SIDDC South Island Dairying Demonstration Centre | LUDF Tomorrow's farming, today

FOCUS DAY

22/23 BREEDING & MATING RESULTS

Monday 19 June 2023

2:00pm - 4.30pm

braidedrivers COMMUNITY TRUST | ASHBURTON event centre

LUDF decreased its not-in-calf rate from 20% last season, to just 12 % this season, however, this still doesn't match local farmer, Liam Kelly's result (8 % not-in-calf rate).

FIND OUT HOW AND WHY !?

We will be comparing and diving further into the results from tests and measurements taken at both LUDF and Liam Kelly's farm in the 2022/23 mating period including:

- Feeding
- Rumination
- Body Condition Scoring
- Milk Lactation curves
- Plant nutritional data (including NDF)
- NEFA results

Speakers: **Jeremy Savage** (Macfarlane Rural Business), **Ryan Luckman** (Vet Centre Waimate), **Liam Kelly** (Alderbrook Farm), **Peter Hancox** (LUDF) and **Jair Mandriaza** (LIC)

SIDDC South Island Dairying Demonstration Centre

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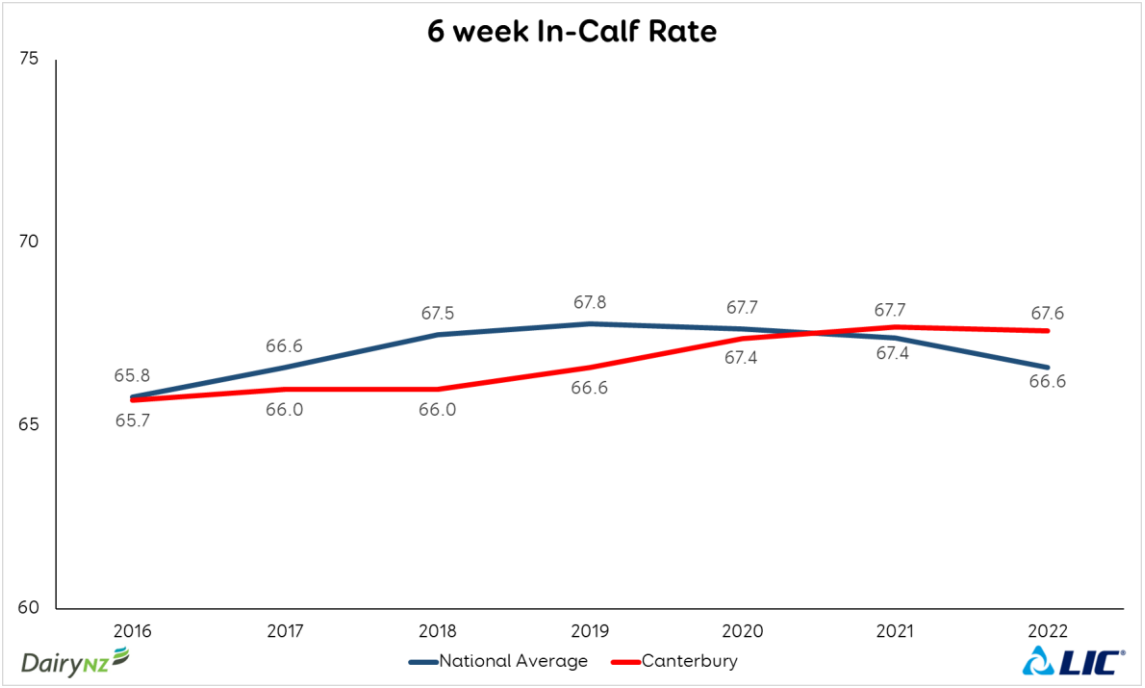
LUDF/Kelly Reproduction

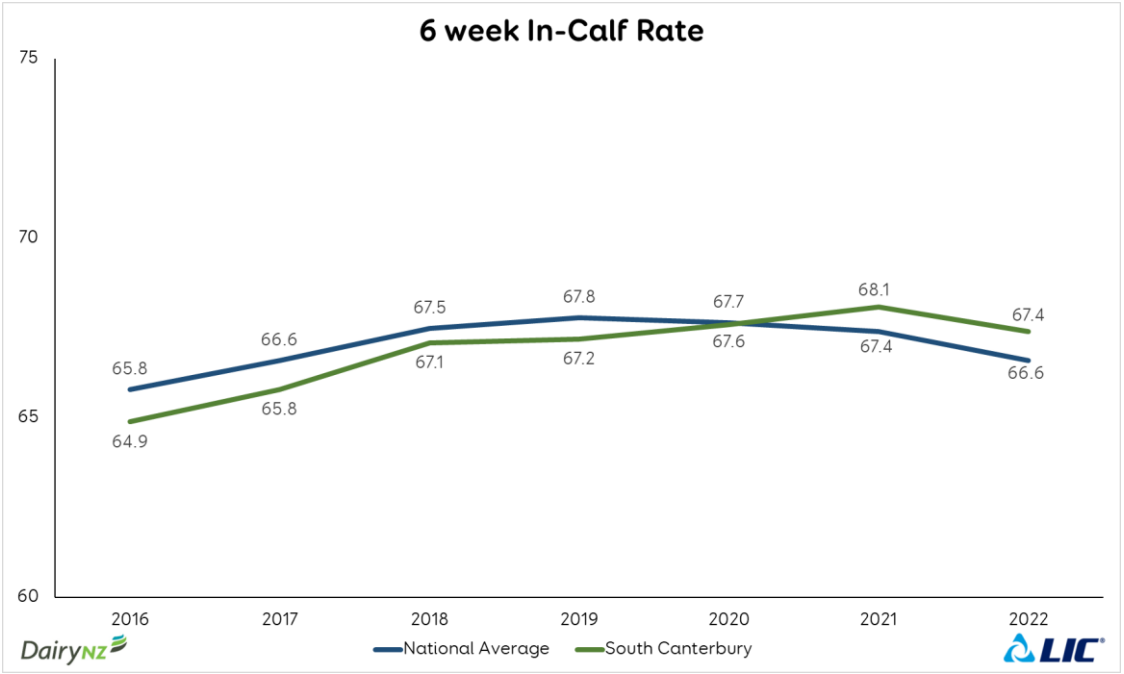
Benchmarking Project May 2023

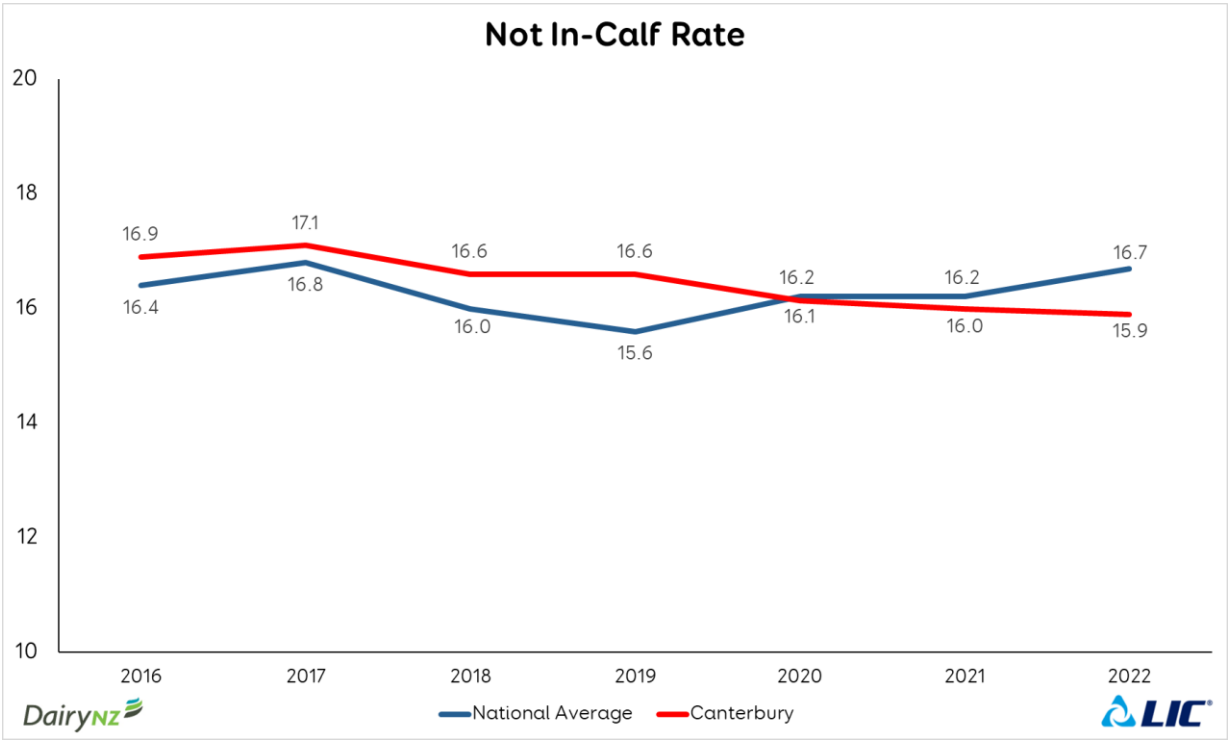
LUDF. Peter Hancox. 541 cows, 160 Ha farm, Lincoln.

Alderbrook Farm. Liam Kelly. 659 cow, 200 Ha farm, Rakaia.

1. National and regional reproduction results






Not In-Calf Rate
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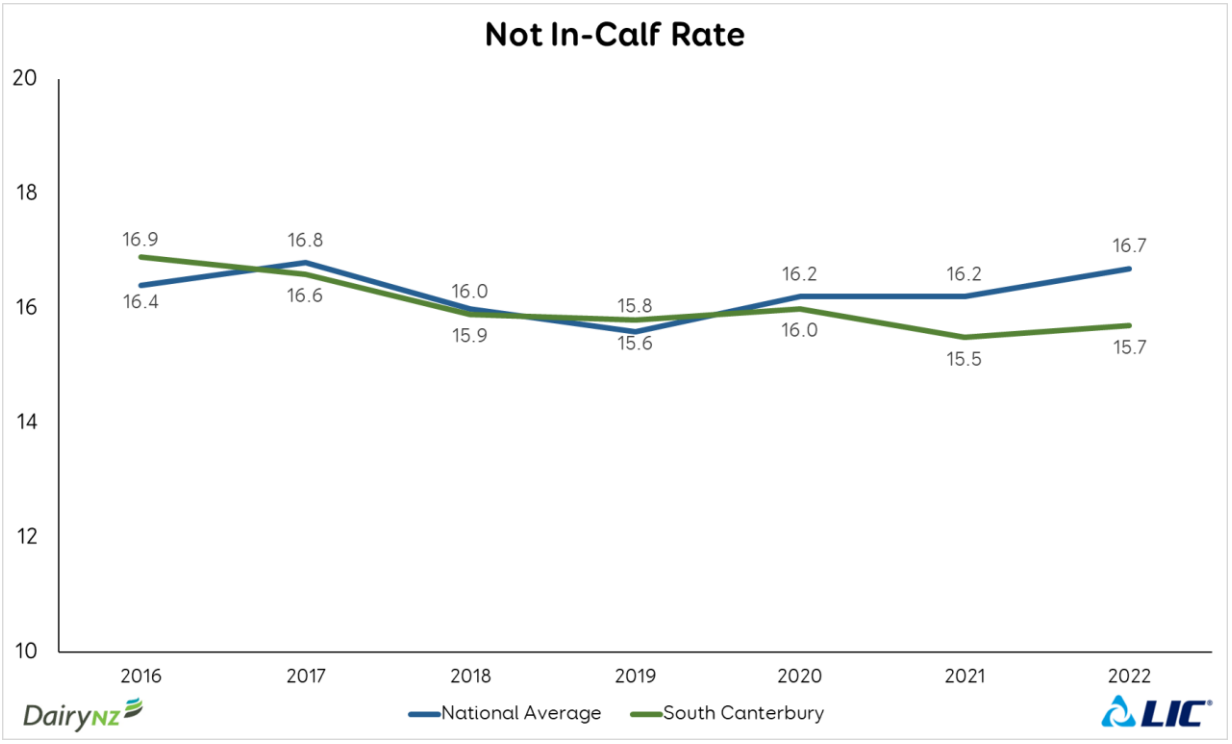
2016
2017
2018
2019
2020
2021
2022
DairyNZ
National Average
Canterbury
LIC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2022
DairyNZ
National Average
South Canterbury
LIC

2. LUDF Results

LUDF improved their not in calf (NIC) rate from a historic 18 – 20 %, to 12 % for the 2022 Spring. Two key changes made in 2022 spring were:

1. Extending mating by 2.3 weeks, using ultra short gestation semen. Mating traditionally was 10 weeks. This would have finished mating 1st January.

2. Collars used to identify mating's and monitor cow activity (and inactivity).

LUDF Improvement in NIC Rate=	8 %
Longer Mating	3.3 % additional cows in calf.
Collars + interventions	5.4 % additional cows in calf.

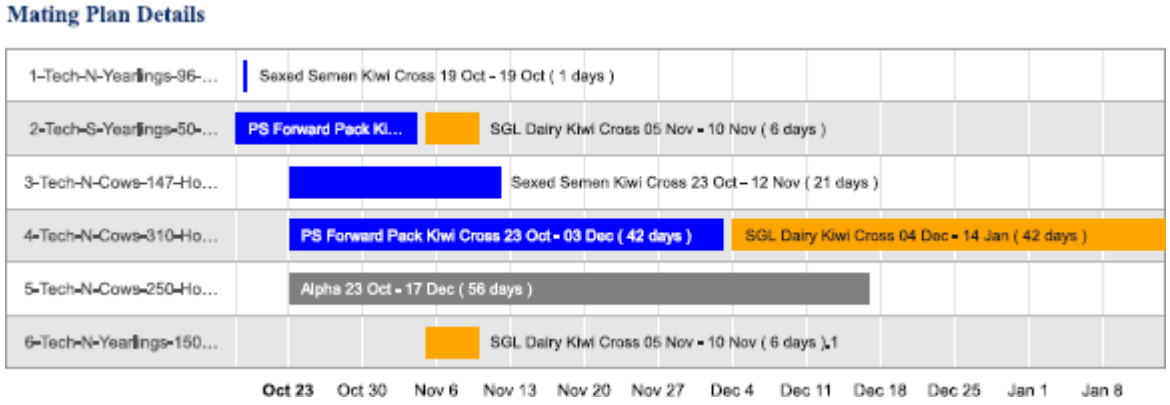
Reviews on previous mating's by LIC highlighted that Peter Hancox mating / drafting skills were not contributing to the higher empty rate. It was not anticipated that any improvement came from improvements in accuracy of drafting due to collars.

An improvement cow condition during November / December was noted. Cow condition improved during this period compared to a drop in condition in the 2021 spring. It is likely this improvement also contributes to the overall improvement in the NIC rate.

It was also noted that there were 24 slips / failed pregnancies from the initial scanning (Dec) to the final scan.

2.1 Mating Period / SGL Semen

The mating period was extended from the traditional 10 weeks to 12.3 weeks for the 2022 mating period. Ultrashort gestation semen was used for the tail end of mating:



Scanning was completed on a weekly basis through December, with a final scan in early March. It was confirmed that an additional 3.3% cows were in calf with combining the collar and short gestation technologies. Mating can be extended without collars, however we will be demanding staff do extra work (drafting) through the xmas/new year break. Collars are automated.

2.2 Prostaglandin Use & Phantom Cows

PG (Prostaglandin) was used in the first cycle of mating. LUDF had only 2 anoestrus cows at the PSM. An additional 19 cows were identified as non-cyclers at day 19 of mating and PG'd.

The data from the collar technology was used to identify "Phantom Cows". These are cows that have cycled, have been inseminated and failed to get in calf, and failed to start cycling again. These animals will show up on the collar information pages as In calf, and give a likelihood. These cows identified with the collar technology, are scanned by the vet to confirm if they are pregnant. Scanning takes place 28 – 35 days after the m Cows that were not pregnant were administered a PG dose and inseminated 3 days later.

41 cows were given a PG based on identifying them as Phantom cows with use of collar technology and scanning from 27th November to 9th January. Cows were scanned every 10-14 days. This intervention could also be achieved with Tail paint / Kmars, but with some difficulty and risks of inaccuracy. 67% of these cows were determined as pregnant in the final scan.

In addition to the phantom identification, a further 11 cows were PG when it was noted the drafting numbers were wrong on a later 11 am Saturday milking. With 10 in 7 milking, staff need to change some parameters in the drafting program.

Intervention with PG

Mating Start Date	23-Oct						
Traditional Intervention with PG	Date	Day of Mating	Cows	MT Cows	IC Cows	IC Rate	% Of 540
PG'd start of Mating.	21-Oct	-2	2		2	100%	Herd IC
due to miss draft.	09-Nov	17	11	1	10	91%	
non-cyclers day 19 of mating.	11-Nov	19	39	10	29	74%	
Traditional Intervention Total			52	11	41	79%	7.6%
Collar + Scan + PG Intervention							
Phantom Cows	27-Nov	35	11		11	100%	
	08-Dec	46	16	4	12	75%	
	22-Dec	60	7	3	4	57%	
	09-Jan	78	9	7	2	22%	
Phantom Cows - Total			43	14	29	67%	5.4%

3. Learnings from Benchmarking LUDF Vs Kelly

Liam Kelly farms in the Rakaia district. Liam achieves consistently high performance, per cow production 525 – 540 kgMS/cow with empty (Open Rates) typically 10%. We have been able to benchmark between the 2 farms:

1. Reproduction
2. Rumination and activity.
3. Cow Condition.
4. NEFA Testing (Non esterified fatty acids)
5. Milk Production.
6. Feeding Levels

Benchmarking data between LUDF and Kelly highlighted several areas of improvement that could be adopted by LUDF:

1. Early nutrition and rumination of the LUDF herd was behind Kelly's in the first 10 days. Higher rumination rates were observed on the Kelly herd, with lower NEFA levels, suggesting that they had a better energy balance. LUDF feeds only bailage to springers, and nil bailage to milkers. Feeding some straw/hay to springers, and offering bailage to colostrum's is anticipated to improve rumination rates and energy balance for the LUDF cows through this period.
2. Late November rumination rates at LUDF lifted higher than Kelly. Combined with observations in milk protein levels, and higher NEFA tests during this period the LUDF also had a lower conception rate than Kelly. The combination of the data sets suggests that LUDF has some nutritional challenges with the 100% pasture-based program which may be contributing to reproductive performance. Kelly is potentially overcoming these deficiencies with the feeding of energy dense feeds. Typically for LUDF the drop in reproductive performance is declining from 6-8th November. Through this period Kelly was feeding 1.7 kgDM of energy dense feed. Further work and research is needed in this area to give firm recommendations to farmers.

3.1 Reproduction Results

Difference in Not In Calf Rate between LUDF and Kelly – Day 78 of Mating

Kelly = 78 days	11 Weeks	94 % (excl slips)
LUDF		87 %
Difference		7 %

Liam achieves exceptional results.

3.2 Feeding and Rumination

Transition (Springers to Early Lactation)

Transition Rumination Rates:

NEFA Blood Test Results:

CORNELL University Herd Level NEFA Interpretations

Negative energy balance in dairy cows: Dairy cows in the periparturient (transition) period are always in a state of negative energy balance due to high energy demands from the developing foetus and milk production (particularly with the emphasis on selection for high milk-producers). However, this state of negative energy balance can be excessive and affected cows are at risk of gastrointestinal (displaced abomasum), metabolic (clinical ketosis), and infectious (e.g. metritis) diseases in the early postpartum period. Thus, dairy practitioners frequently monitor dairy herds for excess negative energy balance by testing for NEFAs. Results of these tests can be interpreted at the herd level (i.e. a proportion of tested cows have NEFA values over a certain cut-off value). Identification of excess negative energy balance in individual cows (and more importantly) in the herd indicates the need for changes in nutrition and transition cow management to decrease energy demands and stresses on transition cows.

Cornell herd level target is <15% high prepartum and <15% high postpartum

3.3 Feeding Levels

Diet for Period	LUDF	Alderbrook
Springers (Day -1 to -7)	Grass = 4kg Baleage = 6kg (Ad-lib) *Calving on cropping dirt*	Grass = 4kg Baleage = 4kg Straw = Ad-lib *Calving on dry soils*
Colostrum (Day 1-4)	Grass = Ad-lib (1700-1800 residuals) *OAD Milking, Skip-a-day on Day 1 if Required*	Grass = Ad-lib (1700 residuals) Baleage = Ad-lib *OAD Milking, Skip-a-day on Day 1 if Required*
Early Lactation (Day 8-10)	Grass = Typically 100% of diet. Silage more likely to be added in later round when ground drier (1600 residuals)	Grass = To balance (1600 residuals) PKE = 3-4kg (1kg replaced with silage if FEI Index spikes) Grain = 1-2kg

3.3.1 The transition rumination of LUDF sits in the lower quartiles of performance vs the reference benchmark data (Vet Centre client Benchmark Data), and much lower than Alderbrook. This tracks across Springers to Early Lactation.

3.3.2 This matched up with the NEFA blood levels, which showed much higher levels of fat mobilisation at LUDF vs Alderbrook (which sat under the reference target).

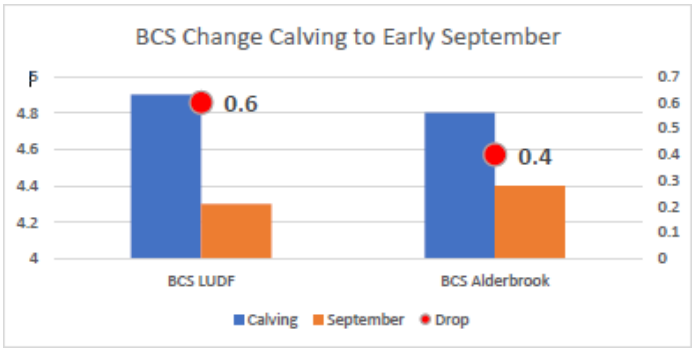
Recommendations / Discussion Points

Springers – Look at adding 2kg Straw to the diet to increase rumination rates. Balance intakes to be 90-100% of maintenance energy (typically 10kg green, 2kg straw).

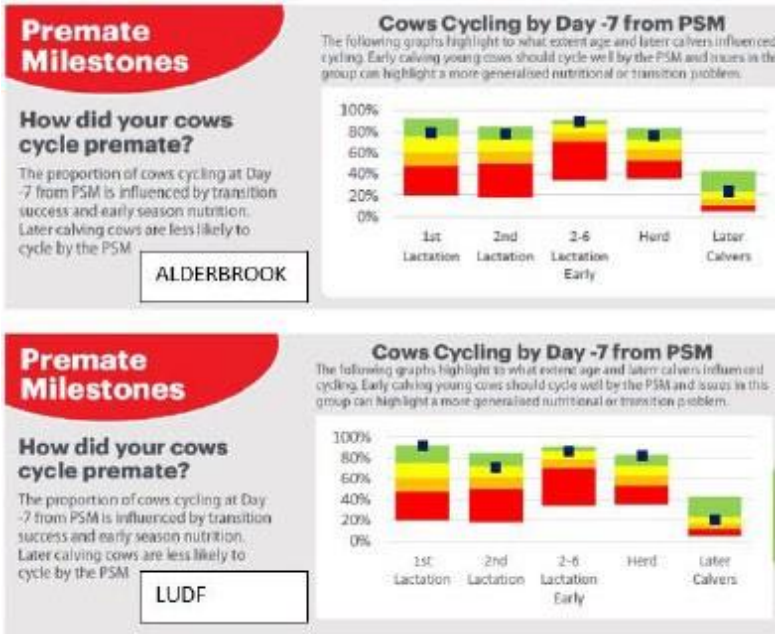
Colostrum – With the extended data set (backed up by the Alderbrook data) grass only diets in the colostrum period hasn't reached rumination targets. It appears that 3+ offerings of feed (with 2+ sources) are required to increase voluntary feed intake i.e 2x grass breaks, 1x silage.

Currently LUDF is NOT set up to be able to offer supplement feeding without wrecking paddocks. Discussion was made around using "Waste nots" for colostrum's along fence line, and regressing afterwards (like Alderbrook).

3.4 Pre-Mate Period (Cycling + Feeding)



BCS Change Calving to September



Pre-Mate Cycling Rates (Day -7 from PSM)

Summary:

3.4.1 BCS loss was greater at LUDF vs Alderbrook. However, both farms started with BCS scores under industry targets.

3.4.2 The cycling rates in both herds were similar, and at the upper end of the benchmark set. No major red flags were raised during this period, however it should be noted that LUDF has moved back their PSM date this season so this figure should be reassessed in the 2023/24 season.

3.4.3 The only area of concern for LUDF was the cycling rate of 2nd lactation animals which was 15-20% behind other groups.

3.4.4 Given the cycling rates, it would appear that transition (where we had recorded high NEFA level) was a key difference between the two farms with regard to condition loss.

Recommendations / Discussion Points

Winter BCS – Consider looking at mitigation strategies (including dry-off targets) for BCS for wet Winters. At LUDF the MA cows came out of Winter at a 4.6 BCS (not split for Alderbrook).
Given the cycling rates of 2nd lactation animals, consideration of differential calving BCS

3.5 Weekly Conception Rate

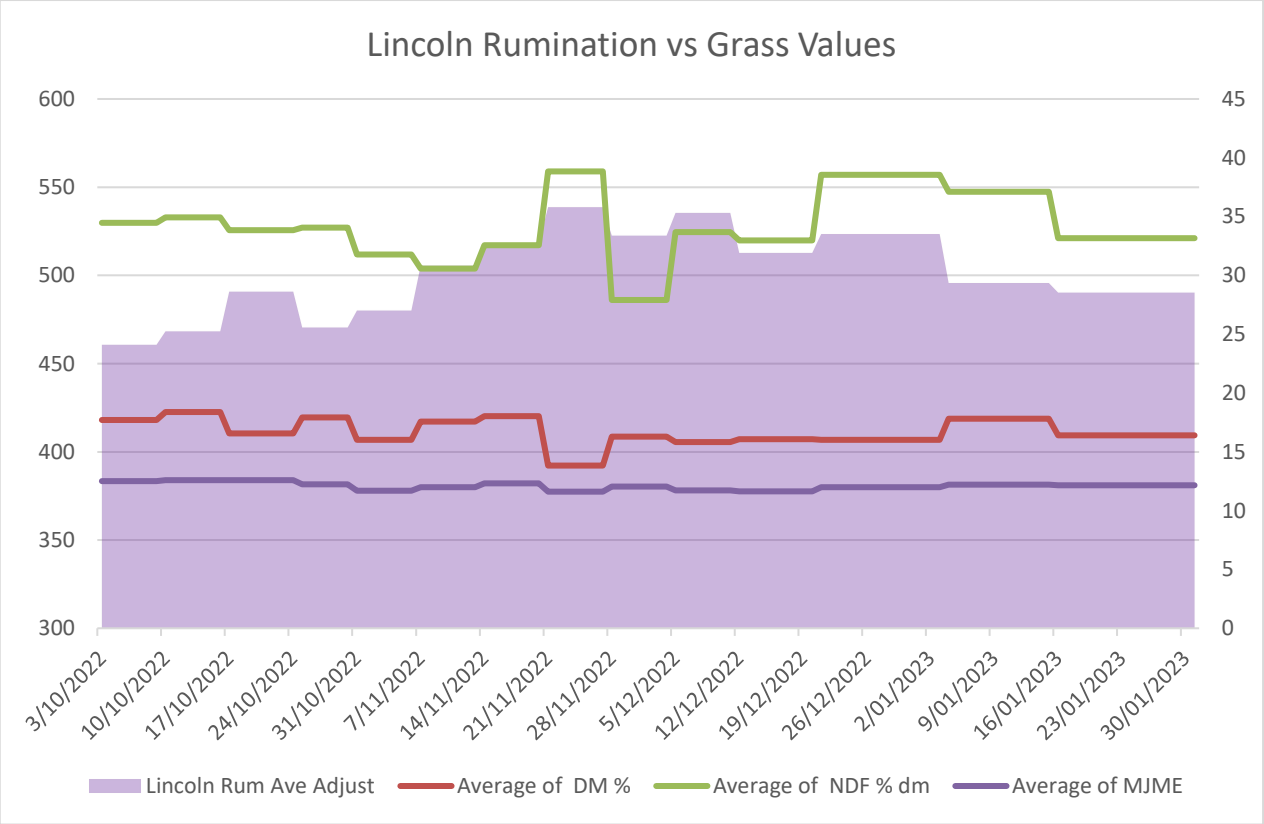
Alderbrook conception rates for 9 weeks.

LUDF conception rates for 9 weeks.

- LUDF performed relatively well in Round 1 of mating, but performance dropped significantly in Round 2 and 3.
- Marked drop in conception rate. In weeks 1-3 the conception rates for traditional semen (not sexed) was 59% at LUDF and 60% at Alderbrook. In weeks 4-6 this dropped to 39% at LUDF, with Alderbrook maintaining a 61% CR.

3.6 NEFA Blood Levels (Milkers)

- Pasture NDF values began rising significantly from around the 10th November, along with rumination minutes. This coincided with a fall in milk production (0.33kgMS at LUDF vs 0.2kgMS at Alderbrook over the same period)



- Increase in fat mobilisation at LUDF (as demonstrated by elevated NEFA levels)

	LUDF	Liam
	NEFA Levels	NEFA Levels
10th Aug	.7	.4
29th Sept	.3	.3
27th October	.2	.3
10th November	.4	.2
24th November	.1	.2
8th Dec	.1	.2
22nd Dec	.2	.2

* NOTE: This energy pinch has been noted at around the same date in previous seasons, and doesn't appear to be a seasonal anomaly.

Recommendations / Discussion Points

Energy Deficit Early November – There is a consistent crunch point with an energy deficit hole in early November at LUDF. This is a common trend in the larger data set on farms that are feeding grass only during this period. Alderbrook on the other hand maintained high conception rates, but was feeding supplements.

The grass quality data shows that Peter has been able to maintain high MJME values in the LUDF pasture throughout this period, with values holding above 12 MJME. However, as NDF of the pasture rises (green line in the graph above) so does the rumination rates of the cows – i.e more fibre = higher requirement to chew cud/ruminate. The likely outcome of this is a drop in voluntary intake, with maximum intake being closely linked to the NDF % of the diet.

As this is a consistent energy hole at LUDF an energy dense supplement may need to be considered during this period to avoid the mating, conception rate, and production drops.

4. Costs Associated with High Replacement Rates

4.1 Cost of Rearing Replacements

Cost of Rearing the Heifer				
Calf rearing Cost - 100 kg.				$ 610.00
IC Heifer	4.5	wks	$ 28.00	$ 126.00
Deaths	2%			$ 34.98
Net Marginal Costs				$ 1,909.98
MT, sold @ $900	5%			$ 52.50
Cost of IC Heifers, 1st June				$ 1,958.01

Impact on budget. 5% Replacement = $0.20 / kgMS on costs.

4.2 GHG Emissions

GHG Emissions. A heifer emits 3 T CO2 Equiv. A 5% lower replacement rate (20% savings in Heifer GHG) = 3% reduction on farm.

Recommendations / Discussion Points

For the spring 2023, LUDF will drop the number of calves reared and retain for replacements from 25% to 20 %. The balance of the AB calves will be sold 4-10 days old. These will be high quality, high genetic merit AB calves.

5.1 Supplements to Deal with a potential Energy Deficit

Is nutrition the answer to these issues? Put simply, we are not 100% sure. This is a comparison, not science. Some observations:

1. LUDF always has a headache from 6-8th November, this ties in well with the seed head emerging.
2. Liam Kelly feeding from 1st November to 30th November:

Grain	0.2 kgDM
PKE	1.5 kgDM
Proliq	0.4 kgDM
TOTAL	2.1 kgDM

Through the same period of time, LUDF fed no supplement. To estimate the costs and returns from this:

1. If LUDF fed 2.1 kgDM of supplement, they would have had substitution (wasted grass) or extra silage to be made.
2. Per cow they would have feed 63 kgDM. 70 kg wet of a Grain / PKE / DDG combo.
3. If 1/3 of each, the cost would be $500 / T wet, $35 / cow for the period.
4. For LUDF, 541 cows $18,935 on feed.
5. The net cost to replace a not in calf cow with a cull value $700/head is $1,300/hd.

To recover the $35 / cow spend for November only, Not incalf rate would need to improve by 2.6 % with no improvement in the per cow production.
There may be other ways to achieve an improvement in quality – eg, timing of nitrogen.

More science in this area is needed for us, and you to be confident.

5.2 Cost of Intervention

For LUDF, 43 cows were identified and treated as phantom cows. These costs are approximate and will vary from practice to practice:

700 cows scanned @ $3.00 / scan	$2,100
43 cows PG shot @ $9 / treatment	$ 387
TOTAL Cost	$2,487

This excludes the costs of collars for farms who have them installed already.

These numbers suggest that intervention at $2,137 is more cost effective than feed $18,935. But we need to recognize that the margin of error is significant. We also do not know if the impacts of each treatment are accumulative.

6.0 LUDF Finance Update

	Season Budget	Season Actual
LUDF	**2023/24 budget**	**2022/23**
Income		
Milk income	$ 2,129,240	2,027,778
+/- Changed in Milk Inc.		
Stock income	$ 129,400	56,358
Other income	$ -	
Gross income	**$ 2,258,640**	**$ 2,084,136**
Expenses		
Wages	$ 267,527	237899
Contract Milker	$ -	
Fertiliser	$ 148,446	188413
Cropping	$ 19,560	42743
Supplement	$ 233,270	
Breeding	$ 61,698	62739
Animal Health	$ 73,450	64985
Calf rearing	$ 21,750	
General Farm Working	$ 10,000	19076
Grazing	$ 308,277	492016
Vehicles and fuel	$ 26,531	23470
Dairy shed	$ 8,475	9843
Contractors	$ 10,000	
Freight	$ 10,000	9994
Dairy electricity	$ 84,750	69763
Weed and pest	$ 23,059	1463
Repairs and Maintenance	$ 92,400	108808
Irrigation		
Administration	$ 15,000	12411
Rates	$ 15,792	19306
Support Lease		
Insurance	$ -	0
Farm working expenses	**$ 1,429,984**	**$ 1,362,929**
Operating Ajustments	19600	19600
Operating Expenditure	**$ 1,449,584**	**$ 1,382,529**
EBIT	**$ 809,056**	**$ 701,607**
Plus Fonterra Dividend		
Debt servicing	$ -	
Capital	$ -	
Principal repayments	$ -	
Tax	$ -	
Drawings/Dividend	$ -	
Total expenses	**$ 809,056**	**$ 701,607**
Net Profit	**$ 1,449,584**	**$ 1,382,529**
Less Operating adj +/- Minc	**$ 19,600**	**$ 19,600**
Equals **Cash Income**	**$ 1,469,184**	**$ 1,402,129**
Financial Indices		
EBIT	$ 828,656	$ 721,207
EBIT/ha	$ 5,179	$ 4,508
FWE/kgMS	$ 5.37	$ 5.42
Op Ex / kgMS	$ 5.45	$ 5.50
FWE:Gross farm income	63%	65%
Debt servicing:EBIT	0%	0%