SIDDC
South Island Dairying Development Centre

LINCOLN UNIVERSITY
DEMONSTRATION DAIRY FARM

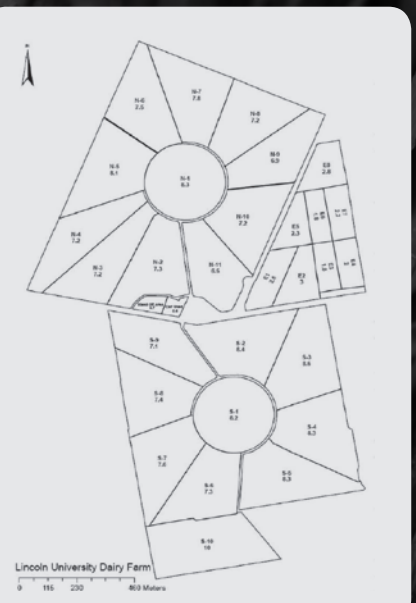
FEBRUARY 2017
FOCUS DAY

STAFF

Peter Hancox	– Farm Manager
Sean Collins	– 2IC
Matthew Costello	– Dairy Assistant
Tom Chapman	– Dairy Assistant

LUDDF 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



Partners Networking To Advance South Island Dairying

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Te Whare Wānaka o Aoraki
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INTRODUCTION

The LUDDF is a progressive farming development facility that is committed to advancing dairy farming practice across the South Island, with particular consideration to productivity and environmental sustainability. Formerly the University sheep farm, the converted 186 hectare Dairy Farm is an excellent cross section of the various soil types evident across the Canterbury Plains. The property, of which 160 hectares is the milking platform, is irrigated using a spray system that includes two centre pivots, small portable lateral sprinklers and k-lines.

STAGE 1: 2001/2 AND 2002/3

The farm initially wintered approximately 630 cows, peak milking just over 600 and producing about 1400kgMS/ha from 200kgN/ha and up to 550kg DM/cow of imported feed. The milk payout (income) in 2002/3 was $4.10/kgMS.

STAGE 2: 2003/4 THROUGH TO 2010/11

During this period the primary development was the increase of the stocking rate to between 4 and 4.3 cows per ha. 654-683 cows peak milked and as a result production averaged 1700kgMS/ha and 411kgMS/cow. LUDDF ran a single herd during stage two, to allow us to focus primarily on simple systems, and low and consistent grazing residuals.

STAGE 3: 2011/12 TO 2013/14

The further development of LUDDF during stage 3 was a move into 'Precision Dairying', resulting from the implementation of the strategic objective (below). This stage focused on minimum standards, two herds were run to increase productivity and profitiability, from a similar environmental impact. Production lifted to 1878kgMS/ha or 477kgMS/cow (630 cows). A change in farm practice was initiated in 2013/14, with the temporary suspension of Eco-n (DCD), in an attempt to hold nitrogen losses without the mitigation effect of Eco-n.

STAGE 4: 2014/15

LUDDF is adopting a 'Nil-Infrastructure, low input' farm system emerging from the P21 (Pastoral 21) research programme, in partial response to the tightening environmental requirements of some catchments across NZ. Targeted milk production is 1750kgMS/ha or 500kgMS/cow from 3.5 cows/ha with up to 150kgN/ha and 300kgDM/cow imported supplement.

LUDDF STRATEGIC OBJECTIVE:

To maximise sustainable profit embracing the whole farm system through increasing productivity;

- without increasing the farm's total environmental footprint;
- while operating within definable and acceptable animal welfare targets; and
- remaining relevant to Canterbury (and South Island) dairy farmers by demonstrating practices achievable by leading and progressive farmers.
- LUDF is to accept a higher level of risk (than may be acceptable to many farmers) in the initial or transition phase of this project.

ADDITIONAL 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 ensure optimal use of all nutrients on farm, including effluent, fertiliser, nutrients imported from supplements and atmospheric nitrogen; through storage where necessary, distribution according to plant needs and retention in the root zone.

3. To manage pastures and grazing so per hectare energy production is optimised and milkers consume as much metabolisable energy [ME] as practicable (within the constraints of the current system and the associated nutrient losses).

4. To optimize the use of the farm automation systems and demonstrate / document improved efficiencies and subsequent effect on the business.

5. To achieve industry targets for mating performance within a 10 week mating period, including a 6 week in-calf rate of 78% and 10 week in calf rate greater than 89% i.e. empty rate of less than 11%.

6. To actively seek labour productivity gains through adoption of technologies and practices that reduce labour requirements or makes the work environment more satisfying.

7. To assist Lincoln University to attract top quality domestic and international students into the New Zealand dairy industry.

ONGOING RESEARCH

- The effect of farm management on groundwater and nutrient losses. (includes 10 groundwater monitoring wells, 60 lysimeters and 6 drainage plots to monitor and manage the effect of fertiliser, grazing, irrigation and effluent inputs over a variety of contrasting soil types.
- Pasture growth rates, pests and weeds monitoring, including a Forage Value Index paddock scale cultivar trial.
- Winter cropping effects on subsequent cow and calf performance.
- Yield mapping of pastures across the season
- Native Plantings – biodiversity effects
- Resource Inventory and Greenhouse Gas Footprint

CLIMATE

Mean 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**

SOIL TYPES

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**

FARM AREA

Milking Platform **160 ha**
Runoff [East Block] **15 ha**
Unproductive land on platform **6.7ha**

SOIL TEST RESULTS AND FERTILISER APPLICATIONS

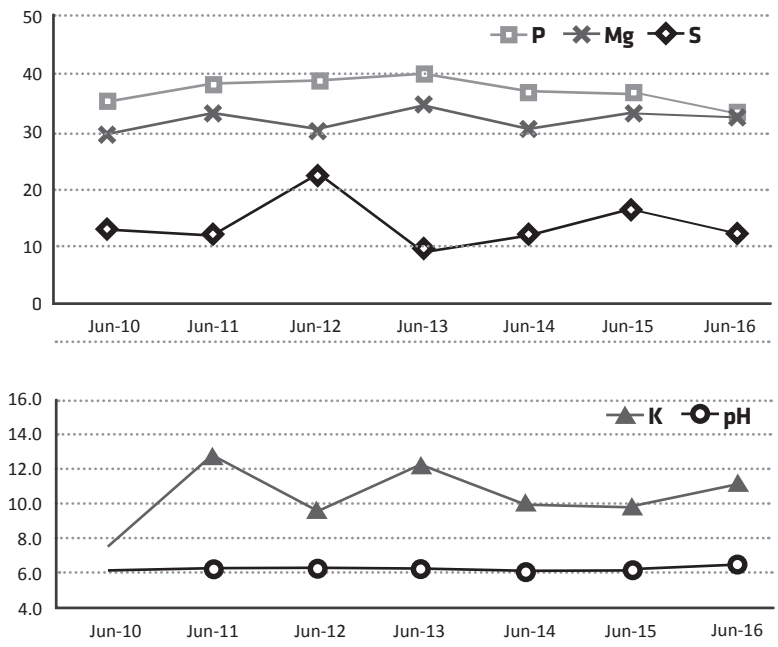
Target Soil Test Ranges:

pH: **5.8 – 6.2** P: **30 – 40** K: **5 – 8**
S: **10 – 12** Mg: **20+**

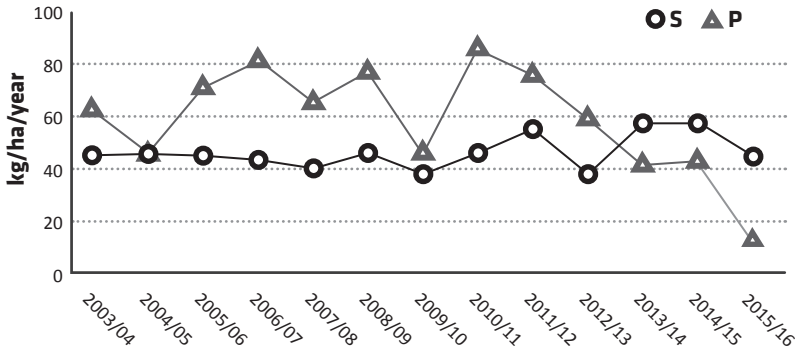
PASTURE

The milking platform was sown at conversion [March 2001] in a mix of 50/50 Bronsyn/Impact ryegrasses with Aran and Sustain white clovers, and 1kg/ha of Timothy.

WHOLE FARM AVERAGE SOIL TEST RESULTS



WHOLE FARM AVERAGE P AND S APPLICATIONS 2003/04 – 2015/16



Paddock	Period Regrassed	Grass Cultivar
N1	Feb-01	Brons. Imp
N2	Feb-11	Trojan
N3	Nov-12/Sept-13	Shogun/Chicory/Plantain/Troj
N4	Feb-15	Base/Troj/Chicory/Plantain
N5	Dec-11/Aug-13	Shogun
N6	Apr-14	Shogun (spray/drill)
N7	Jan-14	Bealey/Troj/Chicory/Plantain
N8	Jan-13	Bealey/Troj/Chicory/Plantain
N9	Oct-13	Bealey/Troj/Chicory/Plantain
N10	Jan-12	Tetraploids
N11	Nov-07	Bealey

Paddock	Period Regrassed	Grass Cultivar
S1	Dec-05	Bealey
S2	Dec-10	Troj. Bealey
S3	Feb-10	Bealey/Arrow
S4	Dec-13	Bealey/Troj/Chicory/Plantain
S5	Dec-08	Arrow - Alto
S6	Dec-14	Shogan/Chi/Plant (spray/drill)
S7	Nov-15	Base/Troj/Plantain
S8	Oct-11	Troj. Bealey
S9	Dec-09	Bealey/Arrow
S10	Nov-14	Shogan/Chicory/Plantain
All paddocks also sown with clover		

STAFFING AND MANAGEMENT

Roster System – 8 days on 2 off, 8 days on 3 off
Milking Times – cups on 5.00am / 2.30pm

IRRIGATION AND EFFLUENT SYSTEM

Centre-pivots	127 ha
Long Laterals	24 ha
K-Lines	10 ha
Irrigation System Capacity	5.5 mm/day
Length of basic pivot	402
Well depth	90m

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.

MATING PROGRAMME – SPRING 2016

KiwiX DNA for 365 cows [F8-F16]; Holstein Friesian Daughter Proven for 280 cows [F0-F7 then follow with Jersey bulls. Heifers start mating 10 days early, Syncro + AI the natural mate for 9 weeks. 10 weeks mating for milking herd. Expect to rear 150 heifers.

HERD DETAILS – OCTOBER 2016

Breeding Worth (rel %) 99 / 46
Production Worth (rel%) 128 / 66
Recorded Ancestry 99%

Average weight / cow (Dec)
Herd monitored walk over weighing
488 kg [Dec 2015]

Calving start date 2016
Heifers 18 July, Herd 1 August

Est. Median calving date
12 August 2016

Mating start date
25 October 2016 (heifers 10 days earlier)

Empty rate (nil induction policy) after 10 weeks mating - 14% (2015-16 mating). 6 week in-calf rate 69%.

	2002/03	2003-07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Total kg/MS supplied	228,420	**277,204**	278,560	261,423	273,605	262,112	297,740	300,484	276,019	278,654	289,906
Average kg/MS/cow	381	**425**	409	384	415	391	471	477	440	498	522
Average kg/MS/ha	1,414	**1,720**	1,744	1,634	1,710	1,638	1,861	1,878	1,725	1742	1812
Farm working expenses /kgMS	$2.98	**$2.68**	$3.37	$3.88	$3.38	$3.86	$3.91	$3.84	$4.28	$3.87	$3.47
Dairy operating profit/ha	$1,164	**$2,534**	$8,284	$2,004	$4,696	$6,721	$4,553	$4,665	$7,578	$1200	$1182
Payout (excl. levy) $/kg (Milk price + div)	$4.10	**$4.33**	$7.87	$5.25	$6.37	$7.80	$6.30	$6.12	$8.50F	$4.60	$4.30
Return on assets	4.4%	**6.18%**	14.6%	4.8%	7%	7%	6%	6%	10%	1.6%	1.6%
1 July cow numbers	631	**675**	704	704	685	694	665	650	650	580	578
Max. cows milked	604	**654**	680	683	660	669	632	630	628	560	555
Days in milk	-	**-**	263	254	266	271	272	273	259	263	267
Stocking rate cow equiv./ha	3.75	**4.05**	4.2	4.3	4.13	4.18	3.95	3.94	3.92	3.5	3.47
Stocking rate Kg liveweight/ha	1,838	**1964**	2,058	2,107	1,941	1914	1860	1878	1872	1680	1724
No. cows/weeks wintered off	500/8	**515/7.8**	546/9	547/7	570/9	652/8.4	650/9.8	650/9.8	650/11.4	580/10.7	578/11.6
No. yearlings grazed - On/Off	0/118	**0/157**	0/171	0/200	0/160	0/166	0/141	0/138	0/140	0/126	0/126
No. calves grazed - On/Off	0/141	**0/163**	0/200	0/170	0/160	0/194	0/190	0/156	0/150	0/126	0/155
Past eaten (dairybase) (tDM/ha)	-	**-**	17.9	17.2	16.2	16.9	17.3	16.8	14.9	15.7	16.6
Purch. Suppl - fed (kgDM/cow)	550	**317**	415	342	259	463	359	434	506.8	300	126
Made on dairy/platform (kgDM/cow)	0	**194**	95	64	144	160	154	93	0	40	277
Applied N/160 eff. Ha	-	**-**	164	200	185	256	340	351	252	143	179

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LUDF Strategic Objective

To maximise sustainable profit embracing the whole farm system through:

- *increasing productivity;*
- *without increasing the farm's total environmental footprint;*
- *while operating within definable and acceptable animal welfare targets; and*
- *remaining relevant to Canterbury (and South Island) dairy farmers by demonstrating practices achievable by leading and progressive farmers.*
- *LUDF is to accept a higher level of risk (than may be acceptable to many farmers) in the initial or transition phase of this project.*

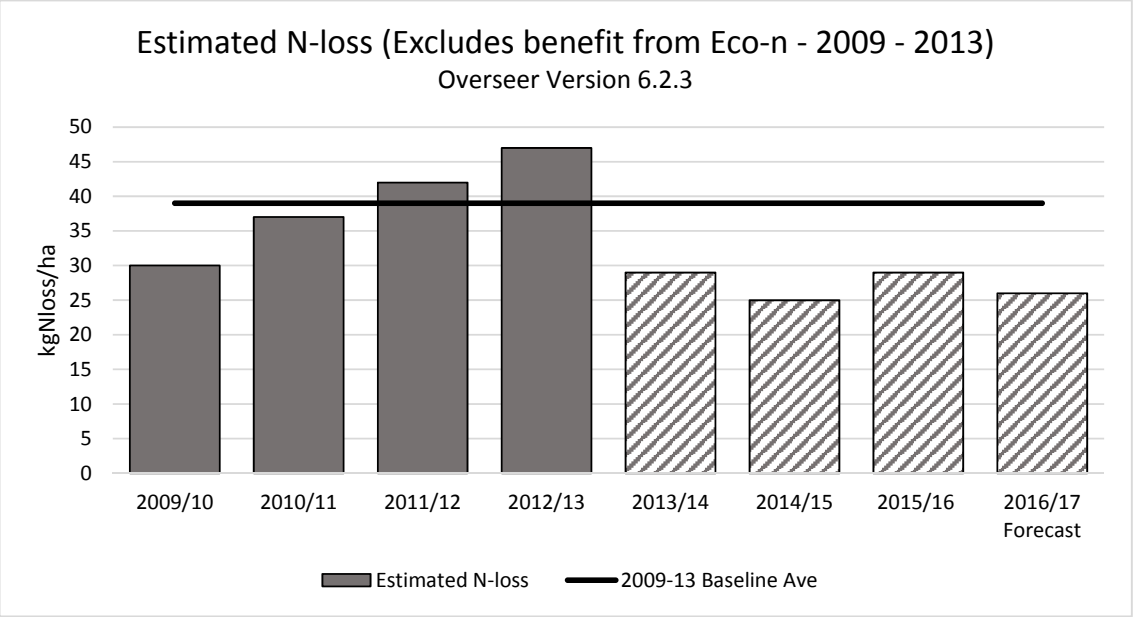
To achieve the above objectives, and considering the changing environmental regulations to reduce nutrient losses, LUDF has since the beginning of the 2014/15 season adopted and scaled up research emerging from the P21 Phase 2 programme. This research (jointly funded by the Ministry of Business, Innovation and Employment, DairyNZ, Fonterra, Beef + Lamb New Zealand and the Dairy Companies Association of New Zealand) identified a "low input, highly productive farming system" that reduced nutrient losses while maintaining profitability when estimated against the LUDF data at the time.

Overview of Low Input, High Production, Highly Profitable, Low Nutrient Loss Farm System

	Initial Target	**2014/15 Result**	**2015/16 Result**
Stocking Rate	3.5 cows /ha		
Nitrogen Fertiliser Input	150 kgN/ha	143 kgN/ha	179 kgN/ha
Imported Supplement	300 kgDM/cow + winter off	126 kgDM/cow + winter off	
Milk Production	500 kgMS/cow and 1750 kgMS/ha	498 kgMS/cow and 1742 kgMS/ha	522 kgMS/cow and 1812 kgMS/ha
Farm Working Expenses	$4.00 /kgMS	$3.87 /kgMS	$3.47 /kgMS

Results from the 2014-15 season identified the system was scalable, but could be improved at LUDF. In particular, the research had not included any regrassing, where-as LUDF, based on prior identification of poorer performing paddocks planned to, and regrassed 3 paddocks (15%) in the 2014-15 season. This put considerable pressure on the farms feed supply, so the plan was reduced to 10% in 2015-16. The reduction in payout subsequently led to this being restricted to only 5% last season. This was a much more manageable area in a low input system and contributed to generating a surplus of home grown silage that was cost effectively fed back to extend lactation of 'cull' cows.

Environmental footprint: estimated Nitrogen Loss with Overseer

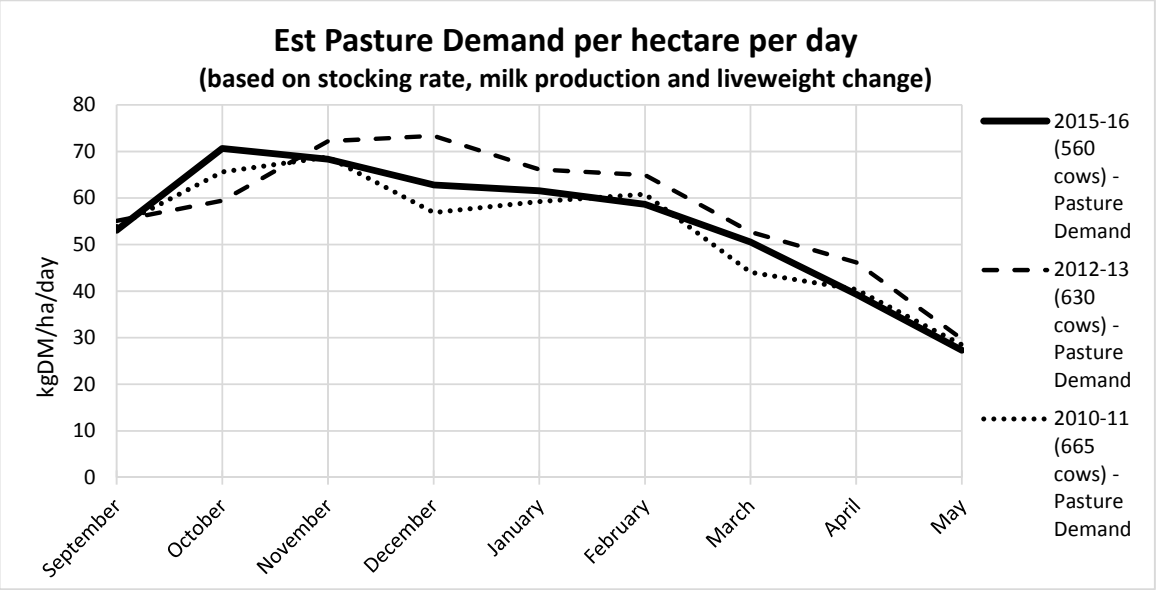


Estimated N losses for LUDF through 7 seasons, compared to baseline as run through Overseer®.

Overseer estimated the farm system in 2014-15 reduced its N-leaching by over 30%, providing confidence the farm could allow the use of a little more Nitrogen fertiliser to push total drymatter production, milk production and profitability in the 2015-16 and 2016-17 seasons. Total N applied as fertiliser therefore increased from 143 kgN/ha to 179kgN/ha last season. The additional Nitrogen was largely applied in the late spring / summer when irrigation plus Nitrogen was likely to give high N-response rates.

Feed Conversion Efficiency

Using the energy requirements for maintenance, walking, change in CS and milk production, enables calculation of the proportion of pasture consumed for milk production to be compared to that required for maintenance. Total pasture consumed and used in milk production has increased since 2010-11 and changed from 61% of pasture eaten to 69% pasture. The farm is thus now both 'harvesting' more pasture, AND turning this into more milk for sale.

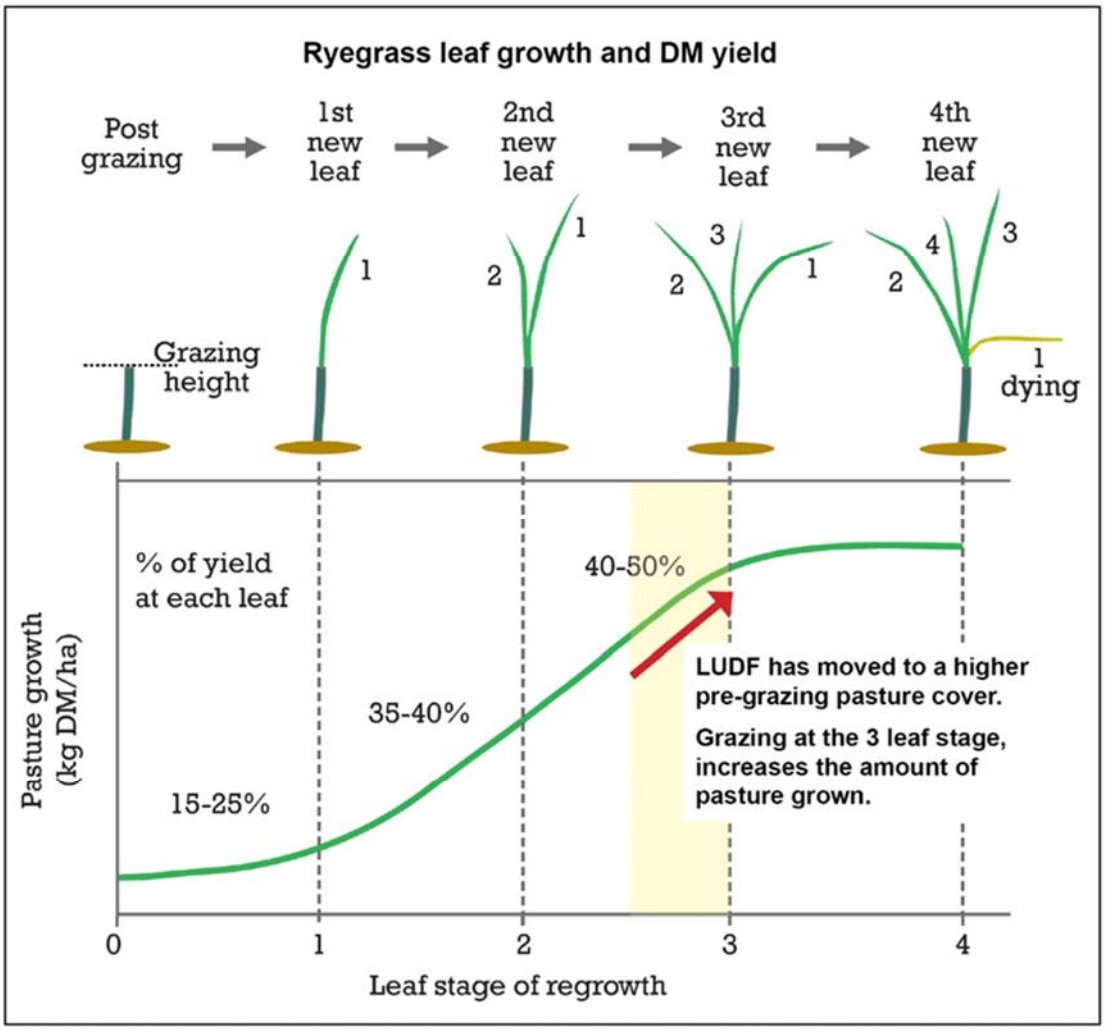


Why (how) LUDF has grown more pasture

A key reason for the increase in pasture grown (and harvested) is the increase in pre-grazing pasture cover (by around 200 kgDM/ha). The science behind this is shown in the diagram below.

The farm has moved from grazing ryegrass at around *2.5 leaves/tiller* to around *3 leaves/tiller*. This has a significant effect as 40-50% of the ryegrass DM yield in a regrowth cycle is produced with the third leaf. Simply put "grass grows grass", and with more leaves the pasture captures more light, has greater photosynthesis, and grows faster.

Post-grazing residuals have remained similar to previously (averaged across the whole season) and a consistent, even post-grazing residual remains a key requirement for LUDF. Running higher pre-grazing covers means the grazing round is longer (by an average of 6 days) and each paddock will be grazed 1-2 times less over the season (this also reduces N application when applied following each grazing).



Two other things are key to managing higher pre-grazing covers (as LUDF has):

- Tetraploid ryegrass, or a tetraploid/diploid ryegrass mix, have a significant advantage for this system. On LUDF 19 of its 21 paddocks have tetraploids, which maintain high cow intakes (in a timely manner) at higher covers. Whereas cows may struggle to graze a straight diploid ryegrass >3300 kgDM/ha, a tetraploid/diploid mix can typically still be well grazed at up to 3600 kgDM/ha (assuming low and consistent grazing residuals in prior grazings).
- Pasture quality issues however can occur more quickly with longer grazing rounds and higher pre-graze covers. Pasture ME can still be very high (12+) at the 3 leaf/tiller stage of ryegrass growth, but beyond this it starts to drop off. Having higher covers means your farm is growing more, and you can move past 3 leaves/tiller into lower quality issues more quickly. Monitoring and controlling pasture quality when necessary (e.g. pre-graze mowing, making silage) are important.

Results to date (to the end of January):

	2012/13	2013/14	2014/15	2015/16	2016/17
Total kgMS sold	198,000	197,000	184,000	190,000	188,000
Total Cows in Milk	624	620	549	548	544
Tot N fert applied - kgN/ha	270	184	100	129	125
Tot Silage Fed - kgDM/cow	251	460	141	114	55
Total Silage Fed – tDM	158	290	79	64	31
Whole Herd WOW (kg)	490	482	493	497	494
Herd Ave CS	4.5	4.2	4.2	4.3	4.3
Silage made on farm (tonnes DM)	49	0	22	125	58
Silage made on farm (kgDM/cow)	78	0	40	223	104

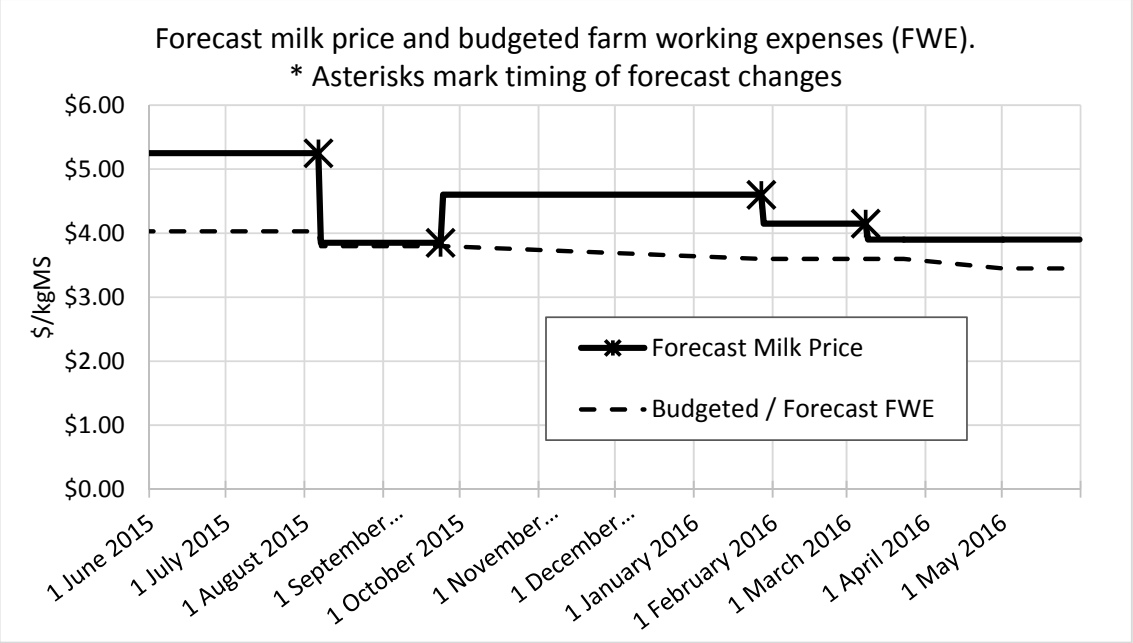
Sensitivity to Production:

Total Milk Production	**275,000**	**280,000**	**285,000**
Budgeted Total Expenses	$1,078,912	$1,078,912	$1,078,912
Ave Milk Production /cow	495	504	513
Expenses $/kgMS	$3.92	$3.85	$3.79

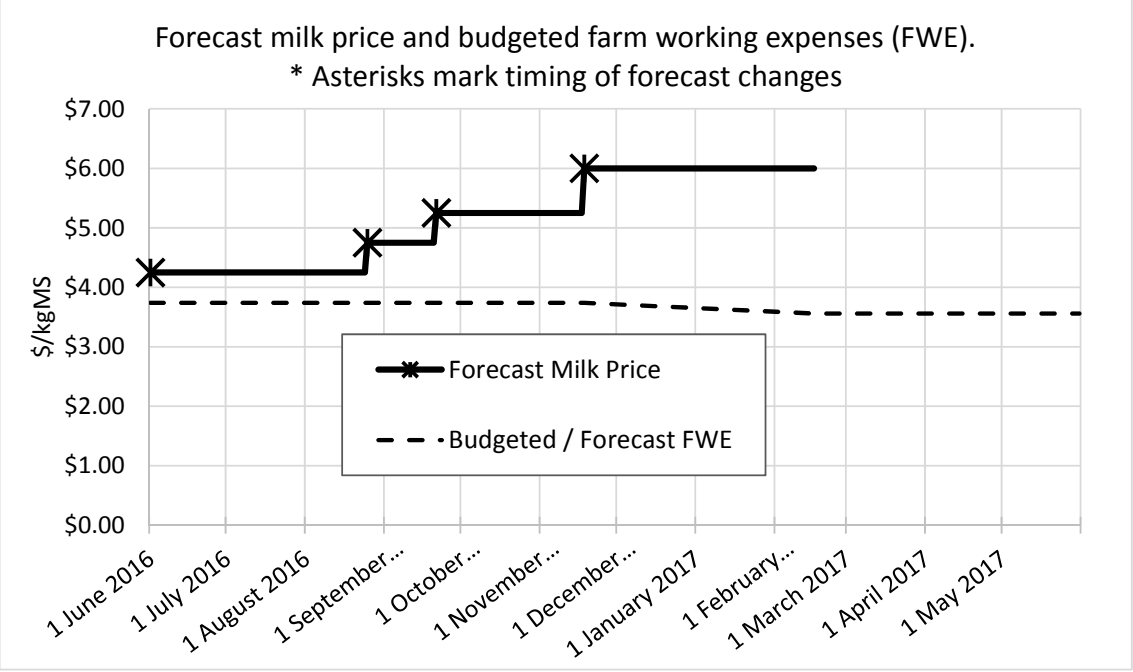
Income / Expenses / Cashflow

Forecast Milk Income – 2015-16 vs 2016-17

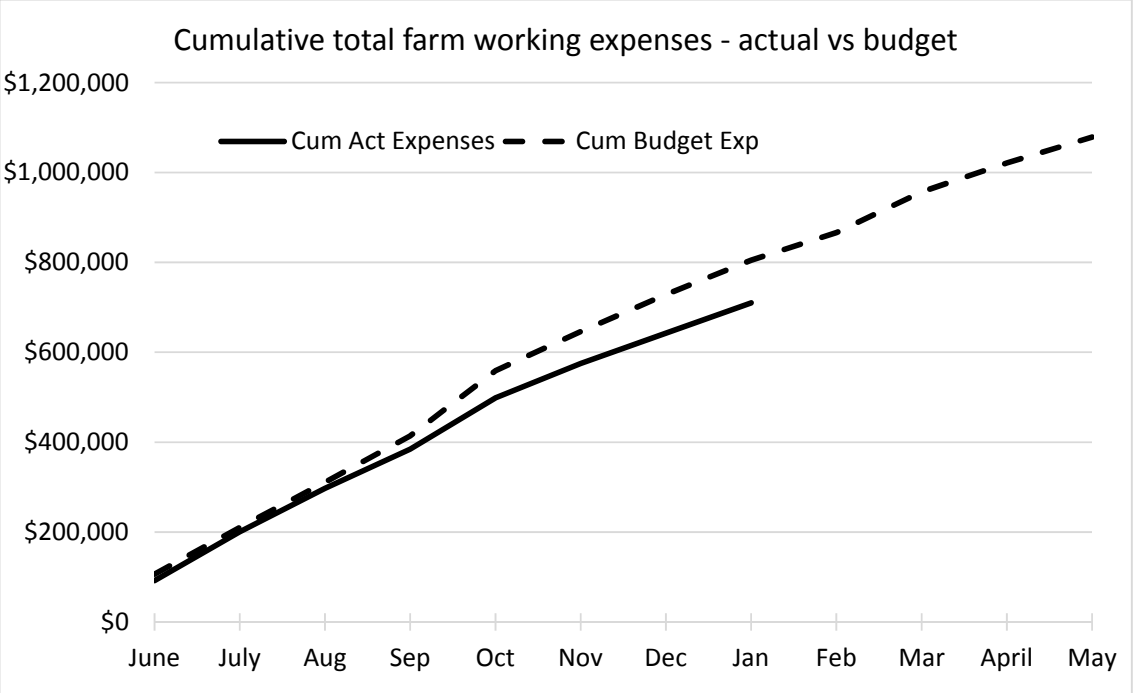
2015-16 Production Year



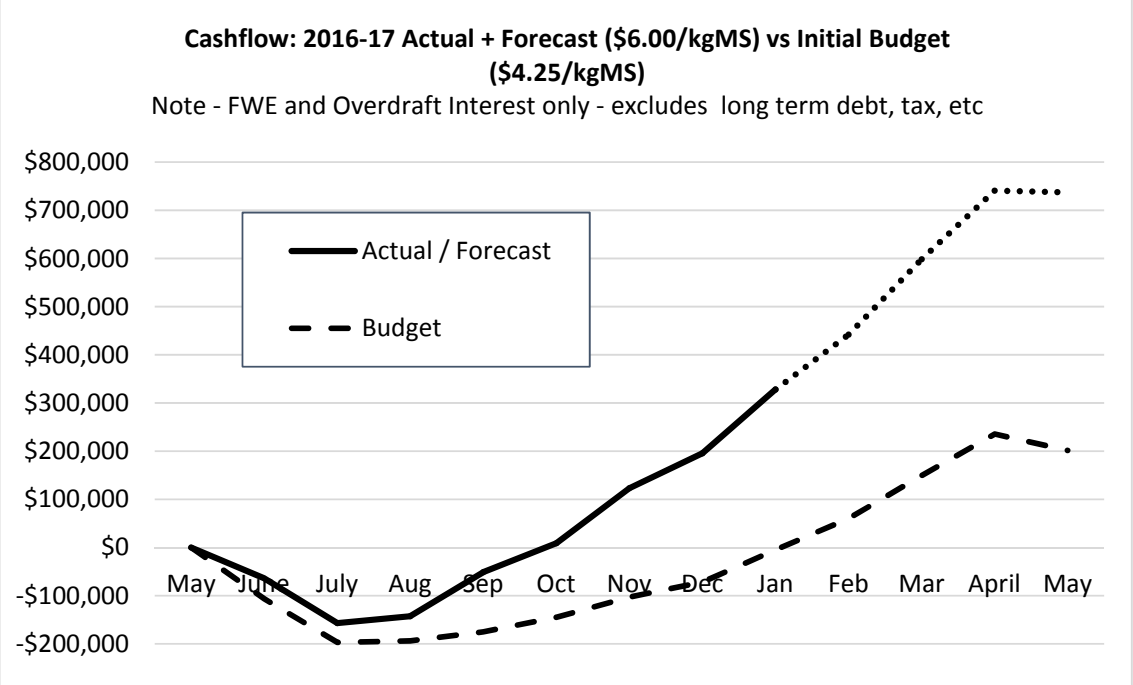
2016/17 Production Year (to date)



2016-17 Production Year:



See details below on expenditure to date.



Notes:

The cash flow above assumes a zero balance as the start of the production year, overdraft interest rate of 7% but no interest / payments associated with term debt. 2015/16 retro payments ($145,000), and dividend payments (assuming 280,000 shares) are included.

Actual vs Budget Income and Expenses to date:

Year ending May 31		2015/16 Actual	2016/17 Budget	Actual to end Jan	Budget to End Jan	Variance (Act—budg)	Forecast Year End	Notes
Milk production (kgMS)		289906	280,000	189,126	192,506	-3,380	276,620	1
160ha	kgMS/ha	1,812 /ha	1750 /ha					
Peak Cow Nos and Prod.		555	560	554				
Staff		3.70	3.7					
Income	Payout $/kgMS	$3.90	$4.25	$6.00	$4.25	1.75	$6.00	2
	Dividend /share	$0.40	$0.40	$0.20/share	$0.20/share	0		
	Milksolid Revenue	$1,130,633	$1,190,000	$1,134,756	$818,151	316,606	1,506,606	3
	Dividend	$115,962	$112,000	$37,825	$38,501	-676	111,324	4
	Surplus dairy stock	129243	$112,959	$62,132	$33,060	29,072	142,031	5
DairyNZ Levy		-$10,437	-$10,080	-$6,809	-$6,930	122	-9958	
Stock Purchases		-84960	-24,000	-33,900	-24,000	-9900	-33,900	6
Gross Farm Revenue		**$1,280,442**	**$1,380,879**	**$1,194,005**	**$858,781**	$335,223	1,716,102	
Expenses								
Cow Costs	Animal Health	$57,851	$53,562	$46,191	$38,548	$7,643	61,205	7
	Breeding Expenses	$42,230	$42,881	$39,422	$37,521	$1,901	44,782	
	Replacement grazing & meal	$135,151	$149,091	$96,833	$96,479	$354	149,445	
	Wint grazg - Herd incl. freight	$195,655	$149,952	$140,339	$143,202	-$2,863	147,089	
Feed	Grass sil purch	$24,668	$62,160	$26,335	$62,160	-$35,825	26,335	8
	Silage making & delivery	$20,088	$18,240	$6,925	$18,240	-$11,315	5,556	9
	Giberillic Acid	$234	$13,120		$9,120	-$9,120	4,000	10
	Nitrogen	$45,093	$45,485	$26,752	$34,114	-$7,362	38,123	11
	Fertiliser & Lime	$14,853	$26,255	$30,001	$25,255	$4,746	30,001	12
	Irrigation - All Costs	$76,030	$64,600	$50,997	$45,292	$5,705	70,305	13
	Re-grassing	$8,654	$20,215	$11,762	$20,215	-$8,453	11,762	14
Staff	Employment	$228,413	$261,945	$150,015	$168,975	-$18,960	242,985	15
Land	Electricity-farm	$25,379	$30,000	$17,574	$18,800	-$1,226	28,774	
	Administration	$24,965	$24,700	$13,235	$14,384	-$1,149	23,551	
	Rates & Insurance	$21,020	$21,020			$0	21,020	
	Repairs & Maintenance	$53,042	$54,000	$43,419	$37,796	$5,623	59,623	16
Shed Expenses excl. power		$9,119	$9,850	$5,140	$9,472	-$4,332	5,518	17
	Vehicle Expenses	$22,989	$31,336	$10,880	$24,939	-$14,059	17,277	18
	Weed & Pest	$1,174	$500	$820	$500	$320	820	
Cash Farm Workg Expenses		**$1,006,608**	**$1,078,912**	**$716,640**	**$805,012**	**-$88,372**	**989,540**	19
FWE/kgMS		**$3.47**	**$3.85**				**$3.58**	
Depreciation est.		$116,000	$116,000				116,000	
Total Operating Expenses		$1,122,608	$1,194,912	$716,640	$805,012	-$88,372	1,105,540	
Dairy Operating Profit		$157,834	$185,967				$610,562	
DOP/ha		**$986**	**$1,162**				**$3,816**	
Cash Operating Surplus		$273,834	$301,967				$726,562	
Cash Operating Surplus /ha		**$1,711**	**$1,887**				**$4,541**	

Notes to Actual vs Budgeted Expenses to date:

1. Milk production 2% behind budget (season to date). September and January were 1% behind last year while October, November and December were 3-4% behind last year.
2. Forecast Milk Price currently $6 compared to budget of $4.25
3. Milk income is therefore up by $316,606 due to increased pay out
4. Dividend payment is calculated on presumption of 1 share for every kg milk produced. Slight decrease due to reduction in production.
5. Extra stock income is a combination of having a higher empty rate in our R2 heifers (9%) plus 6 extra bulls to sell (as below) and higher than predicted beef schedule
6. 6 Extra bulls purchased due to predicted low 6 week in calf rate and effect IBR may have had on AI mating.
7. Animal health is over budget by $7643 due to a combination of having IBR present in the herd which resulted in extra vet visits and IBR vaccines. Increased Lameness has also had an impact on expenses. Expenses were higher than budgeted for minerals, calving expenses and teat sealing R2 heifers.
8. Have only purchased 74.5 tonne of the budgeted 168 tonne of silage, having not used as much in the spring. Will incur some of the extra budgeted costs when we bring in fodder beet for the autumn (potentially up to $21,000).
9. Have only made 57.8 tonne DM on the platform, compared to 150 Tonne budgeted
10. No Gibberellic used this season.
11. Have used budgeted amount Nitrogen Fert to date – difference is mostly due to urea per tonne being cheaper than budgeted.
12. Time of application earlier than in budget. All fertiliser has been applied, including potassium to the non-effluent North Block, this was due to gradually decreasing soil test levels, and not budgeted.
13. Higher maintenance costs than budgeted due to ongoing issues with our 16 year old north pivot.
14. Had budgeted to re grass 2 paddocks. To date have only done one and not likely to do a second one this season but may incur some cost this autumn if we over sow some of our shogun paddocks.
15. Employment cost are lower due to not employing 4th staff member till mid-July and being one staff member down for most of January
16. Over expenditure of $5623 in R&M has been generated by over spending in most areas of R&M. Items include Fan replacement on refrigeration unit, $1867; Vat wash motor, $1206; Security lights, $3115; Service cup removers, $7389. Some of this cost has been off set with $9000 budgeted for Tracks not spent yet.
17. Savings in shed expenses are due to timing rubber ware and detergent changes - will come into February expenses
18. Vehicle expenses are well below budget due to the purchase of new Bikes at the beginning of this season having a good impact but have also had less costs related to Ute and tractor. Fuel cost will increase in February due to timing of expenses.
19. Have managed to operate the farm under budget so far this season but some of the $88,372 saving in the budget will be spent later in the season, for example purchasing fodder beet for the autumn in place of silage and some R&M on tracks and pivot ruts budgeted for but not yet spent.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IBR (Infectious bovine rhinotracheitis) virus

SELWYN RAKAIA VET SERVICES LTD
P.O.Box 52, Dunsandel. Phone (03) 325-4444, Fax (03) 325-4442

- IBR virus is a common herpes virus of cattle
- Stress in a carrier animal can reactivate a latent infection causing virus shedding, like chickenpox/shingles in humans
- Transmitted easily by close contact, aerosol or venereal spread
- Most infections with IBR in NZ cause very mild clinical signs or none at all
- About 90% of herds have been exposed
- NZ strains of IBR seem to be mildly pathogenic compared to foreign strains
- Younger animals seem to be infected more often
- It can cause upper respiratory tract infections (rhinotracheitis), conjunctivitis and genital tract infections (pustular vulvovaginitis)
- Disease outbreaks tend to occur in some years and not others, possible climatic factors involved
- Abortions and encephalitis due to IBR are seen overseas but have not been recorded in NZ.

Vaccines are available to protect animals against the virus but over recent years few people have taken that option, in part because any animal testing positive for IBR cannot be considered for the Chinese export market.

Will treating cows with elevated blood ketones improve their health and productivity?

Preliminary results to date from "The Subclinical Ketosis Trial"

Background:

- Following calving, dairy cows undergo a period of negative energy balance where they mobilise body tissue reserves as they adapt to the demands of lactation. Cows unable to adequately transition through this period often develop hyperketonaemia, characterised by excessive concentrations of ketones (eg. beta-hydroxybutyrate; BHB) in blood.
- Blood concentrations of BHB ≥1.2 to <3.0 mmol/L indicates subclinical ketosis (SCK), whereas BHB ≥3.0 mmol/L indicates clinical ketosis with (or without) symptoms. Subclinical ketosis is the more prevalent issue. NZ data from a Cognosco study indicated that about two-thirds of cows in a herd have at least one SCK positive test during the first 5 weeks post-calving. However, this figure ranged from 12% to 100% of cows across the herds studied.
- That study indicated that cows that had SCK within the first 5 days post-calving had a 2.5x greater risk of a metricheck positive score (purulent vaginal discharge indicating a clinical uterine infection) at 5 weeks post-calving. Furthermore, SCK at any stage during the first 5 weeks of lactation was associated with a 10% lower 6 week in-calf rate.
- These data are consistent with overseas studies that associate SCK with uterine infections, lower reproductive performance, reduced milk production, greater incidence of other metabolic diseases and mastitis in early lactation.
- Recent overseas studies in housed systems indicate that treating hyperketonaemic cows with monopropylene (MPG) drench in early lactation can improve reproduction, animal health, and milk production, and can reduce removal rates from the herd. Therefore, a large-scale trial was initiated to test MPG under a pasture-based system.

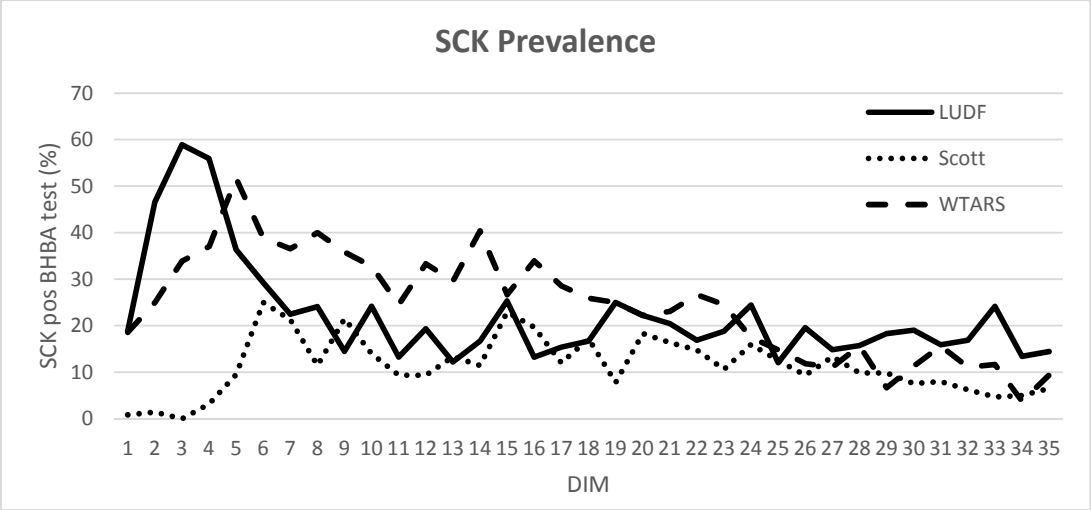
Objective: To determine the effect of treating hyperketonaemic cows with MPG drench on animal health, milk production and reproductive performance in a pasture-based system.

Trial Design:

- 1000 cows were enrolled across 3 farms (Scott, Waikato; TARS, Taranaki; LUDF, Canterbury) during calving 2016 and were randomly allocated to either a control or treatment group.
- Each cow was tested for circulating BHB concentrations 3 times per week for 5 weeks post-calving by taking a blood "prick" sample and using a hand-held meter device.
- If cows in the control group tested positive for SCK (BHB ≥1.2 to <3.0 mmol/L) they were not treated at any stage.
- If cows in the treatment group tested positive for SCK they were given a daily drench of MPG until BHB went below 1.2 mmol/L.
- If cows in either control or treatment groups tested positive for clinical ketosis (BHB ≥3.0 mmol/L), they were given Ketol drench twice daily for 3 days with veterinary treatment sought if clinical symptoms were present.

Preliminary Results:

- The incidence of SCK was similar to previous NZ studies, and varied between farms. Approx. 65-80% of cows had at least one test with elevated BHB concentrations during the first 5 weeks of lactation. About 4-13% of cows developed clinical ketosis.
- Most cows first tested SCK positive in the 1-2 weeks immediately post-calving (i.e. incidence of new cases). The % of cows that tested SCK positive on each DIM was greatest in the first 10 days post-calving, but ~10-25% of cows still tested positive each day between 21 and 28 DIM (i.e. prevalence – see graph below).



- Without treatment, it took 3-6 days for an episode of SCK to resolve spontaneously to at least one SCK negative test, but 6-10 days for 2 consecutive SCK negative tests. The higher the BHB concentration and the earlier the days in milk at the first SCK positive test, the longer it took for cows to resolve spontaneously.
- Generally, cows that developed SCK were higher producers and had a greater live weight and BCS at calving.
- The effect of MPG drench on resolution of SCK, milk production, and risk of developing clinical ketosis is currently being analysed with preliminary results indicating that drenching at blood tests of BHB ≥1.2 to <3.0 mmol/L reduced BHB concentrations, and helped to shorten the duration of clinical ketosis episodes in cows that developed this disorder.
- Reproductive parameters are being analysed to determine if treatment of SCK with MPG drench improved submission, conception and pregnancy rates.
- Results from this "proof-of-concept" trial will be used in developing and testing practical, cost-effective strategies to prevent or treat cows at risk of SCK during early lactation.

Disclaimer: *The results presented herein are preliminary and have not been subjected to rigorous statistical analysis and interpretation. Outcomes may change following final data analyses.*

Acknowledgements: *This study is part of a larger programme on improving cow fertility and lifetime productivity, which is funded by NZ dairy farmers through DairyNZ Inc. and by the Ministry of Business, Innovation and Employment. We gratefully acknowledge the support and dedicated contributions of the farm staff, technicians and veterinarians who worked tirelessly at the 3 farms (LUDF, Scott, TARS) enrolled in this study.*

For more information contact: claire.phyn@dairynz.co.nz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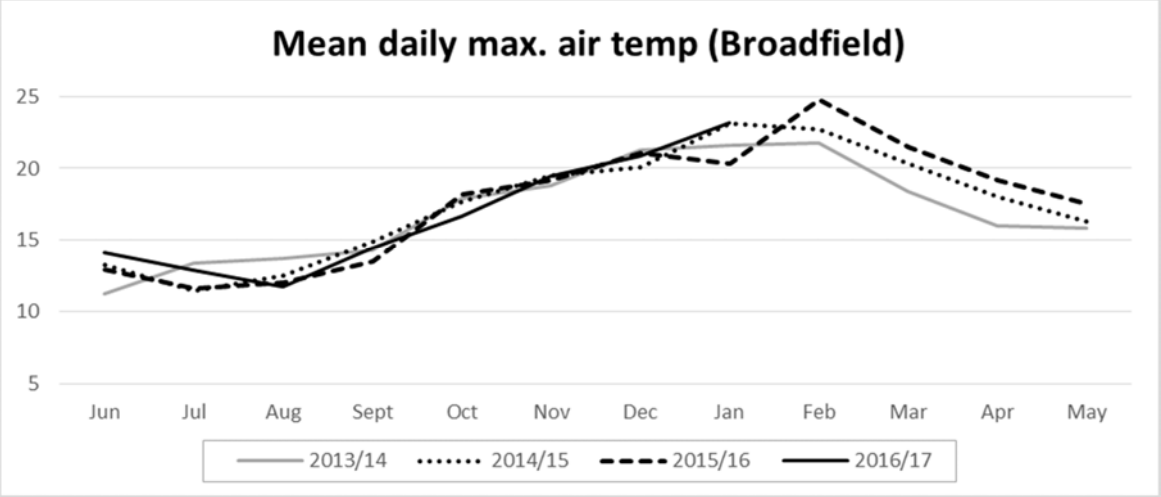
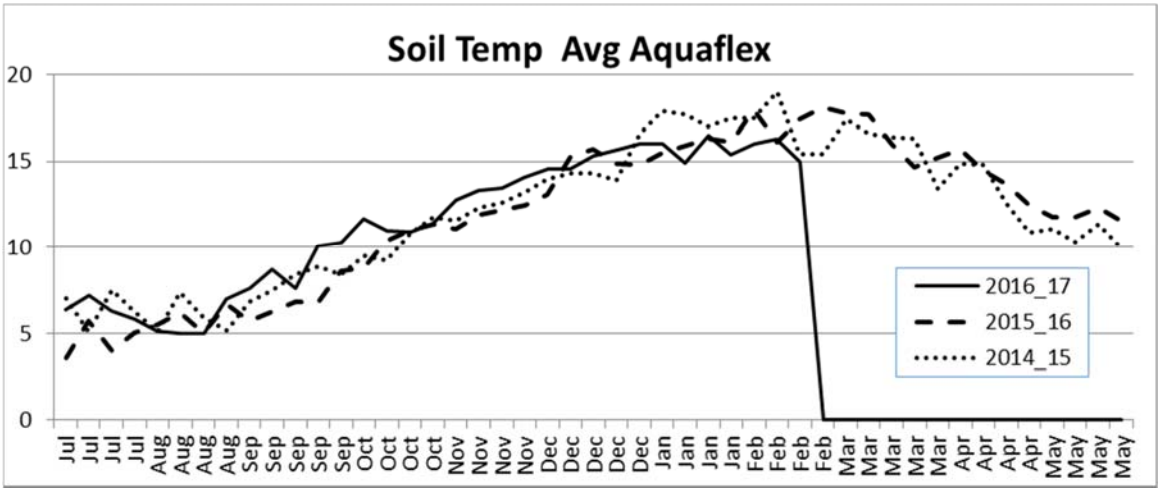
LUDF Season-to-date update

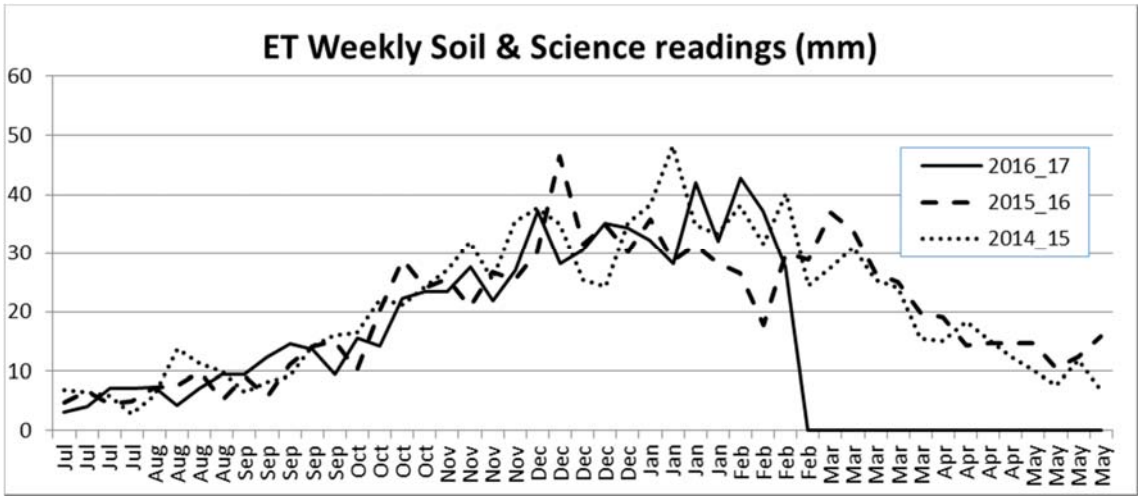
Temperature, rainfall and irrigation

The start of the 2016-2017 season was influenced by a mild early winter, then slightly cooler August and September. During spring, temperatures were similarly not as high as in previous seasons. Summer air temperatures show higher average temperatures in January.

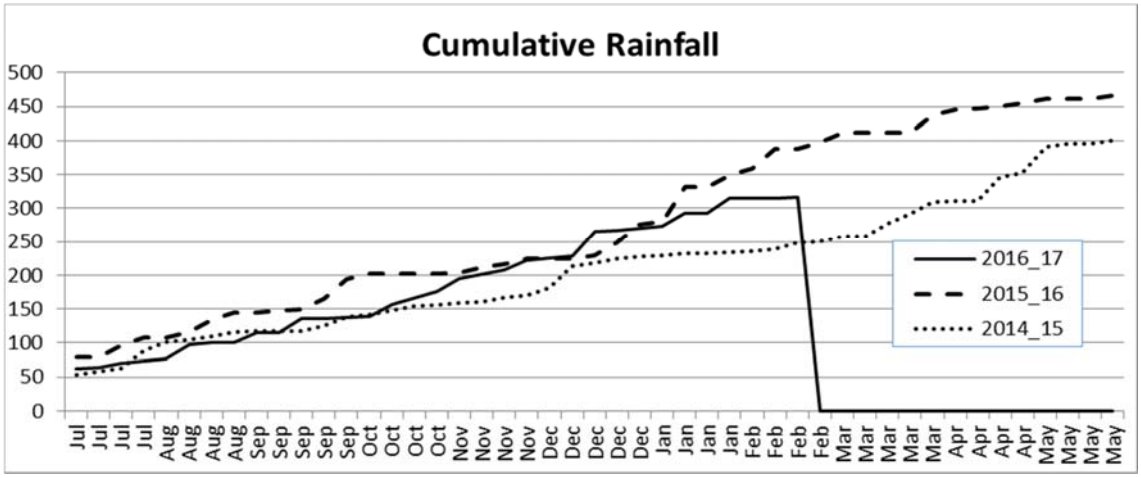


Soil temperatures, though, show a slightly different picture, being generally higher than the past 2 seasons in late August – September and October, but cooler in January / February.

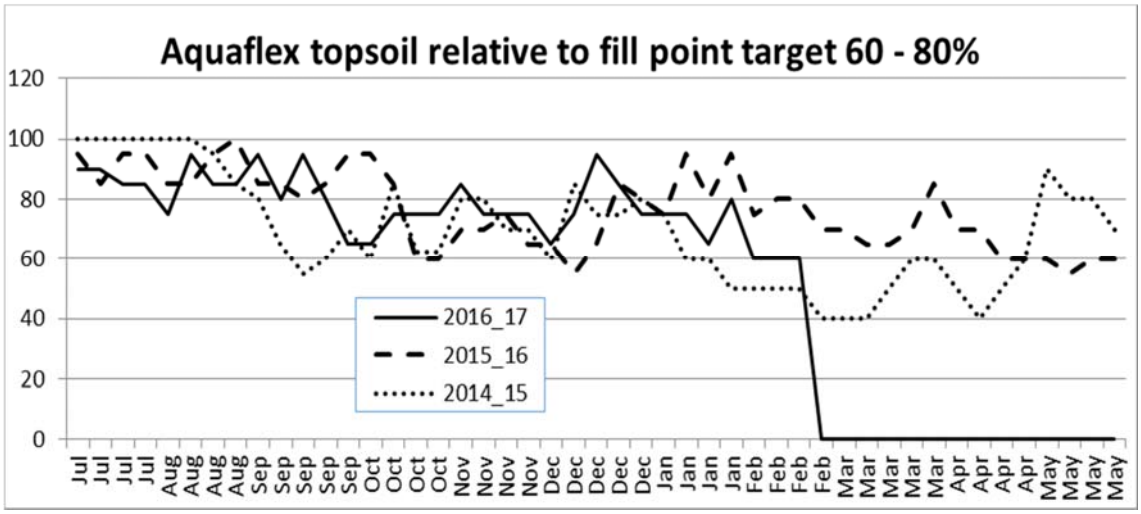




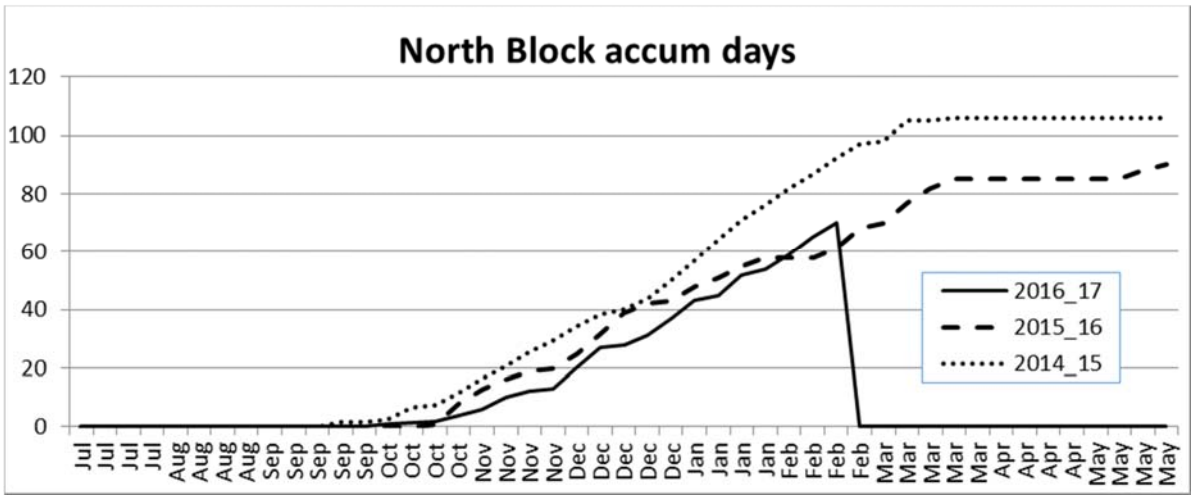
The summer temperatures in the latter part of January and February have resulted in similar ET to 2014/15 summer.



The rainfall received this season did not follow the expected pattern predicted at the start of the season. Rain events were initially more regular than in previous seasons (up until this last month where we have gone for about 4-5 weeks without rain). Season-to-date we have now recorded nearly 100 mm less total rainfall than last season.

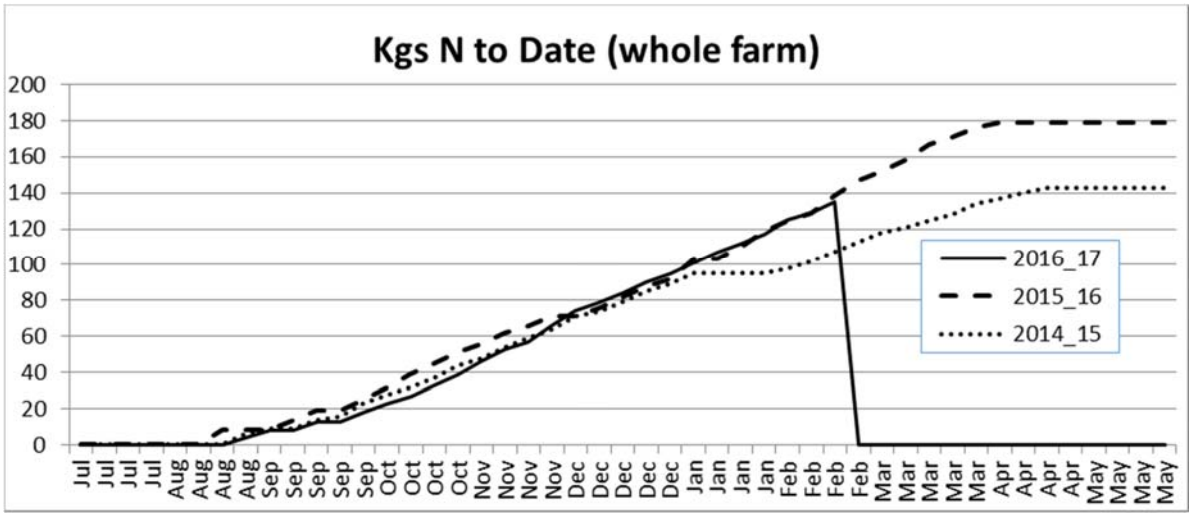


The combination of rainfall and a reliable irrigation supply resulted in our topsoil moisture level holding a little higher in general for much of the season. The high temperatures and resultant higher ET's in later January / February (plus some irrigation breakdowns) resulted in a drop of soil moistures at that time. Together this has resulted in fewer days' total irrigation for the early part of the season, up until the January/February period when irrigation has basically been required almost daily.



Accumulated irrigation days for the season show the delayed start to irrigation this season, compared to the previous two seasons. Total irrigation is now ahead of last year but still well behind that of two years ago.

Pasture Performance



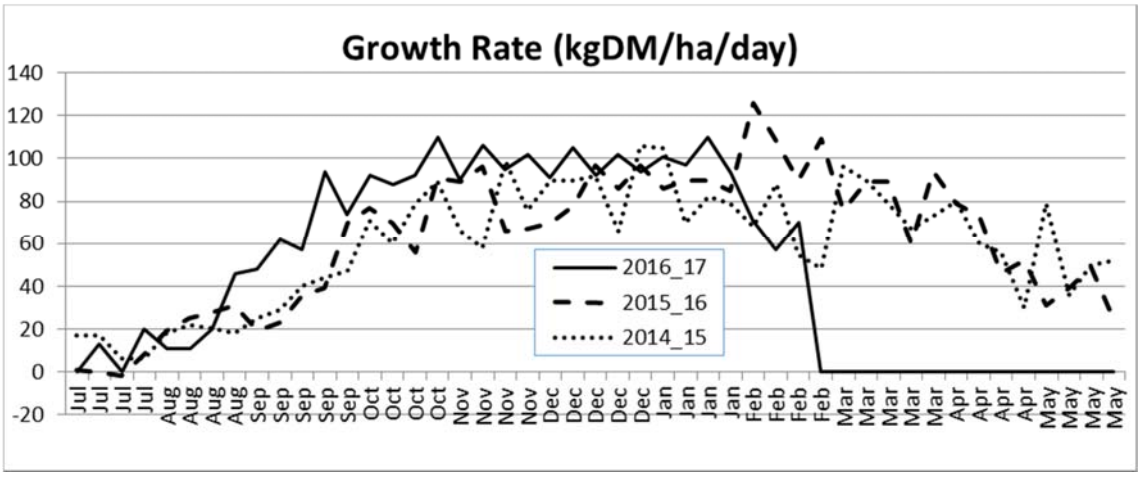
Rising Plate Meter Yield Estimates, Growth Rates and Average Pasture Cover

LUDF walks the farm every Tuesday, measuring pasture yield data in every paddock using a rising plate meter.

Comparing this data with the previous week's data enables growth rates to be calculated and a comparison made of changes in average pasture cover.

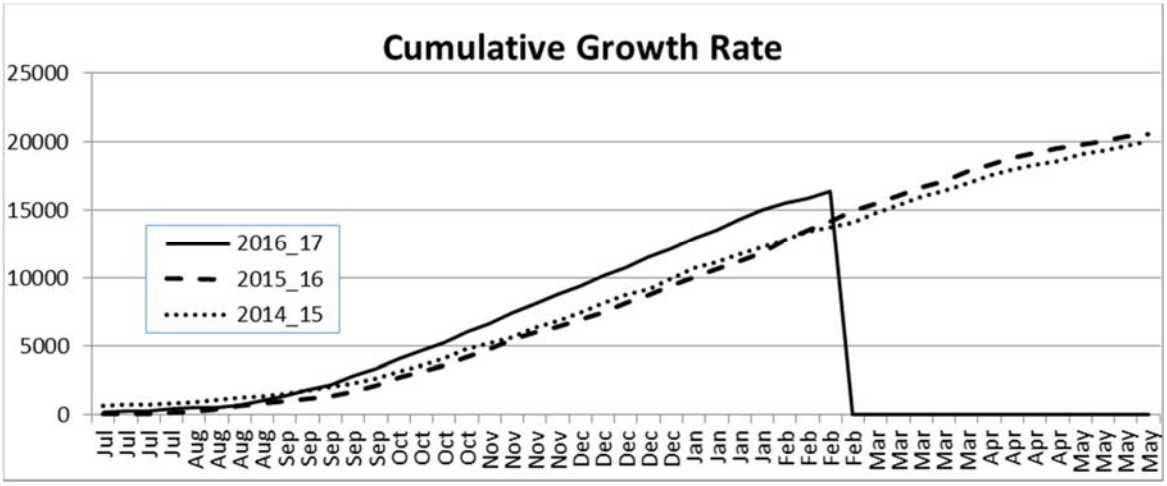
Rising Plate Meter data collected in recent months has appeared to routinely overestimate pregrazing pasture cover, and possibly post grazing covers also. This results in an overestimate of growth rate and impacts reported average pasture cover. Throughout this time, grazing residuals have generally been 'low and consistent' with little remaining feed available – even at the higher plate meter readings.

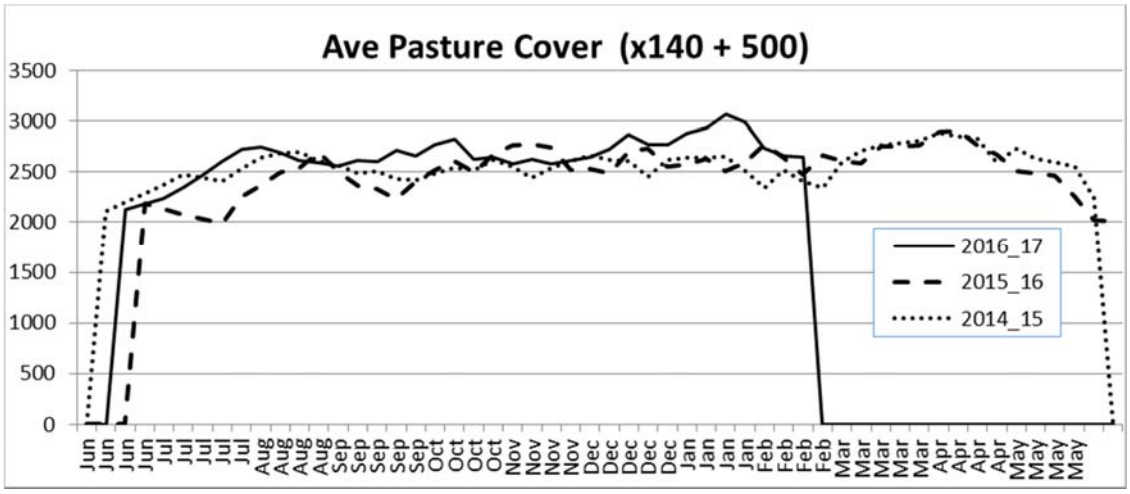
Seeking to address this, the plate meter data collected and reported since early February is the result of a more considered focus on technique and an average of 2-3 plate meters, combined with some discussion on the apparent yield in each paddock. This means data collected in late January is not comparable to the February data, but data collected now on should, provide a better reflection of likely growth rates, APC and therefore available feed on farm.



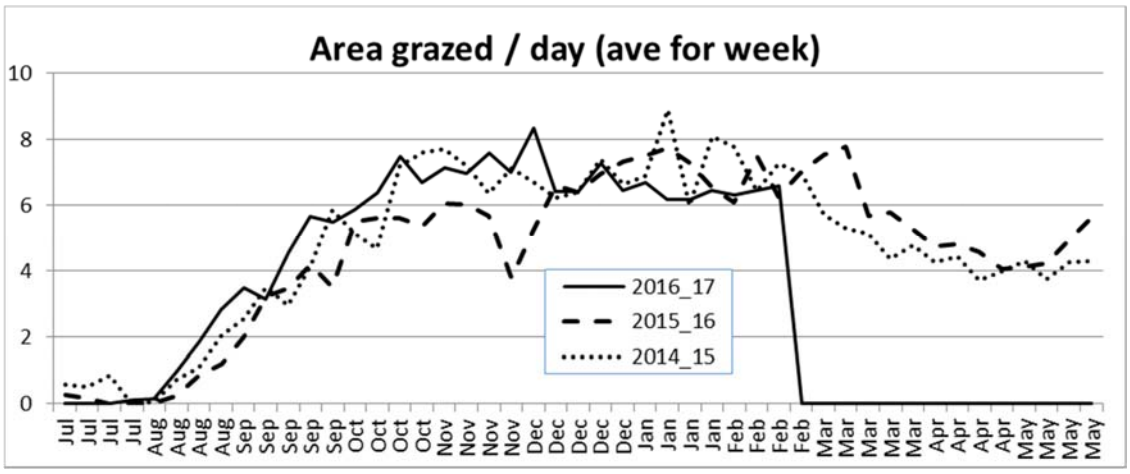
Growth rates appeared consistently higher in September – October than past years, reflecting higher soil temperatures at this time. Note the reported growth rates above of approximately 100kgDm/ha/day through November – January, compared to the demand over this time of up 75 kgDM/ha/day. Clearly growth was not 25kg/ha/day higher than demand for this period (as noted in the farm walk notes through this period – where cow observation suggested less available feed in most paddocks than the plate meter reported).

The cumulative growth rate season-to-date shown in the graph below, will also have been influenced by the consistent overestimation of the growth rates through the October-February period.





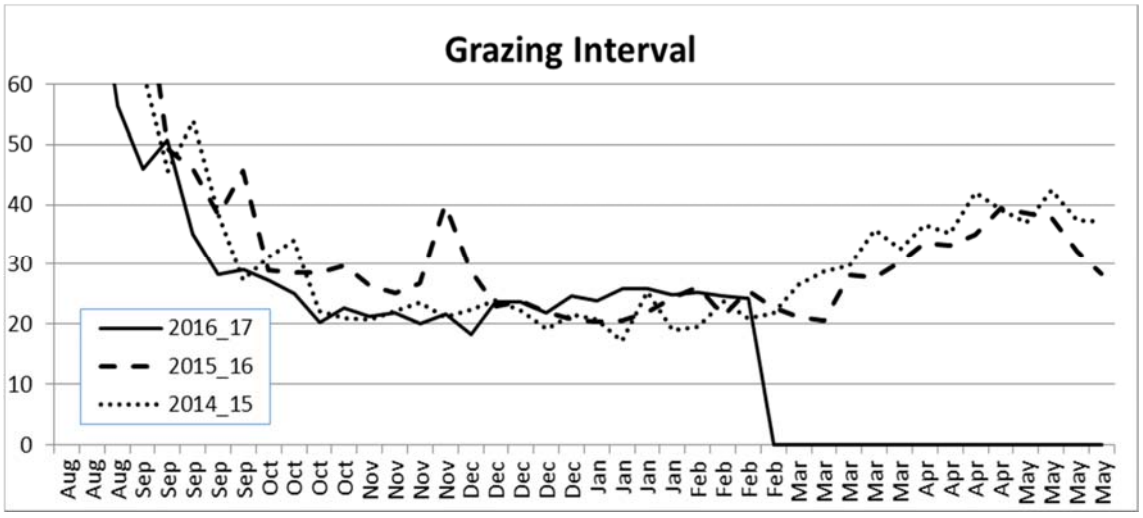
Similarly, APC above is the result of over estimates of pre and post grazing covers. The data was however consistent week to week, so a 'flat' APC suggested demand was approximately equal to supply.

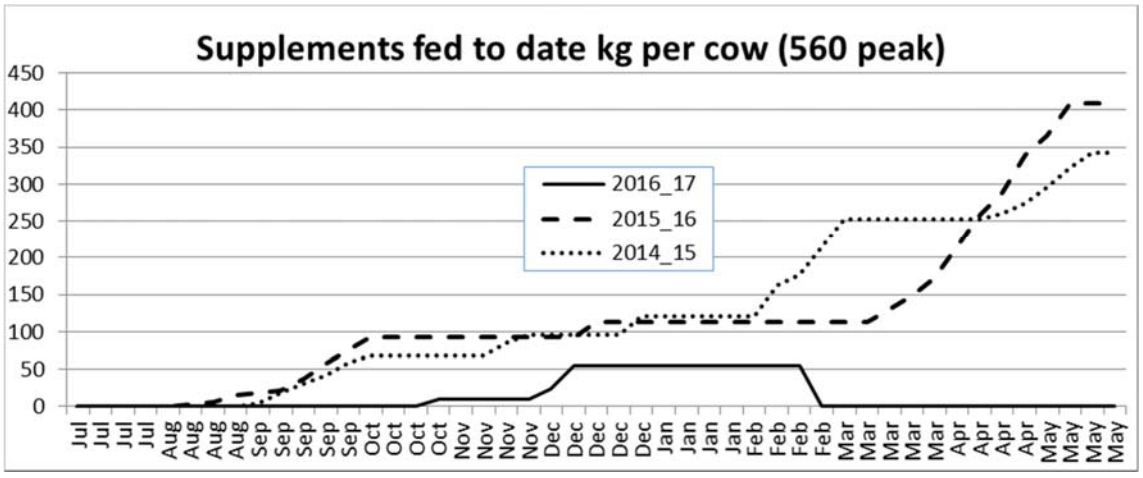


In terms of the area grazed/day and the round length through the season, the exceptional late winter conditions allowed the farm to fully feed cows through the whole spring on grass. This explains the higher-than previous rates of area grazed/day shown above (particularly from mid-September to mid-October).

The daily grazed area remained higher during the October – November period this season as the farm deliberately chose to run a shorter grazing round than in 2015/16. Each week, weather conditions and growth rates estimated that the farm should be able to be managed under this round length without the need of supplements, however, this was not the case, resulting in an 18 day round by late-November.

At this point, the decision was made to extend the round to 25 days, with the use of a little grass silage which can be seen in the graph above as the area grazed dropped to around 6 ha/day. This has remained similar till now, with the round now extending to around 28 days. The paddock that was regrassed also returned to the grazing round in December which aided the feed supply.

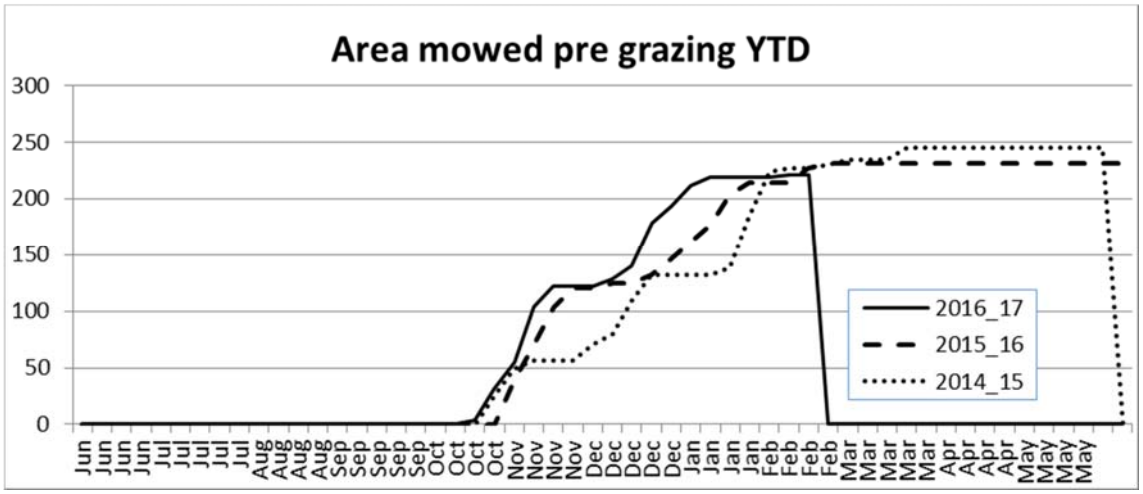




The late winter growth rates and dry conditions resulted in minimal pasture damage and enabled the farm to hold to its target Spring Rotation Planner without the need for any supplements.

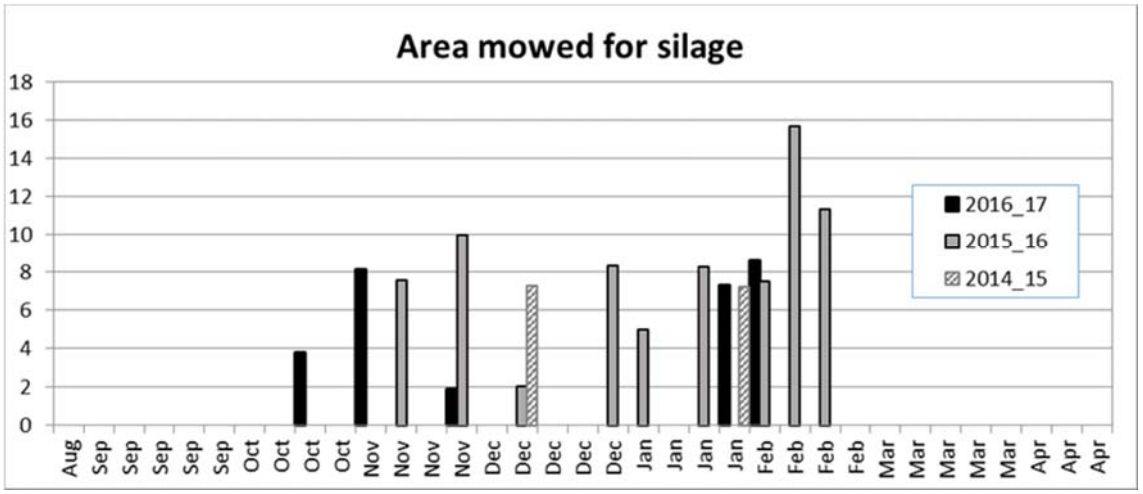
Supplements were fed very briefly in late October then again at the end of November to push the round out to 25 days.

Note supplements fed in the graph above include purchased feed (up to 300kgDM/cow imported feed) and home grown silage.



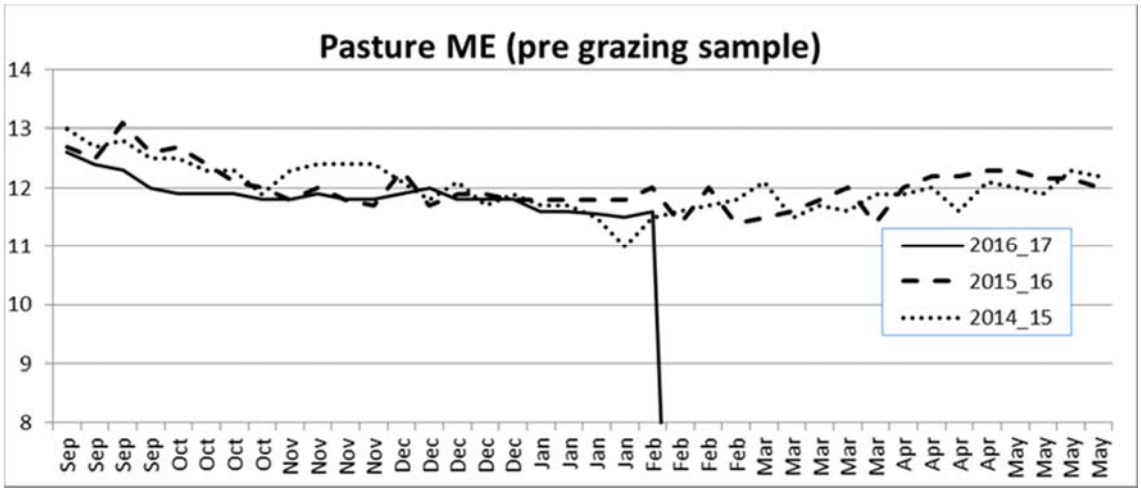
Pre graze mowing has been used this season as per usual management at LUDF. Occasional rainfall events in November and December meant that the use of this tool was not available at all the times when it could have been used to advantage. In part this has led to some post grazing mowing in paddocks that otherwise may have been pre-graze mown at an earlier grazing event. A similar amount of pre-graze mowing has been done across each of the past three years at this point in time.

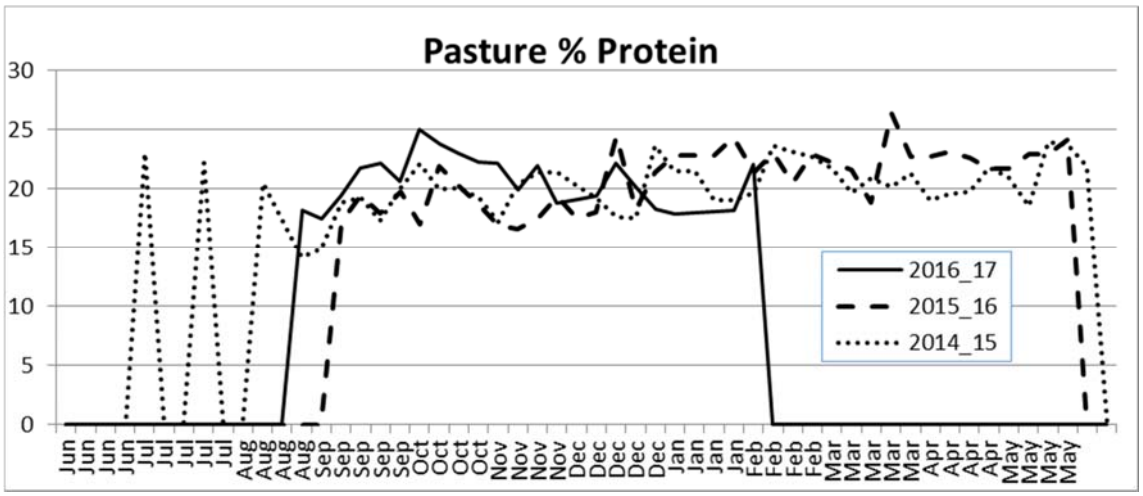
In total, about 50 ha has been mown following grazing, 30 ha mown for silage and 220 ha mown pregrazing this season. The farm has been grazed approximately 6 times over this period.

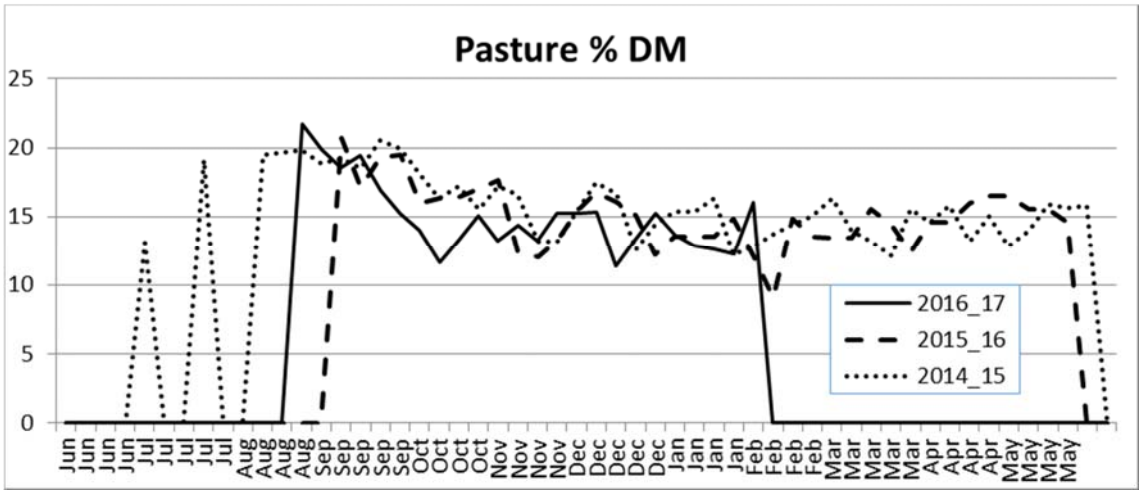


Pasture Quality

Pasture samples are collected weekly from 2 paddocks that will be grazed in the coming days. The data below is an average of the pasture quality from both paddocks sampled.






Pasture % DM
25
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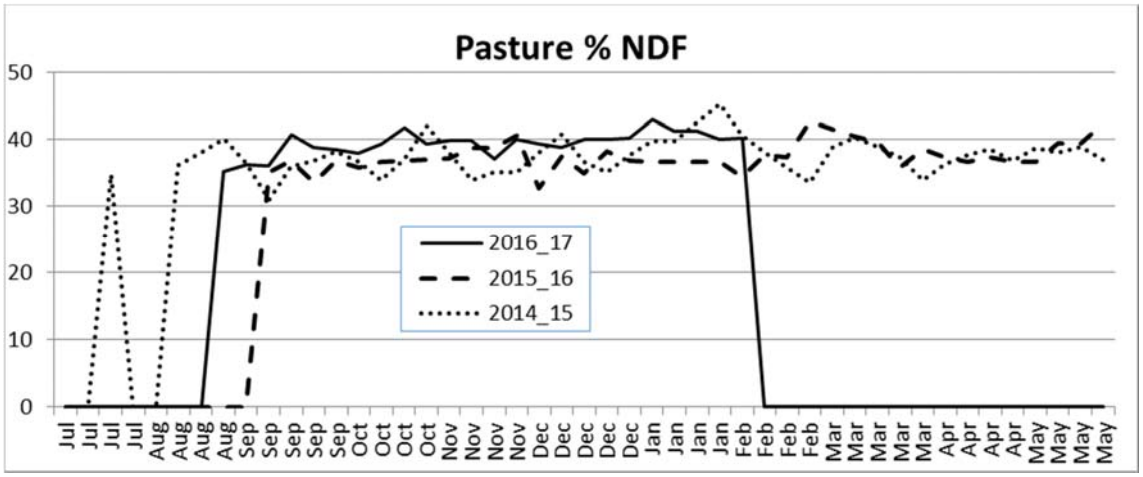
Pasture % NDF
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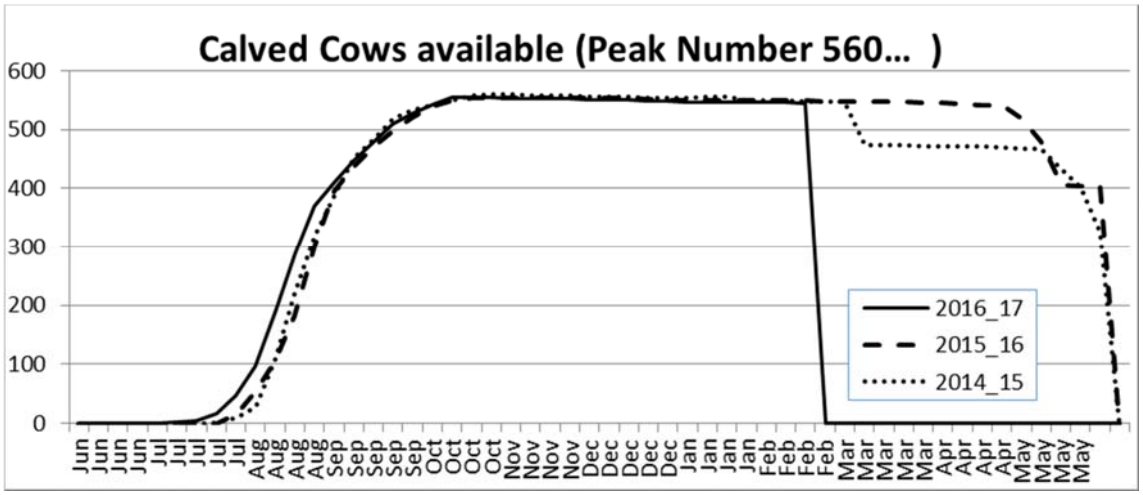
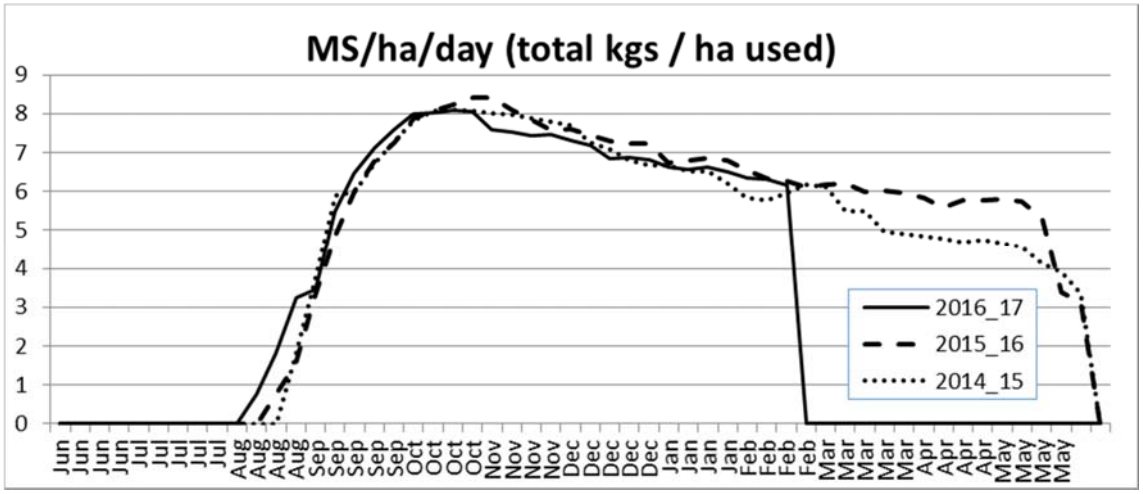
Herd and cow performance & health

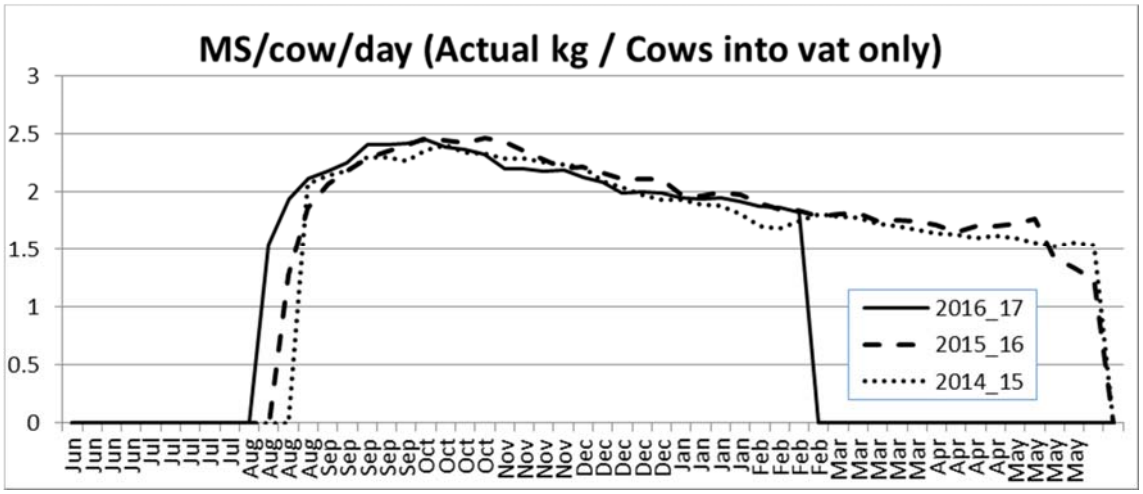
Calving spread this season resulted in slightly more cows calving earlier than past years. September calving was however similar to the past two years.

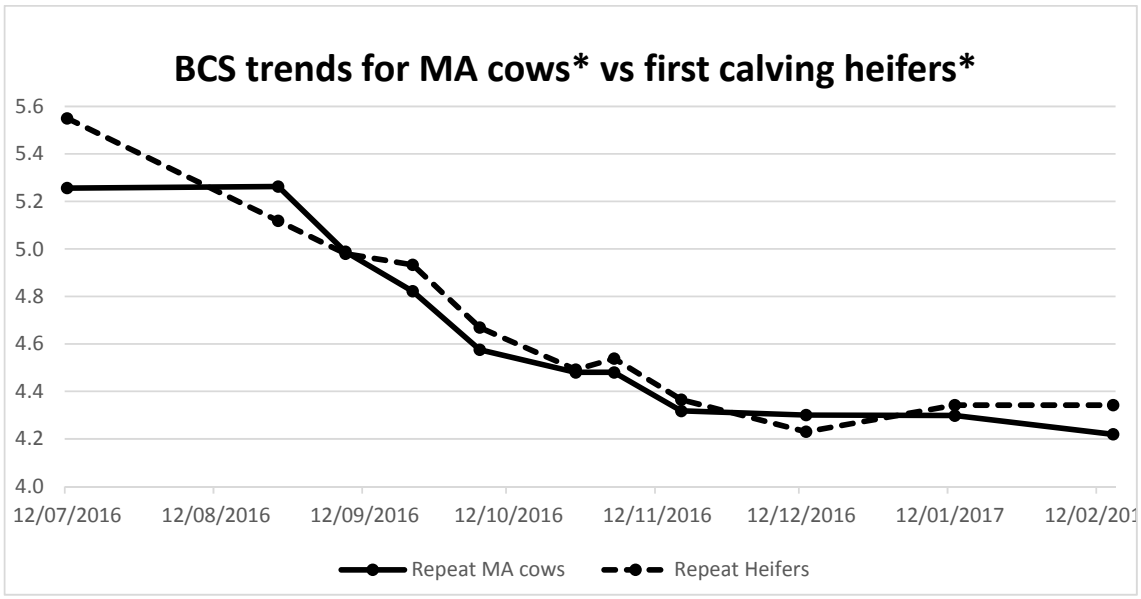
The system targets peak milking 560 cows however this has not been achieved in the past two seasons, with 555 cows peak milked in 2015/16 and 556 this season. The farms culling decisions, including culling for Johnes, and overall lower in-calf rates have prevented some culling that may otherwise have reduced winter cow losses.





Peak milk production per cow and per hectare was a little lower this year and for a shorter period. Aside from the steep drop in late October, the drop has been gradual this season. Production has now levelled out with similar production to February last year.





* Note data shown for all cows or heifers present at each BCS event.

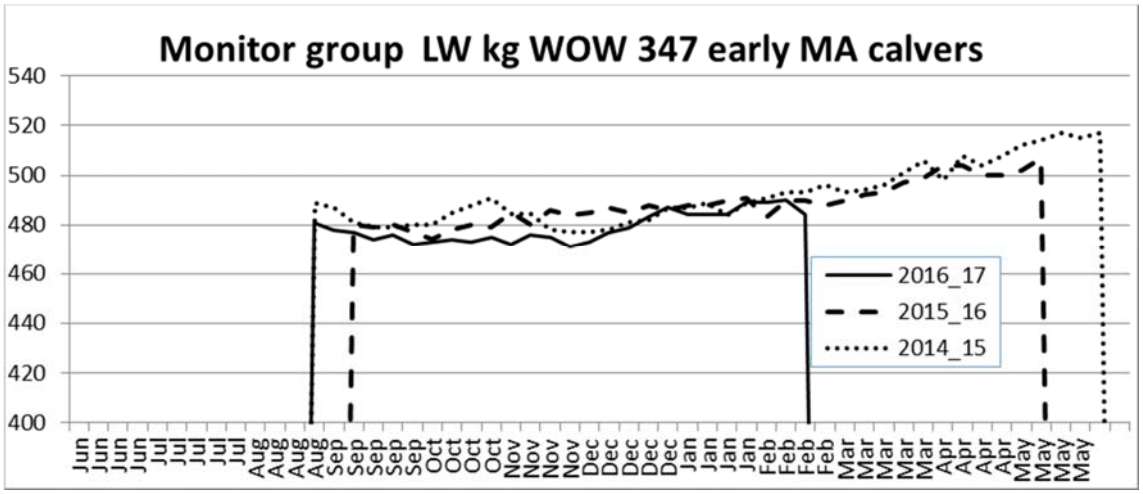
Mixed age cows lost 1 BCS from the start of the season to the middle of November, and first calving heifers have lost (on average) 1.2 BCS. The heifers continued dropping in condition a little into December but have since started to increase in condition score (while MA cows dropped a little further at the most recent BCS event).

Animal Health:

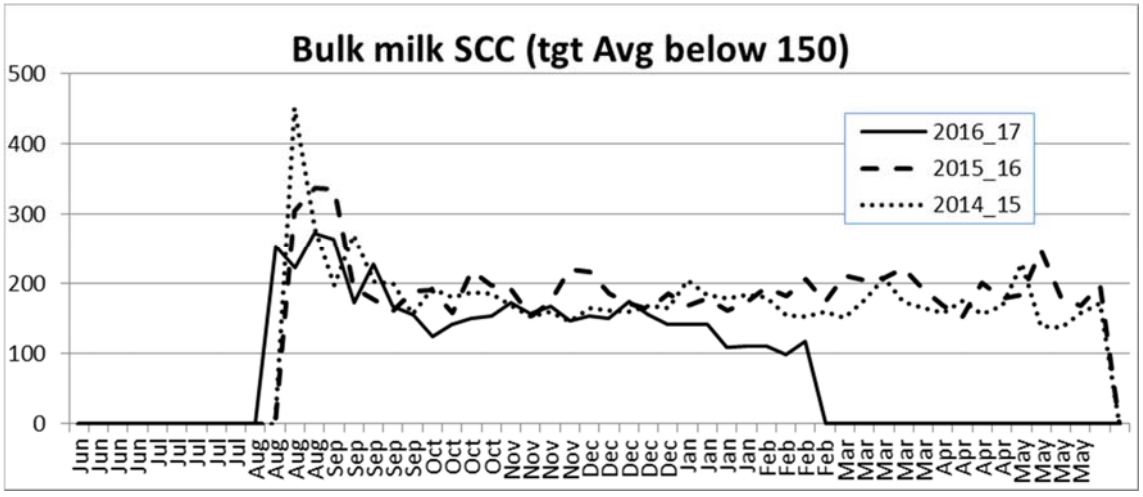
A respiratory problem was observed in the heifers early in November. The problem extended to most of the first calved animals and was later diagnosed as IBR. Symptoms continued in some animals into December.

Small Herd / Large Herd

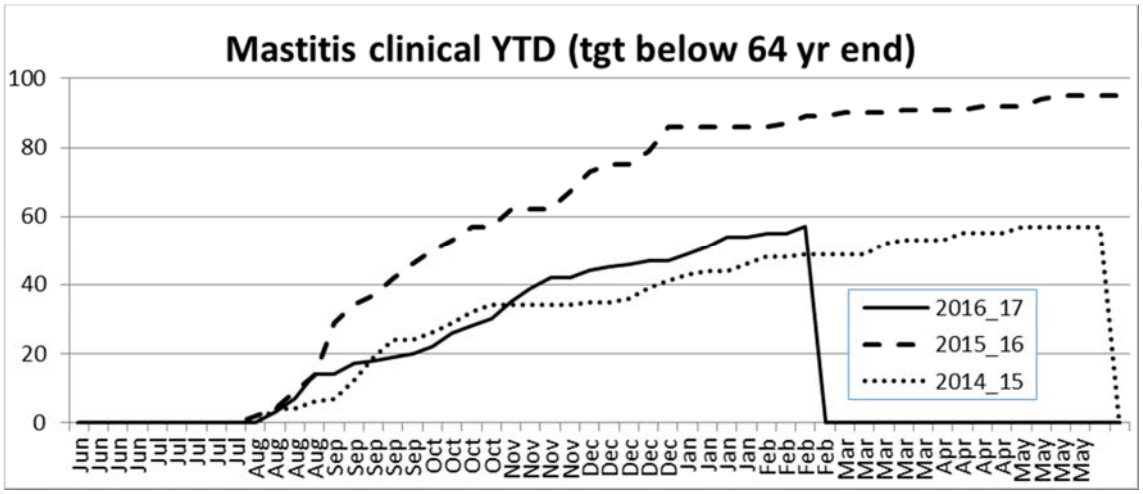
From calving till mid January the small herd was all first calvers and a few light condition MA cows. This herd now comprises light CS early calving cows and heifers (47 first calvers have remained in this herd). The focus for the small herd is primarily to enable higher liveweight gain while retaining them in milk for as long as practical, however the LUDF's dry-off rules will apply to ensure light condition cows are dryed off in time to reach calving targets.



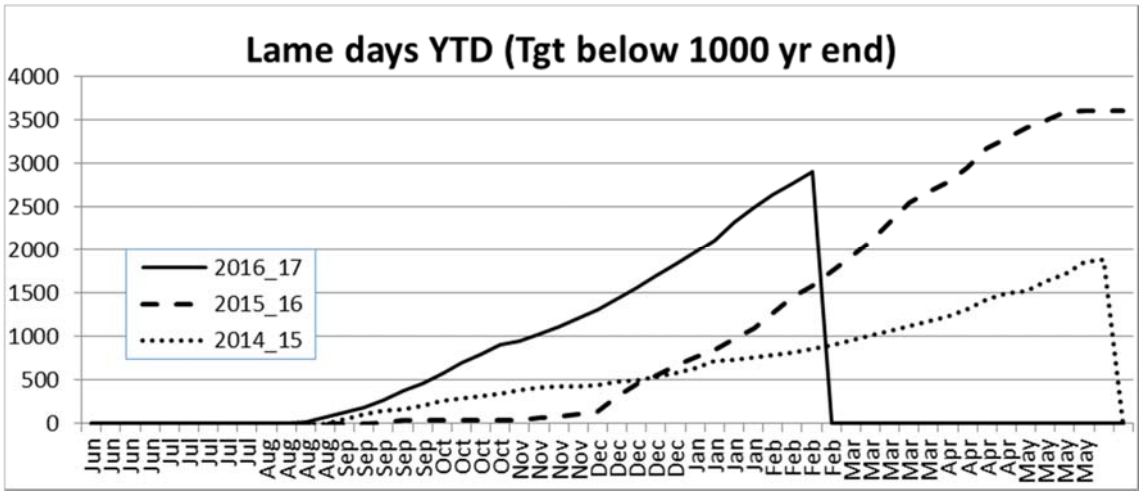
A monitor group of early calving mixed age cows enables changes in liveweight to be tracked across the season, with less influence of calving patter than occurs with the whole herd data. Its interesting that this group of cows were consistently a little bit lighter in liveweight than past years monitor groups of cows in the September – November period. Live weight is however a poor indicator of BCS gains as it is heavily dependent on gut fill and shows a different trend to the CS data above.



Last seasons changes to the vacuum levels of the milk pump and the change in teat spray have continued to deliver lower Somatic Cell levels this season. The drop in SCC in mid January was the outcome of culling one cow that had very high SCC.

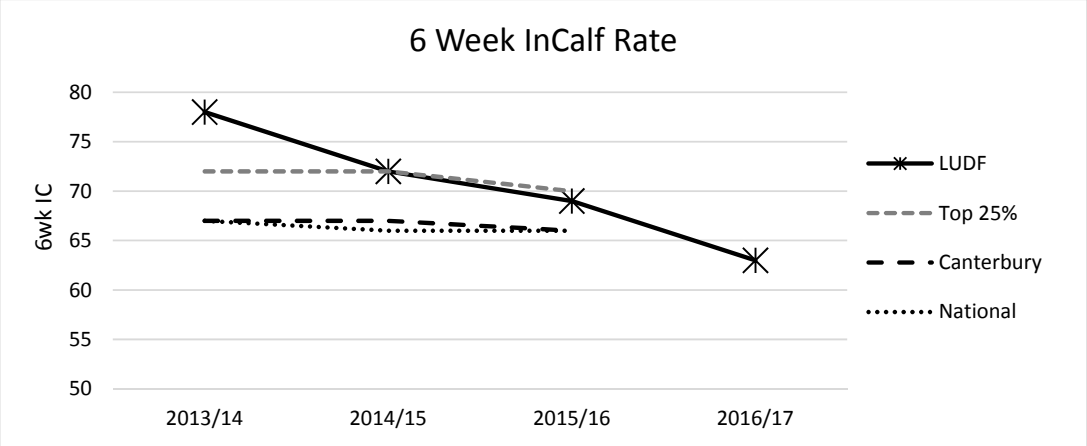


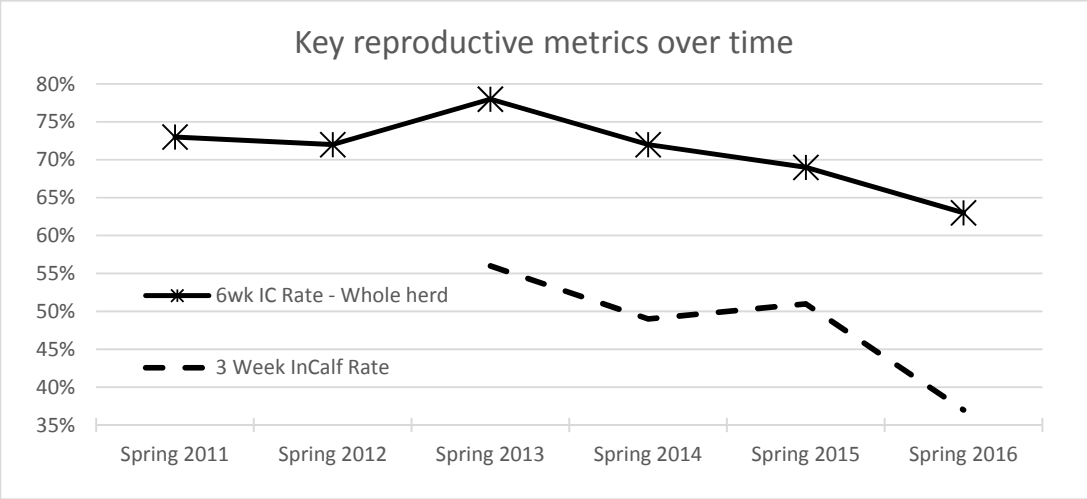
Supporting the previous comment, the levels of mastitis on farm this year has been well below last year's levels.



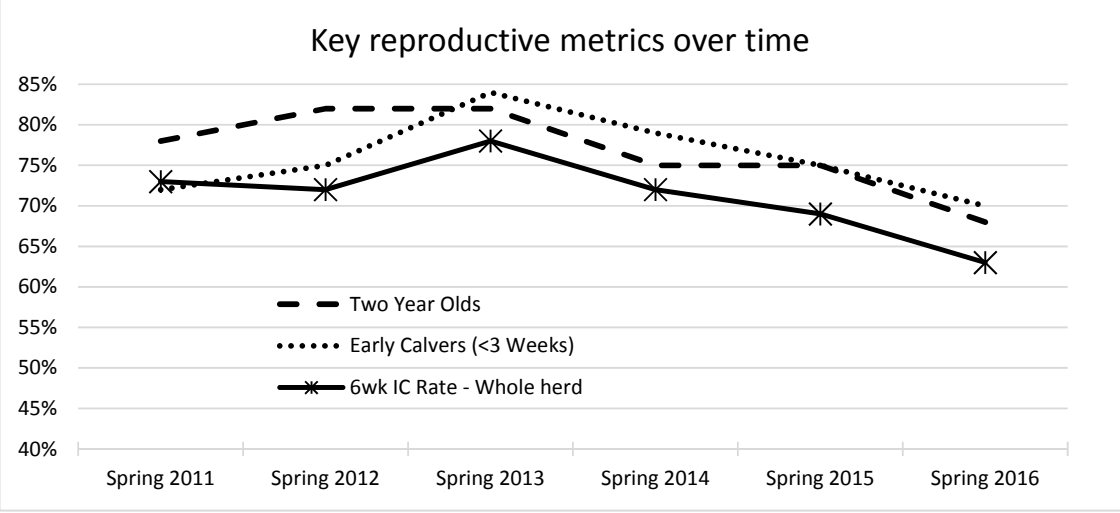
The challenge for the farm this year has been lameness. A professional hoof trimmer has been contracted to help with treating lame cows and some preventive hoof trimming. Most of the issues found seem to be white line problems on back left legs.

LUDF – Overview Reproductive results – 2016 Mating





The decrease in 3 week in calf rate is thought to be at least partially influenced by IBR in the first calvers at the beginning of mating.



Fertility Focus 2016: Seasonal

Lincoln University
The Manager (University Dairy Farm) Hancox

Report date:	20/02/17
PTPT:	BQCY
Herd Code:	6/114
No of cows included:	559
These cows calved between:	17/06/16 and 23/12/16
Mating start & end date: (based on AB or pregnancy test data)	25/10/16 - 04/01/17
Next planned start of calving:	03/08/17
Duration of mating:	72 days
Duration of AB period:	39 days

incalf FERTILITY FOCUS
Version 2.15

DairyNZ

LIC

1 Overall herd reproductive performance

6-week in-calf rate
Percentage of cows pregnant in the first 6 weeks of mating

Your herd	63% (63-64%)
Aim above	78%

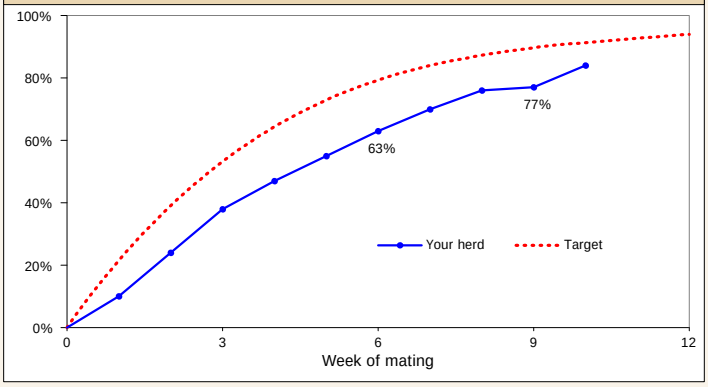
☆

Not-in-calf rate
Percentage of cows not pregnant after 72 days of mating

Your herd	15%
Aim for	8%

☆

% of herd in calf
Cumulative by week of mating



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	81%
Aim above	90%

☆☆☆

Non-return rate
% of inseminations that were not followed by a return to heat

Your herd	
Aim above	

Conception rate
% of inseminations that resulted in a confirmed pregnancy

Your herd	48%
Aim above	60%

☆

3 Key indicators to areas for improvement

Calving pattern of first calvers
Well managed heifers get in calf quickly and calve early.

Calved by	Week 3	Week 6
Your herd	84%	98%
Aim above	75%	92%
	☆☆☆☆☆	☆☆☆☆☆

Calving pattern of whole herd
Did late calvers reduce in-calf rates?

Calved by	Week 3	Week 6	Week 9
Your herd	65%	86%	97%
Aim above	60%	87%	98%
	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆

Pre-mating heats
A high % of well managed cows will cycle before the start of mating.

Your herd	73%
Aim above	85%

☆☆☆

3-week submission rate of first calvers
Well managed heifers cycle early

Your herd	76%
Aim above	90%

☆

Heat detection
A high % of early-calved mature cows should be inseminated in the first 3 weeks of mating.

Your herd	93%
Aim above	95%

☆☆☆☆☆

Non-cycling cows
Treated non-cyclers get in calf earlier.

Treated	By MSD	Wks 1-3	Wks 4-6
Your herd	0%	0%	0%

Rating	What does it tell me?	What should I do?
☆☆☆☆☆	Top result	Ideal - keep up the good work!
☆☆☆	Above 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.

Performance after week 6
Expected not-in-calf rate helps assess management affecting performance after week 6 (including bull management and herd nutrition).

Not-in-calf rate

Your herd	15%
Expected	13%

Seek advice

Behind Your Detailed Fertility Focus Report

Version 2.15

Report period: Cows calved between 17/06/16 and 23/12/16.
This was the most recent period with sufficient herd records that enabled an analysis to be completed.

Calving system: Seasonal
Your herd has been classified as seasonal calving because most calvings occurred in a single batch lasting less than 21 weeks.

Level of analysis: Detailed.
Your good record keeping means a detailed analysis was possible for your herd.

Report date:	20/02/17
PTPT:	BQCY
Herd Code:	6/114
Calvings up to this date requested for analysis:	19/02/17
No of cows included:	559
These cows calved between:	17/06/16 and 23/12/16
Mating start & end date: (based on AB or pregnancy test data)	25/10/16 - 04/01/17

Part A) Herd records cross check

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

2016/17	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
No. of calvings	1	82	340	122	27								572
No. of AB matings					146	532	20						698
No. of preg tests							462	540	192				1194
No. of non-aged/late aged positive preg tests													0
No. of cows culled or died		1	5	8	9	1	4	2	2				32

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 you supplied. The ACTUAL 6 week in-calf rate is shown for your herd.

Records available for not-in-calf rate

Recorded pregnant	467
Recorded empty	81
Doubtful/recheck*	1
Culled without pregnancy test	7
No record of cull or pregnancy test	3
Cows analysed	559

*Includes cows whose most recent empty diagnosis was less than 35 days after mating end date.

2 Drivers of the 6-week in-calf rate

3-week submission rate

554 cows had calving dates in the required range and were not culled before day 21 of mating and 81% of these were submitted during the first 21 days of mating.

Non-return rate

Non-return rate is not calculated when pregnancy test results provide an accurate estimate of conception rate.

Conception rate

The conception rate was calculated for 691 AB inseminations on and between 25.10.16 and 02.12.16.

3 Key indicators to areas for improvement

Calving pattern of first calvers

139 cows with eligible calving dates were recorded as calving at less than 34 months of age. The calving pattern of first calvers was calculated from their records.

Calving pattern of whole herd

571 cows had calving dates that were eligible for this report.

3-week submission rate of first calvers

137 first calvers had calving dates in the required range and were not culled before day 21 of mating and 76% of these were submitted during the first 21 days of mating.

Heat detection

209 cows at least 4 years old at calving had calved at least 8 weeks before mating start date and were not culled before day 21 of mating and 93% of these were submitted during the first 21 days of mating.

Pre-mating heats

554 cows had calving dates in the required range and were not culled before day 21 of mating and 402 of these had a pre-mating heat recorded.

Non-cycling cows

554 cows had calving dates in the required range and were not culled before day 21 of mating and 2 of these were identified as being treated for non-cycling.

Performance after week 6

Your herd's not-in-calf rate and 6-week in-calf rate were 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 got cows in calf.

Induced cows

No cows were identified as having induced calvings. If cows were induced, ensure all inductions are recorded.

Interim LUDF Reproduction Review: 17 February 2017 (Courtesy of LIC)

The drop in reproductive performance in mating 2016 has been disappointing for the LUDF team. Analysis suggests several factors may have contributed to the result. Further investigation may help to pinpoint these and allow a plan to be created for the 2017 season.

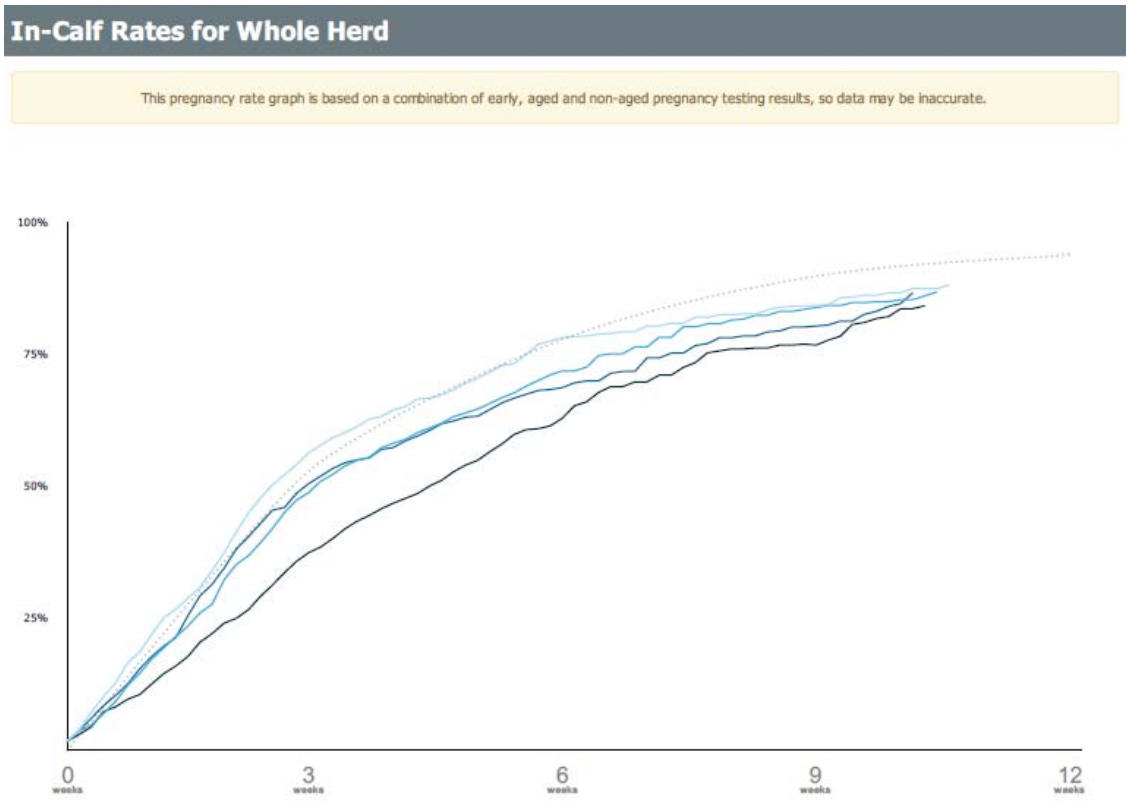
Summary Points:

- 6 week in-calf rate, submission rate and conception rate performance is down in all groups analysed in 2016. At a herd level the higher level of (reproductive) performance usually seen in 2 and 3 year old cows is absent.
- The drop in performance is likely to be multi-factorial in origin.
- Two and three year old pregnancy rates were considerably reduced in 2016, especially in the first 3 weeks of mating. This could be attributable to the respiratory virus infection that swept through the herd pre-mating.
- The second three weeks of mating saw a recovery of herd in-calf rates, but not enough to close the gap, leaving the final in-calf rate result down 3% on the 2015 season
- Body condition score:
    - Cows at BCS 6 or higher at calving had poorer in calf rates.
    - Lower BCS cows (less than 4.5) at start of mating had lower in-calf rates (18-30% Not In Calf compared to 12-14% for all other cows).
    - Note only 5% of cows were above 6 at calving, BUT 46% of cows were below 4.5 CS at the start of mating.
- Transition: Metabolic disease incidence was high, with older (>6 years) and fatter (> BCS 5) cows at highest risk of clinical milk fever.
- Improving herd submission and conception rates for LUDF appears to direct attention to:
  - preventing and dealing with non-cycler cows,
  - BCS and transition management in winter and spring,
  - recovery of an early calving pattern for the later calving 3 and 4 year olds in 2017

Review of 2016's Results:

1. Comparison with past seasons:

The in-calf rate graph for 2016 shows a different pattern to previous years, with a slower than usual pregnancy rate in the first 3 weeks of mating and a recovery of rates though weeks 3-9, albeit never quite recovering lost ground. See Figure 1.



	3 Weeks	6 Weeks	9 Weeks	9+ Weeks	Not In Calf Rate
Spring 2016	38%	63%	77%	84%	16%
Spring 2015	51%	69%	81%	87%	13%
Spring 2014	49%	72%	84%	87%	13%
Spring 2013	56%	78%	84%	88%	12%

Figure 1. In-calf rates by season

2. Age:

The 2 and 3 year old cows were particularly hard hit, especially in the first 3 weeks of mating, although older cows also had lower overall performance in 2016.

Age Group	Count	%	3 Weeks	6 Weeks	9 Weeks	9+ Weeks	Not In Calf Rate
2 yr olds	140	25%	38%	69%	84%	92%	8%
3 yr olds	105	19%	35%	61%	80%	87%	13%
4-8 yr olds	272	49%	41%	63%	75%	82%	18%
9+ yr olds	42	8%	24%	49%	60%	65%	35%

Figure 2. In-calf rates by Age

3. Milk production:

There was no significant impact evident by milk production.

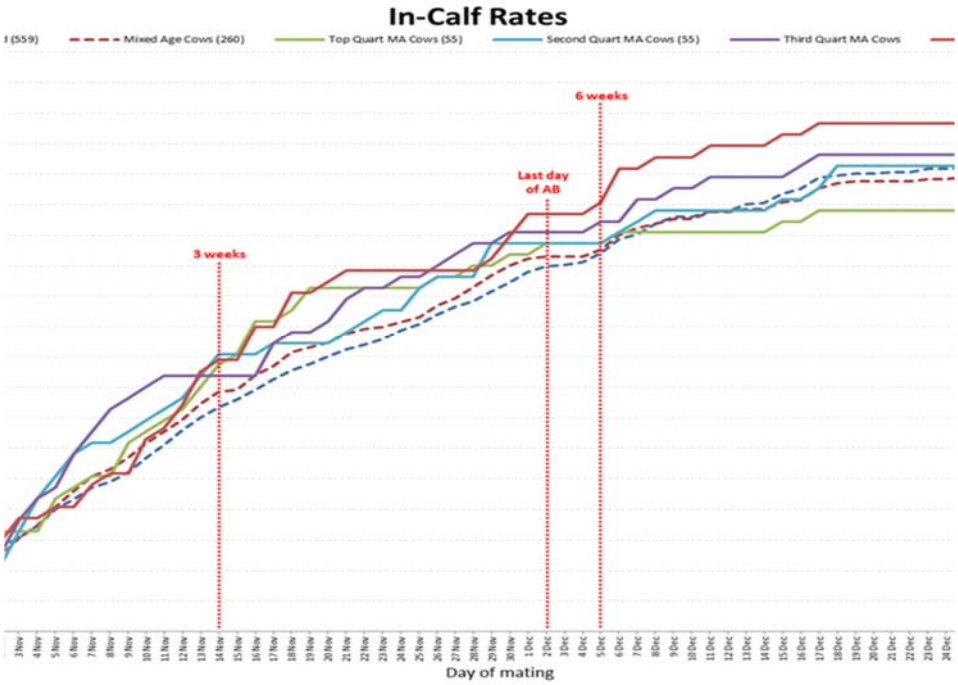
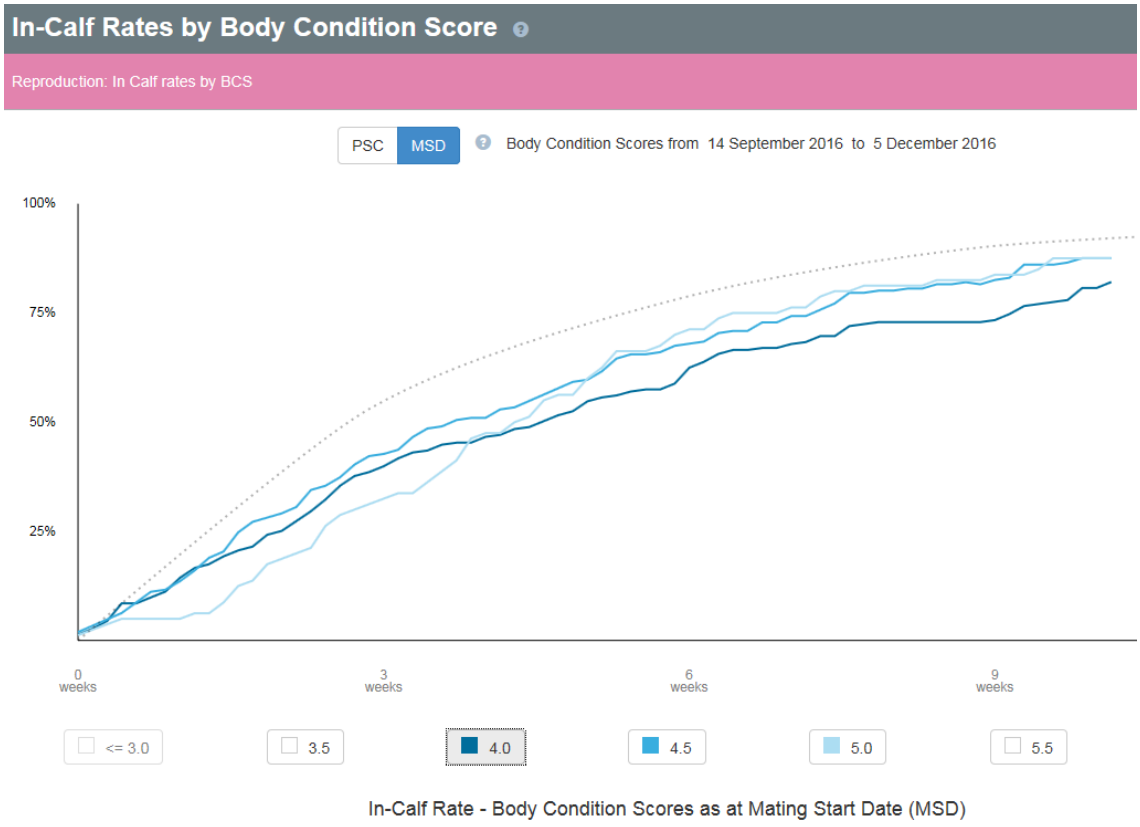


Figure 3. In-calf rates by quartile of milk production in 4-8 year old cows.

4. Body Condition Score (BCS):

Cows that were high BCS (> 5.5) at calving or lower at start of mating (<4.5) were slower to get in calf in the first 3 weeks. Lower BCS cows at start of mating (CS 3.5 or 4) were slower to get in calf compared to fatter cows right through mating.



BCS at start of mating	Count	%	3 Weeks	6 Weeks	9 Weeks	9+ Weeks	Not In Calf Rate
3.5	31	6%	14%	41%	55%	70%	30%
4.0	224	40%	39%	59%	73%	82%	18%
4.5	207	37%	42%	67%	82%	88%	12%
5.0	81	14%	31%	70%	82%	87%	13%
5.5	14	3%	43%	71%	86%	86%	14%
>5.5	2	-	0	50%	100%	100%	0

Figure 4. In-calf rates by body condition at mating start date

5. Animal Health:

Older cows were over-represented in milk fever cases, with 9.5% of the herd clinically affected and 7 deaths due to milk fever. These occurred throughout the calving period. Figures 5, & 6.

Two year old cows also had issues with a respiratory virus infection early in the mating period (see IBR notes above).

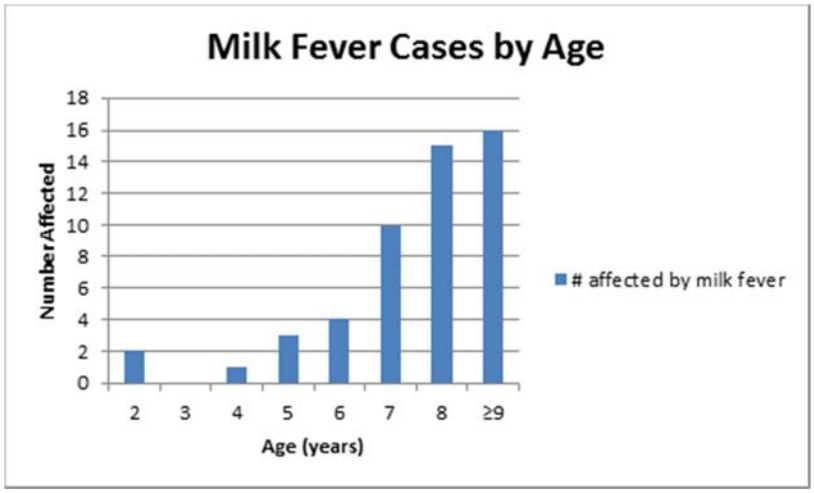


Figure 5. Age distribution of milk fever cows

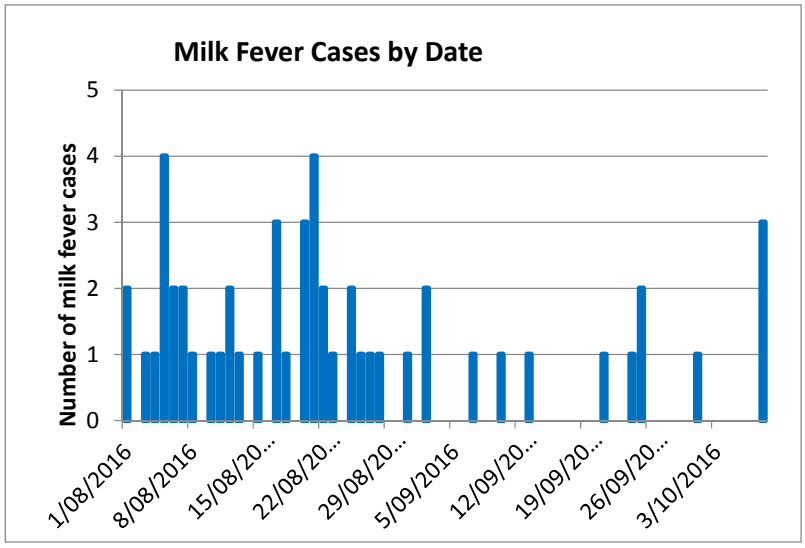


Figure 6. Distribution of milk fever cases by calving date.

6. Non-cycling cows:

Non-cycling cows were a bigger issue in 2016, particularly in 2 and 3 year olds. Pre-mating heats were down 9% at 73% (3 weeks immediately prior to start of mating).

7. Calving pattern impacts:

Mid-calvers still perform below expectations compared to other groups suggesting transition or combination of the above issues for this group.

Additional data – CS at start of mating in past seasons.

Spring 2016 – InCalf rate vs CS at start Mating

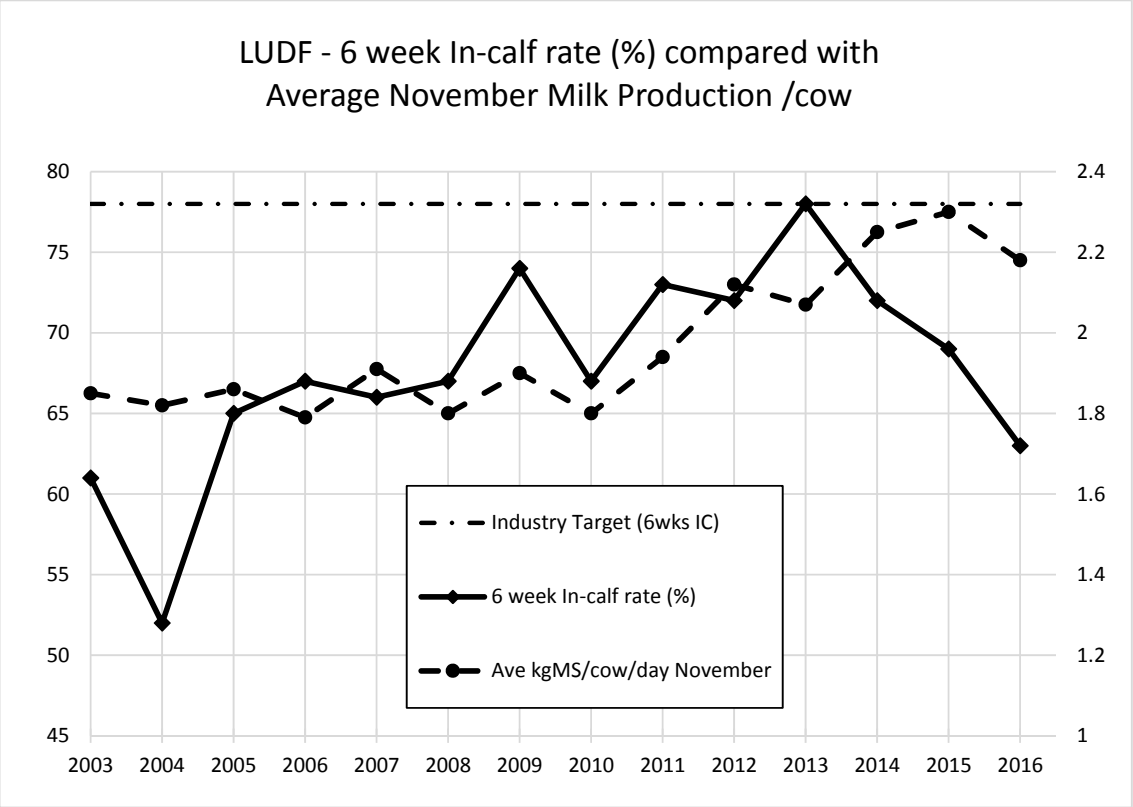
BCS	Count		3 weeks	6 weeks	9 weeks	9+ weeks	Not in-calf rate
3.5	31	6%	14%	41%	55%	70%	30%
4.0	224	40%	39%	59%	73%	82%	18%
4.5	207	37%	42%	67%	82%	88%	12%
5.0	81	14%	31%	70%	82%	87%	13%
5.5	14	3%	43%	71%	86%	86%	14%
>=6.0	2	0%	0%	50%	100%	100%	0%

Spring 2015 – InCalf rate vs CS at start mating

BCS	Count		3 weeks	6 weeks	9 weeks	9+ weeks	Not in-calf rate
3.5	17	3%	41%	59%	76%	88%	12%
4.0	223	40%	48%	66%	75%	84%	16%
4.5	188	34%	57%	73%	83%	88%	12%
5.0	108	19%	49%	71%	89%	92%	8%
5.5	14	3%	43%	79%	93%	93%	7%
No BCS	6	1%	0%	0%	0%	0%	100%

Spring 2014 – InCalf rate vs CS at start mating

BCS	Count		3 weeks	6 weeks	9 weeks	9+ weeks	Not in-calf rate
3.5	21	4%	33%	67%	86%	90%	10%
4.0	341	61%	49%	72%	83%	86%	14%
4.5	151	27%	52%	73%	86%	90%	10%
5.0	34	6%	50%	74%	88%	88%	12%
5.5	2	0%	50%	100%	100%	100%	0%
No BCS	11	2%	27%	27%	27%	27%	73%



Note probable influence of IBR on 2016 mating results.

Impact of InCalf results on herd numbers for 2017/18 season:

Target number cows to winter	580
Target cows to peak milk	560
Possible winter / calving culls	3.4%
InCalf Cows available (Feb 2017)	464
R2 Heifers in calf	134 (24% peak cows)
Total cows and heifers in calf	598
Cows available to cull (including culling for Johnes)	18

Autumn Management at LUDF

At LUDF, at this time of season, the key drivers change from production to focussing on ensuring the herd and farm are well set up for next season. For this, there are 2 key aspects that we must ensure are centre of attention from now until dry-off. These are:

- The BCS of ALL cows (not average)
- The Average Pasture Cover of the Farm

Looking after next season means that over the next 2-3 grazing rotations stocking rate and supplement used may be manipulated based on drying off rules (CS and culling dates), while paddocks will continue to be grazed to low and consistent residuals. Target APC at the end of May will also influence grazing management decisions.

Setting the herd up for next season

The key aspect of ensuring the herd is well set up for next season is ensuring ALL cows reach their BCS target at calving. This is all mixed age cows at BCS of 5 and all R2 and R3 calve at BCS 5.5 minimum. It is also, as much as possible, ensuring few cows are markedly above these targets.

Individual animals in the LUDF herd are condition scored at monthly intervals and this BCS information is used in conjunction with the dry-off rules presented below to enable sufficient time (and feeding) for CS gain. These dates are used on an individual cow basis and ***require feeding good quality feed to dry cows*** ie - above maintenance levels.

Cows (4 years old and older)

Cow Condition	Dry off time (days before Calving)	Date cow need to be dried off (calving date 1-15 August)	Date cow need to be dried off (calving date 15-30 August)
3.5	100	20 April – 5 May	5-15 May
4	80	10-20 May	20 -30 May
4.5	60	NA	NA

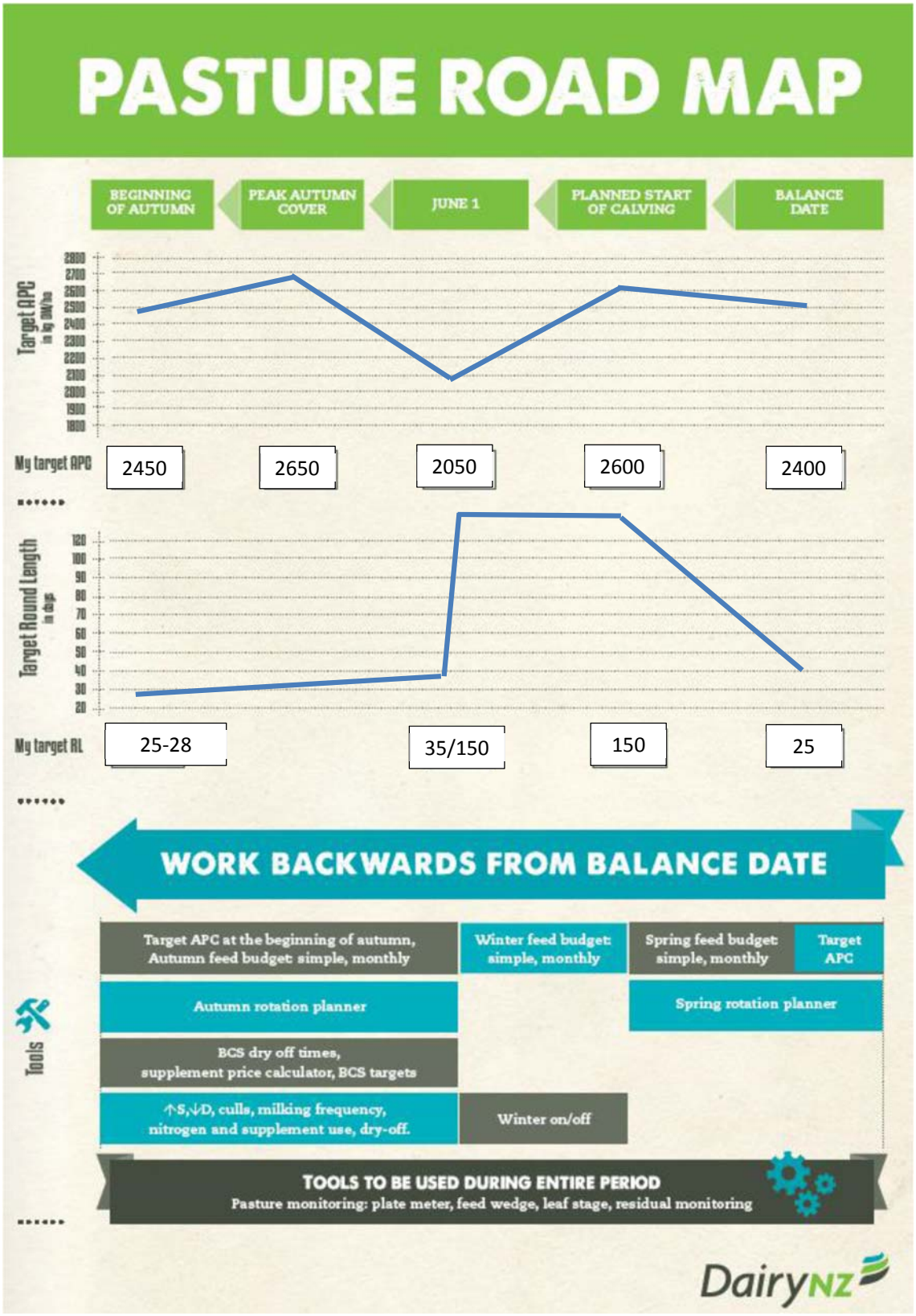
Rising 3 year Old

Cow Condition	Dry off time (days before Calving)	Date cow need to be dried off (calving date 1-15 August)	Date cow need to be dried off (calving date 15-30 August)
3.5	120	1-15 April	15-30 April
4	100	20 April -5 May	5-15 May
4.5	80	10-20 May	20 -30 May
5	60	NA	NA

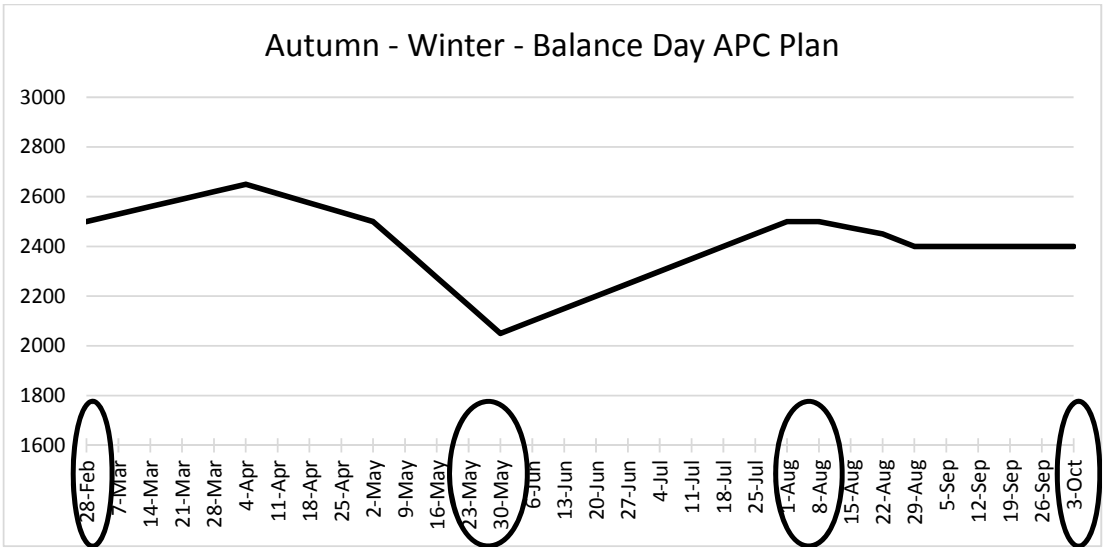
LUDF has secured high quality winter grazing on fodder beet and grass silage, as well as an option on lifted fodder beet for the autumn. It is expected that both these tools will result in appropriate CS gains over the winter, so the farm is comfortable with the later end of the date range shown above.

Setting the farm and pastures up for next season

To ensure pastures are well set up for winter, LUDF considers pasture cover targets and round length targets at balance date (early October) and works backwards from there to the start of autumn. This ensures the key dates are linked and the targets flow from one to the next. The LUDF Pasture Road map shows how these targets look graphically below.



Supporting the above, we use a weekly and monthly tracker spreadsheet shown below:



Both trackers link the 4 key dates in the calendar year to ensure the farm achieves targets at each point:

1. Start of Autumn (now)
2. Dry-off / End May
3. Planned start of calving
4. Balance date.

It is important to link the autumn management to the winter plan to ensure all feed transitions are well achieved to decrease any risks of animal health issues.

This will be the first time the whole herd at LUDF is wintered on fodder beet. To support this wintering system and as a partial transition LUDF will purchase lifted fodder beet for use on the platform in the autumn. FB is commonly considered a good feed source to support body condition score gains during autumn, its hoped this will enable a longer average lactation whilst supporting CS and pasture cover targets at calving (and achieve profitability and nutrient loss targets).

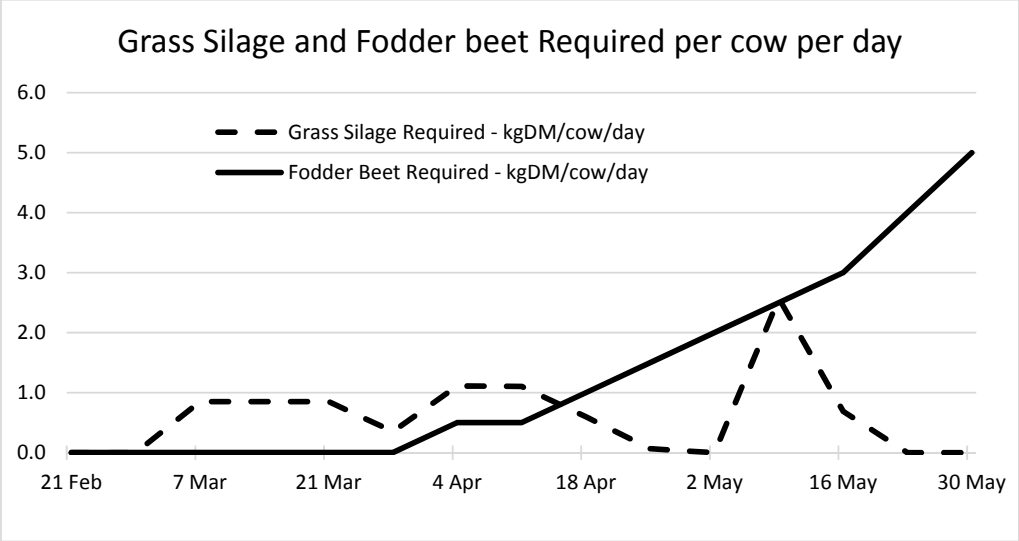
Note however this won't be at the expense of next year's herd or pasture cover targets. Dry-off rules will still be observed.

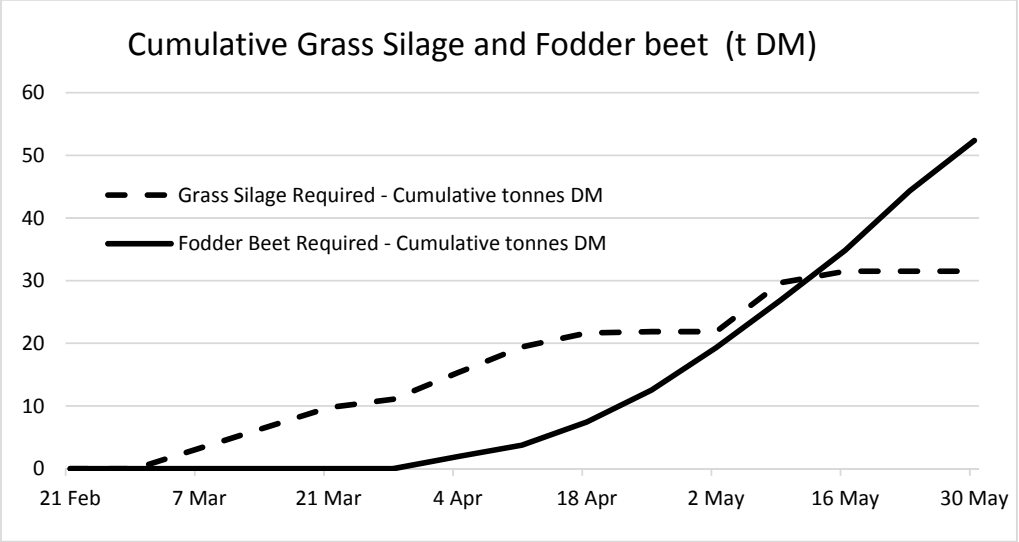
On top of the fodder beet, LUDF has harvested around 57 TDM of home grown silage and may feed a little more purchased silage. This will be fed back to the herd during the autumn period to support the fodder beet transition as well as any feed deficits encountered.

With this in mind, the following feed budget has been developed:

Date (7 days periods)	21 Feb	28 Feb	7 Mar	14 Mar	21 Mar	28 Mar	4 Apr	11 Apr	18 Apr	25 Apr	2 May	9 May	16 May	23 May	30 May
APC	**2650**						**2650**								**2050**
Supply															
Growth Rate - kgDM/ha/day	70	70	60	60	60	60	45	45	45	45	45	30	30	30	30
Decrease in APC (ave/day) - kgDM/ha/day	0.0	0.0	0.0	0.0	0.0	0.0	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Total supply	**70**	**70**	**60**	**60**	**60**	**60**	**56**	**56**	**56**	**56**	**56**	**41**	**41**	**41**	**41**
Demand															
No Dry cows (based on BCS rules)								10	10	40	0	10	10	40	0
Total dry cows								10	20	60	60	70	80	120	120
Intake Dry Cows (kgDM/cow/day)								16	16	16	16	16	16	16	16
Culling										0	0	40	45		
Total No Milking Cows	544	544	544	544	544	544	544	534	524	484	484	434	379	339	229
Production: MS/cow/day	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5
Ave Intake - kgDM/cow/day	18.5	18.5	18.5	18.5	18.5	18	18	18	18	18	18	17.5	17.5	17.5	17.5
Total Demand - kgDM/ha/day	**63**	**63**	**63**	**63**	**63**	**61**	**61**	**61**	**61**	**60**	**60**	**54**	**49**	**49**	**37**
Feed balance: (kg/ha/day)	7	7	-3	-3	-3	-1	-5	-5	-5	-5	-5	-14	-9	-8	4
Fodder Beet supplement															
kg/cow/day							0.5	0.5	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Fodder beet required kgDM/ha/day						0.0	1.7	1.7	3.3	4.5	6.1	6.8	7.1	8.5	7.2
Cum use of fodder beet (kgDM tot)						0	1904	3773	7441	12523	19299	26894	34853	44345	52360
Silage supplement															
Pasture Silage Reqd - kgDM/ha/day	0.0	0.0	2.9	2.9	2.9	1.2	3.8	3.7	2.0	0.2	0.0	7.0	1.6	0.0	0.0
Silage /cow/day	0.0	0.0	0.9	0.9	0.9	0.4	1.1	1.1	0.6	0.1	0.0	2.6	0.7	0.0	0.0
Cumulative silage use	0.0	0.0	3248	6496	9744	11088	15328	19463	21659	21881	21881	29691	31520	31520	31520


SIDDC
South Island Dairying Development Centre
Partners Networking To Advance South Island Dairying
Lincoln University
DairyNZ
ravensdown
LIC
Plant & Food RESEARCH
agresearch
SIDE





Total Fodder Beet and Grass Silage Required:

Summary of autumn supplements required	
Total pasture silage fed (TDM total)	32
Total FB (TDMtotal)	52
Fodder beet area required (@20tDM/ha)	2.6

Note:

If cows are gaining sufficient CS through the autumn, the planned drying off dates in the feed budget above could be delayed and a little more supplement may be used. This could lift silage required by 4 tonne DM and Fodder beet by about 7 tonnes DM and will be a decision made during the autumn, and primarily influenced by expected CS of these animals at the end of May.

Assumptions in the feed budget:

- Growth rates are conservative growth rates used yearly to develop the feed budget
- The fodder beet crop will yield 20TDM/ha (harvested)
- The number of cows to be dried off – using above dry-off rules for BCS gain is a conservative figure (drying more animals than usually required as BCS gains typically increase during autumn)
- All cows are at a BCS of 4.5 by end of May
- All dry cows remain on the platform until sent to grazing on the 31st May. In practice LUDF has normally purchased low cost grazing off the platform, for dry cows in late April / early May

LUDF has had a target of 300kgDM/cow (168 tonnes DM) imported feed. Given the farm has only fed 55kgDM/cow to the middle of February, it's likely the forecast fodder beet and grass silage above will remain under the 300 kgDM/cow target.

As in the previous season, LUDF continued to use nitrogen fertilizer during the high response periods (spring, summer and early autumn) to enable harvesting home grown silage where possible. This season we've harvested 57 TDM silage off the platform (vs 137 TDM silage made of the platform last season) and will again use this in the autumn. Unlike last year, where the payout dictated little value in feeding purchased feed in the autumn, this years forecast milk price suggests feeding low cost, high quality imported grass silage and or fodderbeet will be profitable.

It's likely also that high producing culls will be kept on the farm longer this autumn, in part because the high producing empty cows are to be sold to a farm that will milk them through the winter. LUDF is therefore likely to benefit from the milk income generated in excess of the cost of buying supplements for these extra cows.

Simple economic analysis – Presuming supplement is purchased to feed to in-milk cows (ie presuming cows will be fed maintenance and additional feed is purchased to extend lactation)

Forecast milk price:	$6.00/kgMS
Supplement price:	30-40 cents/kgDM
Energy required to produce milk:	80 MJME/kgMS

At 11MJME/kgDM require 7.3 kgDM/kgMS
Cost to feed 7.3kgDM at 40 cents/kgDM = $2.90/kgMS
Gross Margin without allowing for wastage, feed out costs, milking costs etc is therefore approximately $3.00/kgMS.

Feeding fodder beet to dairy cows in late lactation

Fodder beet offers a high quality and cost competitive alternative to PKE, silage and grain for late lactation feeding where supplements are required to meet feed budget deficits. An increase in the use of higher dry matter varieties more suited to lifting provides an opportunity for the fodder beet to be grown off the milking platform and harvested and transported in as required.

Factors to consider when feeding fodder beet in late lactation

1. **Level of feeding**
   The relatively low protein (11-13% when offered as leaf + bulb; 7-8% bulb only), fibre (NDF < 15%), calcium (0.4-0.5%) and phosphorus (< 0.2%) content of fodder beet creates an upper limit to how much can be fed during lactation before additional supplementation of these nutrients is required. Recommended upper limits to feeding are:
   Grazed fodder beet – 5-6 kg DM
   Lifted, bulb only – 4-5 kg DM
   Offered above these levels, the low protein intake can reduce milk yield and animal health issues related too low fibre (poor rumen function) and phosphorus and calcium intakes (production losses, SCC issues, down cows) can occur. Seek veterinary advice if you are concerned about mineral intakes.

2. **Practicalities of feeding during lactation**
   Grazing is always the most effective method of offering crop but increased walking between the pasture and crop paddocks can increase the risk of lameness, at a time when the prevalence of lameness is often increasing in our pasture based systems (autumn).
   Mastitis can be an issue if cows are grazing fodder beet in wet conditions.
   Commercial harvesting where the leaf is flailed off and the bulb stored for later use offers the most flexibility. If stored correctly the bulbs will last up to six months.
   Daily or weekly harvesting with a “beet bucket” is possible if the beet is close to/on the milking platform. Leaves will rot within a week therefore harvesting needs to occur regularly, which can be a challenge if conditions get wet.
   Not all varieties are suitable for lifting – higher DM varieties are better.
   Both lifted options can be fed through a silage wagon onto pasture or fed on a feed pad with silage.
   Fodder beet is highly palatable and can affect grazing behaviour on pasture. If feeding immediately after milking only allow access to the crop once all cows are back in the paddock.

3. **Transitioning onto fodder beet**
   The same principles for transitioning as dry cows apply during lactation to avoid rumen acidosis from cows consuming too much too soon. However, access to ample other feed during lactation, because beet is a smaller component of the diet compared with wintering, and the need to maintain milk production makes transitioning during lactation more challenging.

Start at 0.5-1 kg DM/cow/day and increase no more than 1 kg DM every second day. It generally takes at least 14 days to get to 5 kg DM.
It is important to ensure ALL cows transition so that no cows are left behind and without going too fast that others eat too much and acidosis results. Initially up to 30-40% of the mob may ignore the fodder beet so the remaining 60-70% can over eat!.
Provide sufficient space and time – a least a metre of face width if grazing and the same for beet spread out in the paddock through a wagon and at least 1 hour so that all cows have time to try it.
Using the tractor wheel across the row to break the bulb may help encourage cows to try it.
Watch the cows for more than just the first couple of minutes to determine whether they are all eating. Cows may walk across and sniff it and maybe try the leaves but not touch the bulbs.

4. Acidosis

If a few cows get mild acidosis ensure the time and space allocations are being achieved and reduce the allocation back to 2-3 kg DM until all cows are eating it. Oral drench affected cows with a slurry of magnesium oxide (2 handfuls; approx. 500 g mixed with water) 1-3 times per day until they improve and make sure they have alternative feed available. Cows with mild acidosis will be slower to walk to a new break but still act normal. Any cows with clinical acidosis (walking but wobbly or looking drunk) should be removed from the crop, orally dosed with magnesium oxide as above and alternative feed provided. Seek veterinary attention if cows are down.

5. Cost

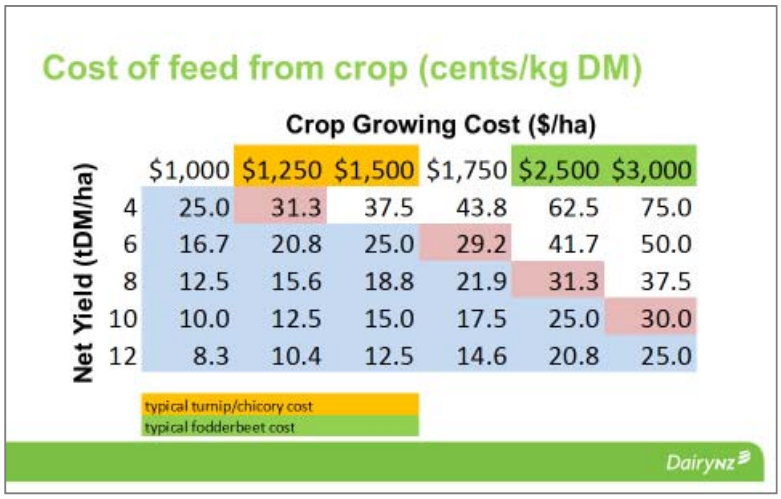
When purchased from off farm the cost can be compared directly with alternative supplements. However, if grown on the milking platform the cost must be calculated based on the gain in crop yield above the amount of pasture that would grow in the paddock over the same time i.e. the net yield = crop yield – lost pasture. Fodder beet paddocks are typically out of the pasture grazing rotation for 12 – 15 months therefore the fodder beet crop must exceed the annual DM yield from this paddock.

The table below puts a value on the dry matter provided by the crop based on net yield increases (above what “old” pasture” would have grown) and the growing costs of the crop.

The blue highlighted area is where the combination of growing cost and net yield makes the crop cost competitive with other feed types such as PKE. Pink is breakeven value if using the average value of feed. No regrassing costs are included.

For a fodderbeet crop (costing $2500/ha) to break even it would need to provide an extra 8tDM/ha (eaten) than the pasture it was replacing.

Evaluating the merits of a crop is ideally done using a farm model like Farmax but in the absence of this a partial budget as described in the table to the right is the most appropriate way to cost a cropping exercise.



Benefits		Costs	
Increases in Income e.g. Milk production from crop		**Decreases in Income** e.g. Milk production lost form pasture	
Decreases in Cost e.g. Reduced silage making Reduced wintering Reduced imported feed		**Increases in Cost** e.g. Cropping costs Feeding out Interest	
Total Benefit:	**$$$**	**Total Costs:**	**$$$**
Net Benefit: $$$			
Other Considerations: e.g. Benefit of pasture renewal Staffing Impact on nutrient losses		Availability of contractors System change required Investment to fix paddock limitations	

LUDF Farm Walk Notes

Tuesday 21 February 2017

LUDF – focus for 2016/17 Season: Nil-Infrastructure, low input, low N-loss, maximise profit.

Farm system comprises 3.5 cows/ha (peak milked), Target up to 170kgN/ha, 300kgDM/cow imported supplement, plus winter most cows off farm. FWE of less than $1 million and Target production of over 500kgMS/cow (>100% liveweight in milk production).

Critical issues for the short term

1. **Hold the rotation length to minimum 25 days to enable higher pasture growth**
2. **Set the farm and herd up for next season with round length and BCS monitoring and management**
3. **Remain focussed on average pasture cover and pasture quality to ensure enough good quality pasture is offered daily to ensure good production and reproductive results.**
4. **Monitor cow BCS changes through lactation.**

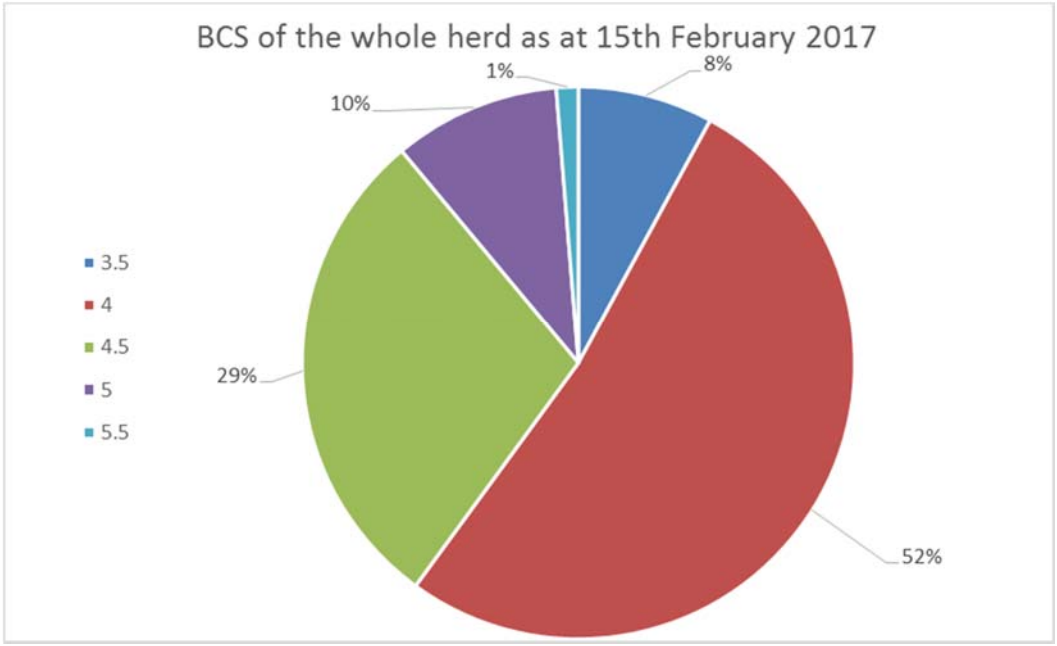
Key Numbers - week ending Tuesday 21 February 2017

Ave Pasture Cover	2811 kgDM/ha	Pasture Growth Rate	92 kgDM/ha/day (as per Pasture Coach)
Round length	27.2 days (160 ha)	Ave Supplement used	3.6kgDM silage/cow/day
No Cows on farm	544	Ave Soil Temp (week)	16°C
Kg MS/cow (546 cows)	1.83	SCC	112,000
Milk Protein : Fat ratio	0.81	Protein: 4.32%	Fat: 5.32%

Herd Management

5. A total of 544 calved cows are on farm. There are 2 milking herds, the small herd comprises 167 early 2017 calving, low BCS cows (BCS below 4.5 as at the 13th January 2017) and the large herd is 364 mixed age cows and heifers, primarily later calvers and in BCS 4.5 or above. Slight preferential grazing continues for the small herd (ie grazing the first part of most paddocks which are then generally followed by the main herd)
6. There are 543 cows going into the vat, with 521 cows on twice a day milking, 22 once a day.
7. There were no new case of mastitis over the past week (57 clinical cases season to date vs 90 cases at the same time last season).
8. This week, there were 6 new cases of lameness (104 cases season to date vs 122 cases same time last year).
9. Trace minerals and magnesium chloride are running through the stock water to all cows on the milking platform.

10. Average herd liveweight (whole herd) for the week was 500 kgLW, an increase of 12 kg from last week. The monitor group (281 early calving MA cows) has increased to 495 kgLW (11 kgLWT/cow vs last week).
11. The herd was BCS on the 16th February. The average BCS of the whole herd was 4.2 (a drop of 0.1 BCS since the 13th January). 8% of the herd is below CS 4.0, 52% of cows are BC 4.0, 29% at 4.5 and 11% at 5 or above. In late October, the average was 4.5, and in mid-July, an average of 5.3. The whole herd will be body conditioned scored again in mid March 2017.



12. 2016 spring born replacement heifers have received their 7 in 1 vaccine booster and an IBR vaccine. They have been drenched and weighed on the 13th February 2017 and presented an average weight of 177 kg liveweight with 94% of them above target liveweight, 7% of them on target and 1 % below target.

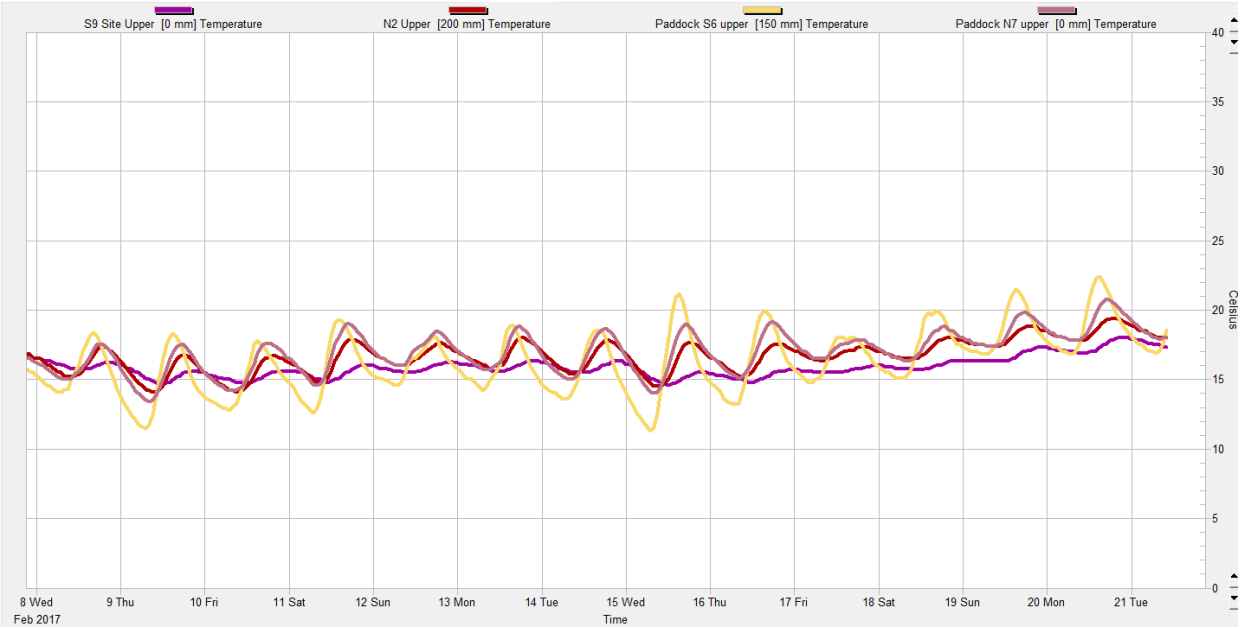
Mating results to date:

13. Cows:
    a. 10 weeks mating started on 25 October and finished 4th January. 82% of the herd was submitted in the first three weeks, compared to the target of 90%.
    b. Scanning results reported in the Fertility Focus Report show a 6-week InCalf rate of 63%, down from 69% last year and reflecting the challenging mating season and IBR outbreak described earlier in the season. The overall not-InCalf rate is 15%, slightly higher than the past few years.
14. Replacement heifers:
    a. 9 weeks mating started for R2 2015 born heifers on 11th October 2016.
    b. Preliminary scanning results reported 98 of the 150 heifers in calf to either the AI straw or a bull mating a day later. (65%). A further scan on the 19th January gave a final result of 91% in calf.
    c. This results in 134 R2yr heifers InCalf or 24% available as replacements to enter the herd next calving. (2 have been culled since mating).

Growing Conditions

15. The average 9 am soil temperature for the past week was 16°C, 1.0°C higher than last week's (but still significantly lower than the 17.8°C at the same time last year).

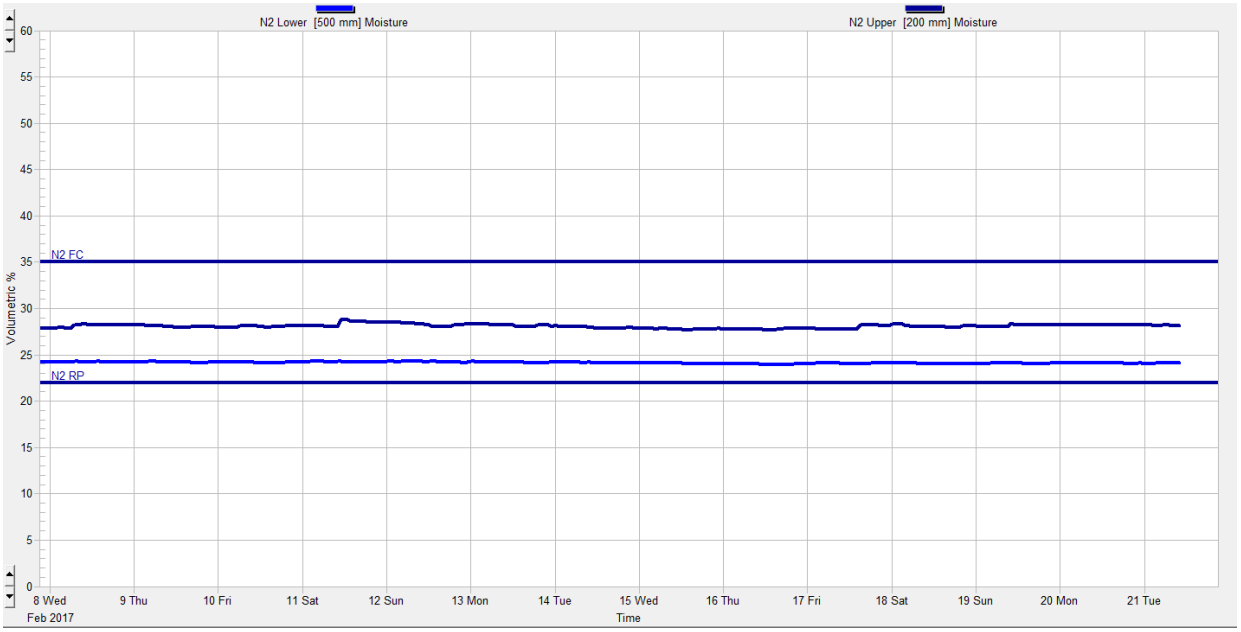
Figure 1: Soil temperature history for the last 2 weeks



16. The farm has only received 1.8 ml of rain over this past week. Our average evapotranspiration (ET) rate this week was 27 mm (3.8 mm/day). 4 days of overcast weather even with the increases in temperature have allowed ET to remain stable.

17. Irrigation occurred for 4 days on the north and south blocks for this week and soil moisture seems to be holding well.

Figure 2: Soil moisture history for the last 2 weeks (Paddock N2)



18. N Fertilizer: 36.34 ha have received nitrogen at a rate of 25 kgN/ha as urea, over the past week. Season to date, 140 kgN/ha has been applied on average across the 160 ha of the farm. This is in line with the target to apply up to 170kgN/ha and finish applying N around the end of March 2017.
19. The non-effluent block of the north block has received the 100 Kg/Ha of potassium behind the cows.

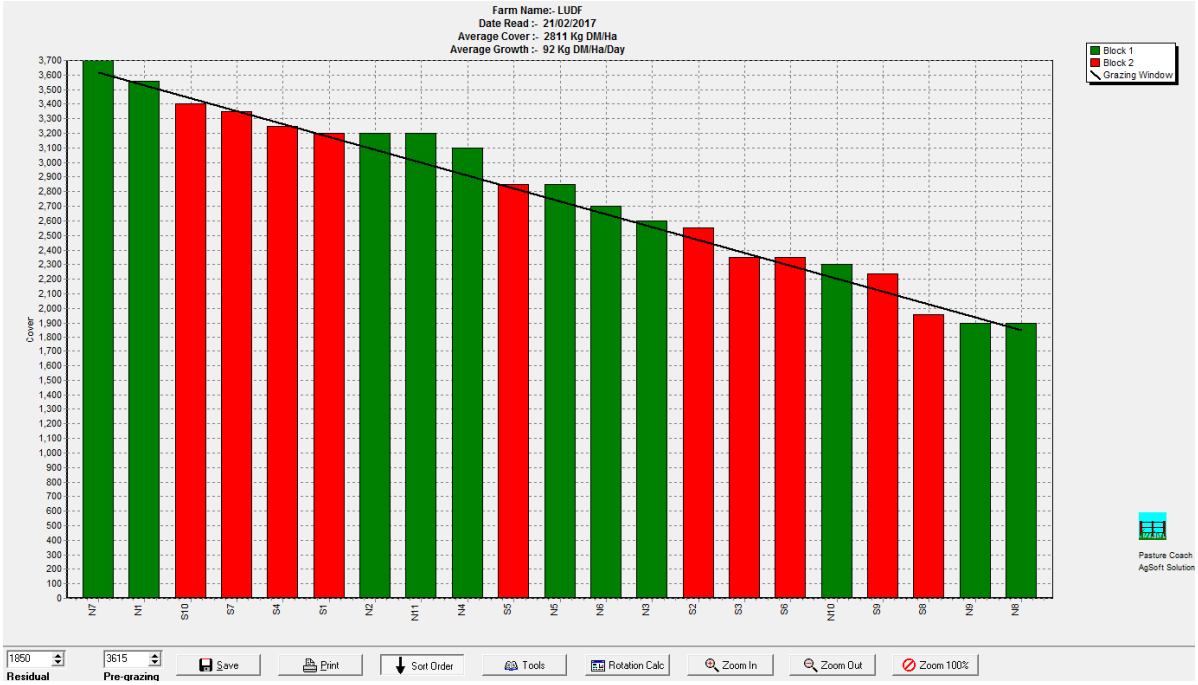
Pasture and Feed Management

20. The planned extension of the round to 28 days supported by the introduction of silage through the week has worked well.
21. A round of 27.2 days was achieved with the addition of 3.6 kgDM silage/cow/day for the week (13.7 TDM total silage used for the week).
22. The focus of offering a high daily intake of high quality pasture, while achieving a low and consistent residual continues so that high quality pasture is available again at the next round.
23. A small amount of seedhead remains visible in some paddocks (at high covers and in urine patches). However its presence was less obvious this week.
24. The consistent warm soil temperatures remain favourable to clover growth, with good levels of clover evident in most paddocks across the whole farm.
25. 4.9 ha have been post-graze mown during this last week's grazing to control weeds.
26. Rising Plate Meter data collected in recent months had appeared to routinely overestimate pregrazing pasture cover, and possibly post grazing covers also. This results in an overestimate of growth rate and impacts apparent average pasture cover. Throughout this time, grazing residuals have generally been 'low and consistent' with little remaining feed available – even at the higher plate meter readings.
27. To counteract this data collected in February is the result of a more considered focus on technique, using an average of 2-3 plate meters, combined with some discussion on the apparent yield in

each paddock. This seems to be working well, with the data collected over the past 3 weeks better aligning with apparent cow intake.

28. Pasture quality from samples collected on 7st February showed an average of 13.9% DM (lower than the previous week).
    a. Energy content higher than the previous week (12 vs 11.2 MJME/kgDM)
    b. Protein levels much higher than previous week (24% vs 18.6%)
    c. NDF lower than previous week (37.7% vs 46%).

Figure 3: This week's feed wedge



29. The demand line on the pasture wedge graph is calculated as follows:
    a. 544 cows on 160 ha: 3.4 cows/ha.
    b. Planned minimum round length for the coming week is 28 days over 160 ha or 5.7 ha/day
    c. The dry matter intake for the current level of milksolids production is around 18.5 kgDM/cow/day
    d. Total demand: 18.5 kgDM/cow/day x 544 average cows for the week = 10,064 kgDM/day (63 kgDM/ha/day)
    e. Demand of 10,064 kgDM/day from 5.7 ha /day requires 1,765 kgDM/ha available.
    f. Assuming the target residual is 1850kgDM/ha, target pregraze covers are 3,615 kgDM/ha. (1,850 kgDM/ha + 1,765 kgDM/ha = 3,615 kgDM/ha pregraze cover).
    g. Target APC would therefore be (3615+1850)/2 = 2,732 kgDM/ha
30. The feed wedge above is showing a surplus of about 8 TDM total at this stage.
31. Average pasture cover this week has increased by 159 kgDM/ha for the week
32. Demand continues to sit at 63 kgDM/ha/day and growth rate as reported by Pasture coach was around 92 kgDM/ha/day. The difference is consistent with the increase in cover observed for the week.

Increase in cover = 2811-2652 = 159 kgDM/ha/week.
159kgDM/ha/week = 22 kgDM/ha/day.
Demand of 63 + increase in cover of 22 = 85, similar to the 92kgDM/ha calculated growth rate.

33. It could be argued that the silage required to achieve the current cover and the extension of the round through the week could have been a bit less than what was used (13.7 TDM used vs an 8 tDM surplus at the moment). However, given the time of the year and the potential quick changes of pasture growth that can happen through autumn, carrying less than 1 days' worth of feed ahead of us in the wedge is not a bad place to be.
34. It appears that the revision of plating technique has reduced much of the previous overestimation of pasture covers and subsequently growth rates, with the data more closely aligning with what cow observation indicates.

Feeding Management for the coming week:

35. In terms of pasture management, we remain focussed on feeding cows as much high quality pasture as they can effectively eat, every day - while holding cow condition, milk production and achieving low and consistent grazing residuals.
36. In preparation for next season, focus turns to target dry off covers as well as BCS in the herd. There will be only about 3 more grazing rounds between now and end-May.
37. The aim is to hold a 28 day grazing round. To achieve this, the current feed wedge would suggest that no silage is required. However, the decision around bringing the silage in will be considered on a paddock per paddock basis.
38. Grazing decisions will continue to be influenced by cow behaviour and pasture growing conditions, taking particular note of area grazed per day. Historically LUDF has experienced growth above demand in Feb-March so silage and round length will be manipulated with any surplus now pushed forward into a longer round.
39. The farm will continue to apply Nitrogen fertilizer following grazing, applying Urea at 25kgN/ha to the non-effluent areas of the farm.

LUDF Weekly report	24-Jan-17	31-Jan-17	7-Feb-17	14-Feb-17	21-Feb-17
Farm grazing ha (available to milkers)	160	160	160	160	160
Dry Cows on farm / East blk /Jackies/other	0/0/0	0/0/0	2/0/0	0/0/0	0/0/0
Culls (Includes culls put down & empties)	0	0	0	2	2
Culls total to date	20	20	20	22	22
Deaths (Includes cows put down)	0	0	0	0	0
Deaths total to date	14	14	14	14	14
Calved Cows available (Peak Number 560…)	546	546	546	544	544
Treatment / Sick mob total	0	1	0	2	1
Mastitis clinical treatment	0	1	0	2	0
Mastitis clinical YTD (tgt below 64 yr end)	54	55	55	57	57
Bulk milk SCC (tgt Avg below 150)	110	110	98	118	112
Lame new cases	6	2	0	3	6
Lame ytd	93	95	95	98	104
Lame days YTD (Tgt below 1000 yr end)	2483	2644	2763	2910	3064
Other/Colostrum					

Milking twice a day into vat	524	522	527	521	521
Milking once a day into vat	22	23	17	21	22
Small herd	163	163	163	161	157
Main Herd	368	359	364	360	364
MS/cow/day (Actual kg / Cows into vat only)	1.92	1.88	1.86	1.82	1.83
Milk Protein/Fat ratio	0.82	0.81	0.82	0.80	0.81
Milk Fat %	5.10	5.22	5.19	5.26	5.32
Milk Protein %	4.18	4.23	4.25	4.24	4.32
MS/cow to date (total kgs / Peak Cows 560	325	338	351	363	376
MS/ha/day (total kgs / ha used	6.50	6.36	6.31	6.18	6.18
Herd Average Cond'n Score					4.2
Monitor group LW kg WOW 281 early calvers	489	489	490	484	495
Soil Temp Avg Aquaflex	15.4	16.0	16.3	15.0	16.0
Growth Rate (kgDM/ha/day)	93	71	57	70	92
Plate meter height - ave half-cms	17.8	16.0	15.4	15.4	16.5
Ave Pasture Cover (x140 + 500)	2987	2737	2656	2652	2811
Surplus/[defict] on feed wedge- tonnes	0	0	4	0	8
Pre Grazing cover (ave for week)	3606	3619	3581	3445	3386
Post Grazing cover (ave for week)	1800	1800	1800	1800	1800
Highest pregrazing cover	3722	3762	3888	3600	3500
Area grazed / day (ave for week)	6.45	6.31	6.47	6.61	5.87
Grazing Interval	25	25	25	24	27
Milkers Offered/grazed kg DM pasture	20.5	17.4	17.9	14.8	19.2
Estimated intake pasture MJME	240	202	208	166	230
Milkers offered kg DM Grass silage	0	0	0	0	4
Silage MJME/cow offered	0	0	0	0	11
Estimated intake Silage MJME	0	0	0	0	43
Estimated total intake MJME	240	202	208	166	273
Target total MJME Offered/eaten (includes 6% waste)					0
Pasture ME (pre grazing sample)	11.5			11.2	12
Pasture % Protein	18.2			18.6	24
Pasture % DM - Concern below 16%	12.3			14.7	13.9
Pasture % NDF Concern < 33	40.1			46	37.7
Mowed pre or post grazing YTD	255.9	256.9	267.7	272.3	277.2
Total area mowed YTD	280.4	290.0	300.9	305.4	310.4
Supplements fed to date kg per cow (555peak)	55.2	55.2	55.2	55.2	79.7
Supplements Made Kg DM / ha cumulative	272.1	361.47	361.47	361.47	361.47
Units N applied/ha and % of farm	25units /19.6%	25units /33.7%	25units /23.5%	25units /20.7%	25units /22.7%
Kgs N to Date (whole farm)	117	125	129	135	140
Rainfall (mm)	23	0	0	0.8	1.8
Aquaflex topsoil relative to fill point target 60 - 80%	80	50-70	50-70	50-70	50-70

Next farm walk: Tuesday 28th February 2017 at 9am. 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 and gumboots. Phone SIDDC – 03 423 0022.

Peter Hancox, Farm Manager, Natalia Benquet, Charlotte Westwood.

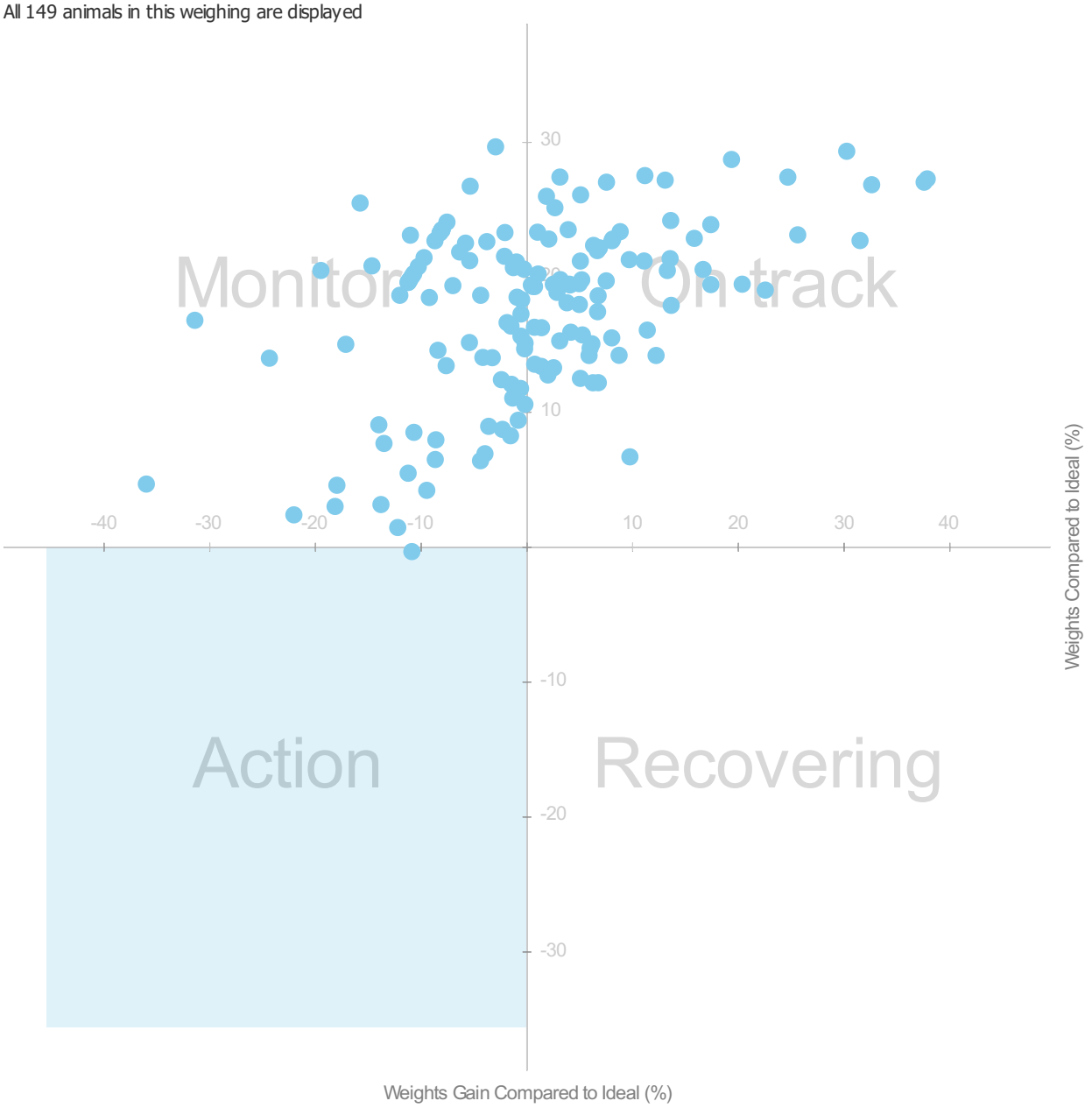
2015 Spring Born

19/01/2017

BQCY

Animal performance

All 149 animals in this weighing are displayed



Take action with these animals

Official Id	AE Breed	Current Weight (Kg)	Weight Gain (Kg/day)	Gain Required by PSC (Kg/day)	Variation from Ideal (%)	Previous Category
BQCY-15-144	HF x J	358	0.37	0.63	-0.33	On Track

Showing 1 to 1 of 1 entries

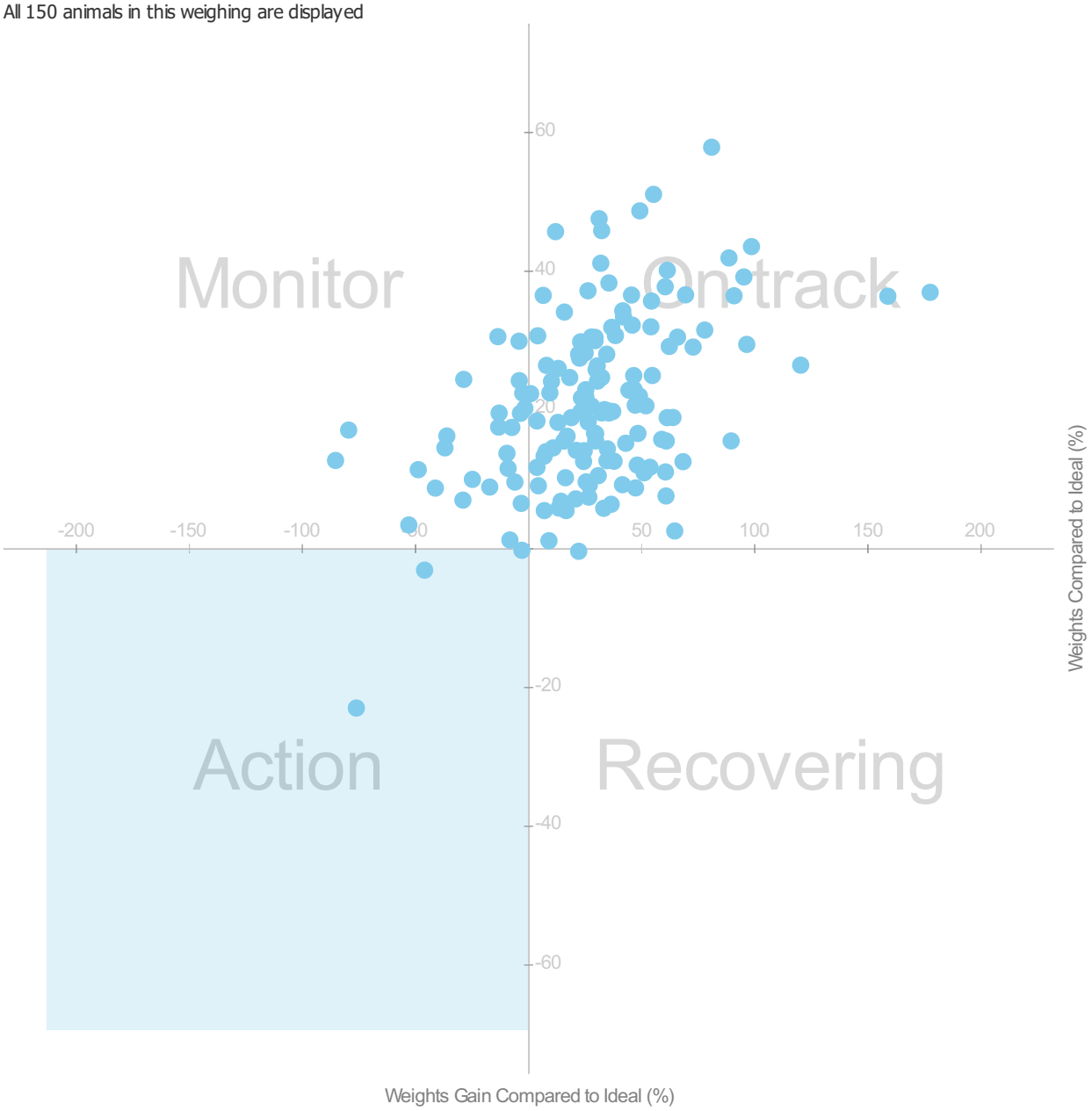
2016 Spring Born

13/02/2017

BQCY

Animal performance

All 150 animals in this weighing are displayed



Take action with these animals

Official Id	AE Breed	Current Weight (Kg)	Weight Gain (Kg/day)	Gain Required by PSM (Kg/day)	Variation from Ideal (%)	Previous Category
BQCY-16-80	HF x J	110	0.00	0.72	-22.97	Action
BQCY-16-103	HF x J	142	0.21	0.62	-3.10	Monitor
BQCY-16-138	HF x J	150	0.61	0.62	-0.23	Monitor

Showing 1 to 3 of 3 entries

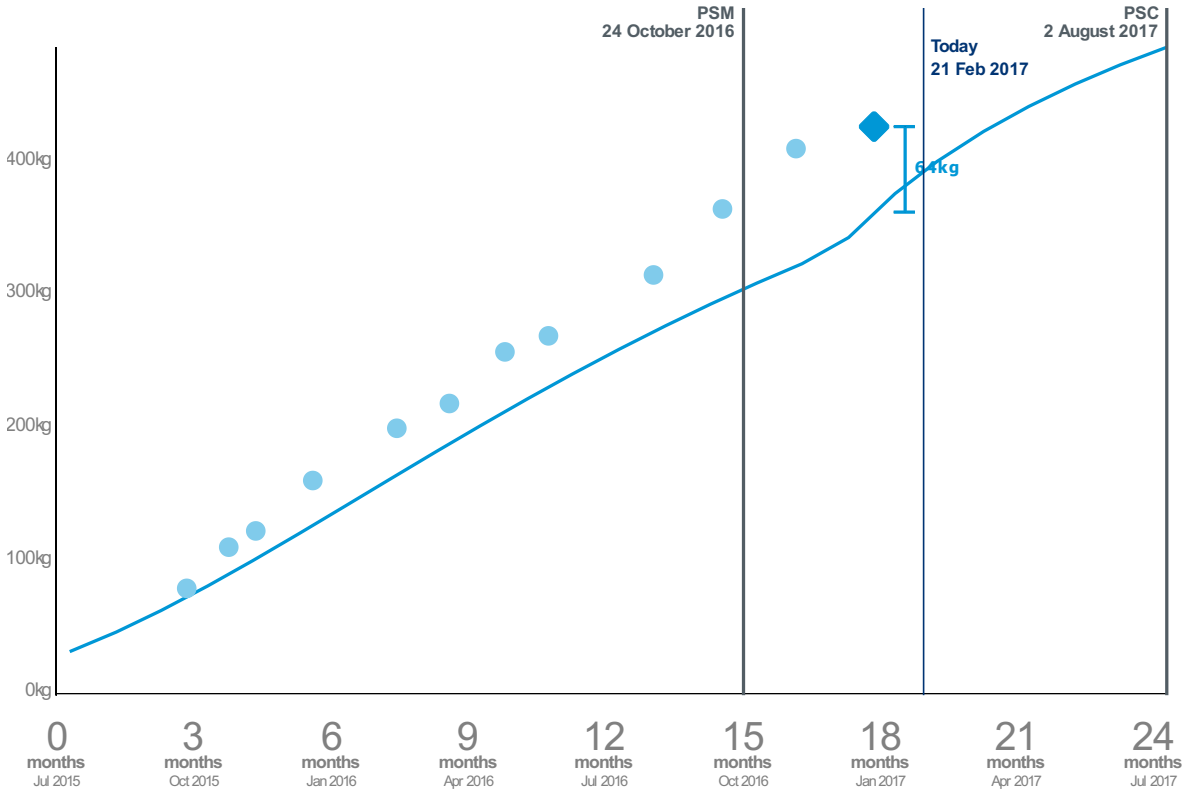
2015 Spring Born

19/01/2017

BQCY

Young stock trend

All 149 animals in this weighing are displayed



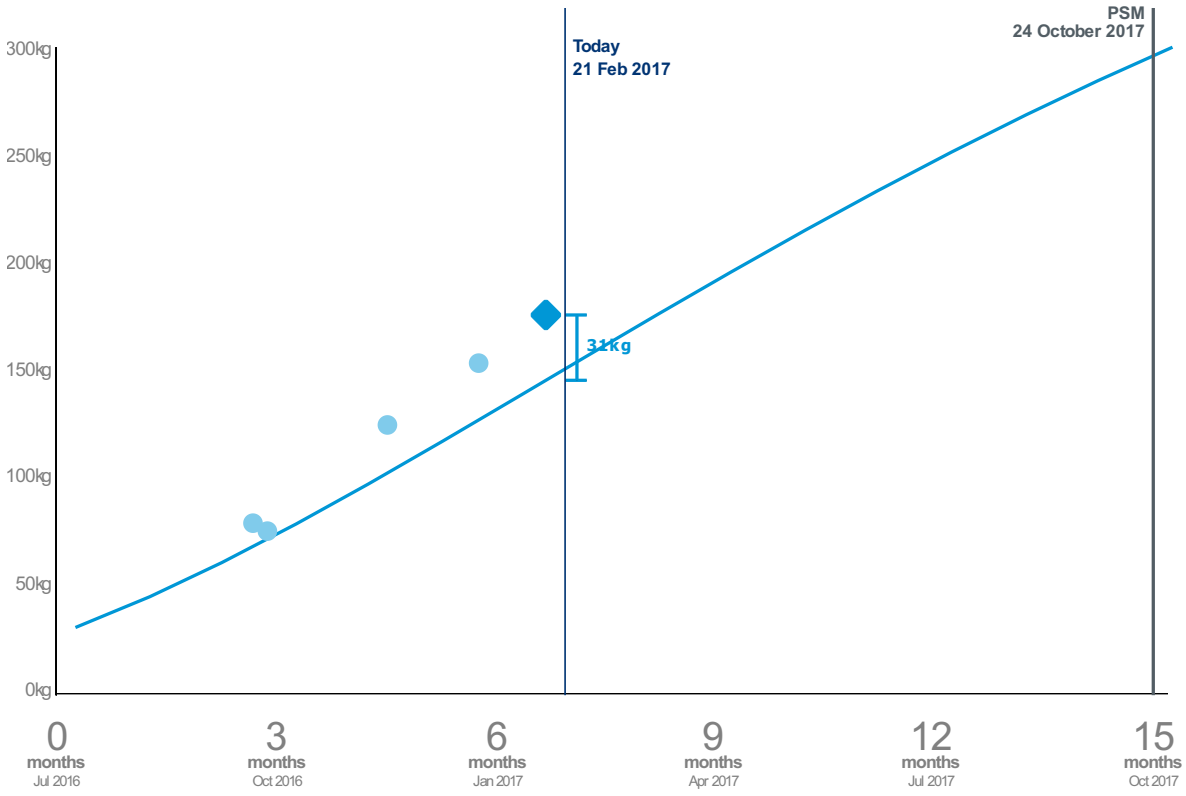
2016 Spring Born

13/02/2017

BQCY

Young stock trend

All 150 animals in this weighing are displayed



Ravensdown Environmental

These days, regulatory bodies want compliance with some fairly complicated rules. While we did not create the challenges you may be facing through emerging regional council regulations, we are determined to help where we practically can.

In all regions, the rules (or the way in which regulators are applying them) are constantly changing. Staying abreast of these changes, and how they may affect your farming operation, is the job of Ravensdown Environmental.

About Ravensdown Environmental

We are fast growing team with one key objective: helping you align your goals and future aspirations for your farm, within the environmental regulation framework.

As a user-pays consultancy, we charge to cover costs. Our pricing reflects the fact that we are providing a commercial service (which has to be sustainable) without seeking to exploit affected farmers. Our consultants work with farming operations of all sizes on a first come, first served basis.

Professional Services

Our experienced team of environmental consultants, coupled with our network of collaborators, can provide an array of environmental services. These include the following, but please get in touch if you can't see what you need here:

- Nutrient Budgeting with OVERSEER®.
- Farm Environment Plans (FEP; FEMP; SMP).
- Resource Consent Applications.
- Water Quality Monitoring and Laboratory Testing.
- Wastewater and Effluent Testing and application modelling.
- GIS Mapping.

If you need a resource consent, are looking at changing your farm system, assessing land use options prior to purchasing or selling additional land, or need to meet other regulatory requirements, we can help you navigate through the complexity of environmental and regulatory constraints in your area.

All our nutrient budget projects are led by Certified Nutrient Management Advisors, using the latest version of OVERSEER® nutrient modelling software, and the latest set of OVERSEER® data input standards.

Act Now

The demand on our services is high. We are currently operating an ECAN approved waiting list for the preparation of regulatory quality nutrient budgets. You can register your interest via your Agri Manger or the customer centre on 0800 100 123.

Farm with greater certainty

Get the advice you can trust. Talk to us today.

0800 100 123 | ravensdown.co.nz

ravensdown

Welcome to Lincoln University Dairy Farm (LUDF).

The farm is a fully operational, commercial dairy farm with a number of potential hazards for both visitors and staff. Many of the potential hazards cannot be eliminated while also providing access to visitors therefore all staff and visitors MUST watch for potential hazards and act with caution.

Hazard Summary: Look, think, act.

The following chart provides a reminder of the types of hazards at LUDF. Watch for these and any other hazards that may be on farm today.

People: • Uninformed / ill prepared visitors may be the greatest risk	**Animals:** • **You are in their space**	**Milking shed:** • Moving rotary platform • Confined animals • Chemicals
Eyes / Ears: • Water / oil / milk / chemical splashes • Welding flashes • Loud machinery		**Touch:** • Hot / cold surfaces, hot water, chemical burns • Electric fences – treat them as high voltage power sources
On farm machinery and tools • Chainsaws, hand tools etc. generate noise, fragments	**Potential slips / trips:** • Uneven surfaces occur across the farm • Fences • Drains • Underpass • Effluent pond	**Vehicles:** • Contractors and farm equipment – **act as though they can't see you** – keep out of their way • Centre Pivot takes precedence over your plan

ARE YOU TRAINED FOR WHAT YOU ARE ABOUT TO DO? If not, STOP.

If you are uncertain how you should act or proceed, stop and contact the farm manager, other farm staff or your host.

By entering this farm, you are acknowledging your receipt of this hazard summary, and your agreement to take personal responsibility to watch out for potential hazards, and act in such a manner as to protect yourself and any others also on-farm.

Feedback Survey

The May LUDF focus day is currently scheduled for Thursday 4th May and DairyNZ have a local farmers forum event planned for Tuesday 16 May.

We are considering combining these events. Please indicate your preference:

Two separate events

OR

One combined event

(note a combined event is unlikely to have much opportunity for direct discussion on LUDF autumn management).

Also, please outline what information was most valuable to you today

And, what other information you would like from LUDF focus days?