

LINCOLN UNIVERSITY DAIRY FARM

Variable Milking Research – Dairy NZ

Many NZ dairy farms have been practicing variable milking for part of the season. The motivations of farmers have been to take the pressure off cows, people and the pasture demand. To confirm the impact of variable milking on milk production and cow welfare outcomes, Paul Edwards, Dairy NZ completed research and Lincoln University Dairy Research Unit.

A variable research trial was completed based on three start dates for variable milking. Day 1 of lactation, 1st December and 1st March. A control comparison of Twice a day milking (TAD) was included with cows milking the full season on TAD,

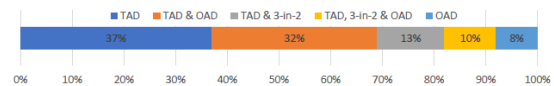
The research concluded that cows will drop 5% from the day that the farmer commences variable milking.

Most of this drop comes in the form of a drop in protein production. Cow condition at the close of the season was 0.25 CS better for full season variable milking. The response in cow condition was linear from the time you started variable milking, eg, mid season = 0.125 CS better.

The research also completed a 6 week trail to confirm the impact of the time between milking on per cow production. The initial concept of variable milking was to milk the cows 8-20-20 hours apart, resulting in some antisocial milking times. The research concluded that Milk period had no significant difference on milk production which gives us greater flexibility on milking time and staff rosters.

Use of milking frequency

- >5400 Fonterra farms with a complete season of vat telemetry in 20/21
- Used each milking frequency for at least 4 weeks



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Test system effects with farmlets



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

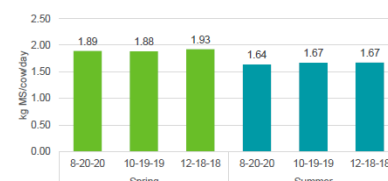
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Key farmlet results



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Results



- No significant differences between groups
- Possible to use more attractive 3-in-2 milking times

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1. Anticipated impact on LUDF –

1.1. Farmax Dairy

- Cow numbers to stay the same.
- Variable milking to commence from day 1.
- Lactation curve projected a 5% drop. Production was dropped from 494 kgMS/cow to 471 kgMS/cow. (274,600 to 270,600 kgMS).
- Culled as per current policy to keep N leaching low.
- Maintained Nitrogen fertiliser at 160 kg/Ha nitrogen.
- Cut silage in spring / early summer to maintain quality, Fed silage back in autumn
- Total Production dropped by 11,800 kgMSh.

1.2. Impact on Inputs, resources and finances

- Decreased petrol and motorbike R&M by 25%.
- Decreased power consumption by 13 % with less running time of shed.
- Cost of cleaning shed and plant dropped by 25 %.
- Winter feed requirements dropped by \$1.80 / wk as cows 0.23 CS fatter at the close of the season. This is based on \$0.29 / kgDM. This will even up/negate the impact on CS on the following mating.
- Lameness, TAD 12%. Var 0%. Will increase in per cow. If \$40 / cow for treatment (excluding milk). Decreases animal health spend by \$4.80 / per cow.

1.3. Changes in Human Resource

- 3.5 FTE's on farm. 50 % of workload in milking. 19 % less time in milking.
- 0.33 FTE Drop in workload. Including house, @ \$65,000 PA. \$19,500.

1.4. 10 in 7 milking

Monday	4:30am	2.30pm	9.5 hours
Tuesday	9.30am		18 hours
Wednesday	4.30am	2.30pm	21.5 hours
Thursday	9.30am		18 hours
Friday	4.30am	2.30pm	9.5 hours
Saturday	11.00am		21 hours
Sunday	8:00 am		21.5 hours

2. Farmax Modelling

FARMAX YOUR ADVANTAGE Dairy 8.2.211		Compare Physical Summary Jun 20 - May 21			
Category	Description	LUDF DSM	LUDF DSM	LUDF DSM	
		202021 Revised Mar	Variable Full Season 2021	Variable Low Stock	
Farm	Effective Area	160	160	160	ha
	Stocking Rate	3.5	3.6	3.5	cows/ha
	Potential Pasture Growth	18.6	18.6	18.6	t DM/ha
	Nitrogen Use per total ha	161	161	161	kg N/ha
	Feed Conversion Efficiency (eaten)	10.6	11.1	11.0	kg DM eaten/kg MS
Herd	Cow Numbers (1st July)	556	575	556	cows
	Peak Cows Milked	556	575	556	cows
	Days in Milk	280	279	281	days
	Avg. BCS at calving	5.1	5.1	5.1	BCS
	Liveweight per total ha	1,641	1,727	1,669	kg/ha
Production (to Factory)	Milk Solids total	274,684	270,612	262,827	kg
	Milk Solids per total ha	1,717	1,691	1,643	kg/ha
	Milk Solids per cow	494	471	473	kg/cow
	Peak Milk Solids production	2.30	2.18	2.18	kg/cow/day
	Milk Solids as % of live weight	104.6	97.9	98.4	%
Feeding	Pasture Eaten per cow *	4.2	4.1	4.2	t DM/cow
	Supplements Eaten per cow *	0.3	0.4	0.3	t DM/cow
	Off-farm Grazing Eaten per cow *	0.7	0.7	0.7	t DM/cow
	Total Feed Eaten per cow *	5.2	5.2	5.2	t DM/cow
Diagnostics	Pasture Eaten per total ha	14.7	14.9	14.6	t DM/ha
	Supplements Eaten per total ha	1.4	1.6	1.3	t DM/ha
	Off-farm Grazing Eaten per total ha	4.5	4.6	4.5	t DM/ha
	Total Feed Eaten per total ha	20.5	21.1	20.4	t DM/ha
	Supplements and Grazing / Feed Eaten *	19.9	20.8	19.7	%
	Bought Feed / Feed Eaten *	9.1	10.5	8.3	%

NB. Previous versions of this report used a different [area definition](#).

(*) feed eaten by females > 20 months old / peak cows milked

FARMAX YOUR ADVANTAGE Dairy 8.2.211		Compare Forecast Profit and Loss Jul 20 - May 21				
			LUDF DSM	LUDF DSM	Difference	
			Variable Full Season 2021	202021 Revised Mar		
Revenue	Stock	Net Milk Sales - this season	1,809,097	1,830,199	21,103	
		Net Milk Sales - last season	0	0	0	
		Net Milk Sales - dividend	0	0	0	
		Net Livestock Sales	92,685	87,388	-5,297	
		Contract Grazing	0	0	0	
		Change in Livestock Value	0	0	0	
		Total	1,901,782	1,917,587	15,805	
	Crop & Feed	Capital Value Change	0	3,200	3,200	
		Total	0	3,200	3,200	
		Total Revenue	1,901,782	1,920,787	19,005	
Expenses	Wages	Wages	140,000	160,080	20,080	
		Management Wage	46,920	46,920	0	
	Stock	Animal Health	71,489	71,760	271	
		Breeding	28,550	27,600	-950	
		Farm Dairy	8,280	9,936	1,656	
		Electricity	19,985	22,356	2,371	
	Feed/Crop	Pasture Conserved	0	3,200	3,200	
		Feed Crop	3,780	3,780	0	
		Bought Feed	83,614	74,415	-9,200	
		Calf Feed	3,639	3,514	-125	
	Grazing	Grazing	271,363	272,558	1,195	
		Other Farm Working	Fertiliser (Excl. N)	35,680	35,680	0
			Nitrogen	42,400	42,400	0
			Irrigation	64,000	64,000	0
			Weed & Pest Control	3,840	3,840	0
			Vehicle Expenses	11,200	12,800	1,600
			Fuel	11,200	12,800	1,600
		R&M Land/Buildings	59,200	59,200	0	
			Freight & Cartage	1,600	1,600	0
		Overheads	Administration Expenses	24,000	24,000	0
Insurance	16,000		16,000	0		
ACC Levies	4,800		4,800	0		
	Rates	12,800	12,800	0		
	Total Farm Working Expenses	964,340	986,039	21,698		
	Depreciation	0	0	0		
	Total Farm Expenses	964,340	986,039	21,698		
	Economic Farm Surplus (EFS)	937,442	934,748	-2,693		
	Farm Profit before Tax	937,442	934,748	-2,693		
	Farm Profit per ha before Tax	5,859	5,842	-17		

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

