efficiency

There are some numbers you can look at to see how well you are doing at utilising your nutrients. These can be found in your NMP and include:

- N conversion efficiency (%): An indication of your farms efficiency at converting N inputs into N contained in product (milk & meat). Average NZ dairy farms range from 25-40%.
- N leaching loss (kg N/ha/yr): Modelled estimate of the amount nitrogen leached and lost from the farm from soil and drainage water below the plant root system. Average NZ dairy farms range from 30-50 kg N/ha/year.
- N Surplus (kg N/ha/yr): Estimate of the amount of nitrogen excess in the farm system. Calculated as Total N inputs – N in Product. Average NZ dairy farms range from 100-180 kg N/ha/year.
- P loss (kg P/ha/yr): Estimate of the amount of P lost from the farm via surface runoff. Average NZ dairy farms range from 0.5-0.8 kg P/ha/year.

Improving nutrient use efficiency

It is important to understand that most things you do to improve the efficiency of converting farm inputs into milk, for example having more efficient cows, will help improve your nutrient use efficiency. This paper however focuses on the parts of the farm system relating specifically to nutrients.

Of course, improved profitability should also be achieved alongside improving nutrient use efficiency. It makes sense that putting more nutrients into product and losing less from leaching also has benefits for the bank balance. Doing the numbers in terms of weighing up the costs and benefits of strategies to improve nutrient use efficiency is important.

There are some basic things you can do to improve nutrient use efficiency. These should be considered in your NMP and include:

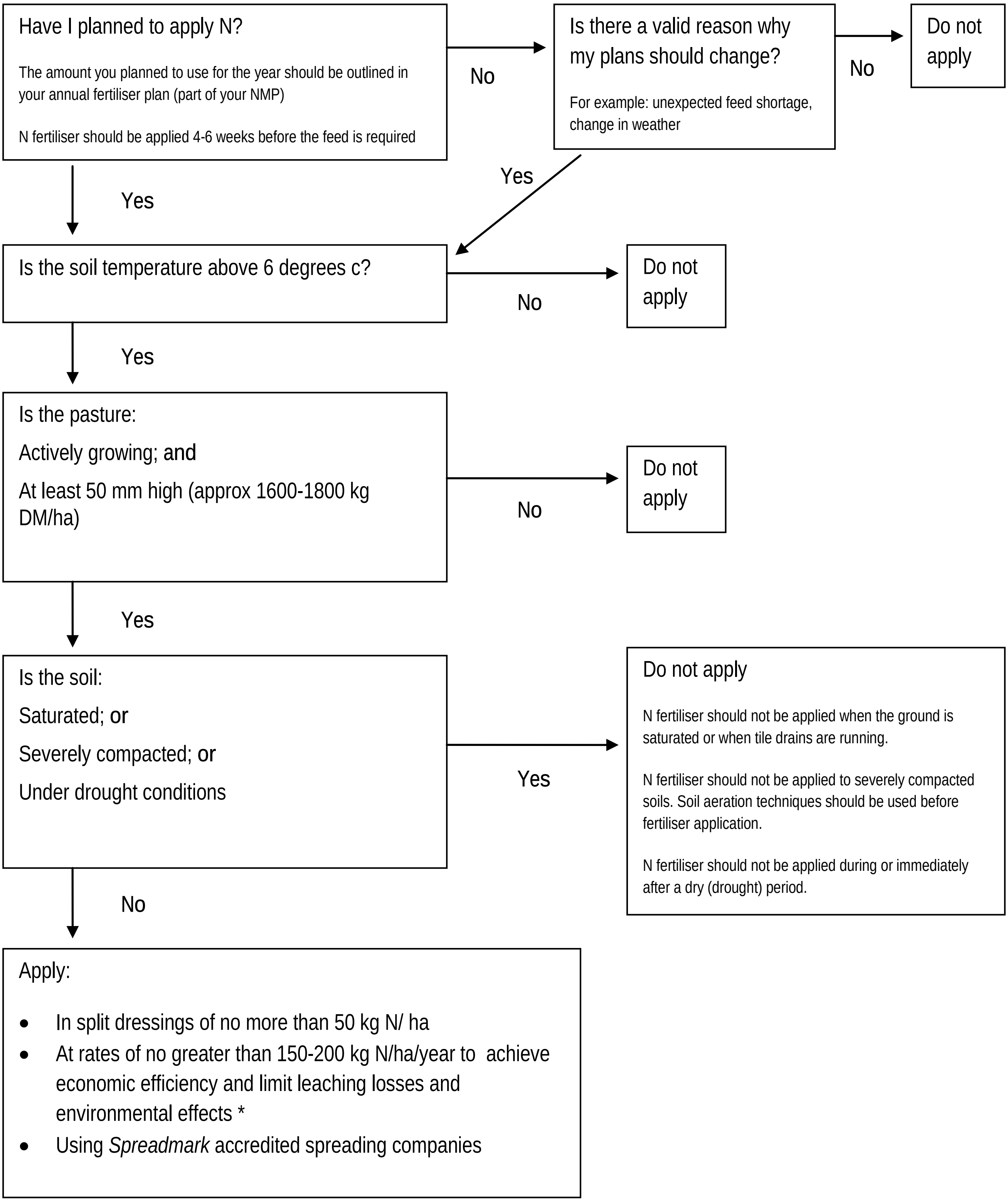
1. ***Keep effluent nutrients in the root zone***
   Applying the right amount of effluent at the right time will ensure the nutrients in effluent are kept and utilised in the root zone.
2. ***Optimise soil fertility***
   Making sure your soil fertility levels are in the target range for optimum plant growth, and applying fertiliser only where necessary to keep them there.
3. ***Effective N application***
   Effective N application is about applying the right amount of N at the right time based on regular feed planning. The N decision tree can help (see figure 1).
4. ***Use mitigation options***
   There are other practices and technologies to consider for further improving nutrient efficiency. Some of these require significant capital expenditure should be considered in conjunction with cost-benefit analysis. Your farm advisor should be able to help you with looking at your options. These include:

   - Standoff and feed pads
   - Winter management
   - Nitrification inhibitors
   - Impact of irrigation practices on N and P loss

DairyNZ has a range of case studies exploring some of these scenarios within the nutrient management section of its website (www.dairynz.co.nz).

Special thanks to Bob Longhurst at AgResearch for his work in developing the nutrient use efficiency case studies.

Figure 1: Decision Tree for Nitrogen Application



* Total N fertiliser applications of 200 kg N/ha/year or more should only be implemented after referring to the Code of *Practice* for *Nutrient Management* (New Zealand Fertiliser Manufacturers' Research Association Inc, 2007) and obtaining the advice of an accredited farm advisor. This may also be restricted in some regions, so check your Regional Council rules first.

The above recommendations are outlined in the Code of *Practice* for *Nutrient Management* (New Zealand Fertiliser Manufacturers' Research Association Inc, 2007).

LIC

National Dairy Herd

- Historic data early 2000 indicated on average 25% mis-identification – in line with international studies
- Well managed SPS herds found to be better at on average 10-15%
- Our findings show rapid increase in mis-recording in herds of 600 cows or more
- Our own surveys indicate most believe better than the average

LIC

Development of Parentage Testing

- Individual Animal testing
  - Old microsatellite technology
- Whole Herd
  - New G3 technology

Process

LUDF

2009 WH Results (165)

17% mis-recording with 23 changes from birth identification
Most significant change - both sire & dam

Further 22 animals had incorrect sires
9 likely NM calves identified
6 calves matched to AB sire where none previously
7 AB sire changes – probably effect cows calving to different mating event

LIC

LUDF

2010 WH Results (192)

27% mis-recording at birth

Most significant change - both sire & dam (42)
Lincoln keep top 160 – re-ranking is the largest impact

11 originally retained now falling out of top 160 (+ 2 without previous parentage recorded) & 13 originally out will now be retained

Other non-calving practice related issues

LIC

Implications for LUDF & wider industry

- Precision Farming
  - Accuracy of identification
  - Reduction of inbreeding & NM may increase genetic gain & productivity
  - Significant wasted cost saved (~$1200/calf) if non-AI replacement
- Best Practice
  - Reduction of replacements reared over time
  - Surplus of heifers allows the best replacements
- Reduced recording pressure at calving

LIC

Recognised Benefits

- Saving time
- Redeployment/saving in labour
- Reduced stress at calving
- Less recording
- Increased herd value

LIC

LUDF Precision Farming - Key changes

Background

The current farm system is very effective at efficiently converting grass to milk, and it is profitable. It has entered a plateau at around 1670 – 1740kgMS/ha, with per cow production 400 – 420kgMS. Stakeholders are determined that the system be further refined to increase profitability through improving productivity, without increasing the footprint. In essence the plan is to refine the system by addressing known weaknesses.

Typically the herd experiences rapid body condition loss early in the milk season, with very slow recovery having significant negative consequences on total days in milk. In two of the last three seasons the whole herd has had to be milked Once a Day from mid April to ensure CS targets are regained by calving. (The alternative is drying the herd off prematurely). Higher average body condition throughout the season (including addressing low BCS animals as they are identified through the season) should result in more total days in milk.

Reproductive performance is typical for the region, though typically LUDF's performance is compared to farms with longer mating periods. Improved performance is required as part of the new strategy, i.e. to run a more mature herd and fewer replacements.

Farm policy was to use grass silage to fill feed deficits. This silage is a mix of bought in feed and surplus grass made off the platform, additionally 10% of the farm is normally re-grassed during periods of surplus. Improvements are sought within season to better match feed supply with energy demand.

In the season 2010 – 2011 clover has been at a much lower level than ever before. This was largely as a result of a build up of clover root weevil and a very prolonged saturation of the soil from late May until late September. Increased Nitrogen usage may have had some impact on this as well.

Recently soil cores from 3 paddocks were tested for buried clover seed. Residual clover seed on all the paddocks tested was very low.

Pasture with no clover reduces appetite and total feed consumption (ref to notes generated by David Chapman, DairyNZ, in Focus day Notes Feb and May 2011).

Precision Dairy Farming at LUDF

Objectives which have significant change to practice or policy 2011 - 2012

Grow and harvest significantly more pasture

Back calculations suggest the volume of pasture consumed by the herd is around 16t DM/ha/yr. This represents close to 200,000MJME/ha. A significant lift in this area is being targeted, while holding the environmental footprint. To achieve this:

a. Increased nitrogen fertiliser will be applied, particularly through the early spring to mid-summer period, provided economic (agronomic) responses can be expected.
b. Giberellic Acid will be used where additional growth is likely to result.
c. Increased re-grassing will occur – with both 'stitching–in' as required and grass to grass of a further paddock – giving a 7 year cycle or 15% re-grassing rate on farm. New species and the act of renovation have proven their ability to increase yield at LUDF.
d. Much of the new pasture is likely to be tetraploid cultivars. Tetraploids typically yield 0.5MJME/kgDM more than diploid cultivars. Over a season this small advantage could add 50 – 60kg milksolids/ha.
e. Individual paddock soil testing is occurring and may lead to variable placement of fertiliser, initially between paddocks, but when appropriate may include within paddock variation.
f. Variable rate irrigation remains on the table for consideration of more efficient use of total water, possible increases in total yield and increased profitability.

Use the cow resource more efficiently

The reduction in stocking rate is based on using the available feed more efficiently. See Pages 26-28 which are a spreadsheet analysis of the 2010 – 2011 season and a budget for the coming season assuming that LUDF produces and consumes a similar amount of pasture.

The key change being milksolids production per cow lifting from 86% of Liveweight to 93%. This will be lifted in subsequent years closer to 100% if pasture utilisation can be maintained at high levels.

Less cows will lower the overall environmental footprint with less to winter and less replacements to rear.

Production increase per cow may require some compromise in pasture utilisation and / or changes or flexibility in how grazing residuals are achieved.

Two herds

Many farmers say that allowing cows that are struggling in the main herd to be separated for a time into a smaller herd allows them to catch up. Typically young cows and others in trouble after illness is the norm for farms that choose this model. Understandably there is little research evidence from large herds to suggest the value of this change. It is one of the few options available to LUDF to potentially improve feeding of the cows that are struggling with adequate feed intake as indicated by condition score, liveweight loss (or no gain) or obvious recent milk reduction.

The most likely practice will be to have up to 200 cows in the first herd (called first herd because it will normally have first access to new paddocks), with 440 in the main herd. The first herd will be given the “normal” allocation of pasture per cow as in the main herd – for example 110m^2 per cow per day on a 22 day round. The main herd will follow into that paddock the day after. From time to time the main herd will have access to the break not quite fully grazed by the first herd.

Cows in the first herd will, in the early part of the season, be typically young and having lost more than the desired amount of condition after calving. Cows will be moved in and out of this herd as required with adjustments made using information from the walk over weighing, individual condition scoring, herd testing, and info from the individual milk monitoring system.

It is not expected that this herd will have shorter walking distances, they will have a shorter time spent at the farm dairy.

This herd management change is expensive in terms of staff time. The farm has used a one herd system and is setup for that. There are 21 paddocks on LUDF. The cow yard does not yet have a fully rotating pair of backing gates needed to facilitate simple herd management by one milker. Under the split herd system staff will spend nearly twice as long bringing cows to the dairy and more than twice as much time putting up break fences.

Automatic cup removers and milk monitoring systems have been installed which will generate the time needed for the additional cow management. In the short term we do not expect to be able to run with one less staff member.

Monitoring of feed volume and quality

The feed allocation policy to date has been to:

- collect pasture samples twice each month from paddocks about to be grazed
- complete a full farm walk each week with rising plate meters to assess average pasture cover and calculate growth rat the week
- record pre and post grazing levels. Often post grazing residuals are visually assessed, though new staff members will use the rising plate meter for visual calibration.

From this data, and that which can be derived from milk production and apparent liveweight loss or gain, feed demand and supply is reported. There is often a gap in this data which does not explain decline in milk production or slow weight gain during the season.

To further enhance the data and better explain milk production and body weight change, the intention is to monitor 3 paddocks using cages to protect pasture from grazing and thereby allowing better estimates of actual pre and post grazing. Hopefully this will enable better understanding of the energy consumed and any other parameters which may be influencing performance.

Pasture sampling frequency will be increased to weekly (probably Friday) to enable a much more responsive approach to seasonal feed quality and quantity.

Monitoring milk production, change in BCS and change in LWT

LUDF policy, practice and focus has been to graze to 7 – 7.5 clicks and accept the milk production and cow that results, in the expectation that the next grazing round will consist of high quality feed for milk production. The system has also relied on using more than 300kg DM of high quality silage as balage in the autumn to extend lactation. This practice should help build cow condition while milking continues but this has not always been reliable with variable numbers of cows needing to be dried off because of low condition and interval to calving.

Possible responses to lower than expected milk production – assuming that the cows have theoretically been offered enough feed include:

- Mow pasture to 7 – 7.5 clicks in front of the herd if DM is very low
- Consider feeding very high quality grass silage if appropriate
- Continue to examine longer grazing intervals to encourage higher NDF
- As a last resort, allow longer post grazing residuals and mow behind the herd.

Increased pasture analysis should help define whether sufficient energy was allocated initially.

Targeted seasonal changes

- Higher profitability
- No increase in overall environmental footprint
- Higher productivity including improved body condition (especially of light cows) – with far fewer cows needing to be dried off early, and more total cow days in milk.

Soil Management

- Carry out soil fertility tests in all paddocks. On some farms this technique has located significant opportunities.
- Increase P to top half of the optimum band of 35 – 40 Olsen P.
- The Olsen P level has declined to an average of 32 in recent years. This was not the target, especially for the heavy soil area on the farm.
- Review ways to increase soil porosity and pasture growing potential on the heavy soils. This may result in additional lime or gypsum being applied. Ripping would give some short-term benefits. More accurate data is required to examine this practice and form a coherent policy.
- Additional drainage on about 8ha (parts of S6, 7 & 8) will be done when a suitable solution is confirmed.

Milksolids Production System	LUDF Actual record 2010 - 2011	Farm Size	160	ha total
Year ending May			160	ha eff.

FEED SUPPLY	12	MJ / kg Grass Equivalent DM	Total Dry Matter (tonnes)	Total Dry Matter (t's/ha)	Total Dry Matter (t's/cow)

Pasture Growth (with zero nitrogen)

	%	ha	t's DM /ha/yr	t's DM /year	Total Dry Matter (tonnes)	Total Dry Matter (t's/ha)	Total Dry Matter (t's/cow)
Pivot	80%	127.5	16.6	2117			
Sprinklers	14%	22.5	15.6	351	2613	16.3	3.9
K lines	6%	10.0	14.5	145			
	0%	0.0	0.0	0			
	0%	0.0	0.0	0			
	100%	160.0					

						Total Dry Matter (tonnes)	Total Dry Matter (t's/ha)	Total Dry Matter (t's/cow)
Nitrogen Grass	326 kgN/ha	@	10 kgDM/kgN	on	128.0ha	417	2.6	0.6
Overall	261 KgN/ha							
Feed Eaten when Utilisation is:-			79.0%			2394	15.0	3.6

Bought in Feed

				KgDM	MJ/kgDM	Utilisation	Avail PEDM t's DM	Total Dry Matter (tonnes)	Total Dry Matter (t's/ha)	Total Dry Matter (t's/cow)
Straw/hay	0kgDM/cow	0	13 be's	300	6.5	80	0			
		0	Bales	230	10.0		0			
		0	Bales	230	10.2	0	0			
Barley	0kgDM/cow	0	tonnes DM	1000	12.5	98	0			
Wheat	0kgDM/cow	0	tonnes DM	1000	12.5	98	0			
Baleage	346kgDM/cow	230	DM tonnes	1000	11.0	87	183			
PKE		0	Tonnes	1000	11.0	80	0	183	1.1	0.28
	346kgDM/cow									
Grazing off R2's		0	8 weeks	8.0 / day	11.0		0			
Grazing off Cows		670	9.7 weeks	11 / day	11.0		438	438	2.7	0.66

Less feed for non milking cows at home

						Total Dry Matter (tonnes)	Total Dry Matter (t's/ha)	Total Dry Matter (t's/cow)
Heifer clvs	0	@	500	kgDM/hd	0			
Yearlings	0	@	2450	kgDM/hd	0			
MT Cows	0	@	2532	kgDM/hd	0	0	0.0	0.0
Beef Clvs	0	@	633	kgDM/hd	0			
Ylg beef	0	@	2532	kgDM/hd	0			
Older beef	0	@	3165	kgDM/hd	0			

	Total Dry Matter (tonnes)	Total Dry Matter (t's/ha)	Total Dry Matter (t's/cow)
Total Feed for Milking Cows	3015	18.8	4.5
Imported feed	621		0.9
	21%		21%

Herd Statistics

			Feed Rqd/cow	Maint- -enance	Preg- -nancy	Prodn. MS	
Breed	XBD		MJ/day	60		77	
LWT	472	kg/cow	MJ	21900	1910	30646	
			MJ/kgDM	12	12	12	
			kgDM	1825	159	2554	4.5
Target MS/cow	398	kg MS	84 % of LW		Cows to milk	664	
Stocking Rate	4.15	cows/ha			Cows to calve	684	
					extra winter %	1.03	

	Total (tonnes)	Total (t's/ha)	Total (t's/cow)
Milksolids Production (kgMS)	264,411	1,653	398

Conversion Efficiencies

kgDM eaten / kgMS	11.4
kgMS / tonne DM eaten	88
kgLWT / tonne DM supplied	104

Milksolids Production System		LUDF system 3 farm - No grain	Farm Size		ha total
	Year ending May	2012		160	ha eff.

FEED SUPPLY	12	MJ / kg Grass Equivalent DM	Total Dry Matter (tonnes)	Total Dry Matter (t's/ha)	Total Dry Matter (t's/cow)

Pasture Growth (with zero nitrogen)

	%	ha	t's DM /ha/yr	t's DM /year	Total Dry Matter (tonnes)	(t's/ha)	(t's/cow)
Pivot	80%	127.5	17.0	2168			
Sprinklers	14%	22.5	16.0	360	2677	16.7	4.2
K lines	6%	10.0	14.9	149			
	0%	0.0	0.0	0			
	0%	0.0	0.0	0			
	100%	160.0					

						(tonnes)	(t's/ha)	(t's/cow)
Nitrogen Grass	380 kgN/ha	@	10 kgDM/kgN	on	128.0ha	486	3.0	0.8
Overall	304 KgN/ha							
Feed Eaten when Utilisation is:-			80.0%			2530	15.8	4.0

Bought in Feed				KgDM	MJ/kgDM	Utilisation	Avail PEDM t's DM	(tonnes)	(t's/ha)	(t's/cow)
Straw/hay	0kgDM/cow	0	13 be's	300	6.5	80	0			
		0	Bales	230	10.0		0			
		0	Bales	230	10.2	0	0			
Barley	0kgDM/cow	0	tonnes DM	1000	12.5	98	0			
Wheat	0kgDM/cow	0	tonnes DM	1000	12.5	98	0			
Baleage	398kgDM/cow	255	DM tonnes	1000	11.0	87	203			
		0	Tonnes	1000	11.0	80	0	203	1.3	0.32
	398kgDM/cow									
Grazing off R2's		0	8 weeks	8.0 / day	11.0		0			
Grazing off Cows		670	8.0 weeks	10 / day	11.0		344	344	2.1	0.54

Less feed for non milking cows at home

						(tonnes)	(t's/ha)	(t's/cow)
Heifer clvs	0	@	500	kgDM/hd	0			
Yearlings	0	@	2450	kgDM/hd	0			
MT Cows	0	@	2500	kgDM/hd	0	0	0.0	0.0
Beef Clvs	0	@	625	kgDM/hd	0			
Ylg beef	0	@	2500	kgDM/hd	0			
Older beef	0	@	3125	kgDM/hd	0			

	(tonnes)	(t's/ha)	(t's/cow)
Total Feed for Milking Cows	3078	19.2	4.8
Imported feed	547		0.9
	18%		18%

Herd Statistics			Feed Rqd/cow	Maint- -enance	Preg- -nancy	Prodn. MS	(t's/cow)
Breed	XBD		MJ/day	60		77	
LWT	472	kg/cow	MJ	21900	1910	33880	
			MJ/kgDM	12	12	12	
			kgDM	1825	159	2823	4.8

Target MS/cow	440	kg MS	93 % of LW	Cows to milk	640
Stocking Rate	4.00	cows/ha		Cows to calve	659
				extra winter %	1.03

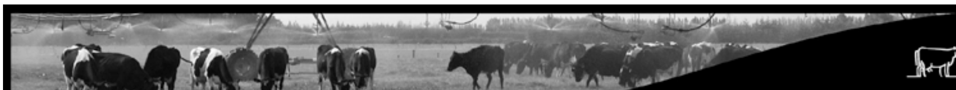
		(tonnes)	(t's/ha)	(t's/cow)
Milksolids Production (kgMS)		281,675	1,760	440
Conversion Efficiencies	kgDM eaten / kgMS	10.9		
	kgMS / tonne DM eaten	92		
	kgLWT / tonne DM supplied	98		

Lincoln University Dairy Farm — Budget for 2011 - 2012 — @ 05/07/2011

Year ending May 31		160.0ha	Budget		2011/12	Actual 10 - 11		Difference
Milk production	Milksolids		$6.80/kgms	1,760/ha	281,675	264,460	1,653/ha	17,215 kgms
Cows	Peak number &prodn		640cows	4.00/ha	440/cow			
Staff		3.70 FTE's	173cows/FTE		76,128ms/FTE			

Income					$/kgMS	$/kgMS		$ change	
Milksoilds	$6.80/kgms	90%	1,915,388		6.80	7.50	1,983,450 -	68,062	-3%
Dividend	$0.30/share	4%	84,300		0.30	0.30	84,300	-	
Surplus dairy stock		3%	70,250		0.25	0.50	133,200	-62,950	-47%
Other stock sales		3%	63,717		0.23	0.36	95,295		
		0%			-	0.00		0	
		0%			-			0	
		100%	2,133,655		7.57	8.66	2,296,245	-162,590	-7%
Stock Purchases			21,600			0.09	23,850	-2,250	
Gross Farm Revenue			2,112,055	13,200/ha		8.57	2,272,395	-160,340	-7%

Expenses				2011/12	2009/10	Actual	$ change in expense	% change in expense
			$/cow	$/kgMS	$/kgMS	$		
Administration		24,050	37.6	0.09	0.08	20,170	3,880	19%
Animal Health		55,341	86.4	0.20	0.23	59,577	-4,236	-7%
Breeding Expenses		43,905	68.6	0.16	0.19	49,310	-5,405	-11%
Electricity-farm		19,500	30.5	0.07	0.07	19,802	-302	-2%
Employment		209,494	327.2	0.74	0.79	208,011	1,483	1%
Grass silage purchased	398 kgDM/cow	73,950	115.5	0.26	0.22	57,358	16,592	29%
Grain	0 kgDM/cow	-	0.0	-				
Silage making & delivery		26,880	42.0	0.10	0.05	12,014	14,866	124%
Replacement grazing & meal		133,343	208.3	0.47	0.51	133,743	-400	0%
Winter grazing - Herd incl freight		122,687	191.6	0.44	0.48	126,678	-3,991	-3%
Nitrogen, EcoN&Giberillin		127,544	199.2	0.45	0.37	99,158	28,386	29%
Fertiliser & Lime		38,197	59.7	0.14	0.12	32,262	5,935	18%
Freight & Cartage		800	1.2	0.00	0.00	23	777	3378%
Irrigation - All Costs		68,000	106.2	0.24	0.24	63,806	4,194	7%
Rates & Insurance		19,020	29.7	0.07	0.06	16,262	2,758	17%
Regrassing		26,130	40.8	0.09	0.09	22,490	3,640	16%
Repairs & Maintenance		45,500	71.1	0.16	0.20	52,109	-6,609	-13%
Shed Expenses excld power		8,200	12.8	0.03	0.02	5,535	2,665	48%
Vehicle Expenses		20,000	31.2	0.07	0.08	22,140	-2,140	-10%
Weed & Pest		500	0.8	0.00	0.01	1,639	-1,139	-69%
Accommodation allowance	3 houses	20,000	31.2	0.07	0.08	20,000	0	
Cash Farm Working Expenses		1,083,040	-	3.85	3.86	1,022,087	60,953	6.0%
Depreciation est		116,000		0.41	0.40	105,000		
Total Operating Expenses		1,199,040		4.26	4.26	1,127,087		
Dairy Operating Profit		913,015	1,426	3.24	4.33	1,145,308	-232,293	
DOP		5,706/ha				7,158/ha -	1,452	
Cash Operating Surplus		1,029,015		3.65	4.73	1,250,308 -	221,293	
		6,431/ha				7,742/ha		
				2011/12	2009 - 10			

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