







# LUDF's progress on repro and flexible milking

















# **Collar Fertility Overview Report**

# LUDF 2022/23 vs 2023/24 Comparison April 2024

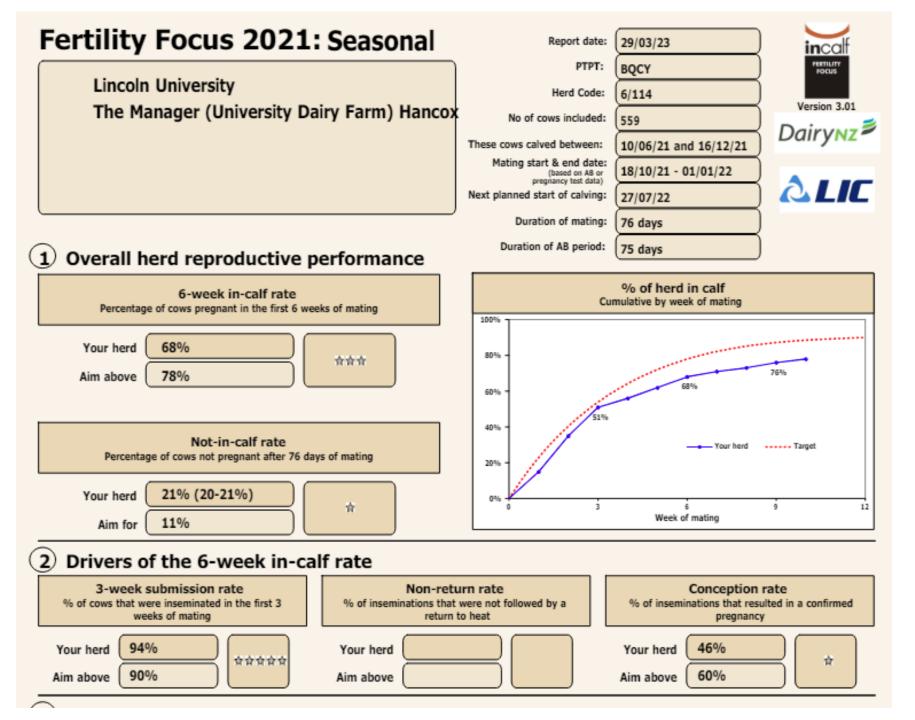
LUDF. Peter Hancox. 541 cows, 160 Ha farm, Lincoln.







# Background



# Farm System Changes from 2021/22 to 2022/23

Mating start & end date: (based on AB or pregnancy test data) 18/10/21 - 01/01/22

Mating start & end date: (based on A8 or pregnancy test data)

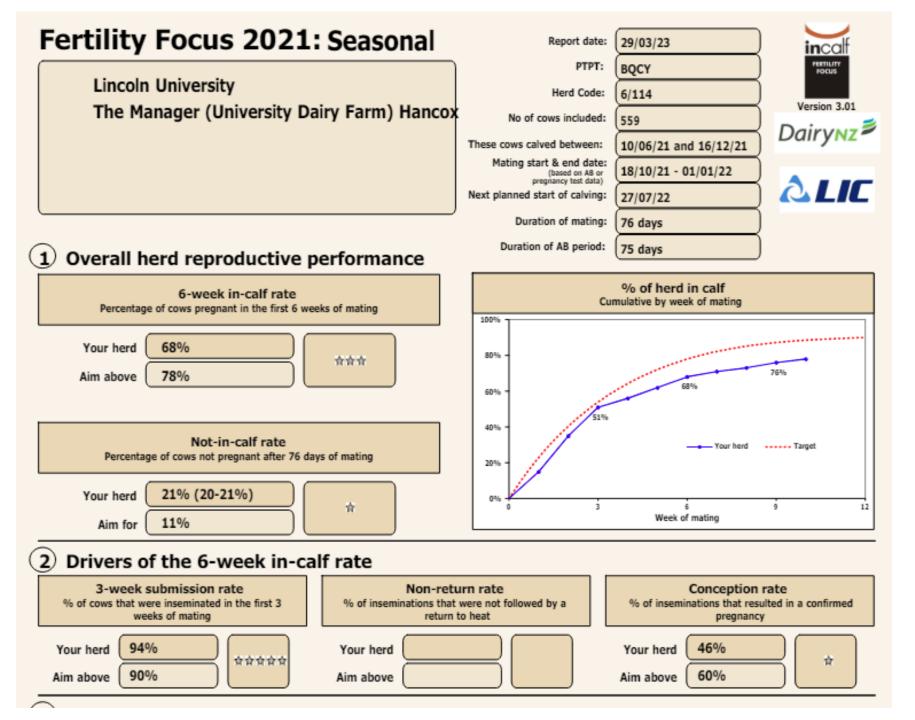
23/10/22 - 23/01/23

# SIDDC Repro Benchmarking Project

\*Started in 2021/22 Season (so consistent across both years)

Flexible Milking

# Background

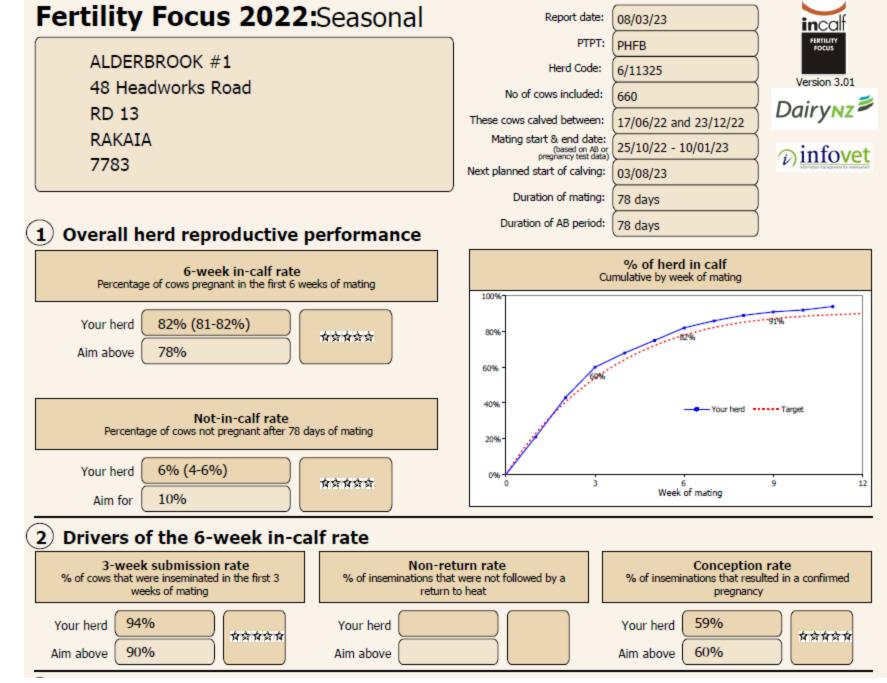


#### SIDDC Repro Benchmarking Project

- Allflex Sensehub Collars
  - Enabled full season
     AB



- Phantom Scanning (to reduce herd NICR)
- Longer mating length (enabled by short gestation semen)



3WICR 51% to 52%

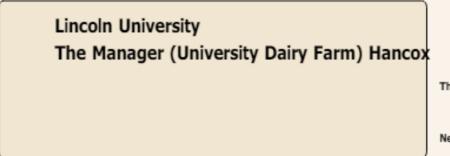
**6WICR** 68% to 75%

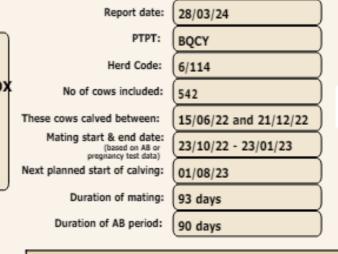
**Conception Rate** 46% to 50%

> **NICR** 21% to 9%

**BUT:24 late** losses (between phantom & final scan) = 4.4%18 days longer mating length

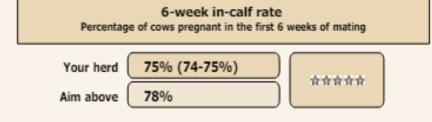
## Fertility Focus 2022: Seasonal Lincoln University The Manager (University Dairy Farm) Hancox

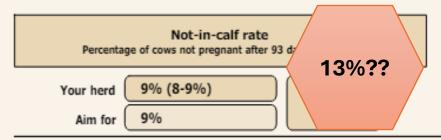


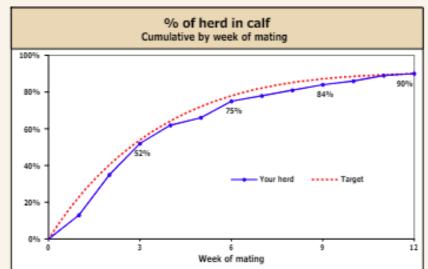




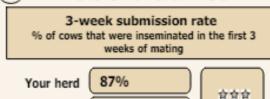






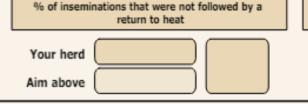


#### Drivers of the 6-week in-calf rate



90%

Aim above



Non-return rate



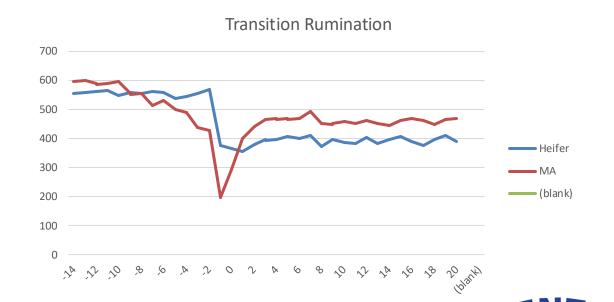
## **End of Season Data Review**



# Transition (Springers through to +10-14 DIM)

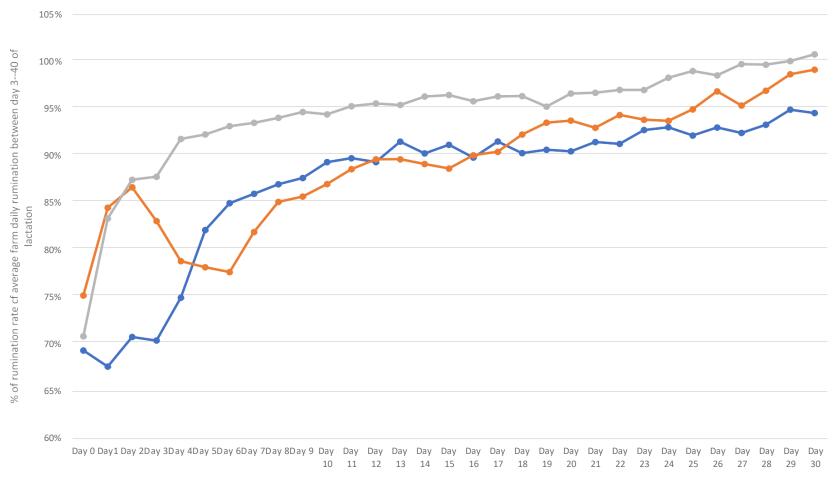
## **Key Influence on:**

- BCS Loss Post Calving
- Endometritis Rates
- Oocyte quality (and first service conception rate)
- Cycling Rates
- Mastitis / Lameness
- Metabolic
- Peak Production





#### Daily Rumination Average by DIM (cf average 30-40 day farm rumination rate)





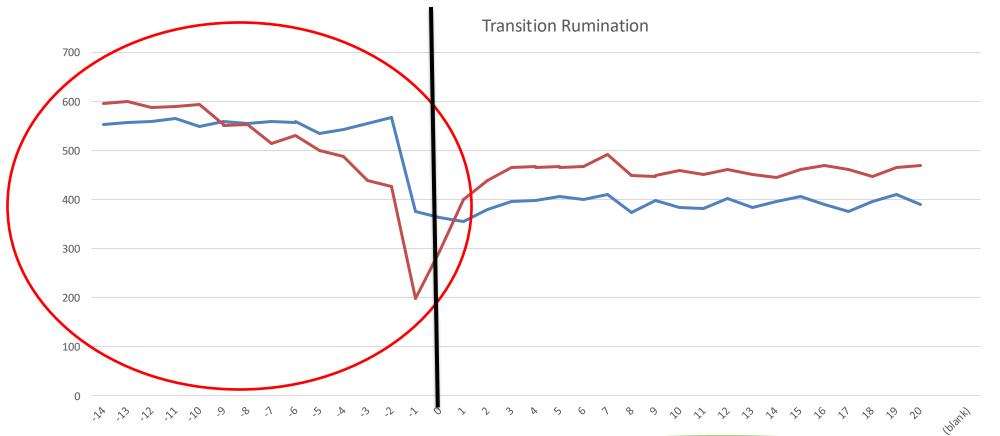
## **Veterinary Centre** by the Big Blue Cross



TAD Colostrum
OAD Variable (25 Days)

OAD 14x Days

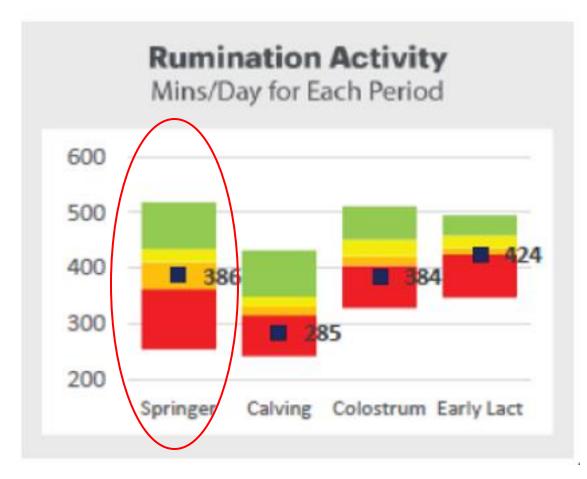
# **Transition Monitoring**





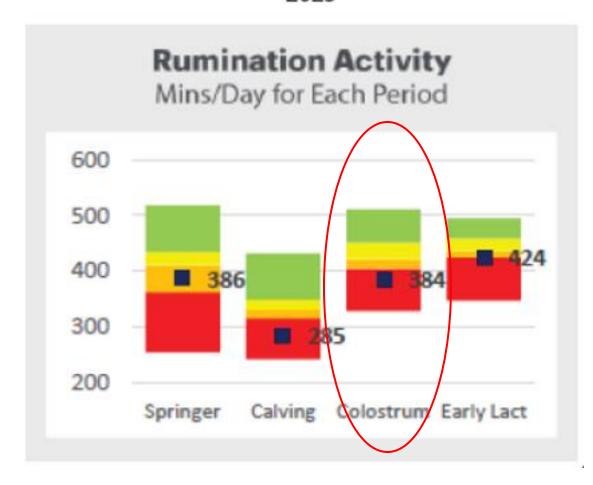
#### **Transition Rumination Rates:**

2023



	ME	Wastage	kg of Feed	Multiplier	ME	Protein %	
Grass	10.5	10%	4	9.45	37.8	22%	SPRINGERS
Crop (Break Fed)	12	15%		10.2		15%	
Grass Silage	11	25%		8.25		15%	
Maize Silage	11	25%		8.25		9%	
Grain	13	11%		11.57		11%	
In Shed Other	13	11%		11.57		28%	
PKE	11	20%		8.8		14%	
Crop (Lifted)	12	10%		10.8		10%	
Baleage	10	20%	6	8	48	15%	
Straw	6	40%		3.6		8%	
Нау	10	20%		8		12%	% Maintenance
Average ME of Diet (maintenance demand increases with lower ME feeds)	10.2	TOTAL DM (kg) Offered	10.0	TOTAL ME	86		74%
	TOTAL DM (kg		8.4	Prot			otein
						18% (	1.51kg)
Liveweight (kg)	500	Maintenance (MJME)	117	90% Target	105		% for Springers al > 2.2kg)

Transition Rumination Rates: 2023



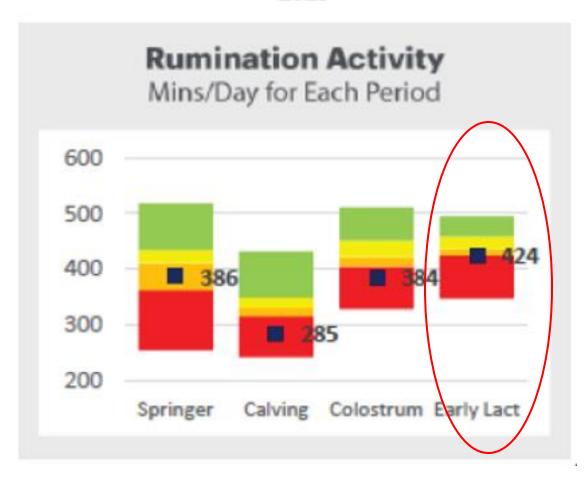
Colostrum (Day 1-4) Grass = Ad-lib (1700-1800 residuals)

OAD Milking, Skip-a-day on Day 1 if Required

- 1) Day 0 is Critical!
- 2) Avoid grazing below 1800
- 3) Allocate Enough Feed
- 4) Offer multiple feeding opportunities
- 5) Limeflour!!!!

**Transition Rumination Rates:** 

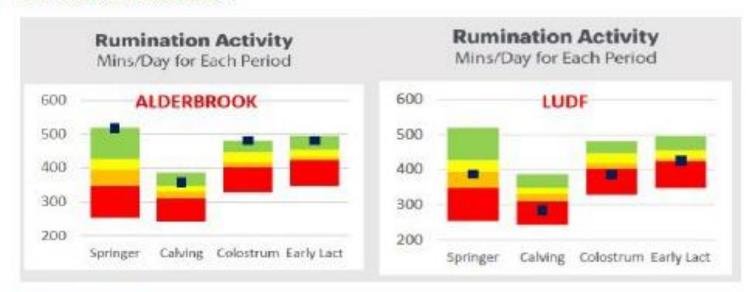
2023



Early Lactation (Day 8-10) Grass = Typically 100% of diet. Silage more likely to be added in later round when ground drier (1600 residuals)

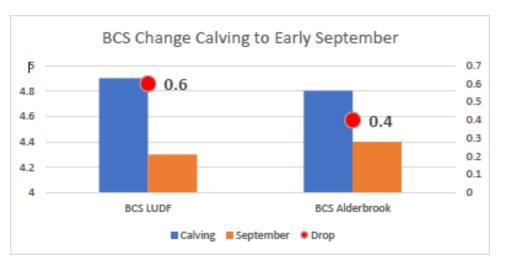
# Other measures of transition success?

#### Transition Rumination Rates:



#### **NEFA Blood Test Results:**





# Feeding Changes 2022/23

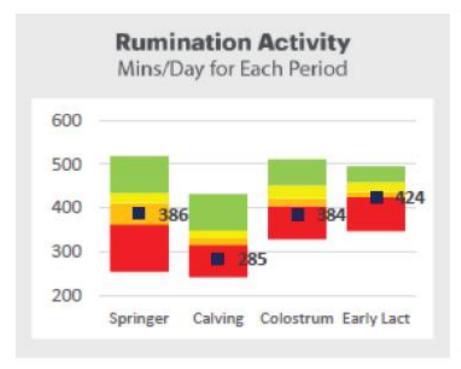
#### **Feeding:**

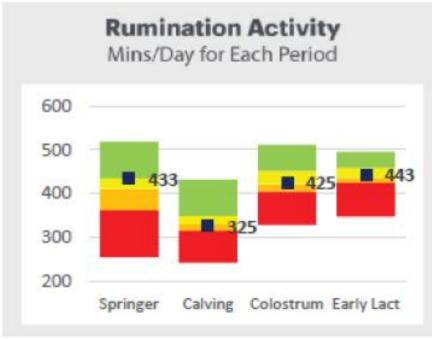
Diet for Period	LUDF 2022/2023	LUDF 2023/2024
Springers (Day -1 to -7)	Grass = 4kg Baleage = 6kg (Ad-lib)  Calving on cropping dirt	Grass = 6kg Silage = 6kg (Pre grazing 3,500 cover)
Colostrum (Day 1-4)	Grass = Ad-lib (1700-1800 residuals)  OAD Milking, Skip-a-day on Day 1 if Required	Grass = 6kg (pre-grazing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

#### **Transition Rumination Rates:**

#### **TRANSITION**

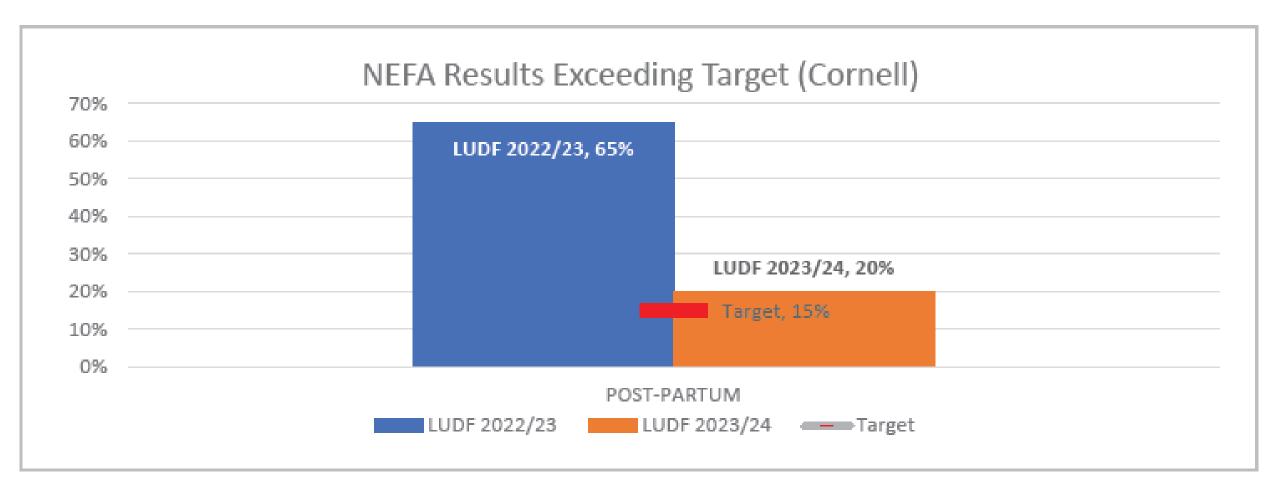
2023 2024





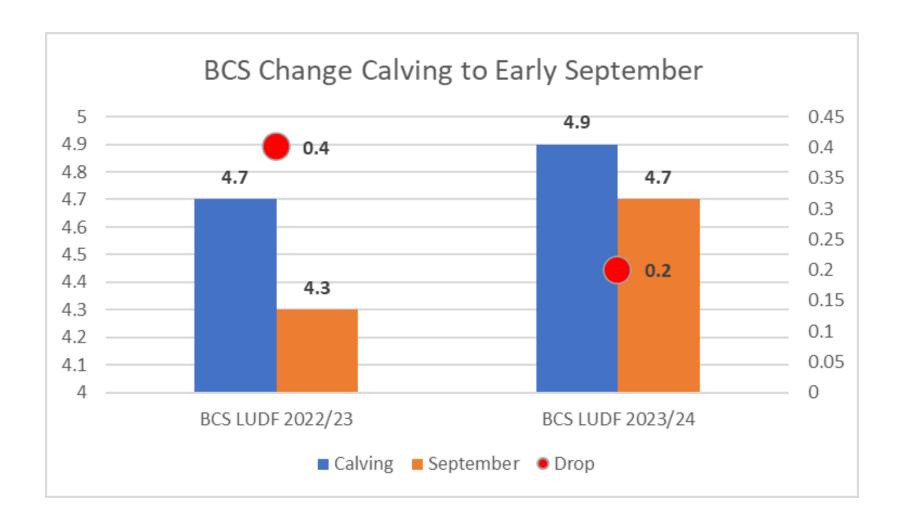
Period	Change
Springers	+47 mins/day
Calving	+40 mins/day
Colostrum	+41 mins/day
Early Lactation	+17 mins/day

#### **NEFA Blood Test Results:**

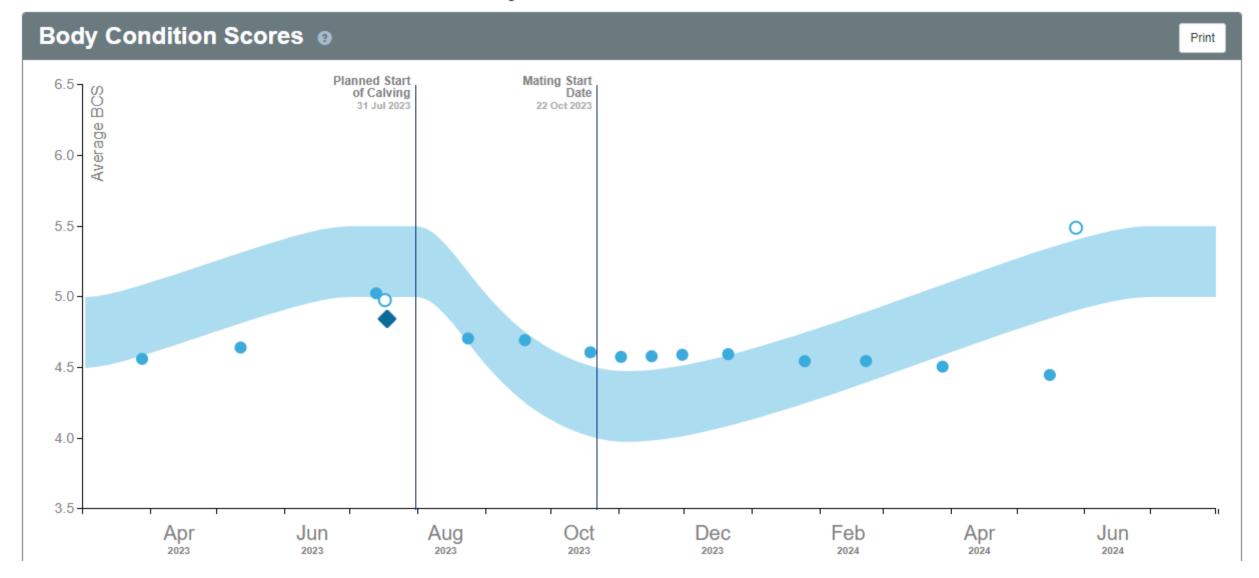


# Pre-Mate Period (Cycling + Feeding)

**BCS Change Calving to September** 



## BCS for 1 March 2023 - 31 July 2024



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

2023/24

Group

Herd

1st Lactation

2<sup>nd</sup> Lactation

2-6 Lactation Early

Change

-11%

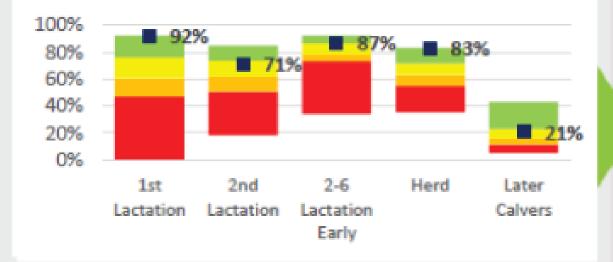
+13%

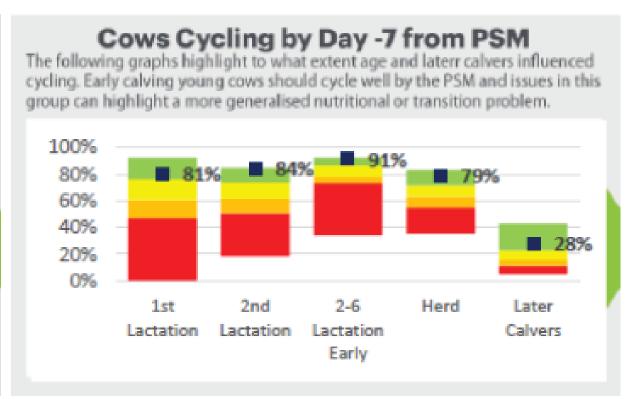
+4%

-4%

2022/23

# Cows Cycling by Day -7 from PSM The following graphs highlight to what extent age and laterr calvers influenced cycling. Early calving young cows should cycle well by the PSM and issues in this group can highlight a more generalised nutritional or transition problem. 100% 80% 87% 83%



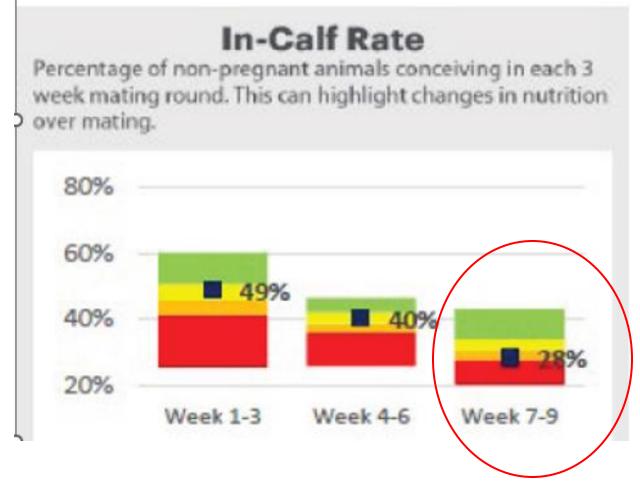


(NOTE PSM delayed 5 in 2022 season – heifers & herd calved VERY early)

# **Mating Period**

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

2022/23



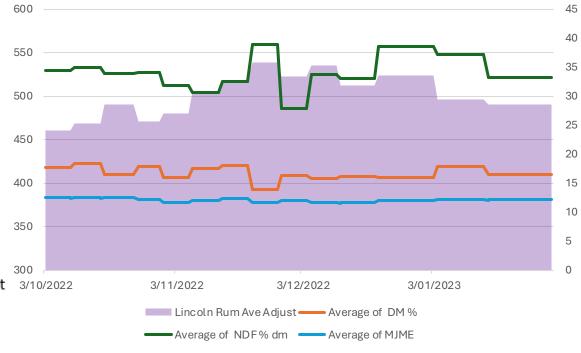


# **Energy Deficit?**

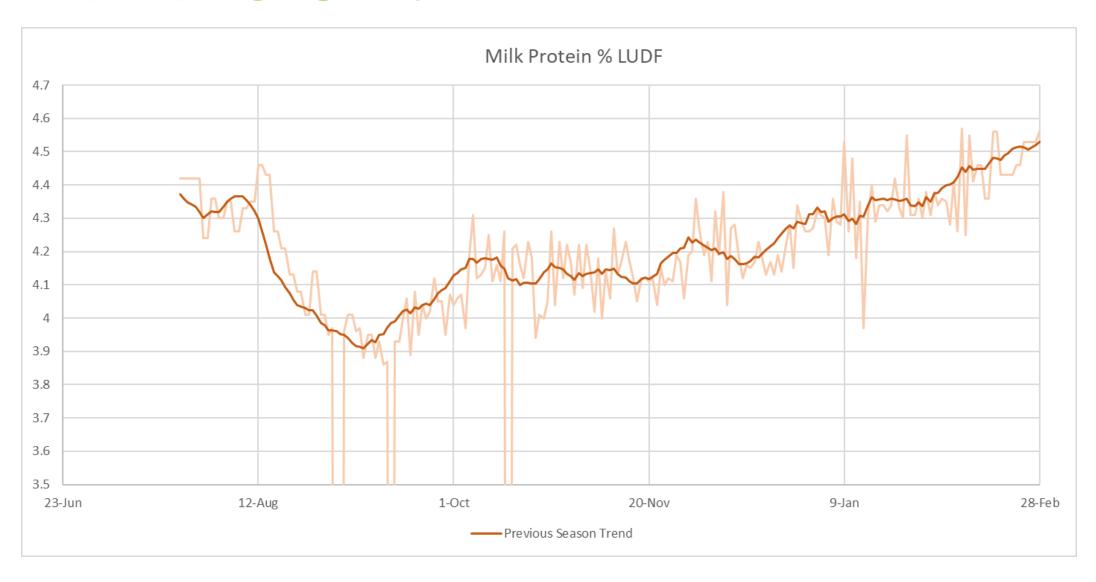
<u>'</u>		
	LUDF	Liam
	NEFA Levels	NEFA Levels
10 <sup>th</sup> Aug	.7	.4
29 <sup>th</sup> Sept	.3	.3
27 <sup>th</sup> October	.2	.3
10 <sup>th</sup> November	.4	.2
24 <sup>th</sup> November	.1	.2
8 <sup>th</sup> Dec	.1	.2
22 <sup>nd</sup> Dec	.2	.2

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

#### Lincoln Rumination vs Grass Values



# Milk Protein?

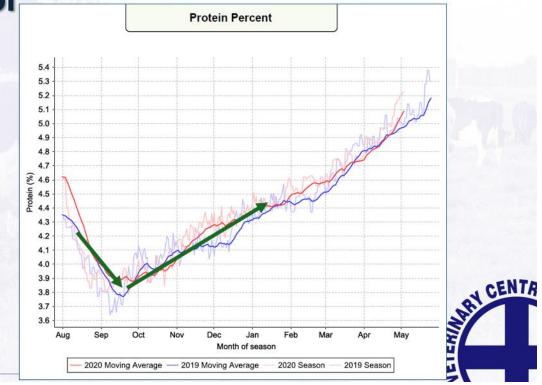


## The Nike Tick – Is it real?

Feeding over Mating - Milk Protein as an

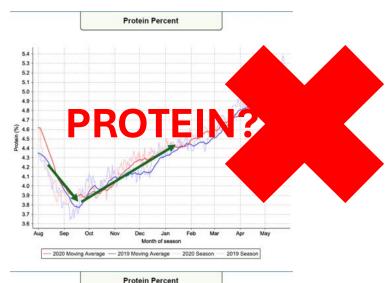


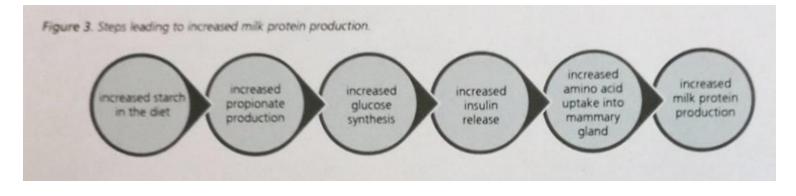
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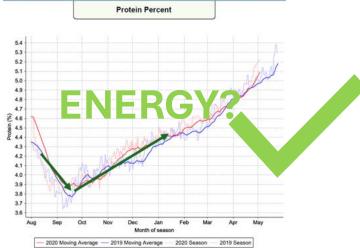




# The Science – Energy & Milk Protein

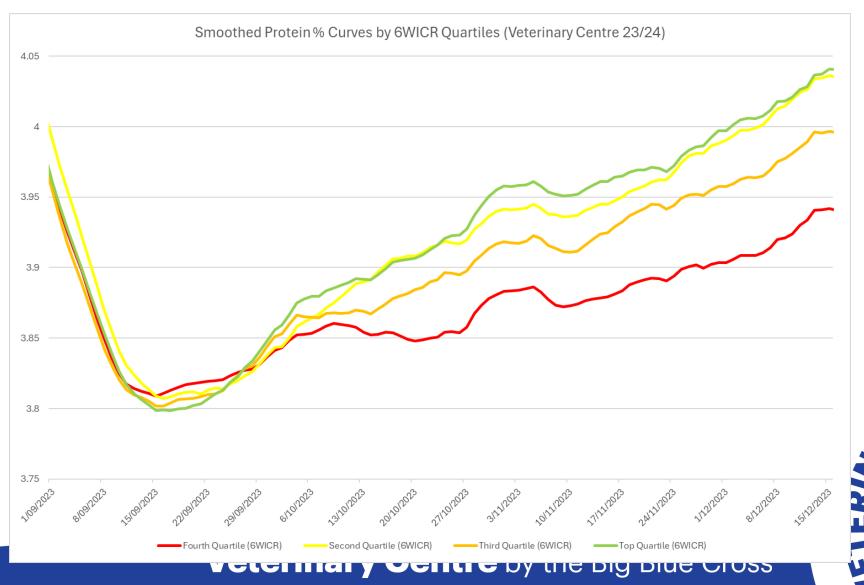




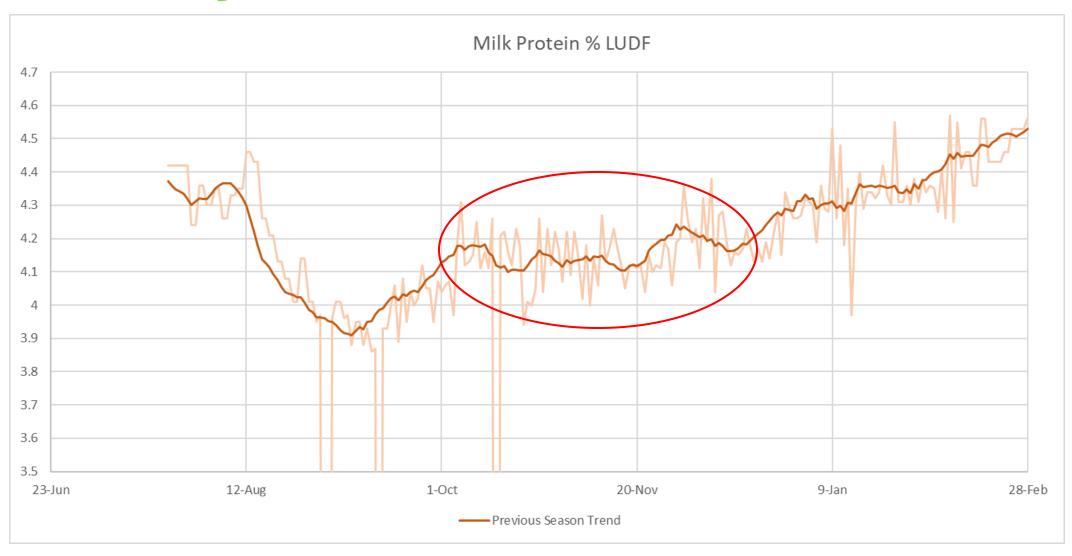


"So basically starch/concentrate/energy feeding increases insulin which ends up increasing MP synthesis"

# **Protein Curves vs Repro Quartiles 23/24**



# How do you fix the flat line?



Farm Name		LUDF 2022/23			Date	4/07	/2024		
7	ME	Wastage	kg of Feed	Multiplier	Protein %	Protein (kg)	ME	Ave ME of Gr	as
Grass	12.08	10%	19	10.872	25%	4.28	206.568		
Crop (Break Fed)	12	15%		10.2	15%				
Grass Silage	11	25%		8.25	25%			4	Ü
Maize Silage	11	25%		8.25	9%			R.	
Grain	13	5%		12.35	11%			ERINA	
In Shed Other	13	11%		11.57	28%			≋∟	
PKE	11	5%		10.45	14%				
Crop (Lifted)	12	10%		10.8	10%				
Baleage	10	20%		8	17%			<b>"</b>	
Molasses	12	5%		11.4	4%				
Straw	6	40%		3.6	3%				
Other (i.e DDG)	12.5	5%		11.875	28%			Feed Offered vs Demand (%)	
Average ME of Diet (maintenance & milk	12.1	TOTAL DM (kg) Offered	19.0		Totals	25.0%	207	98%	
demand increases with lower ME feeds)	12.1	TOTAL DM (kg) Eaten	17.1			Protein %	Total ME	-5.11 MJME	
					Maintenance (MJME)	53.	.675	NEGATIVE ENERGY BALANCE	
Liveweight (kg)	475	Walk (km) Flat	2.00		Milk (MJME)	1	54		
Milk kgMS/Cow	2.00	Walk (km) Rolling			Walking		4		
Ver 3		Walk (km) Hilly/Steep			Total Demand (MJME)	2	12		E

ss(22/23) = 12.08



**Expected Weight** Change

-0.14 Kg/Day

-0.14 BCS

**Expected BCS Change** over 30 days

Lactational **Energy Checker** 

### **Urea Supplementation**

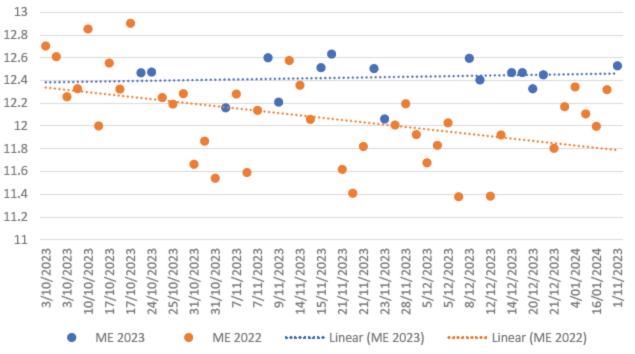
1<sup>st</sup> Round – 25kg N/ha 2<sup>nd</sup> Round (Sept) – 46kg N/ha 3rd Round (October) – 40 kg N/Ha

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 180 kgN/Ha Cap.

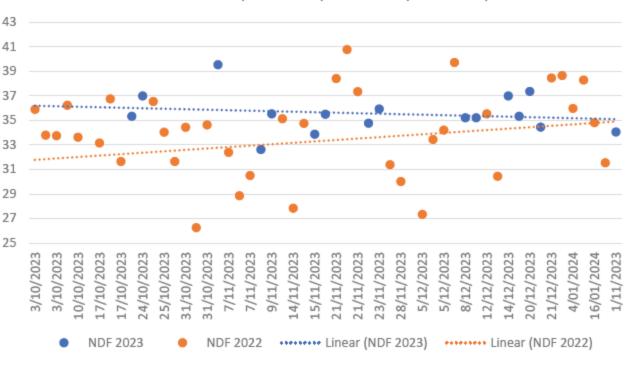
Date	Event	Description	Area	Rate/Reading
28/10/2023	Fertiliser	UREA Bulk	50.97	Variable
21/10/2023	Fertiliser	UREA Bulk	32.12	Variable
16/10/2023	Fertiliser	UREA Bulk	12.68	85kg/ha
16/10/2023	Fertiliser	UREA Bulk	36.72	85kg/ha
16/10/2023	Fertiliser	UREA Bulk	20.06	85kg/ha
12/10/2023	Fertiliser	FLOWFERT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

# **Grass Quality**





#### NDF Levels 2022 (33.2 ave) vs 2023 (35.5 ave) LUDF

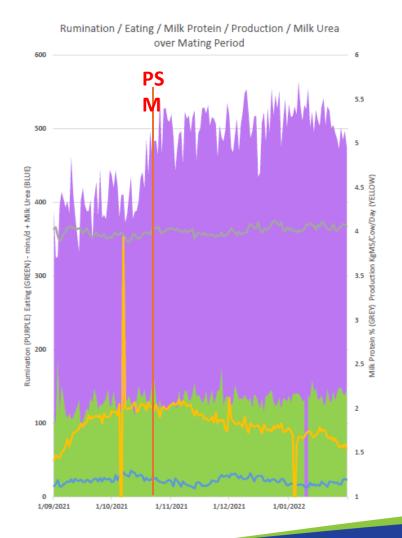


Farm Name	L	UDF 2023/24			Date	4/07	/2024		
	ME	Wastage	kg of Feed	Multiplier	Protein %	Protein (kg)	ME	Ave ME of Gra	ass (22/23) = 12.42
Grass	12.42	10%	19	11.178	25%	4.28	212.382	7110111201010	
Crop (Break Fed)	12	15%		10.2	15%				ENTA.
Grass Silage	11	25%		8.25	25%			4	CEIVIRE
Maize Silage	11	25%		8.25	9%			R.	
Grain	13	5%		12.35	11%			3	
In Shed Other	13	11%		11.57	28%			$\gtrsim$	CENTRE
PKE	11	5%		10.45	14%				
Crop (Lifted)	12	10%		10.8	10%				
Baleage	10	20%		8	17%			m l	
Molasses	12	5%		11.4	4%				
Straw	6	40%		3.6	3%				
Other (i.e DDG)	12.5	5%		11.875	28%			Feed Offered vs Demand (%)	Expected Weight Change
Average ME of Diet (maintenance & milk	42.4	TOTAL DM (kg) Offered	19.0		Totals	25.0%	212	100%	0.02 Kg/Day
demand increases with lower ME feeds)	12.4	TOTAL DM (kg) Eaten	17.1			Protein %	Total ME	+0.71 MJME	0.02 BCS
					Maintenance (MJME)	53.	675	POSITIVE ENERGY BALANCE	Expected BCS Change over 30 days
Liveweight (kg)	475	Walk (km) Flat	2.00		Milk (MJME)	1	54		
Milk kgMS/Cow	2.00	Walk (km) Rolling			Walking		4		
Ver 3		Walk (km) Hilly/Steep			Total Demand (MJME)	2	12		Lactational Energy Checker

# **Balancing the Diet**

Do your energy

sums



#### Concentrate

%         ME/kgDM         %DM         %DM         %DM         %DM         %SSS           Barley         89.0         13.0         11         1.8         21.0         61.4         90.0           Bran         85.0         9.8         17.1         2.7         51.0         20.6         95.0	%
1	
Bran 85.0 9.8 17.1 2.7 51.0 20.6 95.0	2.0
	4.4
Canola meal 90.0 11.5 38 6.1 30.0 - 1.5	3.5
Lupin 89.0 12.0 34.2 5.5 33.0 22.0 90.0	5.5
Maize grain 89.0 13.6 8 1.3 9.0 75.1 99.0	4.3
Dats 89.0 11.5 13 2.1 31.0 47.5 90.0	4.9
Peas 87.0 13.0 24 3.8 23.0 46.0 -	1.8
Soya bean meal 90.0 12.9 50 8.0 14.0 27.0 90.0	1.4
Soya bean hulls 88.0 12.0 13.5 2.2 60.0 27.0 1.4	-
Tapioca 88.0 12.8 5 0.8 20.0 27.0 71.0	2.0
Taploca         88.0         12.8         5         0.8         20.0         27.0         71.0           Wheat         89.0         12.6         11.3         1.8         14.0         70.0         90.0           Whole cotton seed         88.0         16.0         23         3.7         44.0         70.0         90.0           Cotton seed meal         89.0         12.0         min 43         min 6.9         20-23         70.0         1.5	1.9
Whole cotton seed 88.0 16.0 23 3.7 44.0 70.0 90.0	18.0
Cotton seed meal         89.0         12.0         min 43         min 6.9         20-23         70.0         1.5	0.1

**Veterinary Centre** by the Big Blue Cross

# **Mating Period**

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

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

2022/23

2023/24

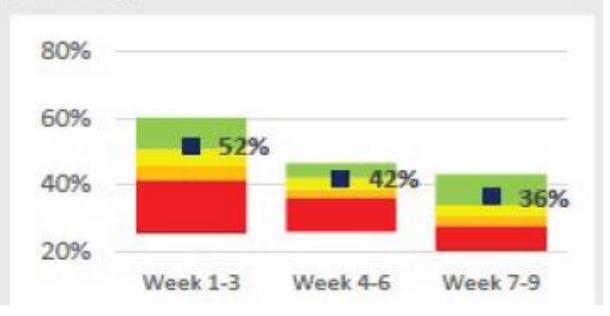


Percentage of non-pregnant animals conceiving in each 3 week mating round. This can highlight changes in nutrition over mating.



#### In-Calf Rate

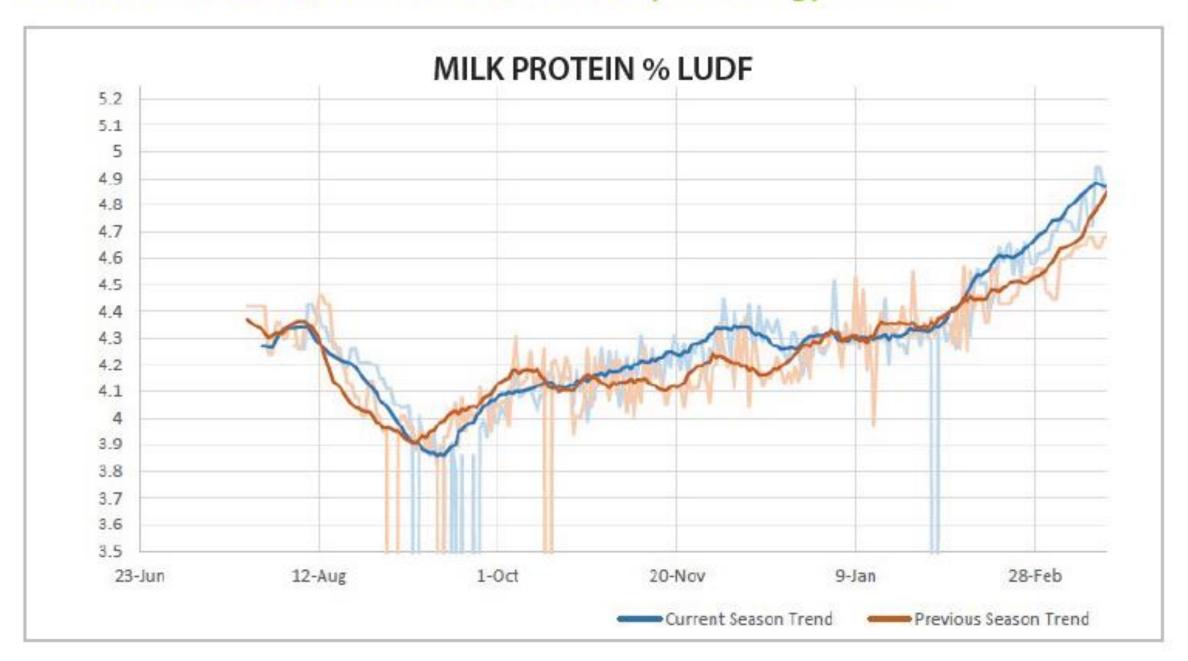
Percentage of non-pregnant animals conceiving in each 3 week mating round. This can highlight changes in nutrition over mating.



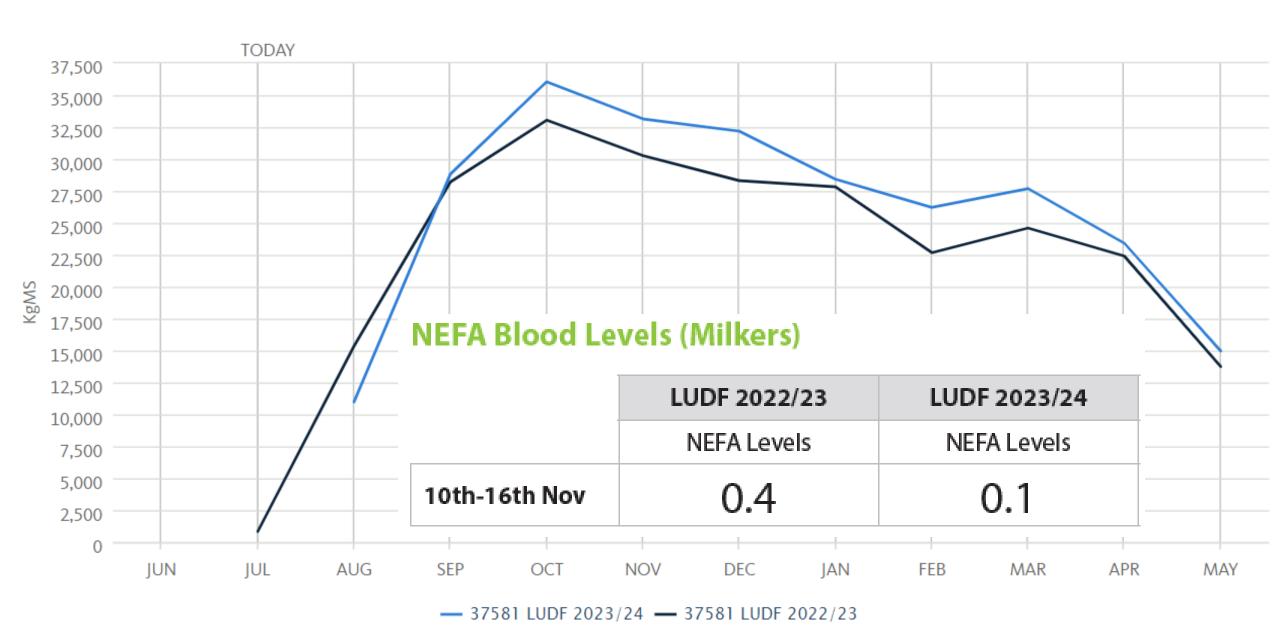
# **Weekly Conception Rate**



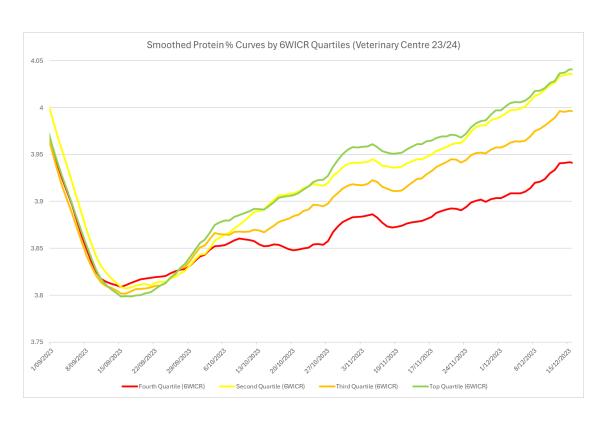
#### Milk Protein Curve (the NIKE Tick) as a Proxy for Energy Balance



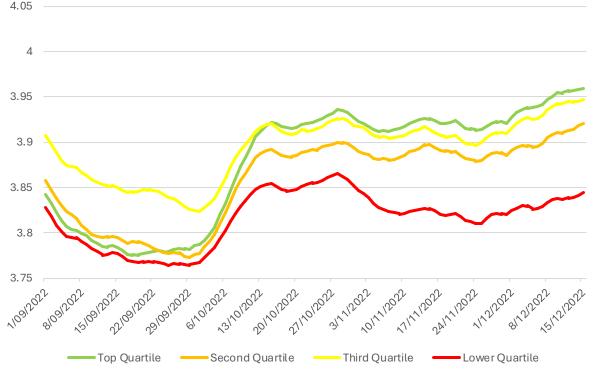
# Milk Solids / Lactation Curve



# Urea or Season??? Protein Curves 23/24 vs 22/23



Smoothed Protein % Curves by 6WICR Quartiles (Veterinary Centre 22/23)







# Addressing the NICR

PHANTOM COWS

**EXTENDING MATING** 

## 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

#### PHANTOM COWS

In 2022/23 if NO intervention
EXPECTED NICR from JUST
Phantom cows would have been
>10%

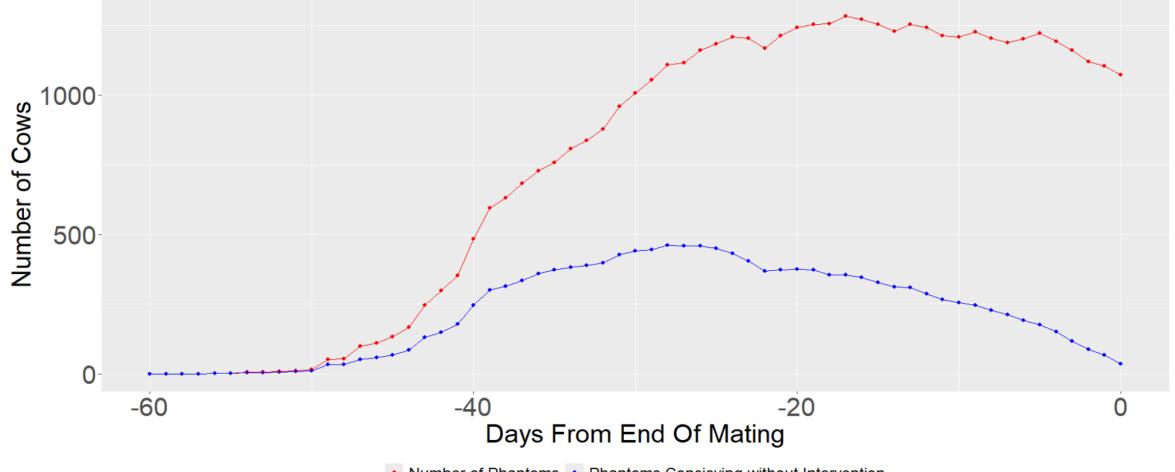
(In 2023/24 < 7%)

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

#### Number of Phantoms and Number Concieving Without Intervention Against Days From End of Mating



→ Number of Phantoms → Phantoms Concieving without Intervention





Days From End of Mating	10	15	20	25
Percentage of Herd to Scan	73.4%	69.0%	64.1%	57.8%
Phantom Percentage	8.3%	9.2%	10.0%	11.4%
Percentage Mismated	2.8%	2.6%	2.3%	2.5%
Submission Rate Phantoms Before End of Mating	35.4%	49.0%	58.2%	64.7%
Percentage phantoms conceiving naturally	20.0%	26.1%	29.6%	35.5%
GPG +P4 Pregnancy Rate	45.0%	45.0%	45.0%	45.0%
Empty Rate Difference	25.0%	18.9%	15.4%	9.5%
DIM Change per phantom cow	-0.93	0.31	1.43	1.97
Benefit from Days in Milk per Phantom Cow	-\$8.18	\$2.71	\$12.60	\$17.32
Benefit from Empty Rate per Phantom Cow	\$250.13	\$188.92	\$154.06	\$95.31
Total Cost Benefit	\$286,835	\$216,087	\$175,669	\$85,557
Cost Benefit Per Phantom	\$183.75	\$133.06	\$106.53	\$50.75
Herd Empty rate change	1.52%	1.20%	0.99%	0.63%
ROI	4.16	3.27	2.77	1.82





### **Conclusions**

#### 1. Treating after first round of AB

- There was a positive return on investment of 1.7-2 x
- Delaying slightly to 26+ days resulted in a better ROI
- Expected herd empty rate change 0.6-0.7%
- Never too late to intervene

#### 2. Phantom cow scanning

- Scanning 10 days before the end of mating gave the biggest return
- Reducing the cut off from 35 to 28 days increased the benefits
- 1.5% reduction in empty rate
- Mismatings a significant issue to be aware of

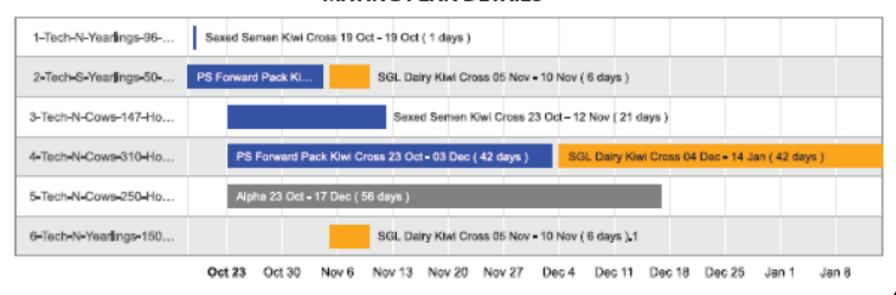




#### Mating Period / SGL Semen

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

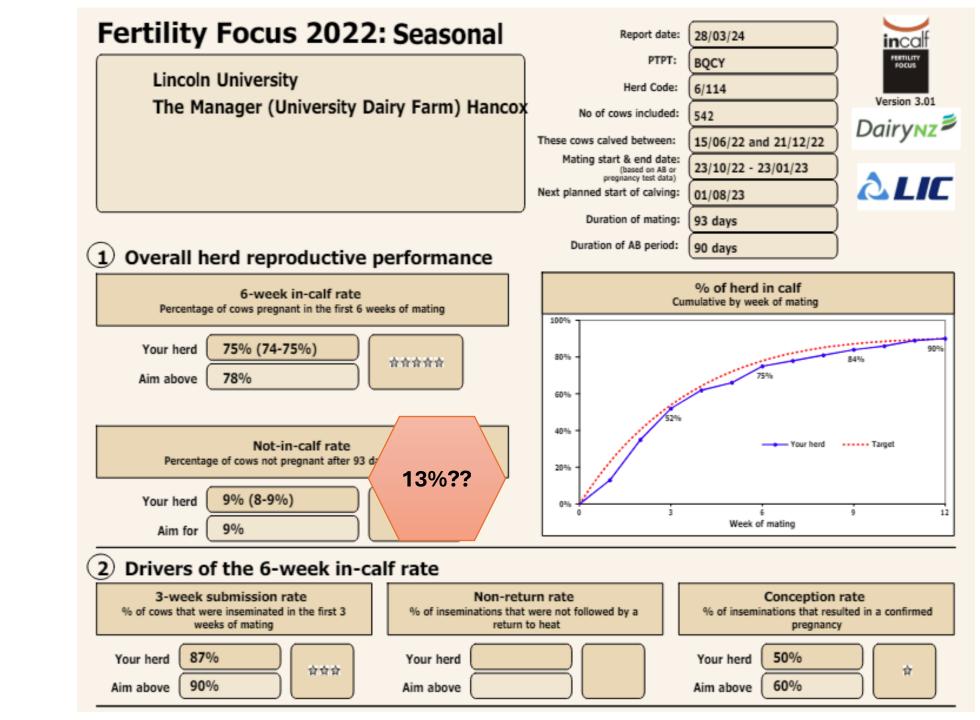


Scanning was completed on a weekly basis through December, with a final scan in Late February. It was confirmed that an additional 4.2% (24) cows were in calf with combining the collar and short gestation technologies. Mating can be extended without collars, however we will be demanding staff do extra work (drafting) through the xmas/new year break. Collars are automated.

#### EXTENDING MATING

In 2022/23 by extending the mating length 3.3% more cows got in calf

In 2023/24 4.2% (with 5 days less mating)



3WICR 52% to 54%

6WICR 75% (held)

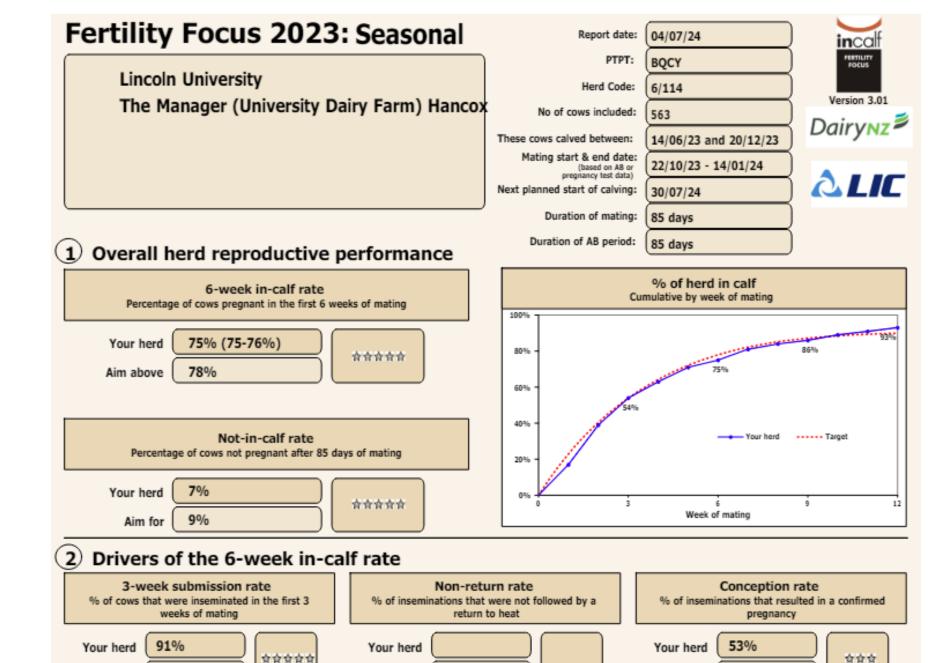
Conception Rate 50% to 53%

NICR 9% (13%?) to 7%

5 DAYS LESS MATING

90%

Aim above

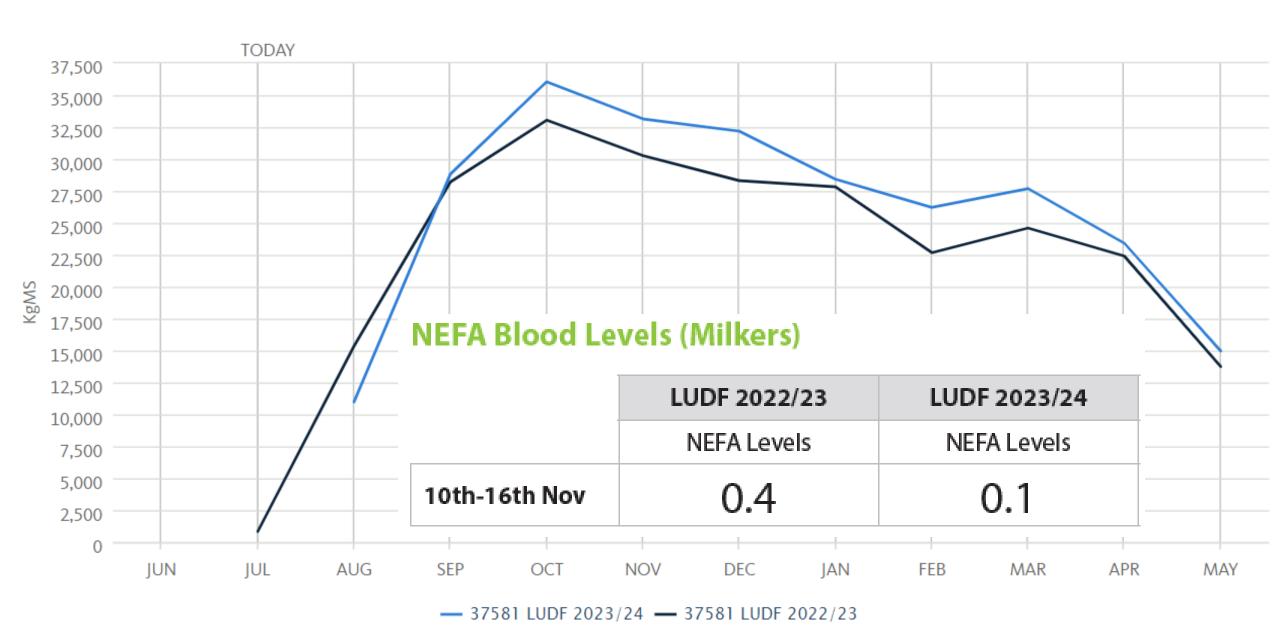


Aim above

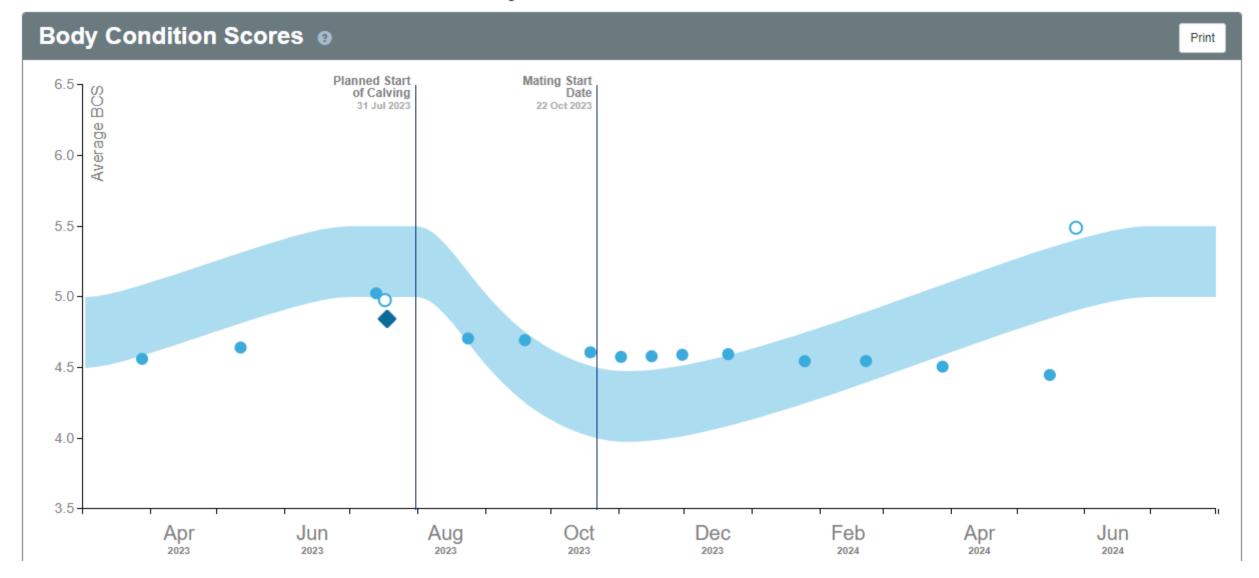
60%

Aim above

# Milk Solids / Lactation Curve



#### BCS for 1 March 2023 - 31 July 2024



Thank you to our SIDDC partners for enabling this project and to Ryan Luckman from The Veterinary Centre.



















