DairyNZ

LUDF's progress on repro and flexible milking

Hear about the results of Lincoln University Dairy Farm's (LUDF) Reproduction Benchmark Project year 2 results (75% 6WIC, 7% Not-in-calf).

LUDF has halved their not-in-calf rate - how did they do it and what were their keys to success?

There will be a review of LUDF's 10 in 7 variable milking regime which has been in place for 3 seasons. Hear the key learnings - what does their team think? What savings have been made and what happened with milk production?

Antoinette Archer, Partnership and Demonstration Lead for South Island Dairy Demonstration Centre (SIDDC), **Peter Hancox**, Farm Manager for LUDF, and **Ryan Luckman**, Vet & Partner of Waimate Veterinary Centre will present.

Events in partnership with:

LUDF
Tomorrow's farming, today

SIDDC
South Island Dairying Demonstration Centre

Veterinary Centre

Both meetings Thursday 4 July

9:45am - 12:00pm
Papakaio Community Hall,
Papakaio Road, Papakaio

1:45pm - 4:00pm
Alpine Energy Centre,
Domain Avenue, Temuka

LUDF Farm System Overview

SIDDC

Lincoln University Dairy Farm (LUDF) is a demonstration farm developed by the South Island Dairy Demonstration Centre (SIDDC). This industry-funded partnership of seven leading dairy sector organisations collaborate to promote the sustainable development of South Island dairying via demonstration activities, research, education, and training of farmers. The current partners of SIDDC are:

Strategic Objective at LUDF

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.

Focus for 2023/24 Season:

Nil-Infrastructure, low input, low N-loss, optimise profit.

Current farm system:

- 3.5 cows/ha – at peak milked.
- Target use of up to 190kgN/ha synthetic nitrogen, not to exceed 190kgN/ha cap.
- 648 kg DM/cow imported supplement in budget.
- Winter cows off farm.
- FWE budgeted at $5.63/kg MS.
- Target production 470 kg MS/cow (>100% liveweight (500kg) in milk production less 6% with 10 in 7 milking).

Current research projects on the farm

Variable Milking Project

- 10 milkings in 7 days.
- Commenced from start of season, this is the third second season of the project.
- Predict 6% drop in MS production.
- Profitability should remain the same due of lower costs (drop a labour unit, less animal health and shed costs, better cow condition and higher mating results).

Plantain Grazing Project

- Aim to get a minimum of 10% of the diet, with a target of 30% of the diet in plantain via a mixed sward.
- To assess composition over time through direct drilling and broadcast with a spring and autumn sowing date.
- To result in decrease in N loss in OverseerFM from 26 kg N/ha/yr to 23 kg N/ha/yr for expected composition when direct drilled and 22 kg N/ha/yr for expected composition when broadcasted.

Mating Benchmarking Project

- Benchmark project with top quartile local performing farmer, Liam Kelly. This project has improved mating results of 21% empty 2021/22 season, to a not in calf rate of 9% for 2022/23 season and 7% for the 2023/24 season.

Collar Fertility Overview Report

LUDF 2022/23 vs 2023/24 Comparison

April 2024

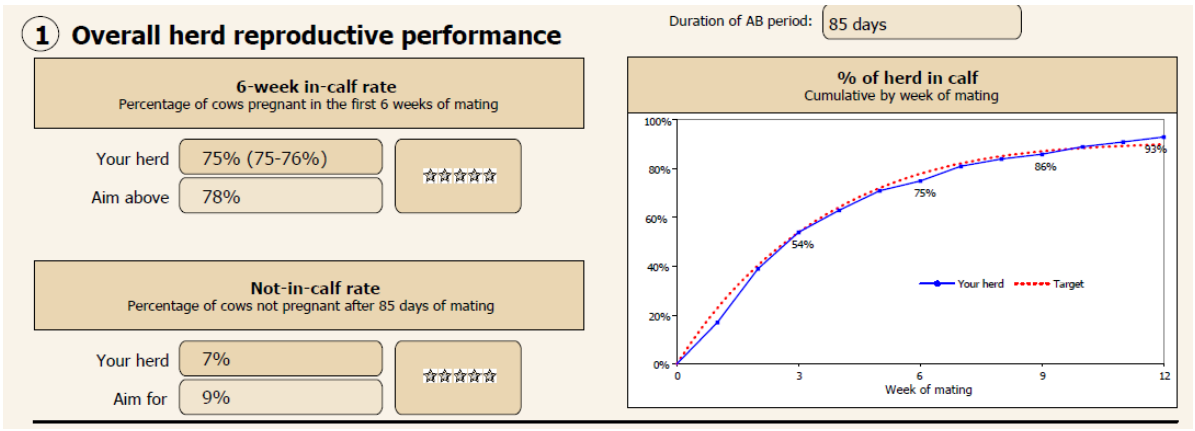
LUDF. Peter Hancox. 541 cows, 160 Ha farm, Lincoln.

Overview

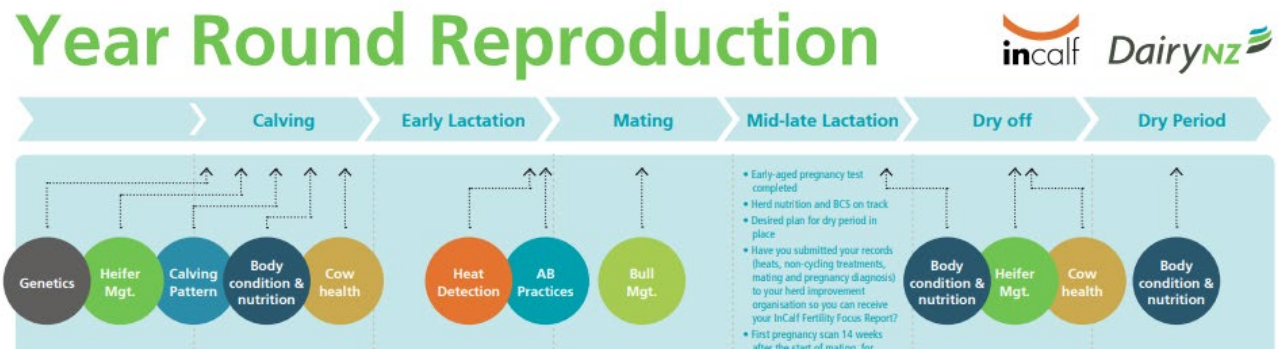
Typically LUDF has had an 18-20 % Not In calf Rate, for 2022 Mating it was 12%, for 2023 Mating it has been 9%. A significant improvement, utilising technology and applying best practice.

Attributing NICR Drop:

- Phantom scanning initial glance shows a 4.8% improvement in not in-calf rate, however it is likely ~ 20% of intervention cows would have got pregnant without intervention (VC data), so impact on drop = 3.4%.
- Extending mating, using short gestation semen resulted in 4.2% (24) cows in-calf in weeks 11 and 12. These cows will still calve within the 10 week window.
- This leaves a further herd level drop in NICR of ~ 3.4% (attributable to improved performance in areas like BCS, transition, and mating energy levels)



Farm reproductive performance is multi-factorial, and top performance requires hitting targets in multiple areas over an extended time period. The infographic below (in calf model DairyNZ) captures the breadth of areas to consider from calving through to the dry period.



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

SELWYN RAKAIA VET SERVICES

VETERINARY CENTRE

Historically there are a number of tools available that we have used for traditional Repro Review analysis. Things like Fertility Focus Reports, Infovet/MINDA Graphs, Milk Protein Data, and Animal Health data offer a valuable insight into potential areas of improvement or areas of success on farms.

The addition of Allflex SCR Collars further enhances the data available to analyse performance, and fills in many of the blind spots of knowledge.

The following report will take a timeline based approach over the season, combining Allflex SCR Collar data with the other metrics that were captured as part of the benchmarking project to highlight areas of difference between LUDF and Alderbrook's performance (in 2022/23). For this year's analysis the focus is on LUDF only, looking at recommendations that were put in place after the 2023 season end review, and subsequent 2023/24 season performance.

The key timeline areas of focus will be:

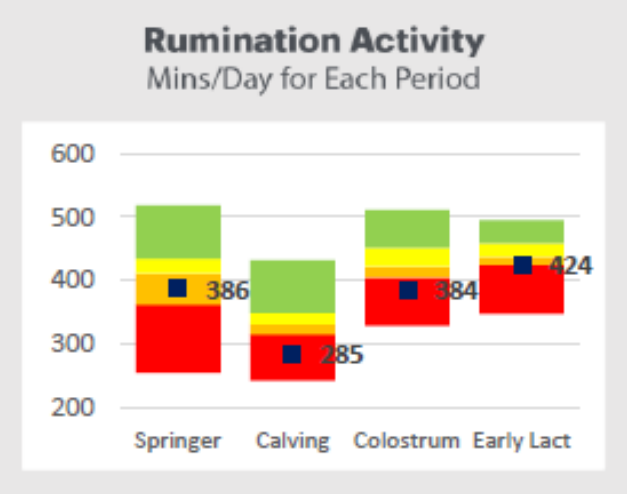
- Transition (Springers to Early Lactation)
- Pre-Mate Period (Pre-Mate Cycling + Feeding)
- Mating Period

Transition (Springers to Early Lactation)

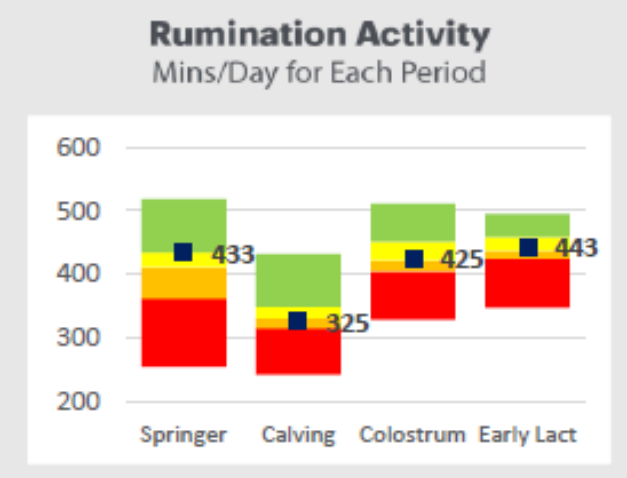
Transition Rumination Rates:

TRANSITION

2023

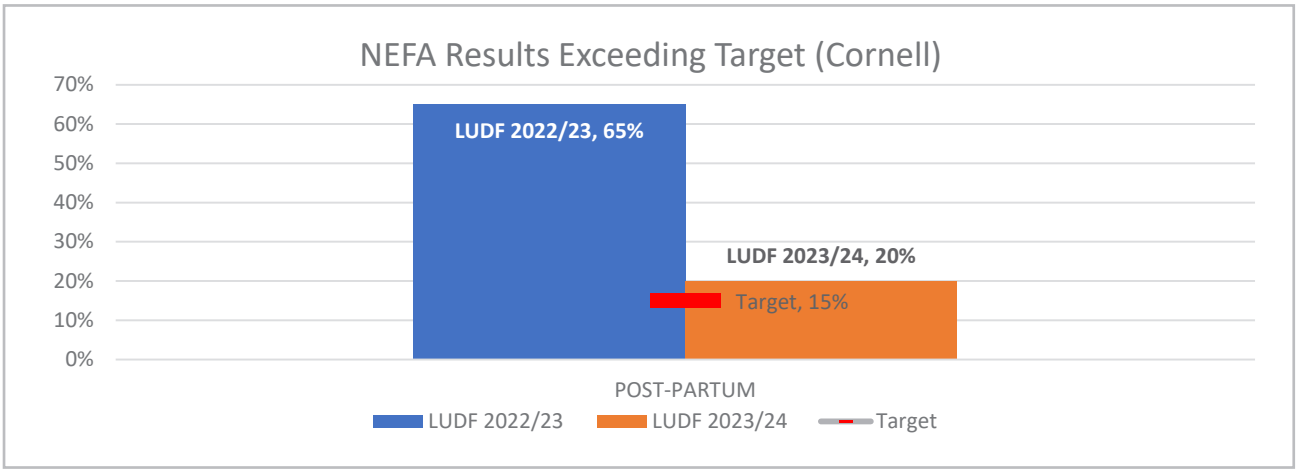


2024



Period	Change
Springers	+47 mins/day
Calving	+40 mins/day
Colostrum	+41 mins/day
Early Lactation	+17 mins/day

NEFA Blood Test Results:



Feeding:

Diet for Period	LUDF 2022/2023	LUDF 2023/2024
Springers (Day -1 to -7)	Grass = 4kg Baleage = 6kg (Ad-lib) *Calving on cropping dirt*	*Grass = 6kg* *Silage = 6kg* *(Pre grazing 3,500 cover)*
Colostrum (Day 1-4)	Grass = Ad-lib (1700-1800 residuals) *OAD Milking, Skip-a-day on Day 1 if Required*	*Grass = 6kg (pre-grazing 3,300)* *Silage = 6kg* *OAD Milking*
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 = 14kg Silage = 2-3kg

Summary

- The transition rumination of LUDF sat in the lower quartiles of performance vs the reference data (and much lower than Alderbrook) in the 2022/2023 season. This tracked across Springers to Early Lactation.
- Changes made have markedly improved rumination levels by around 40 + minutes per day in the critical colostrum and early lactation period.
- The blood NEFA levels have showed far less fat mobilisation with these changes – just 20% exceeding a threshold of 0.7 vs 65% in the 2022/23 season.

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.

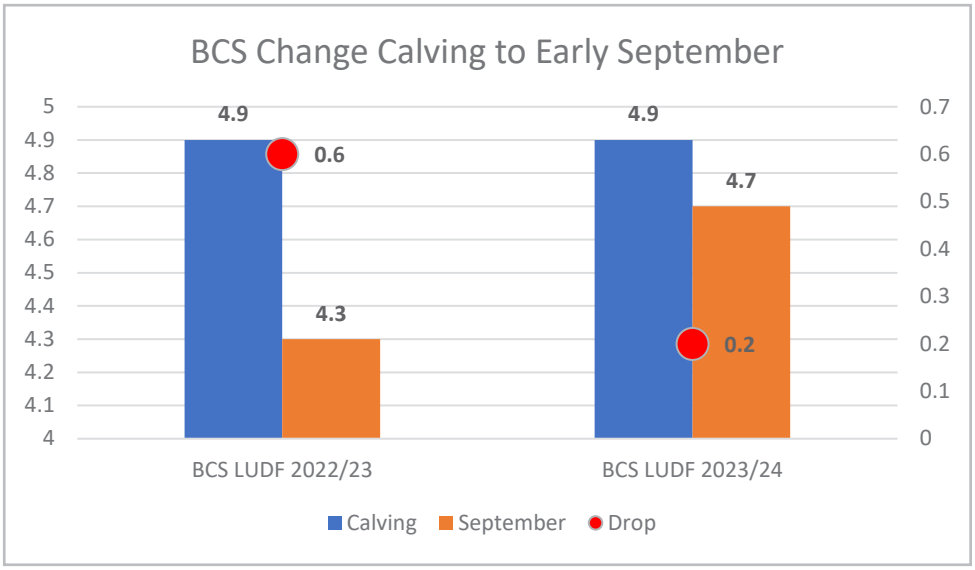
Cornell herd level target is <15% high prepartum and <15% high postpartum

Recommendations / Discussion Points

Continue with current changes in the 2024/25 season. Will be important to ensure that the management changes can be maintained in a wetter season.

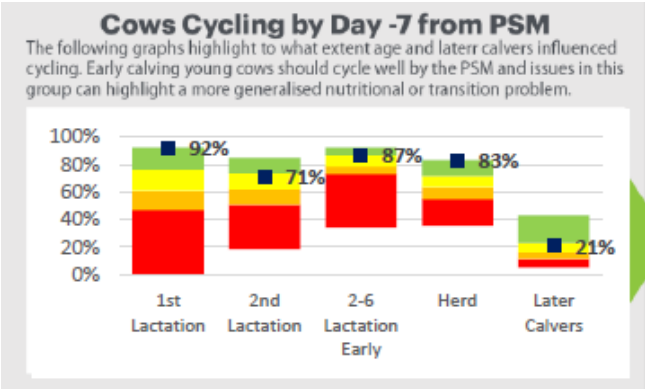
Pre-Mate Period (Cycling + Feeding)

BCS Change Calving to September

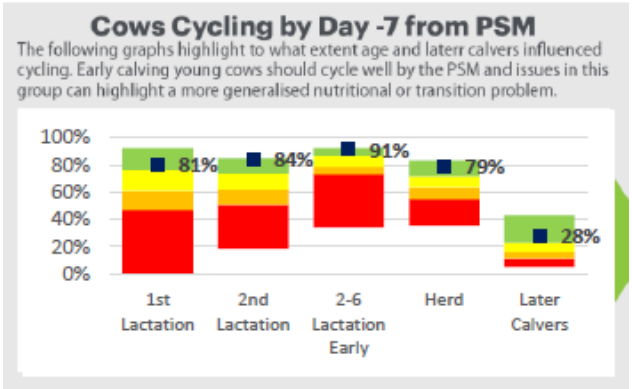


Pre-Mate Cycling Rates (Day -7 from PSM)

2022/23



2023/24



(NOTE PSM delayed 5 in 2022 season – heifers & herd calved VERY early)

Group	Change
1st Lactation	-11%
2nd Lactation	+13%
2-6 Lactation Early	+4%
Herd	-4%

Summary

- BCS loss from calving to pre-mate was just 0.2 BCS units this season, vs 0.6 units last season. NOTE however that the herd average is still under BCS target for calving.
- There were improved cycling rates in 2nd Lactation, 2-6 Lactation Early (Engine Room), and Late Calvers compared to last season. The only group to fall behind were the 1st Lactation animals. HOWEVER – in 2022 most of the heifers had calved prior to the 15th July (a result of an earlier PSM date), so had significantly longer to recover. The 1st lactation animals drove the difference in Herd cycling rate.
- The improvement of the 2nd lactation animals was promising (an area of focus from last year's report).
- It appears that the changes in management which have reduced the BCS loss this season have overall improved group pre-mate cycling rates.

Recommendations / Discussion Points

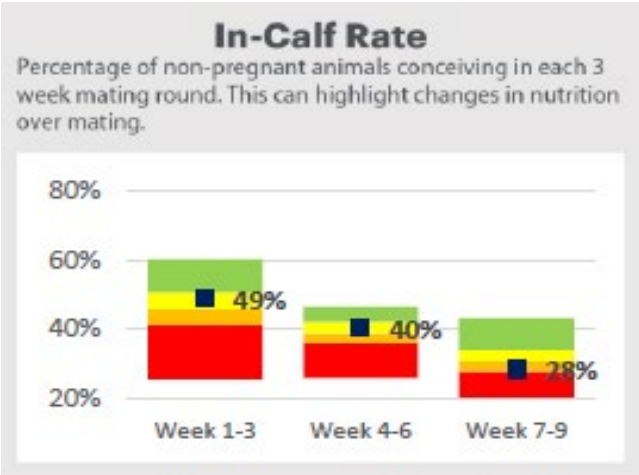
Winter BCS – Consider looking at mitigation strategies (including dry-off targets) for BCS for wet Winters. At LUDF the MA cows came out of Winter at 4.8, and Heifers at 5.0 BCS.

BCS target of 5.5 for 1st calving heifers needs to be prioritised for the 2024/25 season.

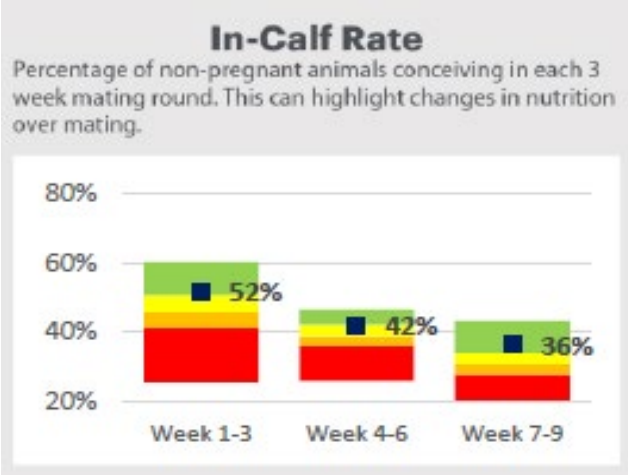
Mating Period

% of Non-Pregnant Cows Conceiving in each 3 Week Mating Round

2022/23



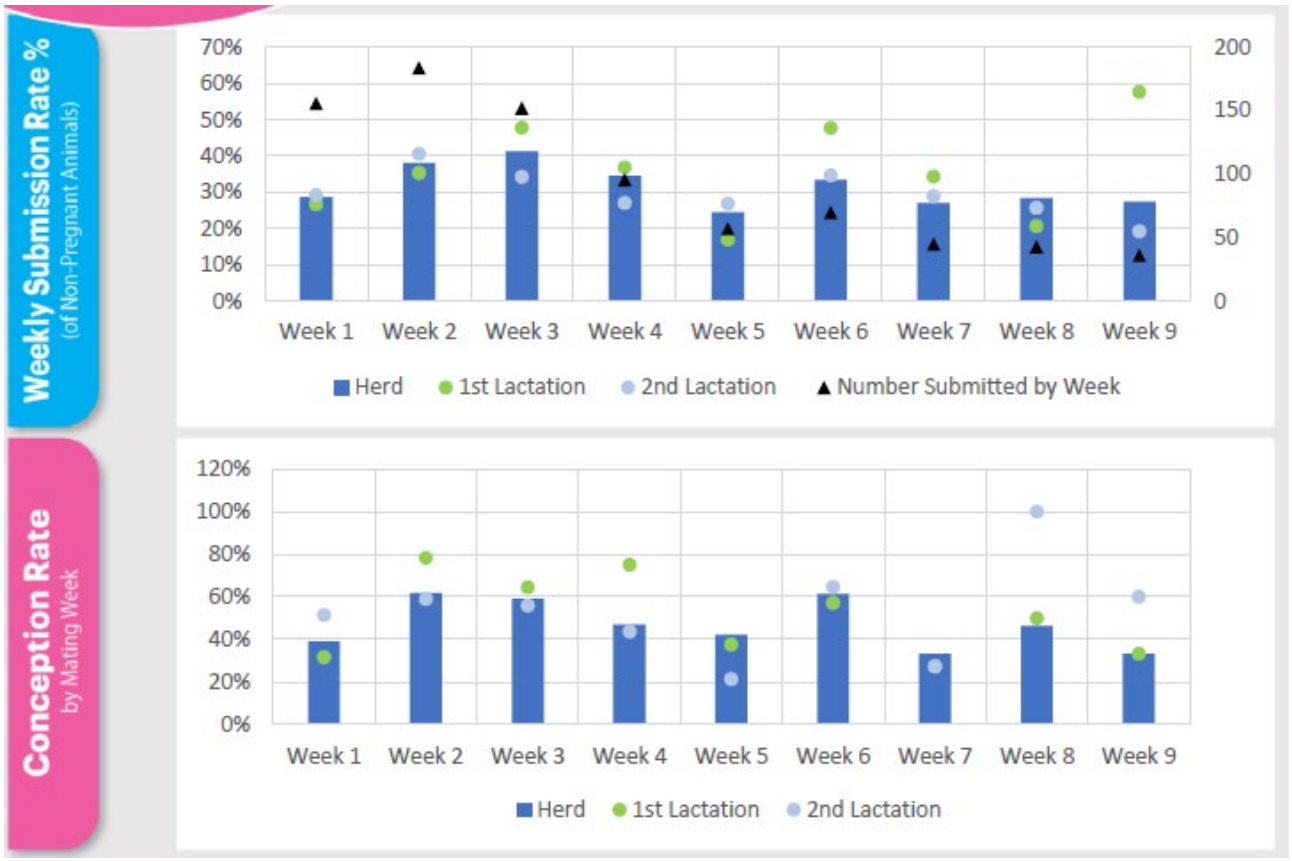
2023/24



Group	Change
Week 1-3	+3%
Week 4-6	+2%
Week 7-9	+8%

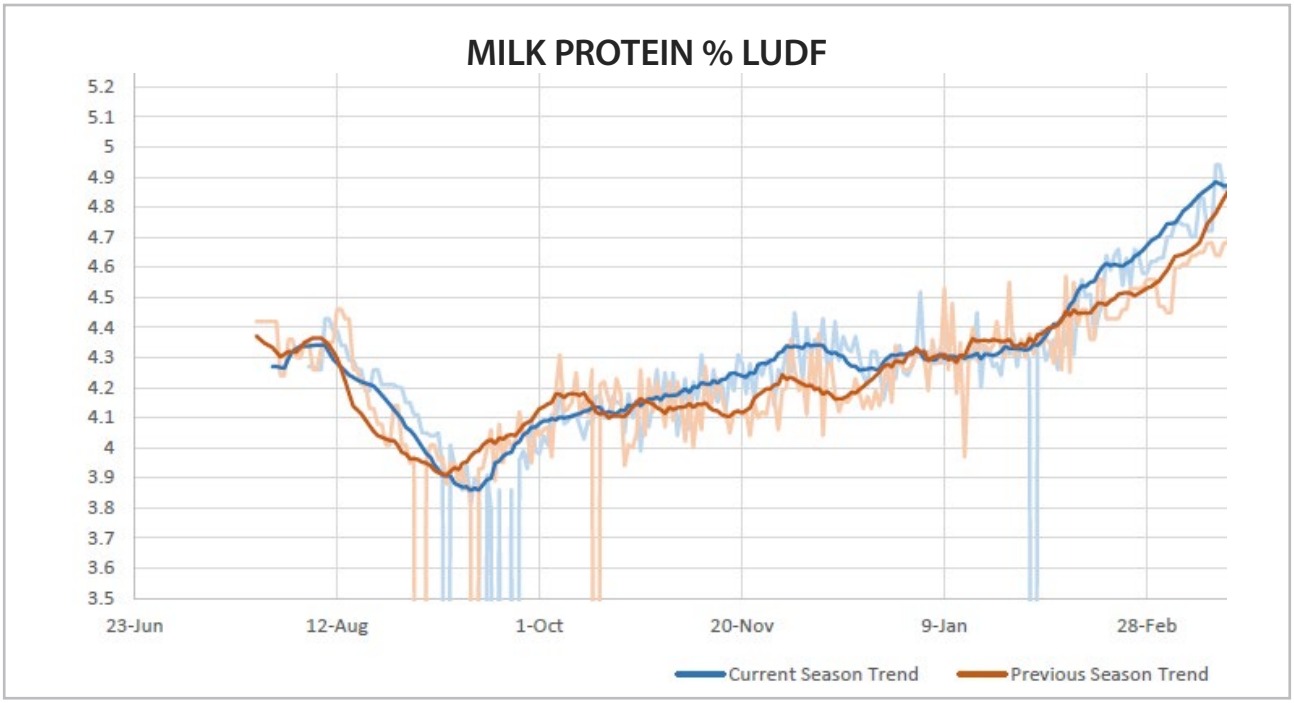
Weekly Conception Rate

2022/23

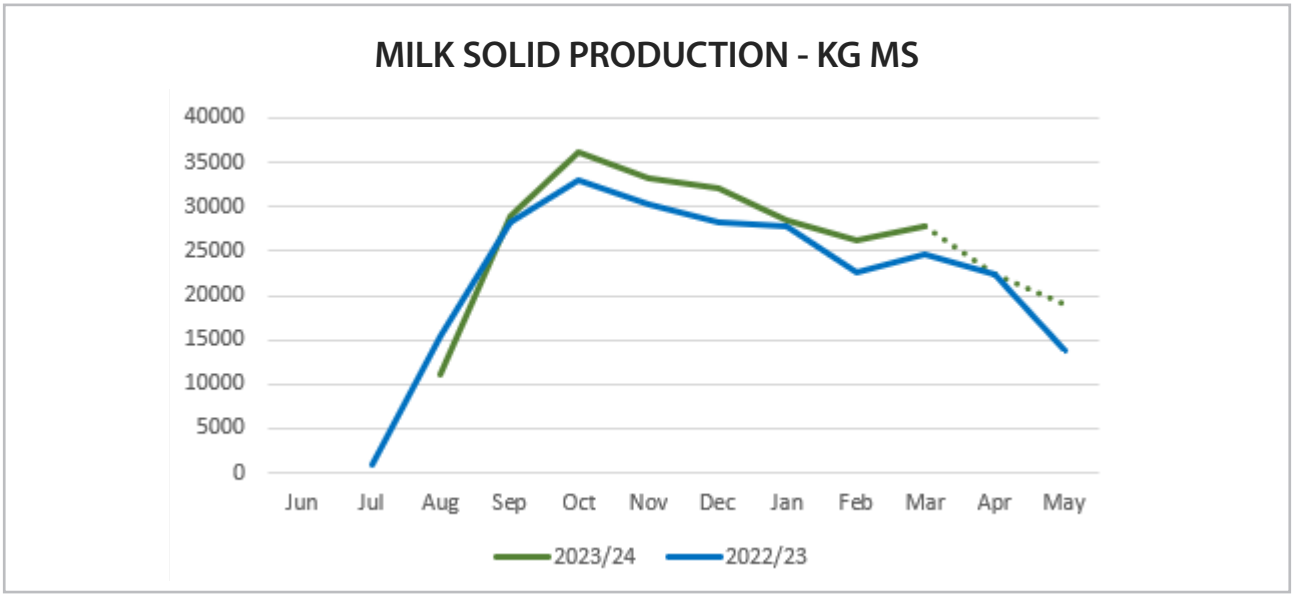


2023/24

Milk Protein Curve (the NIKE Tick) as a Proxy for Energy Balance



Milk Solids / Lactation Curve



NEFA Blood Levels (Milkers)

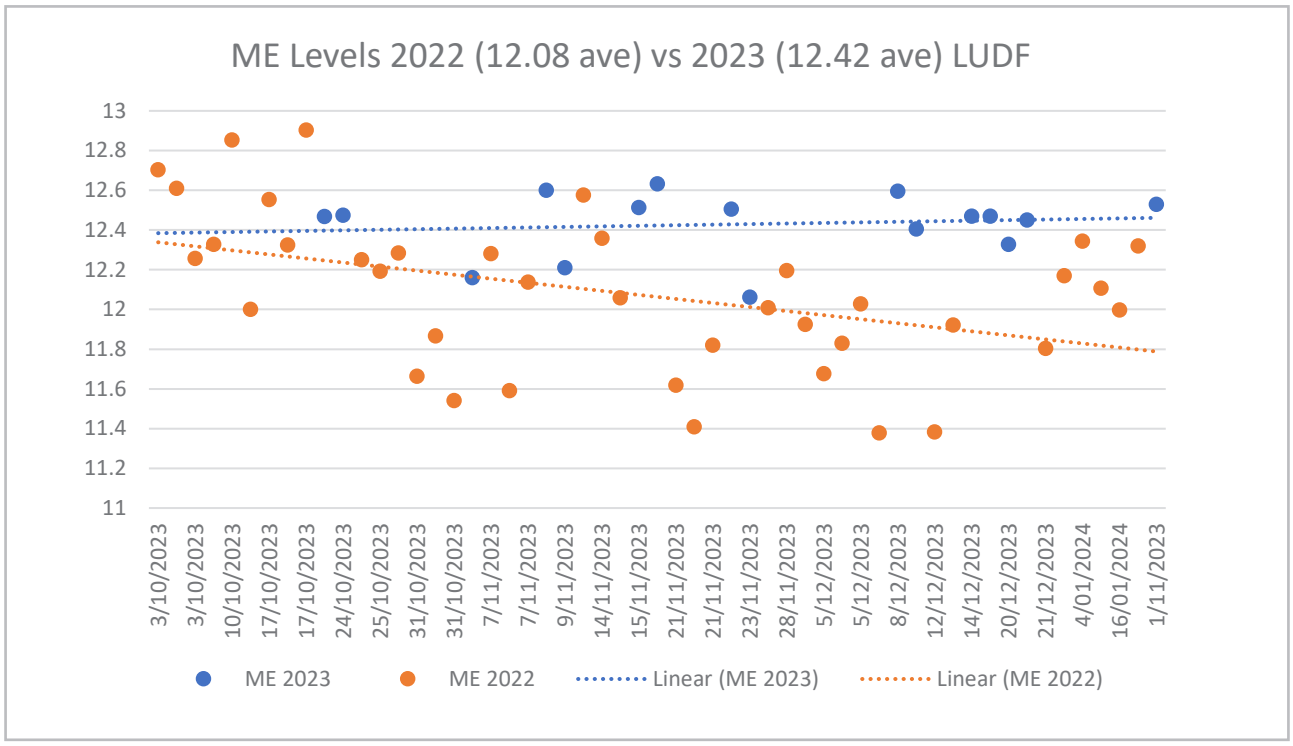
	LUDF 2022/23	LUDF 2023/24
	NEFA Levels	NEFA Levels
10th-16th Nov	0.4	0.1

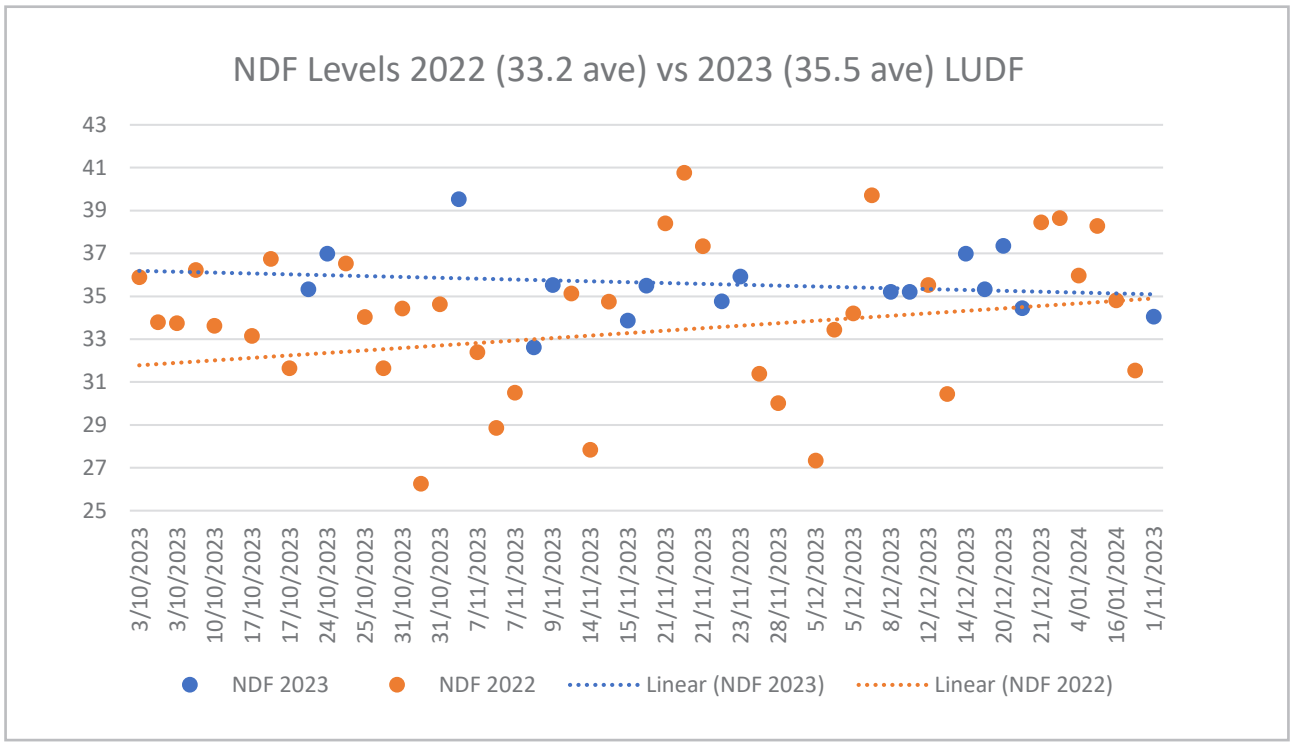
Grass Quality

Report from Peter –

"Grass quality and quantity was improved.
Good residuals and recovery/growth, was a good spring.

Less seed head through Nov/Dec, however did come through in Jan/Feb.
This is likely seasonal as observed by a few farms."





Urea Supplementation

1st Round – 25kg N/ha

2nd Round (Sept) – 46kg N/ha

3rd Round (October) – 40 kg N/Ha

Luxury nitrogen levels in the soils during the heading phase encourage vegetative growth, plus we get higher response rates. Nitrogen rates were cut Jan/Feb to keep under the 190 kgN/Ha Cap.

Date	Event	Description	Area	Rate/Reading	Operator
28/10/2023	Fertiliser	UREA Bulk	50.97	Variable	McCarthy Contracting Ltd
21/10/2023	Fertiliser	UREA Bulk	32.12	Variable	McCarthy Contracting Ltd
16/10/2023	Fertiliser	UREA Bulk	12.68	85kg/ha	McCarthy Contracting Ltd
16/10/2023	Fertiliser	UREA Bulk	36.72	85kg/ha	McCarthy Contracting Ltd
16/10/2023	Fertiliser	UREA Bulk	20.06	85kg/ha	McCarthy Contracting Ltd
12/10/2023	Fertiliser	FLOWFERT N	34.15	222L/ha	McCarthy Contracting Ltd
06/10/2023	Fertiliser	FLOWFERT N	33.37	222L/ha	McCarthy Contracting Ltd
29/09/2023	Fertiliser	UREA Bulk	35.79	85kg/ha	McCarthy Contracting Ltd
26/09/2023	Fertiliser	AMMO 31 Bulk	39.17	100kg/ha	McCarthy Contracting Ltd
13/09/2023	Fertiliser	AMMO 31 Bulk	37.64	100kg/ha	McCarthy Contracting Ltd
05/09/2023	Fertiliser	AMMO 31 Bulk	80.55	100kg/ha	McCarthy Contracting Ltd

Phantom Cows

LUDF 23/24 season phantom cow summary

4 phantom scanning visits -

05/12/2023	15 phantoms treated
14/12/2023	11 phantoms treated
28/12/2023	8 phantoms treated
08/01/2024	8 phantoms treated

Total 42 phantom treatments (38 cows), 4 cows got treated twice, after not responding to their first PG shot.

26 of the 38 cows (68%) ended up pregnant.
Drop in MT rate = 4.8%

LIKELY ~ 20% of intervention cows would have got pregnant without intervention (VC internal data set), so impact drop = 3.4%

Summary

- LUDF performed relatively well in Round 1 of mating, but performance dropped significantly in Round 2 and 3 in 2022/23. This was significantly better this season, with increases of +3,+2,and +8% for each period.
- Last season we reported:
    - 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).
- 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.
- Increase in fat mobilisation at LUDF (as demonstrated by elevated NEFA levels)
- NOTE: This energy pinch has been noted at around the same date in previous seasons, and doesn't appear to be a seasonal anomaly.

- This season, the conception rate held much higher to the end of the mating period (almost 10% higher conception rates in weeks 7-9). This coincided with a significantly higher ME value of the pasture fed out. NDF levels held very similarly to the previous season.
  - Will need repeating to determine the effect of N timing vs seasonal variation
  - Changes coincided with rising protein levels, no increase in NEFA's (that were seen last season)
- Phantom cows represented 7% of the total herd. Intervention has decreased the NICR by about 3.4%.

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. This season they used nitrogen strategically in the pre-mating period to push out the reproductive state (and try to maintain quality for longer). Repetition over subsequent seasons will be required (it should be noted that Canterbury repro performance was up 2.5% for 6WICR, so this has been a good season regionally).

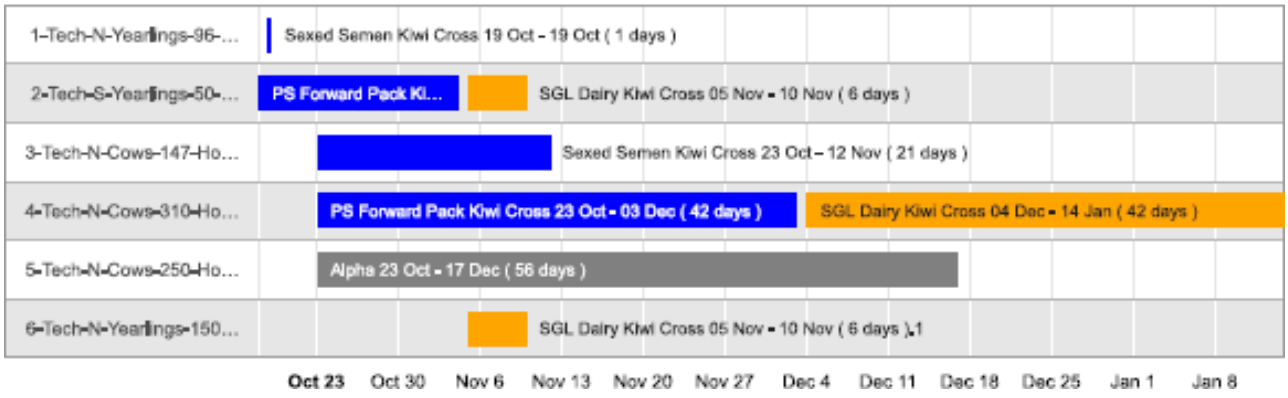
The protein curve showed a steady rise, without the flatline seen in early November in previous years.

Phantom scanning was again a critical factor in reducing the NICR.

Mating Period / SGL Semen

The mating period was extended from the traditional 10 weeks to 12 weeks for the 2023 mating period. Ultrashort gestation semen was used for the tail end of mating:

MATING PLAN DETAILS



Scanning was completed on a weekly basis through December, with a final scan in Late February. It was confirmed that an additional 4.2% (24) 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.


Reproduction
Jair Mandriaza
LIC

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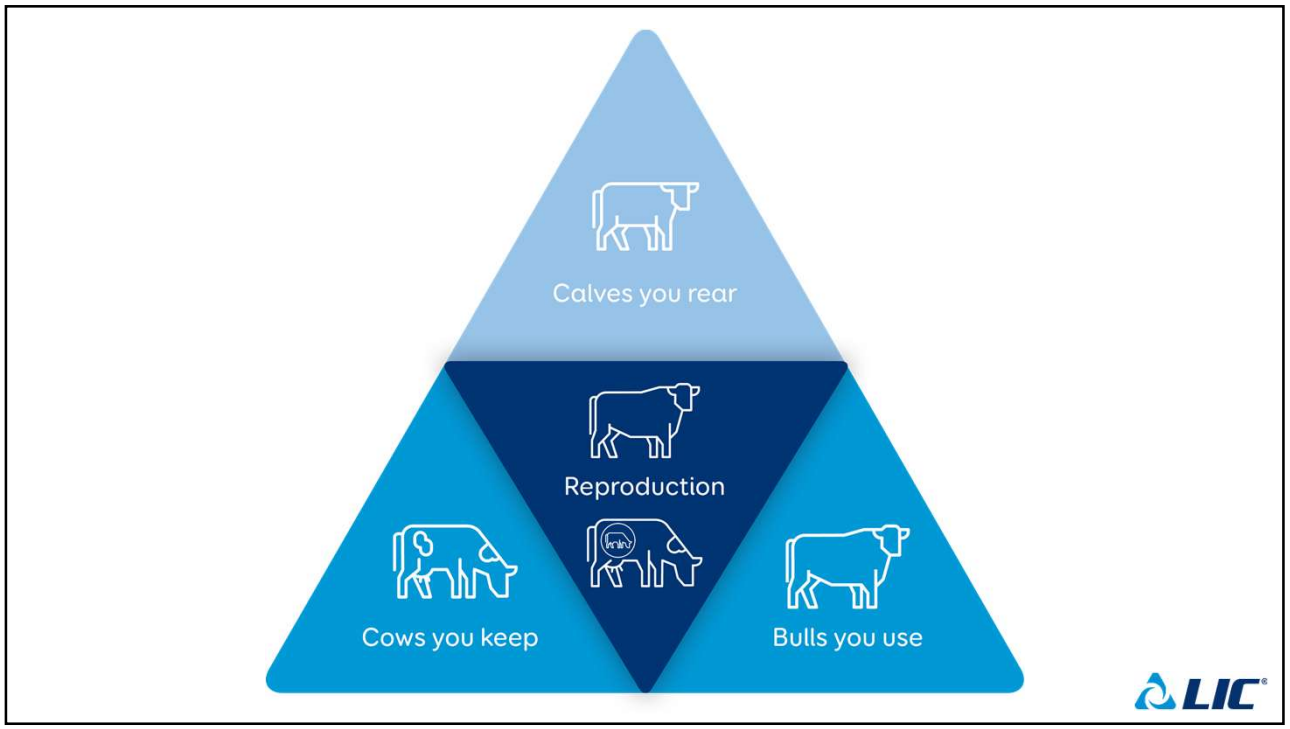
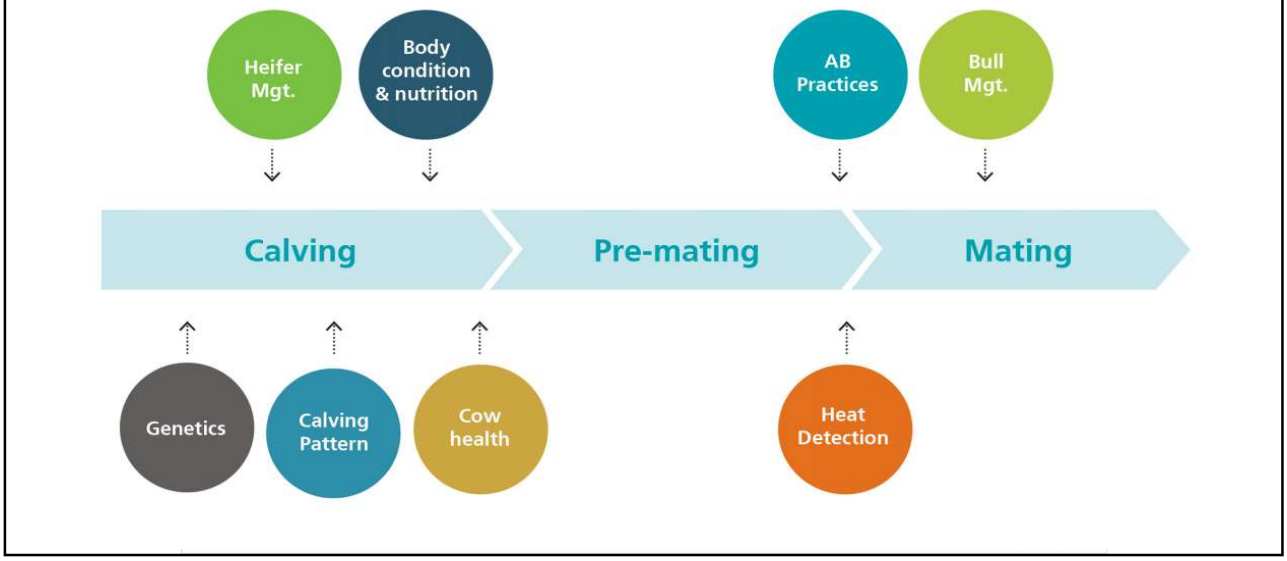

Calves you rear
Reproduction
Cows you keep
Bulls you use
LIC

2

8 Key Management Areas



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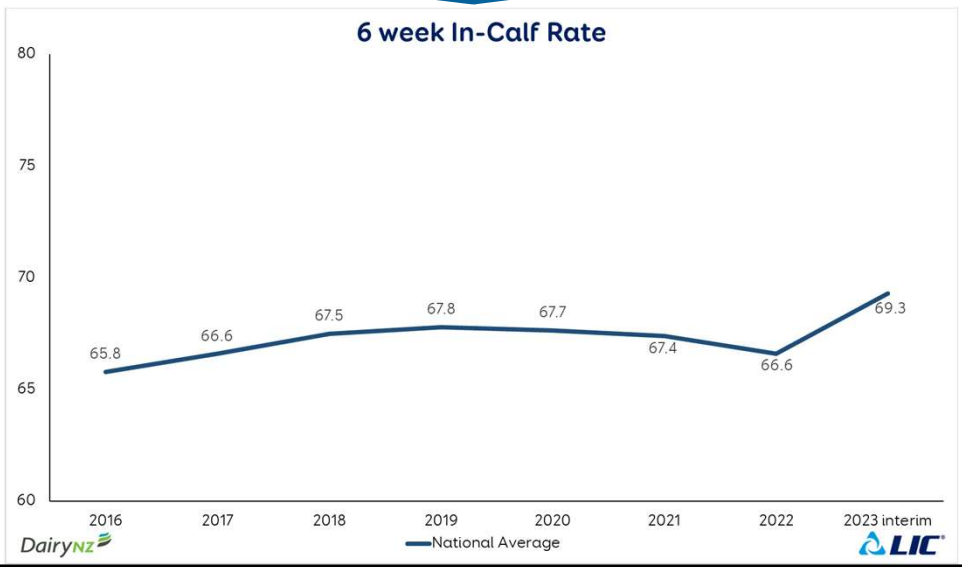
6 week In-Calf Rate - National



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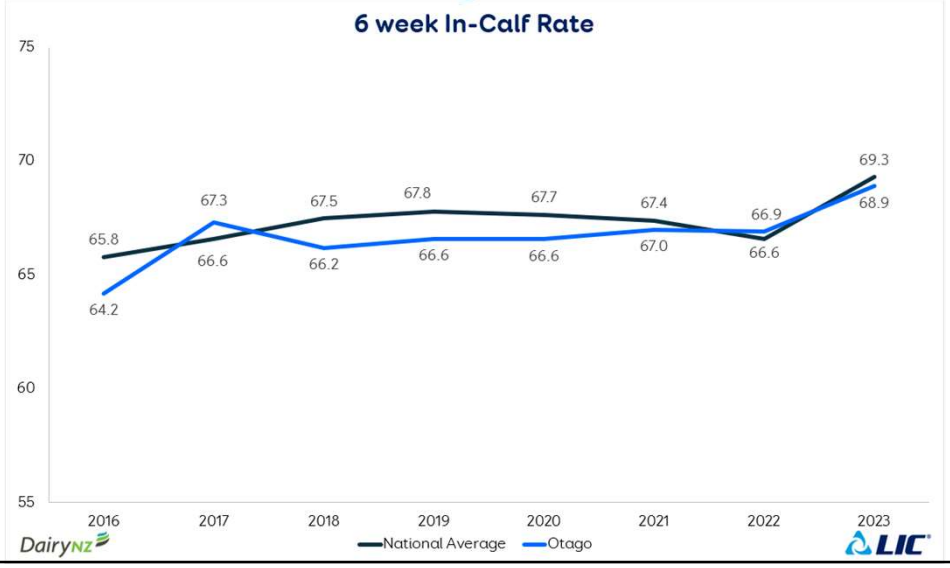
6 week In-Calf Rate - Otago



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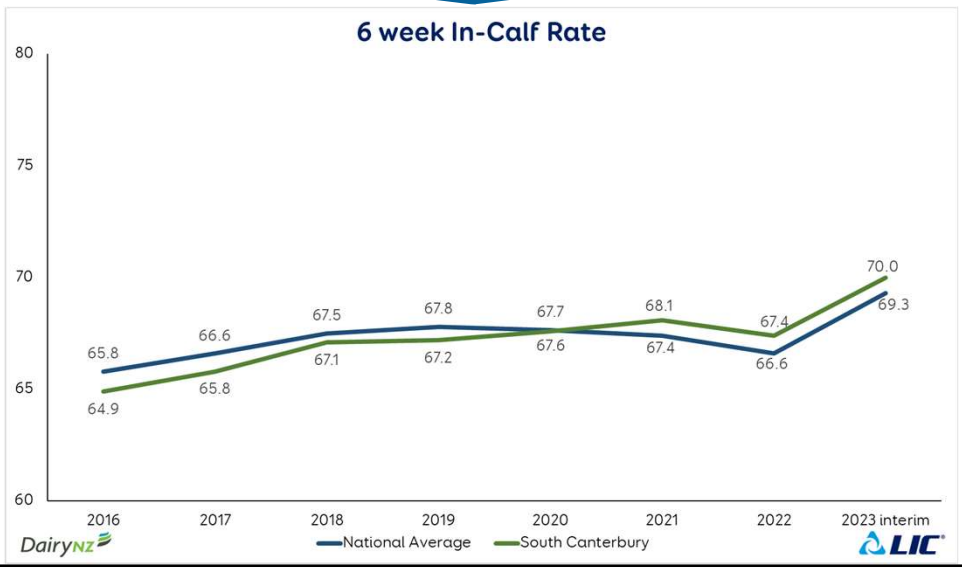
6 week In-Calf Rate – South Canterbury



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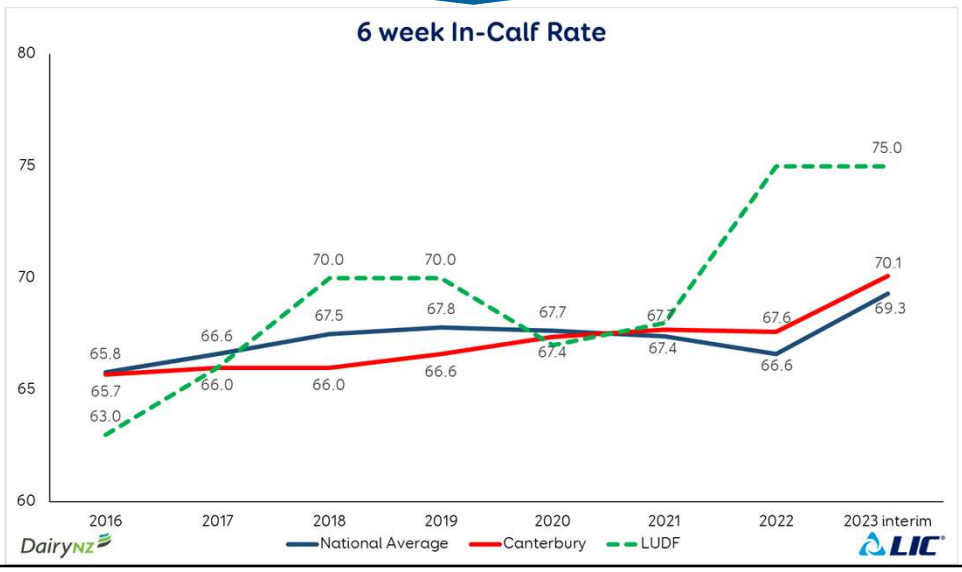
6 week In-Calf Rate – LUDF



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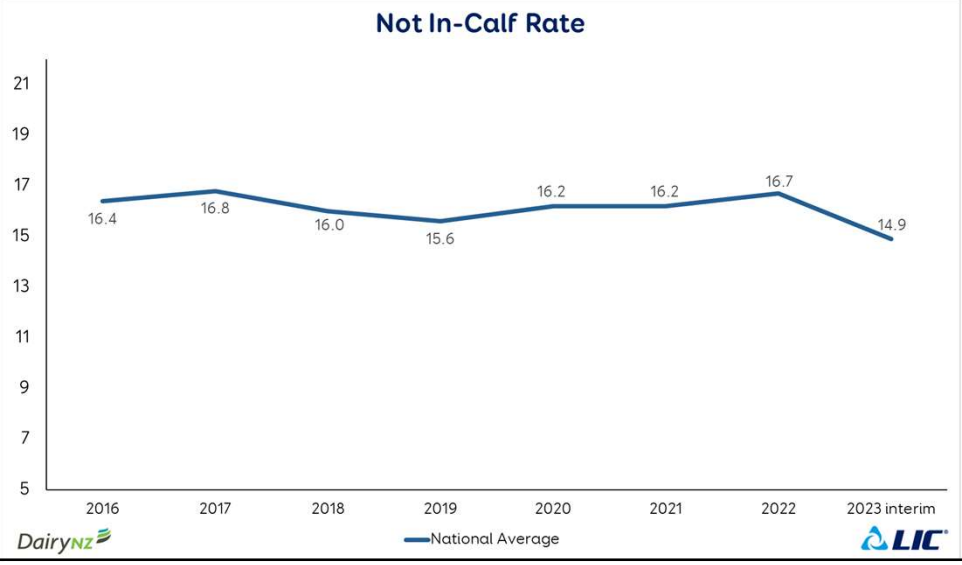
Not In-Calf Rate - National



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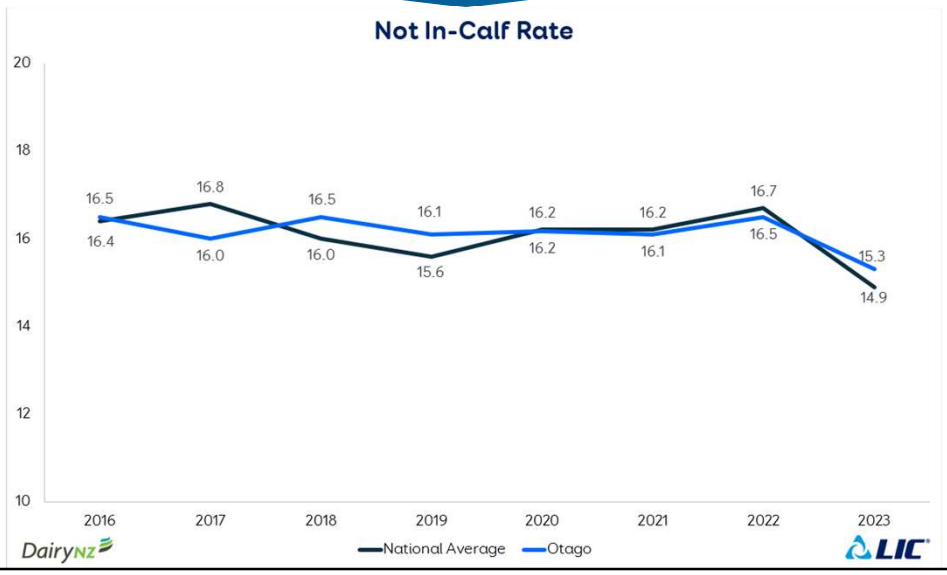
Not In-Calf Rate - Otago



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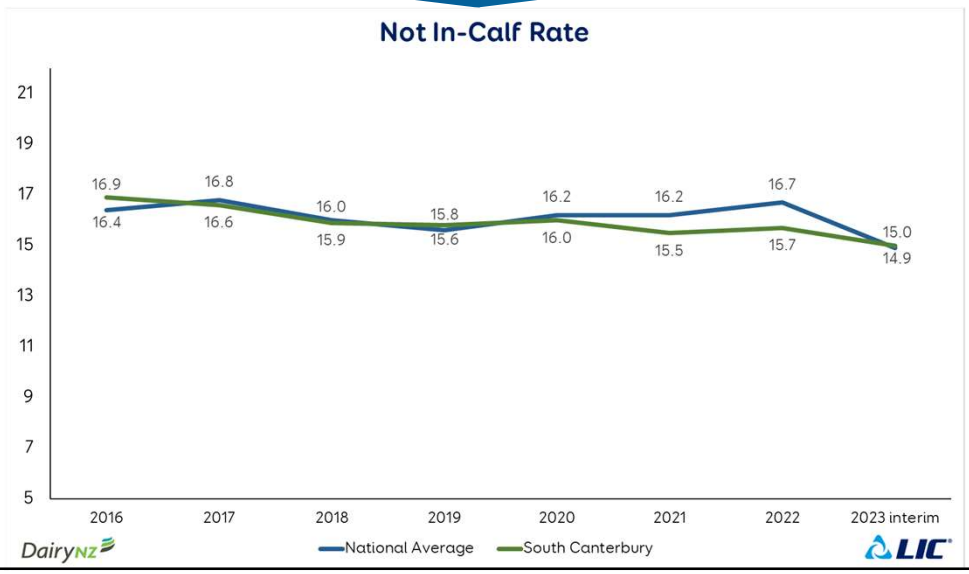
Not In-Calf Rate – South Canterbury



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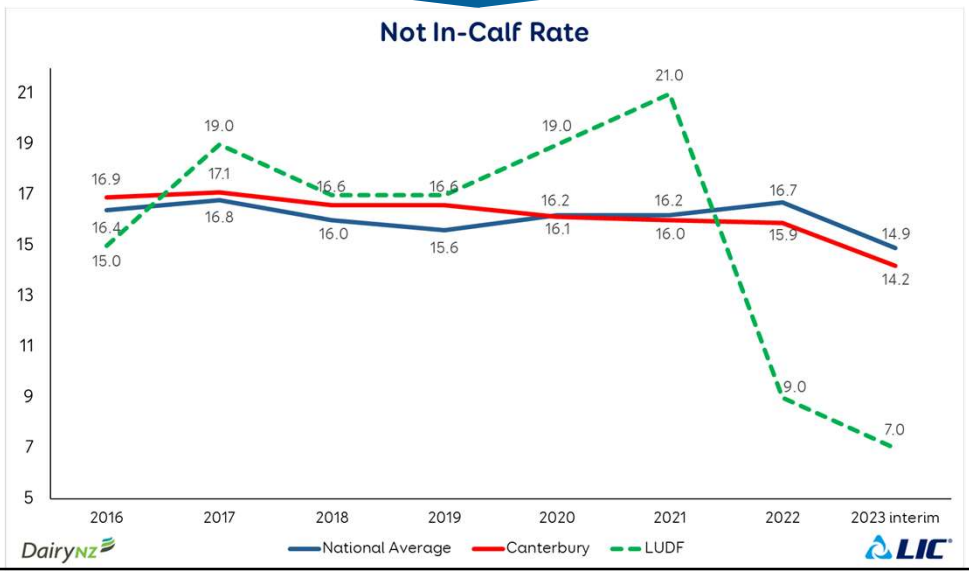
Not In-Calf Rate - LUDF



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NZ Reproductive Performance - Seasonal

National Performance 2023 Interim	6 Week In-Calf Rate	3 Week Submission Rate	Conception Rate	Not In-Calf Rate	Mating Length (weeks)
Top Quartile Average	78.0	86.2	58.9	11.2	9.9
2nd Quartile Average	72.4	83.7	55.0	13.5	10.5
Average	69.3	80.8	53.1	14.9	10.6
3rd Quartile Average	68.0	80.8	51.9	15.5	10.7
Bottom Quartile Average	58.7	72.4	46.8	19.5	11.2
Targets	78.0	90.0	60.0		

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Sexed semen conception rate – Milking cows

Conception Rate	Spring 2021	Spring 2022	Spring 2023	LUDF 2023
Forward Pack	52.7%	50.7%	52.4%	51.7%
Fresh Sexed Semen	49.9%	45.0%	53.1%	66.4%

- Conception of first 3 weeks of mating
- In herds that used Fresh Sexed Semen
- Spring 2023 is an interim result

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Sexed semen conception rate – Yearlings

Conception Rate	Spring 2021	Spring 2022	Spring 2023	LUDF 2023
Conventional	58.4%	58.5%	56.0%	68.6%
Fresh Sexed Semen	44.8%	37.7%	43.2%	34.8%

- Difference in conception rate is expected to be between **-13 and -19%**
- Compared to conventional
- 95% confidence interval
- Dispensation letter needs to be signed by farmer

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Kg MS production quartiles – Mixed age cows

Ranked by Milk Solids

Quartiles	No. of Animals	Avg. KgMS	Avg. Birth Year	Avg. BW	Avg. PW	Avg. LW	Avg. DIM	Avg. Fat	Avg. Protein	Avg. Vol	Avg. Live Weight BV	Avg. Volume BV	Avg. Protein BV	Avg. Fat BV	Avg. Fertility BV	Avg. Breed F16s	Avg. KgMS/LW
Q1	69	586	2017.5	296	486	481	250	327	259	5905	8.1	486.5	27.5	29.8	1.2	10.2	1.15
Q2	69	532	2017.3	260	338	333	248	295	237	5478	5.4	347.8	22.2	24.3	1.7	10.1	1.05
Q3	69	489	2017.5	240	257	256	241	270	219	5081	3.1	302.4	19.9	20.1	2.3	9.8	0.97
Q4	70	410	2017.8	194	74	69	237	224	186	4302	2.9	169	15.9	13.5	2.6	9.7	0.82

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Liveweight BV production quartiles – Mixed age cows

Ranked by Live Weight BV

Quartiles	No. of Animals	Avg. KgMS	Avg. Birth Year	Avg. BW	Avg. PW	Avg. LW	Avg. DIM	Avg. Fat	Avg. Protein	Avg. Vol	Avg. Live Weight BV	Avg. Volume BV	Avg. Protein BV	Avg. Fat BV	Avg. Fertility BV	Avg. Breed F16s	Avg. KgMS/LW
Q1	69	508	2017.3	233	264	260	243	279	230	5296	28.2	422.4	25.1	22.1	1.6	10.9	0.96
Q2	69	504	2017.6	239	262	280	243	279	225	5205	9.8	350.3	21.8	21.9	1.4	10.4	0.99
Q3	69	511	2017.7	267	329	300	247	284	227	5190	-1.1	308.3	21.4	23.7	2.2	9.4	1.02
Q4	70	493	2017.5	250	297	296	243	274	219	5064	-17.2	223.9	17.2	20	2.5	8.9	1.02

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Repro performance – production quartiles – Mixed age cows

Mature cows

DIM: (MIN 150) 150

KGMS	avg.	COUNT		3 week Submission Rate		Pregnancy rate				NICR
						3 weeks	6 weeks	9 weeks	9+ weeks	
Top	586	71	25%	65	92%	44%	76%	86%	93%	7%
Top middle	531	70	25%	66	94%	56%	79%	87%	91%	9%
Bottom Middle	489	70	25%	64	91%	53%	70%	83%	97%	3%
Bottom	413	70	25%	59	84%	53%	67%	80%	87%	13%
Total	504	281		254	90%	52%	73%	84%	93%	7%

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Production – Kg MS

National 2022 Within herd ranking - kgMS	Average kgMS	Number of cows	6 Week In-Calf Rate	3 Week Submission Rate	Conception Rate	Not In-Calf Rate
Top Quartile	497	384,507	71.1	83.6	53.4	12.7
2nd Quartile	441	391,405	72.1	82.0	55.1	12.0
3rd Quartile	404	387,955	70.5	79.6	54.6	13.5
Bottom Quartile	357	381,100	65.7	75.4	51.5	17.7

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Questions

Thank you!

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Flexible Milking Review

Flexible milking regimes, a deviation from the twice a day (TAD) traditional system and therefore a reduction in number of milkings, have become more common for many New Zealand dairy farmers for a multitude of reasons. Some reasons include benefits to the team (hours worked, number of early starts, recruitment and retention) along with improved body condition score (which may lead to improved reproductive results), reduced walking (which may lead to reduced lameness) and changes in variable costs, such as electricity, shed expenses and fuel. Once a day (OAD) milking does occur in New Zealand, however due to reduced production and perceived reduced profit, it is not widely adopted.

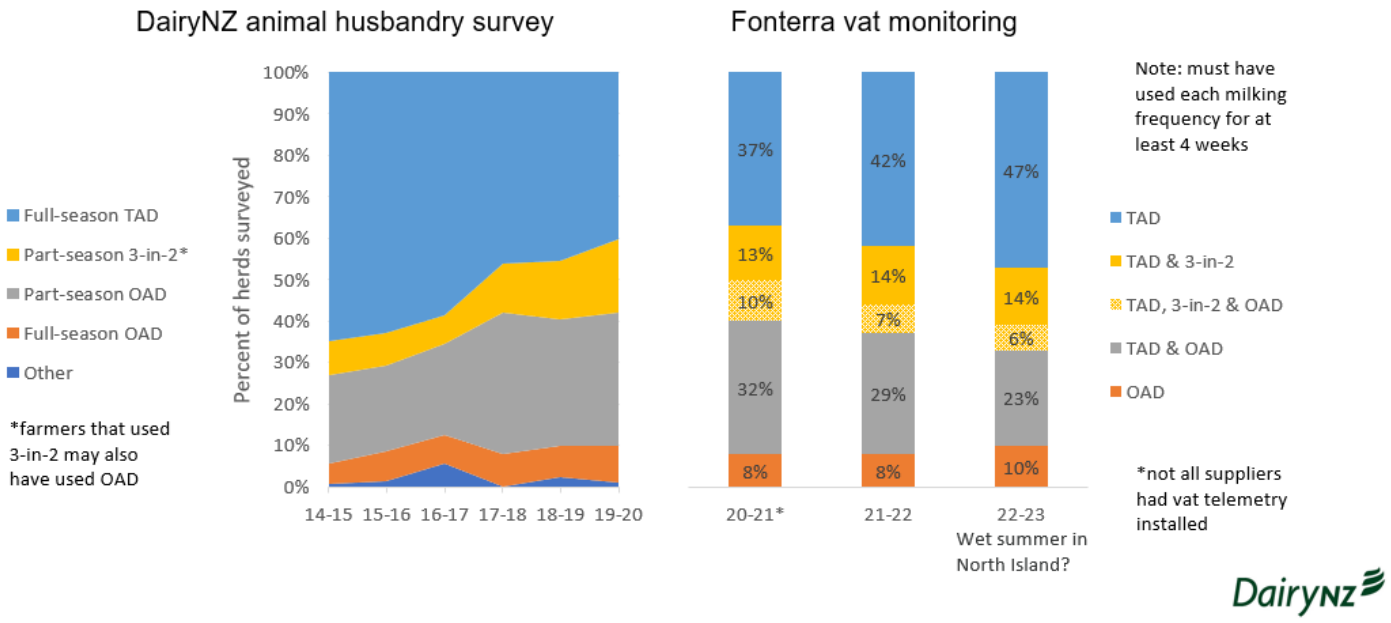
Flexible milking also reduces some variable costs due to a reduced number of milkings. It was expected that fuel, electricity, shed costs and labour demand would reduce.

LUDF implemented this system after the DairyNZ led research *"Flexible Milking for Healthier People & Cows"* project. This project aimed to increase farmer and rural professional confidence to adopt, optimise and support the use of flexible milking approaches to enable better work-life balance and sustainability for people, cows and their business. This research did show reduced milking times, had a limited effect on production, improved BCS and lameness was reduced.

Milking frequency over time can be seen in the below graphs. Full season TAD had been decreasing over time, where part season variable milking had been increasing. OAD has remained relatively static. This data was collated via the DairyNZ animal husbandry survey. *Note a percentage of farmers are surveys annually and provides a representation.*

Data from Fonterra farmers, through vat telemetry, indicates that farmers are adapting their system. Seasonal event may also be a driver. Please note each segment utilised the introduced milking frequency for at least 4 weeks to meet the criteria for that segment. This highlights more information is required around full or part time flexible milking.

Adoption of flexible milking frequency over time



Number of milkings for milking regime

Regime	Milkings per fortnight	Milkings per year	Reduction in milkings	% drop
TAD	28	600	0	0%
OAD	14	300	300	50%
3 in 2	21	450	150	25%
10 in 7	20	429	171	29%

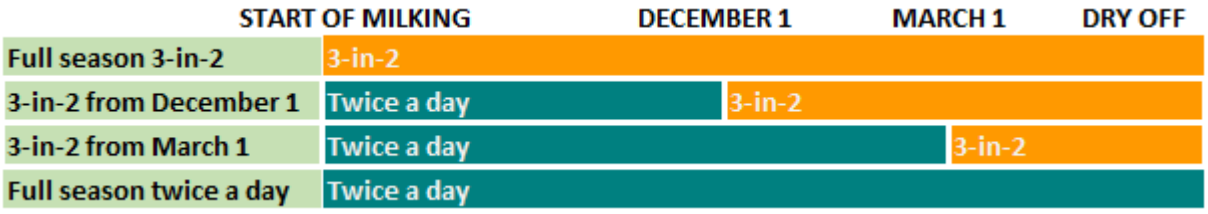
DairyNZ's flexible milking research compared three variations of 3-in-2, compared to a twice a day (TAD) system in a farmlet study. This looked at different start dates: from calving, 1 December and 1 March. This was to compare a traditional TAD system, to a mating/summer dry decision and an end of season/BCS decision.

Milking times were:

- TAD: 6am – 4pm (10-14)
- 3-in2: 5am – 5pm – 11am (12-18-18)
- Stocking rate: 3.5 cows/ha (29 cows/herd, 31% heifers)

Lincoln University Research Dairy Farm

Milking regimes:

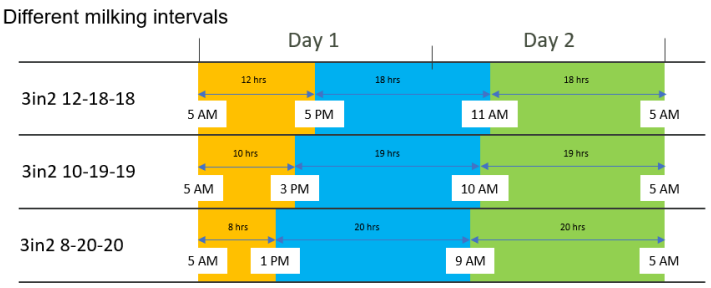


DairyNZ's flexible milking research compared three variations of 3-in-2, compared to a twice a day (TAD) system in a farmlet.

A second, component experiment sought to answer the question "Is it the number of milkings per day, or the timing of them that affects production?"

Design:

- 2× 6-week experiments
- 34 and 146 DIM (spring and summer)
- Herds of 40 cows
- Grazed side-by-side
- 3× 3-in-2 milking intervals.

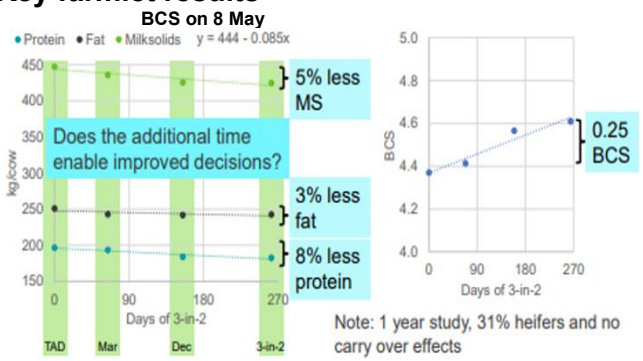


Key findings from research:

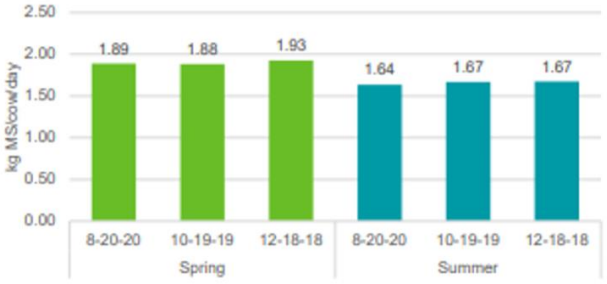
- 5% difference in milk solid production from the date that 3-in-2 was implemented. This was primarily driven by protein (-8%, statistically significant), rather than fat (-3% not statistically significant).
- BCS near dry off was +0.25 (6%) for the full season 3-in-2. All treatments had a linear increase in BCS from the date that that 3-in-2 was implemented.
- Note this was a 1-year farmlet study, so the value of this greater BCS could not be determined in terms of winter feeding, early lactation milk production or fertility. The controlled design of the experiment and small size of the research farm may mean greater benefit on a commercial farm.
- There are no statistically significant differences in milk production in spring and summer between different milking intervals in the 3-in-2 milking times. Likely a small biological effect on protein. Therefore, possible to use more attractive flexible milking times.

For more information, please visit https://www.dairynz.co.nz/milking/milking-intervals/flexible-milking/.

Key farmlet results



Results



- No significant difference between groups
- Possible to use more attractive 3-in2 milking times.

MythBusters

- You're going to make me work late.
- You must milk at 5PM on the TAD day.
- My cows will tank if I go 3-in-2 or 10-in-7.
- 3-in-2 will help me save feed
- You feed your cows less … you have to feed your cows to capacity.
- Flexible milking will affect my conception rates.
- Milkings times will be longer.
- You can't go changing milking frequency if you are doing more than 1.7 kg MS/cow.

10-in-7 at LUDF

SIDDC's strategic purpose is 'to lead and promote the very best sustainable dairy food production systems', to achieve this there are 6 principals to guide SIDDC actives and projects.

They are:

1. People at the core of farm activities;
2. Activities must be supported by the broader community;
3. Mātauraka Māori be adopted;
4. The focus must be on future consumers;
5. Activities must be at the forefront of environmental sustainability, commercial profitability, animal care, and employment relations;
6. Activities will be informed by sound science and underpinned by robust and transparent data collection and analysis.

The flexible milking project has been pursued as it aligns with principle number one - people at the core of farm activities. This was first implemented in the 2021-22 season.

The anticipated impact at LUDF was:

- 6% decrease in lactation curve, with one less milking per fortnight that 3-in-2. TAD - 500 kg MS/cow therefore 10-in-7 = 470 kg MS/cow.
- 25% decrease in petrol and motorbike R&M.
- 13% reduction in power consumption.
- 25% reduction in shed cleaning costs.
- Winter feed costs to reduce by $1.80/week. This is based on feed cost $0.29/kg DM and a BCS of 0.23 higher at dry off.
- Lameness targets were 0%. Based on $40/cow, this equated to a decrease in animal health by $4.80/cow.
- Labour requirement reduced from 19% less time milking. This equated to a 0.33 drop in FTE = $19.5k p.a. This is a combination of fewer milkings and less milking time.

Farm System:

- Stocking rate to remain at 3.5 cows/ha – winter approx. 580 cows, peak milk 560 cows.
- Culls to be removed in April, as per current farm policy, this is to mitigate risk of autumn leaching of N.
- Nitrogen fertiliser use to not exceed 190 kg N/ha.
- Spring/early summer surplus taken as silage and fed in autumn.
- Production target 263,200 (470 kg MS x 560 cows) down from TAD 279,266 (503 kg MS x 555 cows).
- Reduction of 16,066 kg MS.

So how has it gone at LUDF?

LUDF has now completed its third season of full-time flexible milking with a 10 milkings in 7 days strategy, known as 10-in-7.

The first two seasons were relatively wet seasons, where we did see a regional drop in production. At the start of our third season we did see a significant drop in milk in early August. This resulted in a governance discussion as to whether LUDF should revert to TAD over calving to alleviate milk solid loss, however it was decided to continue on the path of 10-in-7 to show the impacts over the full three seasons.

				TAD					10-in-7				
KPI	Projected	Change from TAD to 10-in-7	This season	2018/19	2019/20	2020/21	TAD avg	Change	10-in-7 avg	2021/22	2022/23	2023/24	Notes
Total milk production	263,625	8%	-6%	277,293	280,123	280,381	279,266	-23,254	256,012	258,851	247,291	261,894	
Number of cows	560	0%	1%	550	555	560	555	-1	554	542	560	560	
Production per cow	475	8%	-7%	504	505	501	503	-41	462	478	442	468	
Production per ha	1,648	8%	-6%	1,733	1,751	1,752	1,745	-145	1,600	1,618	1,546	1,637	
Petrol Use	25% drop	-28%	19%	2,425	1898	2540	2,288	-637	1,650	1,401	1,700	1,850	Number of FTE
Bike R & M	25% drop	NC	NC					0					No change
Power consumption	13% drop	-15%	21%	173,983	157,716	164,400	165,366	-24,356	141,011	138,737	154,411	129,884	
Shed cleaning costs	25% drop	-23%	23%	2,752	2,752	2,752	2,752	-628	2,124	2,124	2,124	2,124	
Winter feed costs	-$1.80/week	-$1.96	-$1.96					$ 0.16					Feeding to BCS
Lameness Numbers	0	NC	NC					0					
Animal health	$40/cow	NC	NC					0					
Labour - FTE	$19.5k drop	NC	NC	3.5	3.5	3.5	3.5	-0.7	2.8	2.5	2.5	3.5	
Hours milked - total		-21%	20%	1,125	1,128	1,174	1,142	-245	898	916	863	915	
Hours milked - per day		-21%	19%	3.64	3.64	3.87	3.7	-0.8	3.0	3	2.86	3	

Production:

- The first two seasons for 10-in-7 were wet compared to average, which caused a drop in production across Canterbury.
- We were forecasting a 6% drop off our average production of 280,000, which would be 263,200 kg MS.
- LUDF drop in production was 7.5% in the first season (21/22) and 11% in the second season (22/23). However, the region experienced a 3.5% drop followed by a 5% drop.
- On the assumption that LUDF would track with the region, the 10-in-7 drop was 4% and 6%, respectively.
- One thing to note is that feed grown, and pasture eaten has reduced over this period which has resulted in an increase in supplement fed, which has had an impact on profitability. This is considered not to be attributed to 10-in-7.
- For comparison to benchmark all production data is calculated on kg MS/ha basis.

Milk Production Benchmark

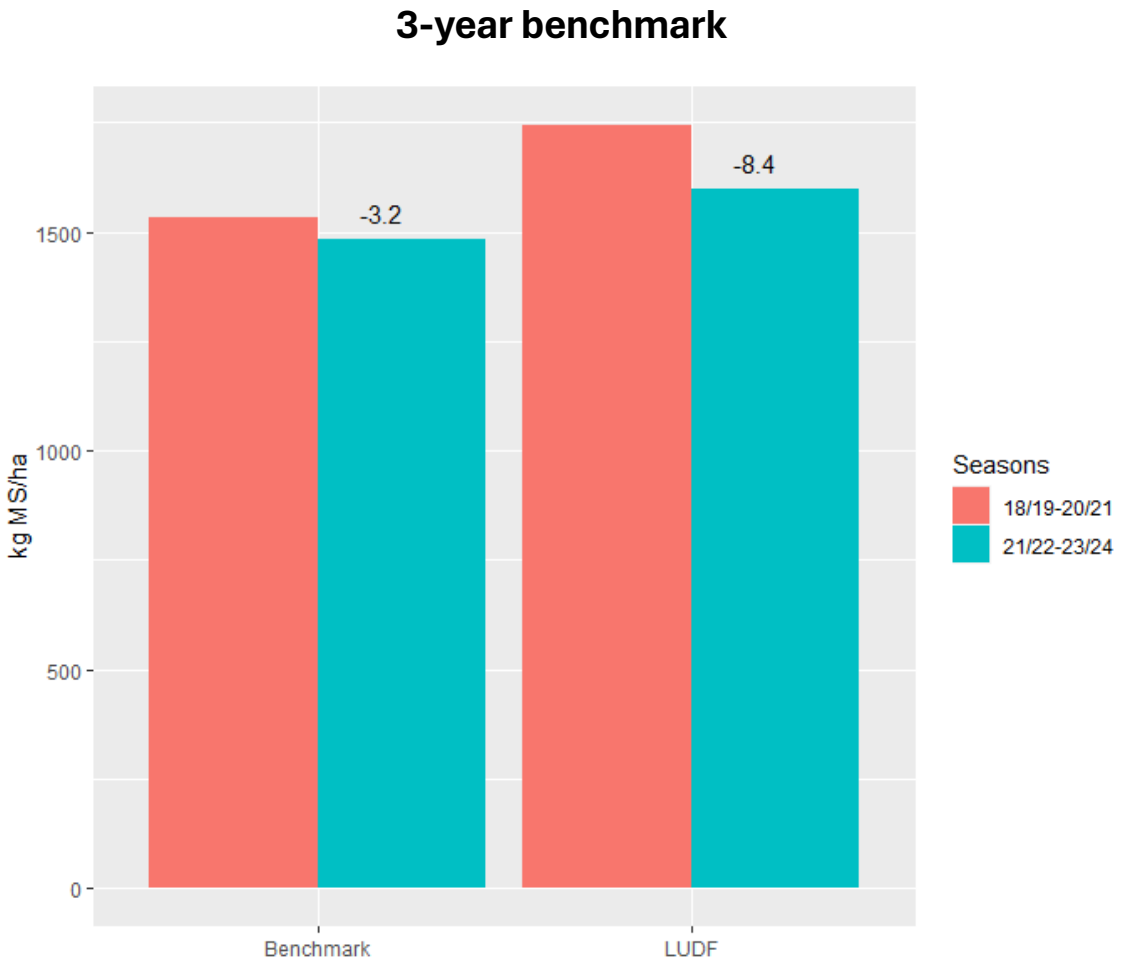
Fonterra has created a benchmark for LUDF to compare to. The criterion was they must be:

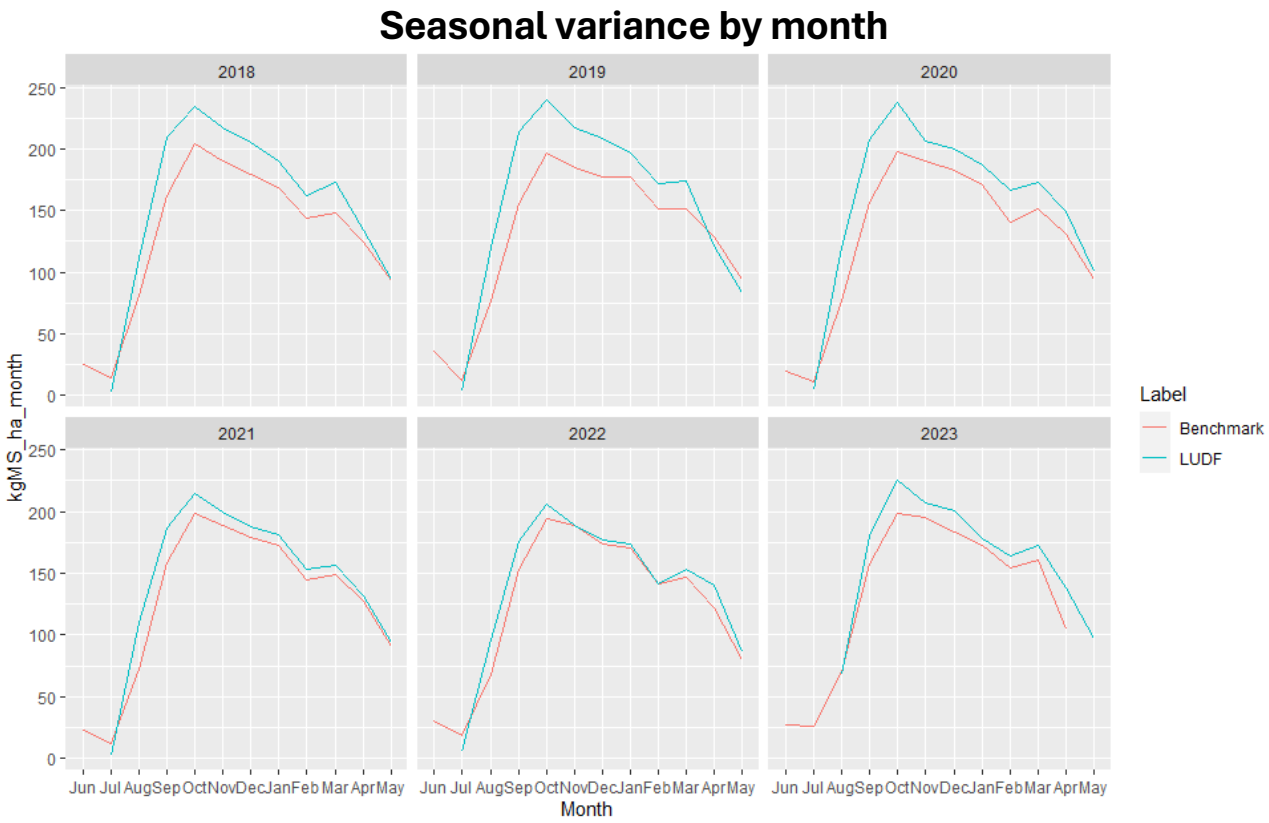
- Spring calving.
- No change in ownership.
- TAD for 86-100% of their days of supply.
- Irrigated dairy platform.
- Producing >1,000 kg MS/ha.
- Geographical location in close proximity.

This resulted in a benchmark of 12 farms.

Milk Production Benchmark

The benchmark has taken a 3-year average over the TAD period (2018-19 to 2020/21) and 10-in-7 period (2021-22 to 2022-2024).



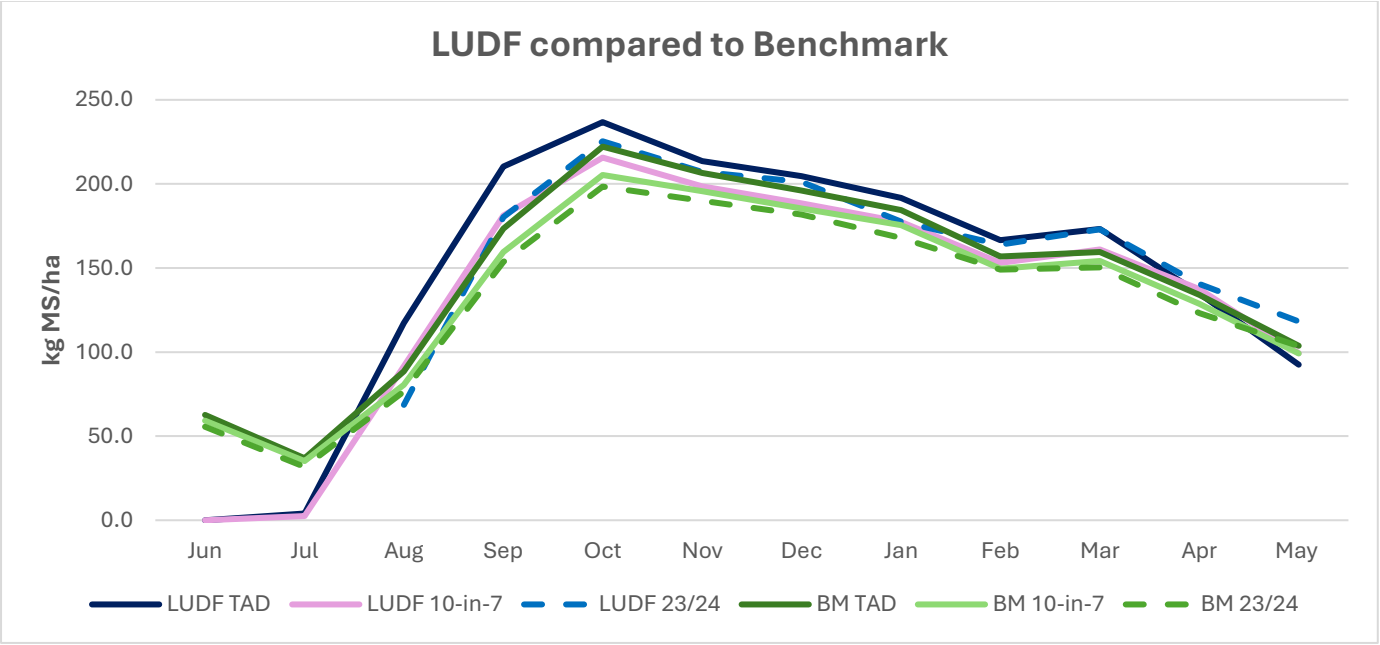


This reporting supports that the benchmark did see a 3.2% drop in production over the 10-in-7 period compared to the TAD period, whereas LUDF had an 8.4% drop for the same period. Suggesting that compared to benchmark LUDF resultant production drop was 5.2%, which we will attribute as a 10-in-7 effect.

The data has also been shown on a monthly basis per year. This suggests that LUDF and the benchmark primarily do follow a similar trend over the season over the TAD period.

For the 10-in-7 period, the first two season (wetter than average), confirms that "gap" between groups narrows which suggests that this is not purely a seasonal effect and that it is a system effect. What is interesting is that for a more "normal" season that LUDF has gained on the benchmark, particularly over the peak in autumn production, which is consistent with previous performance.

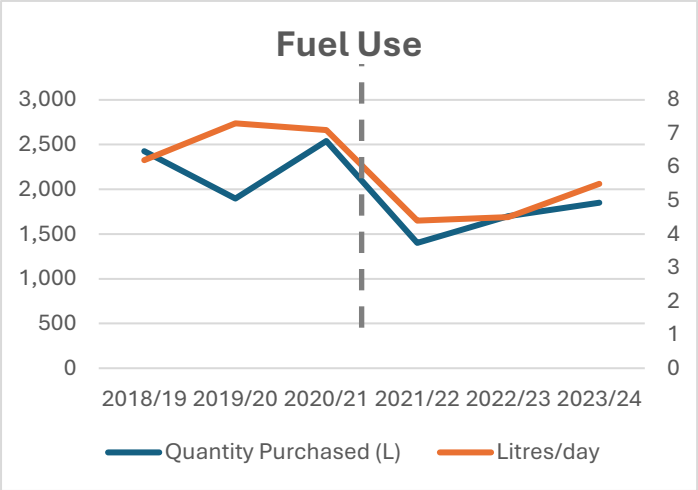
LUDF is continuing to implement full 10-in-7 milking regime for the 2024-25 season and we look forward to seeing if we can further improve the system and continue with a 5-6% production drop, or if we can in fact close the gap.

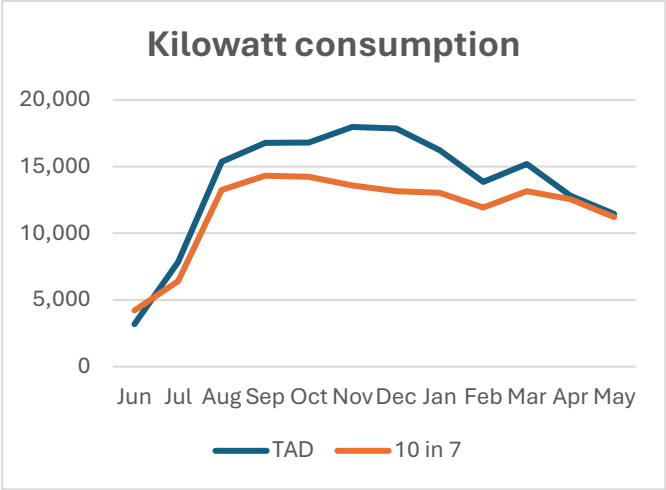


	LUDF TAD	LUDF 10-in-7	LUDF 23-24	BM TAD	BM 10-in-7	BM 23-24
TOTAL	1,745	1,600	1,637	1,725	1,628	1,582

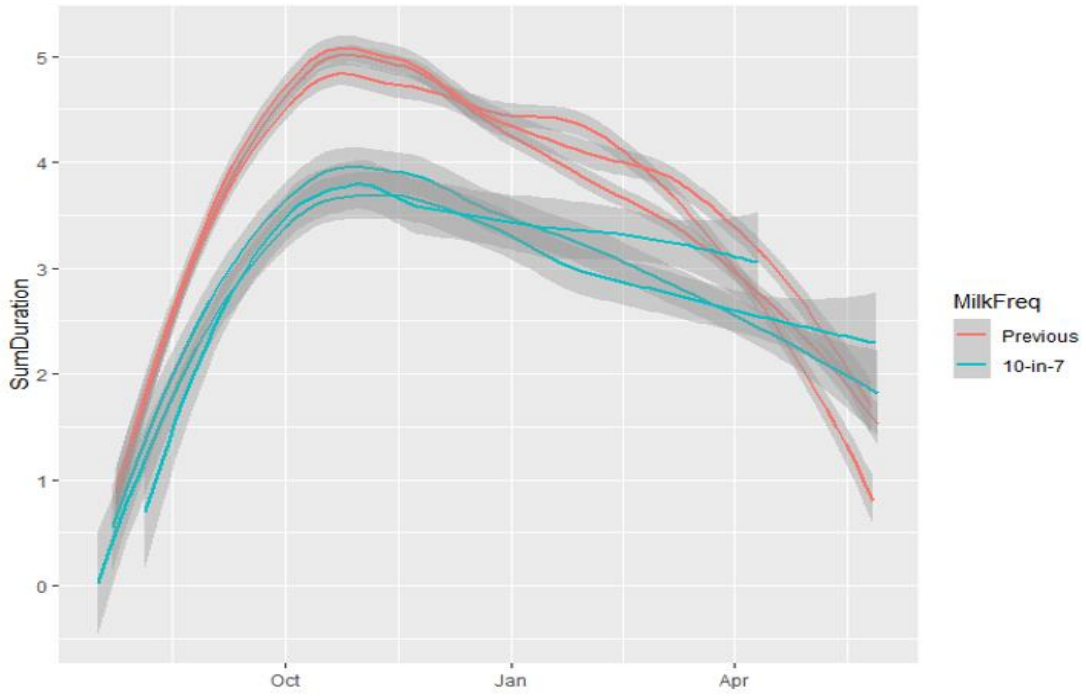
From the above you can see the shift in production for LUDF from TAD to 10-in-7, and the improvement for 23/24 season. The benchmark did follow a similar trend, however LUDF production from March did lift in line with pre 10-in-7 production.

Cost comparison:

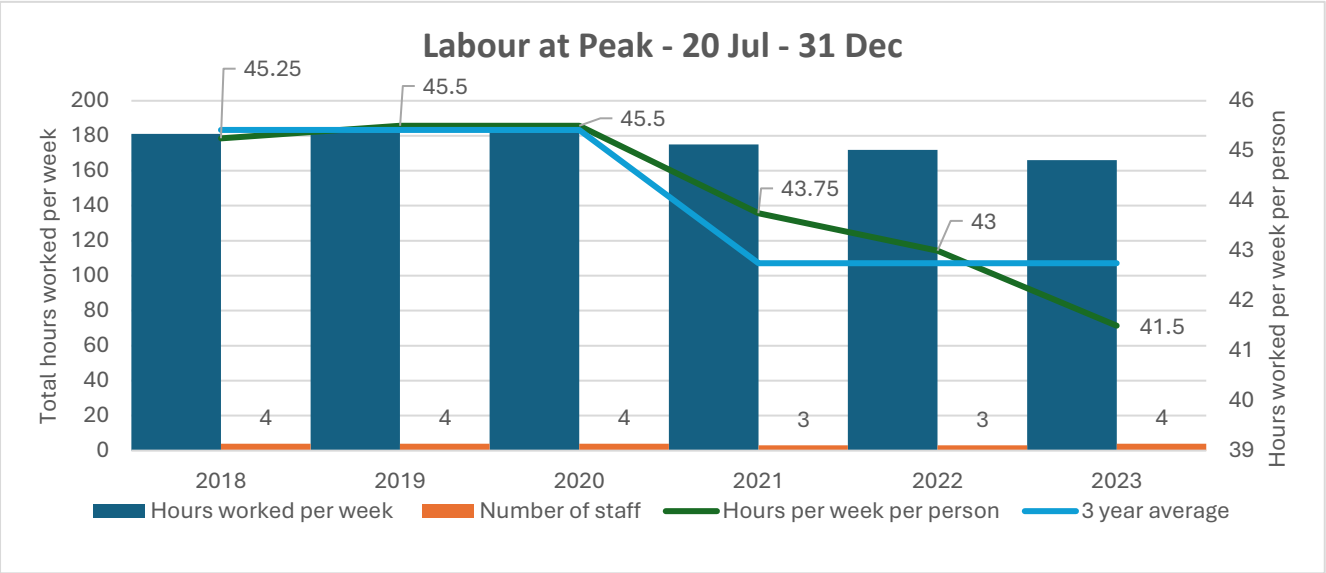




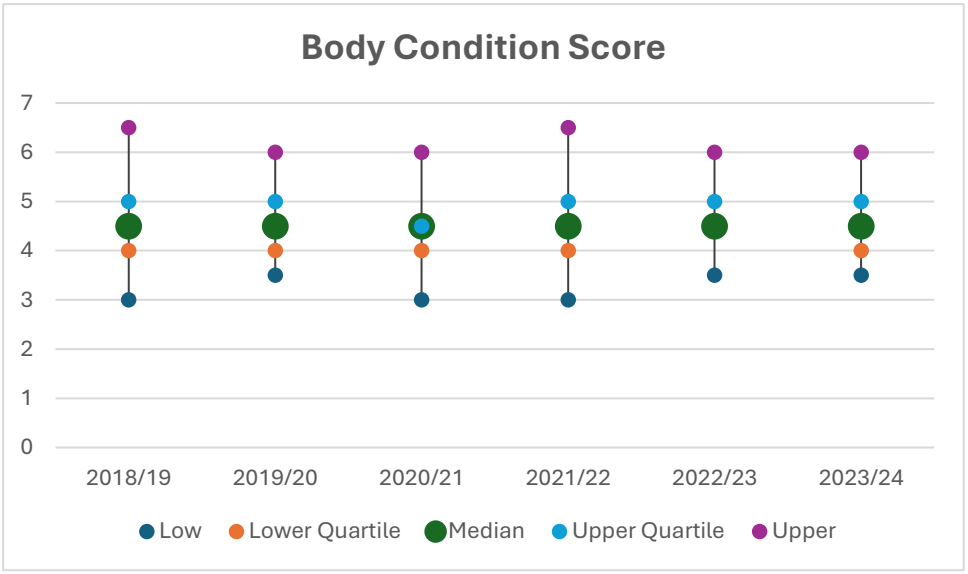
Hours milked per day from Halo data:



Labour:



Body Condition Score:



BCS is trending up, however the main driver here is BCS at dry off and winter feeding, however we have noticed cows holding condition better, particularly at the tail end of the season, and the spread, particularly the lower quarter, has improved. Is this from flexible milking? Or better transition feeding, or seasonal?

Where to from here ...

LUDF has successfully implemented 10-in-7 milking regime and has delivered 6.2% drop in production per hectare and 7.1% drop per cow for the 23/24 season. When compared to the benchmark LUDF has delivered a 5.2% drop in production per hectare over the 3-year period. As with every farm, with every season there are many variables, and we look to the 24/25 season to further refine our system aiming for 470 kg MS/cow or 1,645 kg MS/ha.