



**Dairy Trust**  
TARANAKI



## **Dairy Trust Taranaki Field Day**

### **Step Change**

Gibson Farm, Whareroa Road, Hawera. Supply number: 40374 from 10.00am

### **Autumn Calving**

Kavanagh Farm, Nowell Road, Hawera. Supply number: 40393 from 12.30pm

## **Agenda**

**10.00am - Welcome and introduction**

**10.15am - What is Step Change?**

**10.25am - Trial design and results**

**10.40am - Farm walk**

**11.20am - What next for Step Change nationally?**

**11.30am - Questions**

**11.40am - Lunch**

**12.20pm - Move to Kavanagh Farm**

**12.30pm - Welcome and introduction**

**12.40pm - Trial design and results**

**1.00pm - Farm walk**

**1.25pm - Calving resources involved in mating programs to reduce bobby calves**

**1.40pm - Launch of new trial**

**1.50pm - Summary**

# Gibson Farm - Step Change Program

Reduce footprint & keep profit?

## Zero Carbon Bill

Emissions reduction target is a 10% reduction of methane by 2030 and a 24% – 47% reduction in methane emissions by 2050.

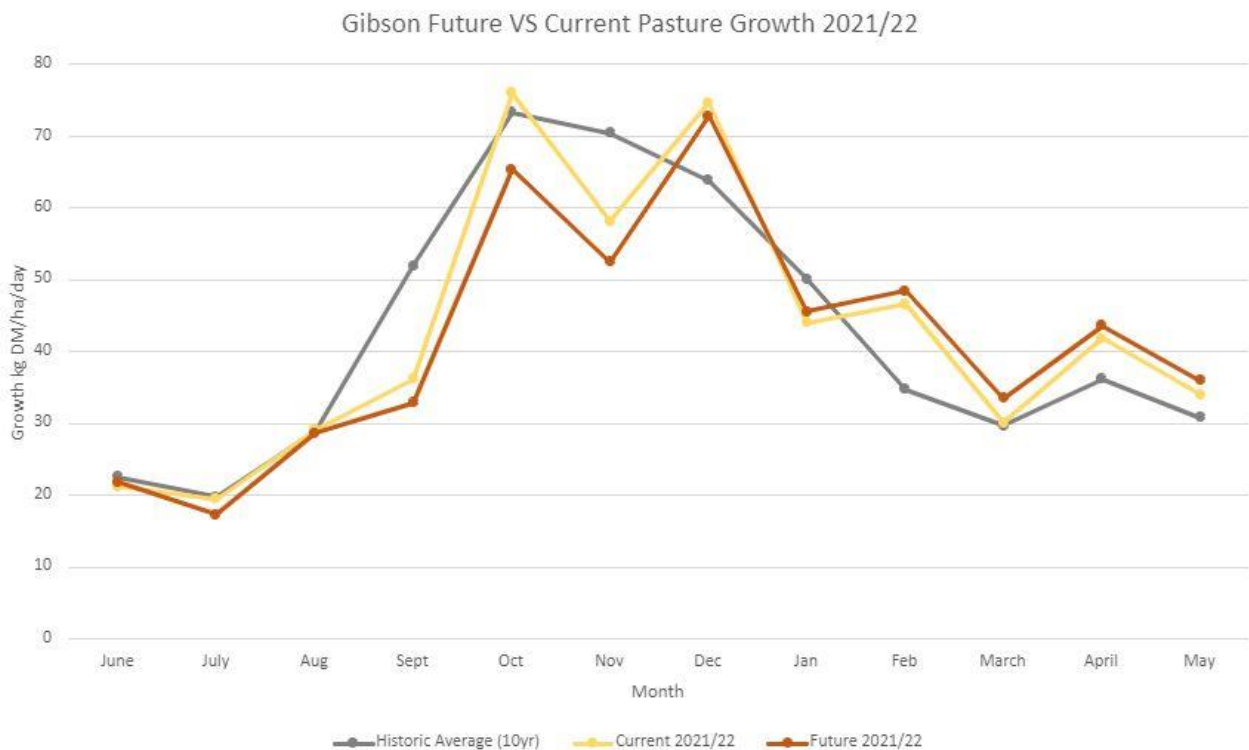
3-year farmlet study at DTT Gibson

2 farmlets:

- Current = 3.1 cows/ha, 190 kg N/ha, up to 700 kg DM/cow imported feed
- Future = 2.5 cows/ha, 75 kg N/ha, up to 300 kg DM/cow imported feed

## Results - Year 2 2021-2022 season

	Current	Future
Cows/ha	3.0	2.5
Kg N/ha	158	71
Pasture grown (t DM/ha)	16.1	15.7
Imported feed (t DM/ha)	1.81	0.33
Total feed offered (t DM/ha)	17.91	16.03
Estimated feed eaten (t DM/ha)	15.76	13.46
% Utilised	88	84



### Milksolids Production

	Current	Future
Kg MS/ha	1249	1093
Kg MS/cow	403	428
Days in milk	282	294
Kg LWT/cow (Dec 21)	495	493
MS as % LWT	0.81	0.84

### Economics per hectare

	Current	Future	Difference**
Milk income (\$9.50/kg MS)	\$11,849	\$10,390	-12%
Stock sales	\$687	\$573	-16%
Gross Farm Revenue	\$12,544	\$10,969	-12.5%
Operating expenses	\$6,775	\$5,310	-21.6%
Operating Expenses/kg MS	\$5.38	\$4.80	-10.7%
Operating profit/ha	\$5,769	\$5,659	-2%

← -\$110/ha

### Sensitivity Analysis

Op profit/ha @ \$6/kg MS	\$1,482	\$1,901	+\$419/ha
Op profit/ha @ \$7/kg MS	\$2,743	\$3,006	+\$263/ha
Op profit/ha @ \$8/kg MS	\$4,003	\$4,111	+\$108/ha
Op profit/ha @ \$9/kg MS	\$5,264	\$5,217	-\$47/ha
Op Profit/ha @ \$10/kg MS	\$6,524	\$6,322	-\$202/ha

Milk price needed for similar operating profit/ha = **\$8.70/ kg MS**

Average imported feed price for similar profit/ha = **\$490/T** (average \$403/T for 2021/22)

Average nitrogen price spread for similar profit/ha = **\$1,700/T** (average \$1167/T for 2021/22)

### Greenhouse Gas (GHG) and Nitrogen Loss Analysis

	Current	Future	Difference**
Total GHG/ha (t CO <sub>2</sub> -eq/ha/yr)	13.3	10.45	-21%
Methane (t CO <sub>2</sub> -eq/ha/yr)	8.75	7.41	-15%
Nitrous Oxide (t CO <sub>2</sub> -eq/ha/yr)	2.74	2.09	-24%
Carbon Dioxide (t CO <sub>2</sub> -eq/ha/yr)	1.89	0.94	-50%
GHG/kg MS (kg CO <sub>2</sub> -eq /kg MS)	10.64	9.56	-10%
N Loss (kg N/ha)	37	28	-24%
N Surplus (kg N/ha)	198	142	-28%
Nitrogen Conversion Efficiency (%)	31	34	+9.6%

← Target is 10% reduction

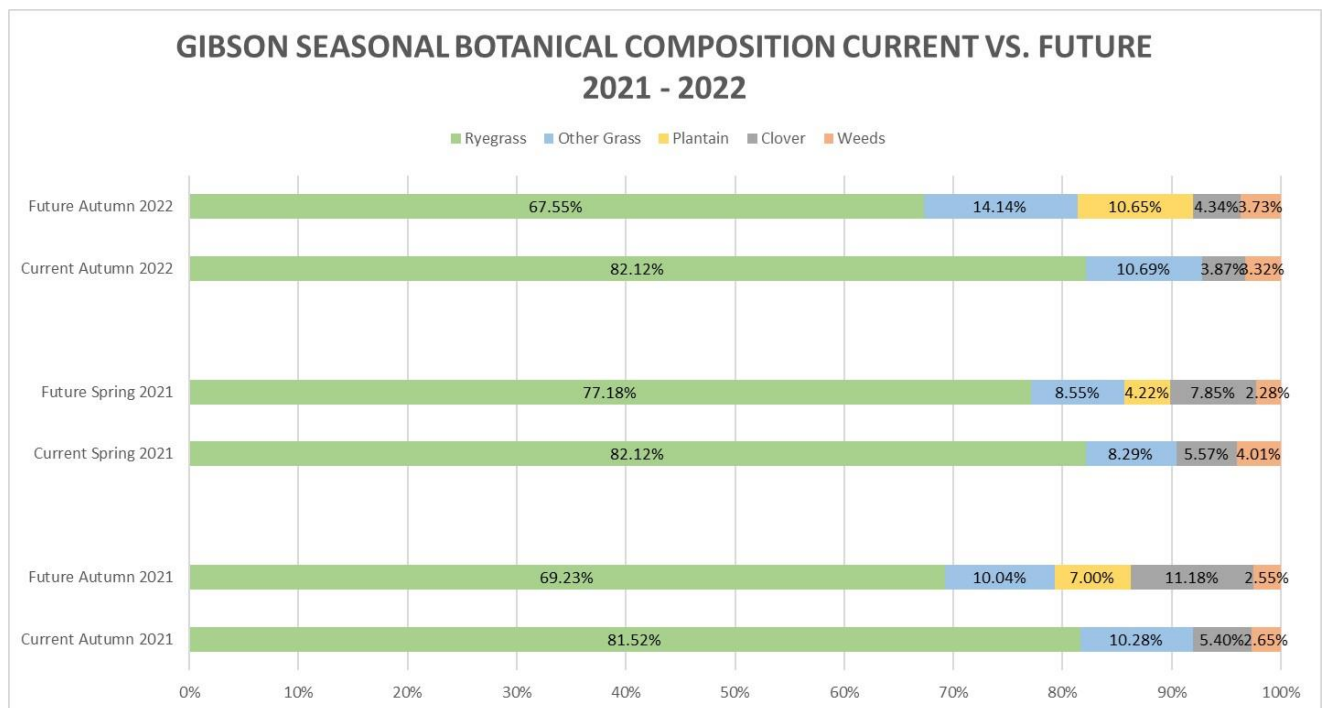
\*\* Difference is calculated as current minus future

**Soil Carbon & Organic Matter (Spring 2021)**

	<b>Current</b>	<b>Future</b>	
Soil Carbon (% ww)	8.97	9.04	Medium level
Organic matter (% ww)	15.47	15.59	Medium level

Typical concentrations of carbon in NZ Allophane soils = 6 - 10 % ww

**Botanical Composition**



## Summary of Year 1 farmlet trial

### *Future farmlet effect 2020-2021*

- N input: - 91 kg N/ha
- Pasture growth: -1.4 t DM/ha
- Milk production: - 211 kg MS/ha
- Operating profit: -14% (\$657/ha)
- Total GHG: -21%
- Methane: -13%
- N loss: -10 kg N/ha = 22%

### *Future farmlet effect 2021-2022*

- N input: - 87 kg N/ha
- Pasture growth: - 0.4 t DM/ha
- Milk production: -156 kg MS/ha
- Operating profit: -2% (\$110/ha)
- Total GHG: -22%
- Methane: -15%
- N loss: 9 kg N/ha = 24%

Continue upward trend per cow and per hectare for the futures while maintaining similar levels of profitability.

### **He Waka Eke Noa**

Consider the implications for these farm systems for emissions pricing that will start in 2025 with He Waka Eke Noa (HWEN).

Indicative price is currently 11 cents/kg methane

Futures in 20/21 emitted 1,100 kg CO<sub>2</sub> eq/ha less methane per ha.

For 21/22 the difference is 1,340 kg CO<sub>2</sub> eq/ha less methane

1,340 kg CO<sub>2</sub> eq/ha = 53.6 kg of methane    x    \$0.11/kg    =    \$5.90 reduction per ha

Lunch kindly sponsored by:





## Kavanagh - Autumn Calving Trial

Biophysical, environmental, and economic effects of autumn vs spring calving.

Summer dry has been identified by farmers as being the most challenging climatic event in many coastal areas of the North Island. The average summer rainfall in Coastal Taranaki is 240mm with evapotranspiration of 410mm. The result is long periods of moisture deficit, reduced pasture growth rates, and greater size and duration of feed deficits. In comparison, winter pasture growth rates have increased over the past 20 years, with more widespread use of urea and gibberellic acid, improved ryegrass cultivars, and increased soil temperatures (+1.6°C in last 30 years).

To add to the incentive of feeding and milking cows during the winter, compared with summer, Fonterra and Open Country were offering Winter Milk Contracts for UHT exports to China and short shelf-life products that need to be made during winter.

The trial that has just been completed at DTT Kavanagh investigated the benefits and costs of autumn calving. The Kavanagh farm is coastally located on the outskirts of Hawera.

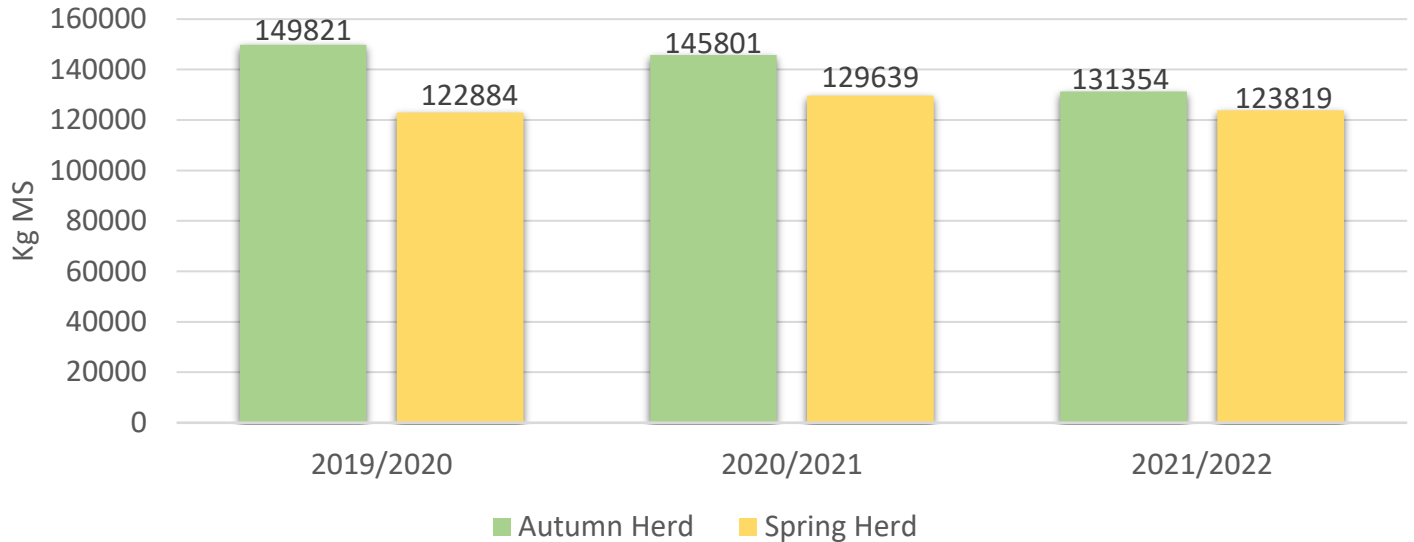
### **Trial Outline:**

- Two 104ha farmlets established in spring 2017 – 4-5ha paddocks all randomized for soil fertility, location/block (equal number on coastal side of farm), and equal effluent paddocks.
- Each farmlet had 300 Friesian cross cows – randomized, balanced herd based on age, PW, BW, LWT, calving date, MS Production from previous season.
- During the transition period the autumn herd required an extended calving interval with extra days in milk ranging from 488 to 577 days max. The key implications of this were a greater winter feed deficit, which increased supplementary feed requirements; a greater summer feed surplus, which required more pasture conservation; improved reproductive performance and greater grazing costs. A full paper is available on the transition period to autumn calving at request.
- The autumn calving trial finished on the 31<sup>st</sup> of May 2022 and what is presented is high level results from the final season. A full paper will be prepared over the next six months and will be communicated to the industry once completed.



**Previous Milk Production**

**Kavanagh Milk Solid Production  
(1 June - 31 May)**



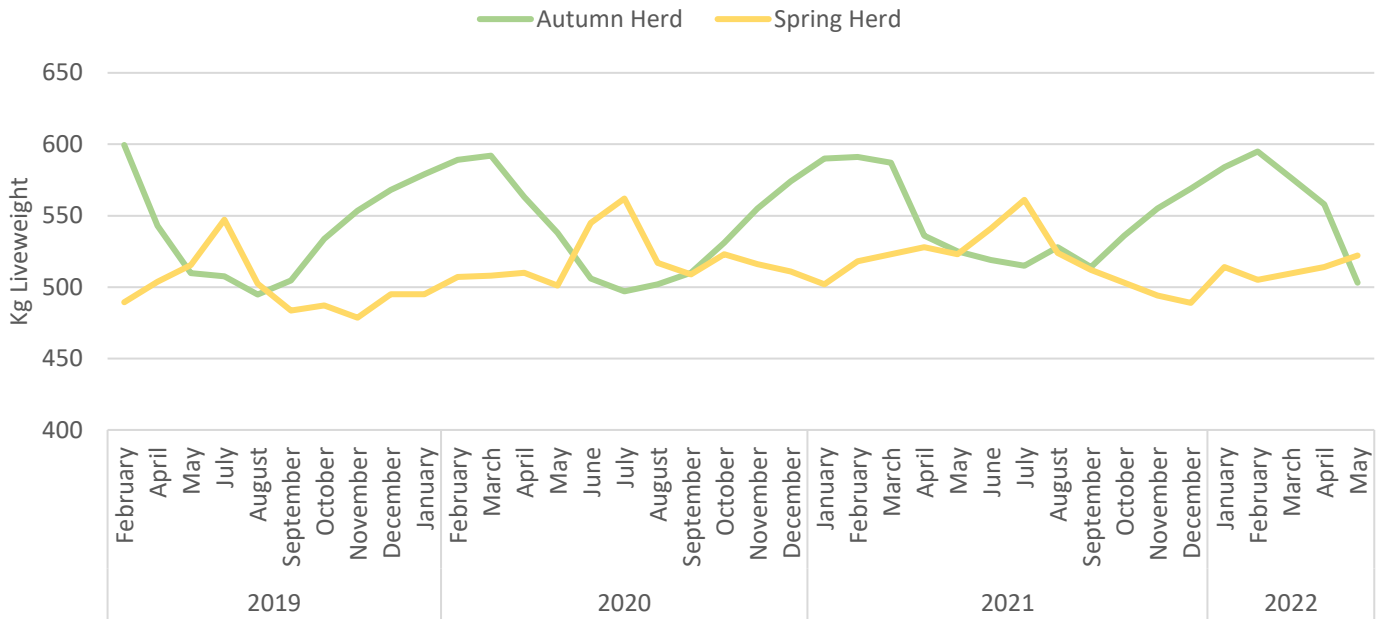
	2019/2020 Season		2020/2021 Season		2021/2022 Season	
	Autumn herd	Spring herd	Autumn herd	Spring herd	Autumn herd	Spring herd
kgMS/cow	504	417	491	428	451	413
kgMS/ha	1427	1170	1389	1235	1251	1179

**Animal Health**

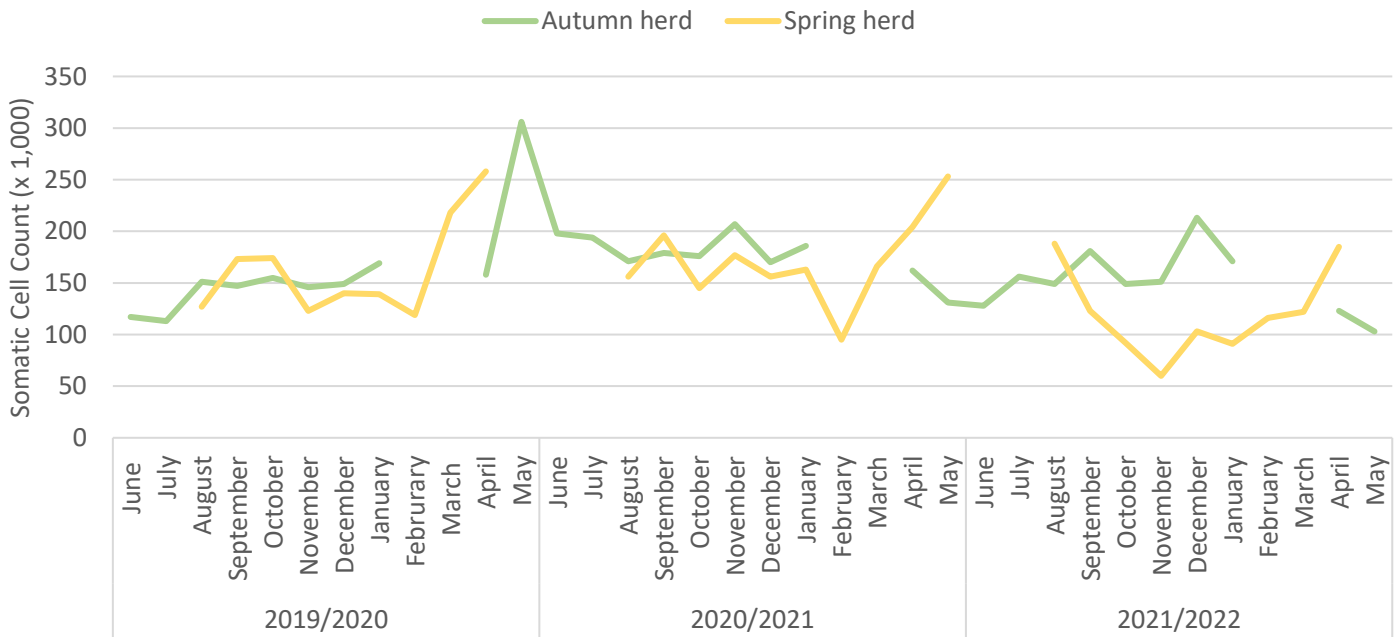
Animal health incidences:

	2019/2020 Season		2020/2021 Season		2021/2022 Season	
	Autumn Herd	Spring Herd	Autumn Herd	Spring Herd	Autumn Herd	Spring Herd
Treated lameness	29	26	19	33	32	36
Mastitis cases	102	97	64	82	30	16

Kavanagh liveweight change over time



Average SCC Autumn herd VS Spring herd



### Average SCC

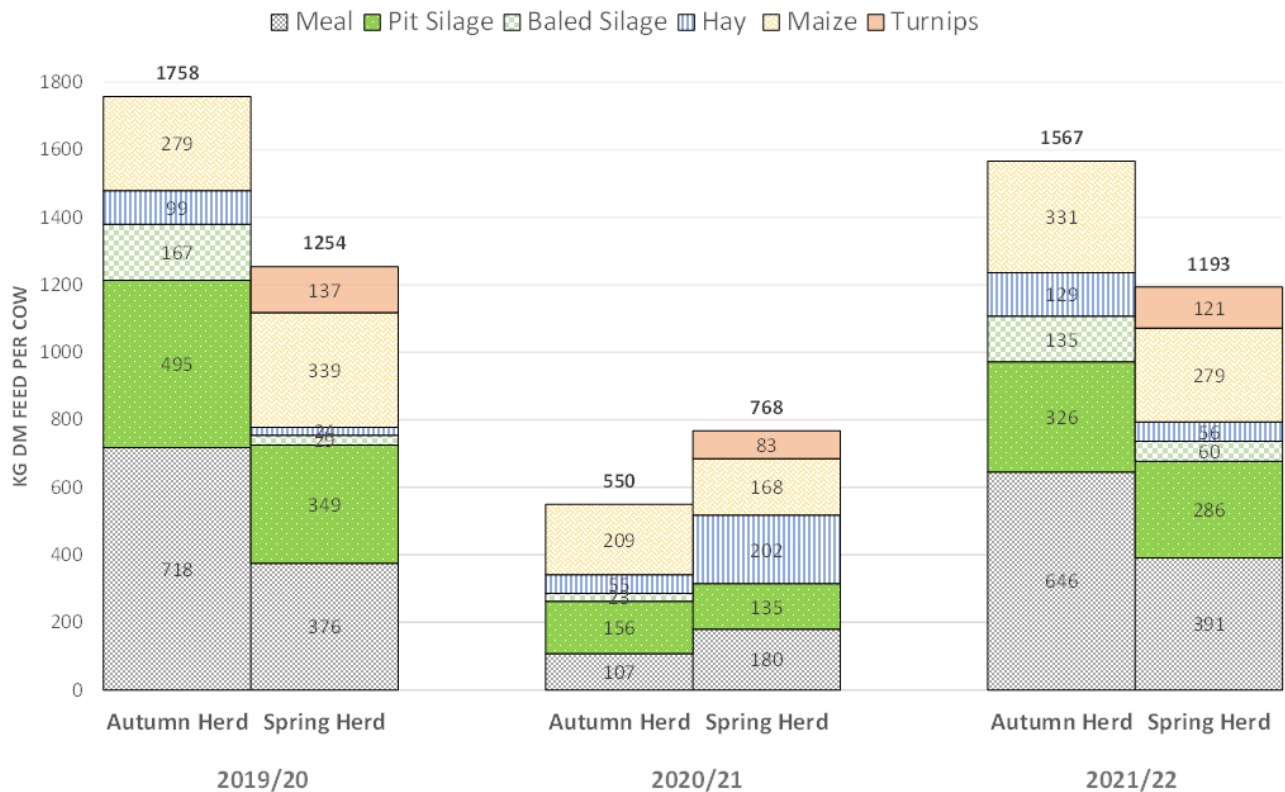
	Autumn Herd	Spring Herd
2019/2020	161	163
2020/2021	178	171
2021/2022	152	120

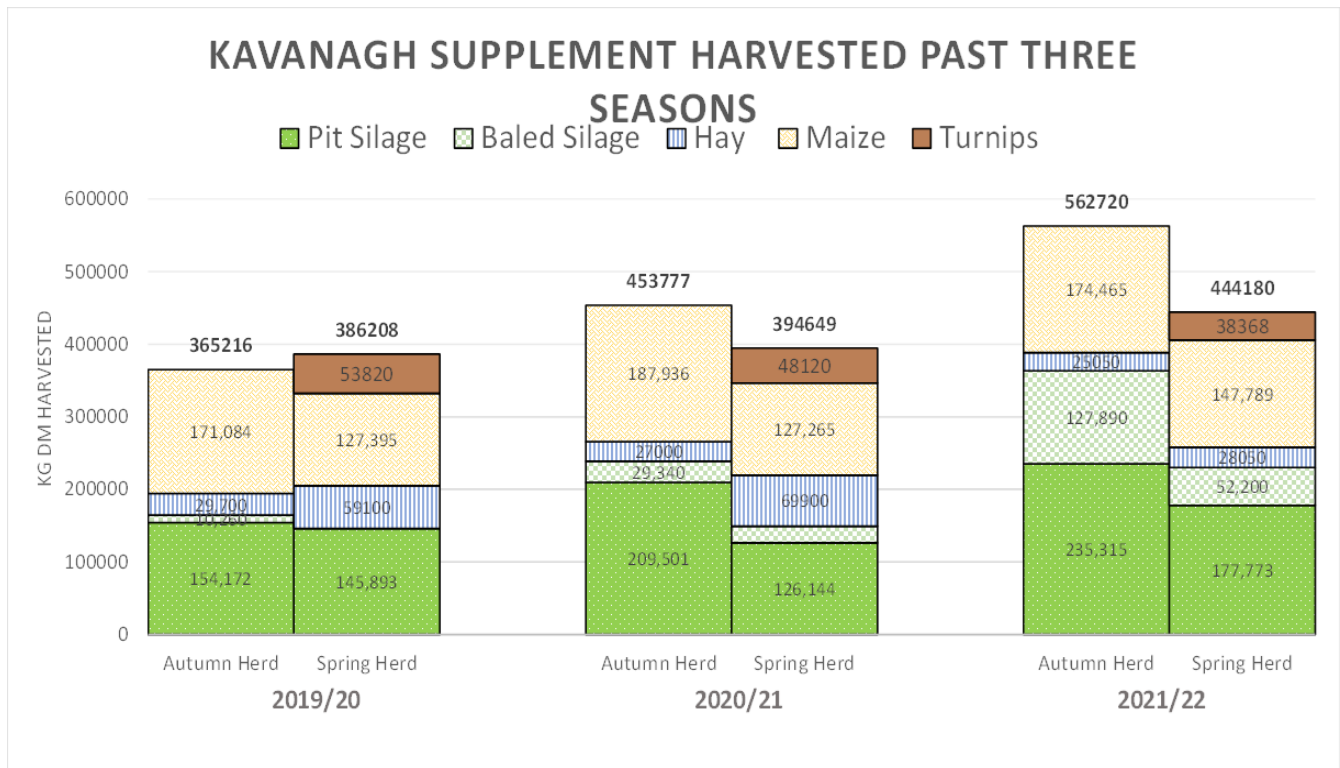
### Feed Analysis

Pasture production (kgDM/ha)

	Autumn herd	Spring herd	Difference
2019/2020	14,167	14,351	-184
2020/2021	17,473	17,818	-345
2021/2022	17,102	16,817	285

### KAVANAGH SUPPLEMENT FED (KG DM/COW)





### Conversion Efficiency 2021/2022

	<b>Autumn</b>	<b>Spring</b>
Pasture growth (kg DM/ha)	17,102	16,817
Supplements fed (kg DM/ha)	1,910	1,116
Total feed (kg DM/ha)	19,012	17,933
kg MS/ha	1,251	1,179
Feed conversion (kg DM/kg MS)	15.2	15.2

## Economic Analysis

### Operating profit per hectare

	Autumn	Spring
2018/2019	\$2,368*	\$3,820
2019/2020	\$5,833	\$3,550
2020/2021	\$5,771	\$4,454
2021/2022	\$6,437	\$5,251
<b>Average</b>	<b>\$5,102</b>	<b>\$4,268</b>

\* Includes infrastructure and additional share costs

2021/2022 Season	Autumn	Spring
Gross farm revenue/ha	\$13,043	\$11,237
Gross farm revenue \$/kgMS	\$10.43	\$9.53
Operating expenses/ha	\$6,606	\$5,986
Operating profit/ha	\$6,437	\$5,251
Operating expenses/kgMS	\$5.28	\$5.08

## Winter Milk Premium factor

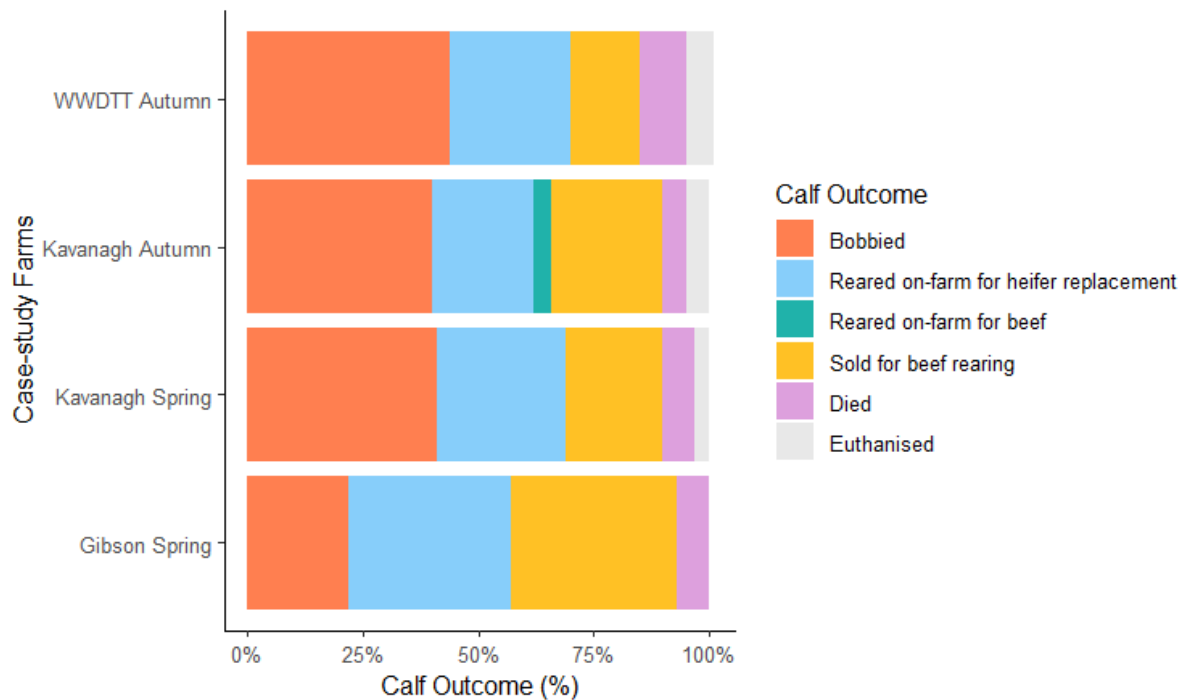
It should be noted the winter milk premium has contributed \$960 revenue per hectare in the last season with the remaining \$846 per hectare increased value coming from increase stock sales and production.

## The Calving Resources Required for Mating Programs Aiming to Reduce Bobby Calves on New Zealand Dairy Farms – A Case Study and Scenario Analysis.

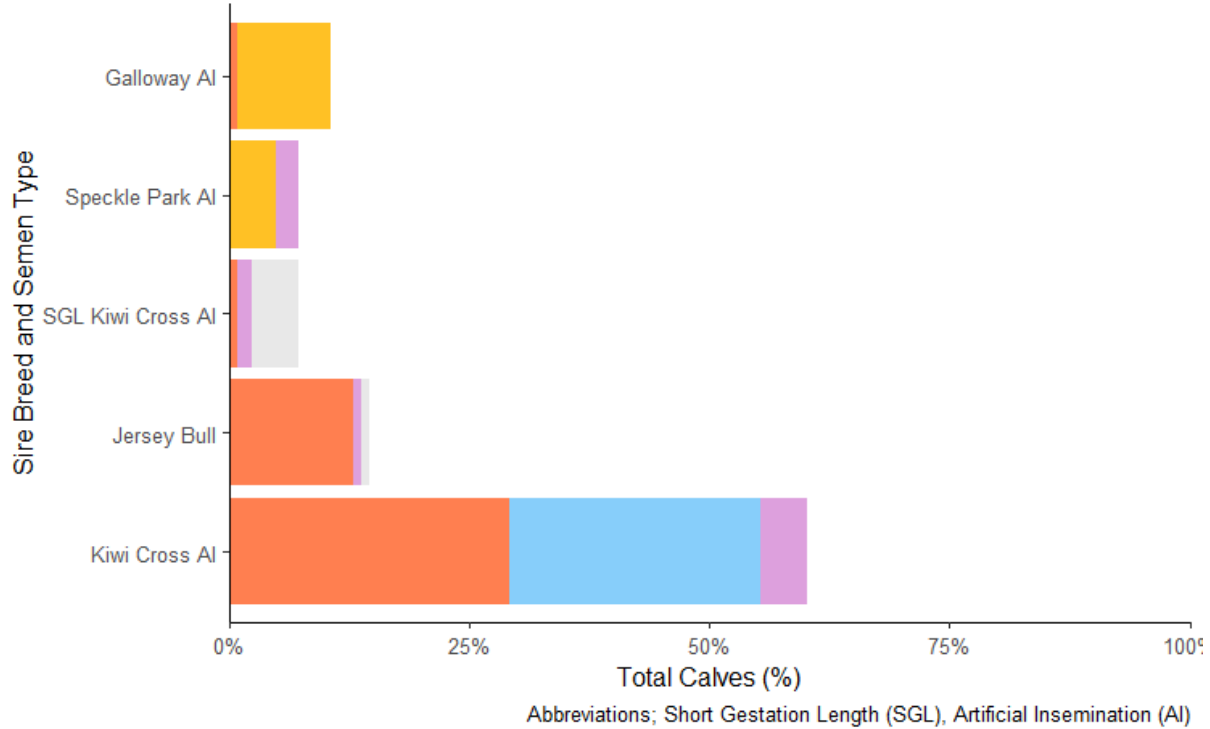
The aim of the study was to evaluate the risks and opportunities of mating programmes aimed to reduce bobby calf numbers and determine the extent that expected outcomes can be achieved on New Zealand dairy farms over the calving period, regarding shed capacity and feed requirements.

**Outcome of calves born to mating programs implemented on case-study farms.**

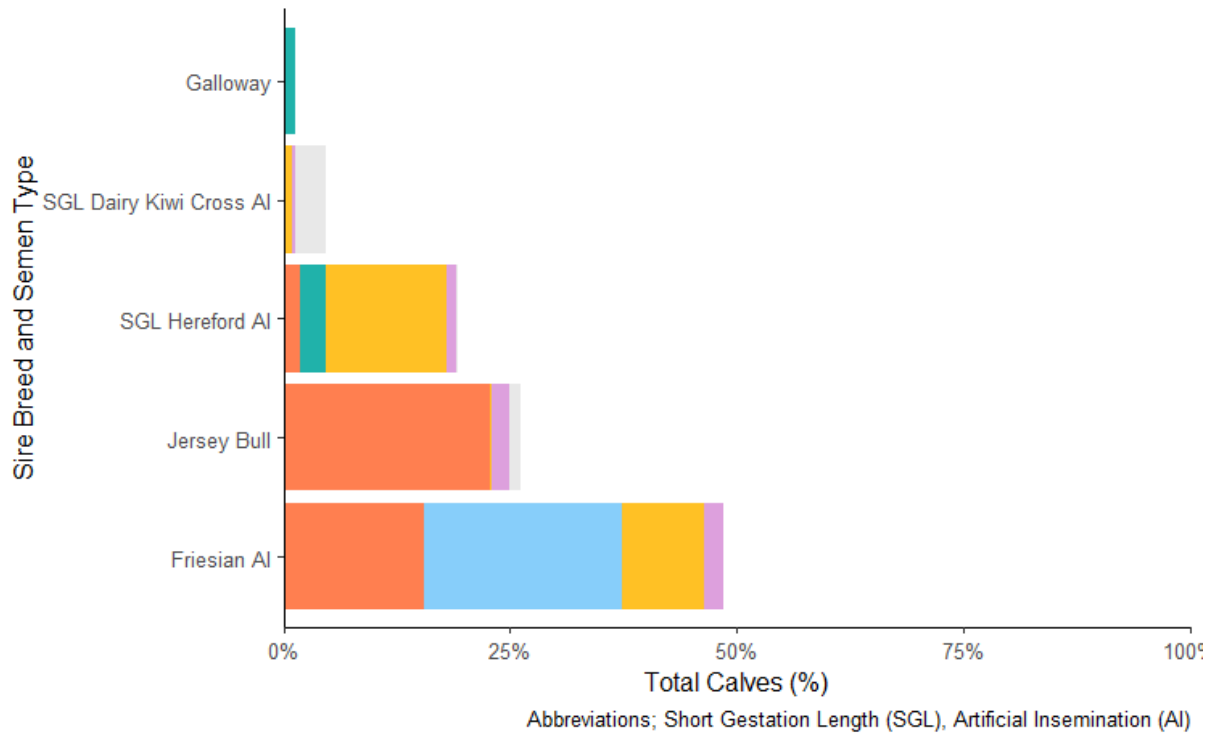
Data collected autumn and spring calving 2021.



**Calf outcome by sire breed and semen type.**  
Waimate West - Autumn Calving 2021.



**Calf outcome by sire breed and semen type.**  
Kavanagh - Autumn Calving 2021.





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