

Automatic feeder

Why are we looking at this feeder?

- Potential to increase milk yield
- Impact of daily weight gains
- Reduction in labour
- Animal health impacts

Automatic feeder details

- Förster-Technik with DeLaval branding.
- Measures milk intake for each calf 24/7.
- Allocates milk periodically to prevent gorging.
- Calves can be weaned individually.
- Machine cleans itself regularly.

Milk allocation for trial

0—10 days	2L every 2 hours
11—42 days	2.5L every 2 hours
43—70 days	Stepdown from ad-lib to 6L
At 95kg	10 days gradual weaning to 0L
Weaning	Individually, based on weight at 95kg

How does the machine work?



Key learnings

- Technical support required for machines.
- Ensure hopper size is correct for number of calves as they reach peak intake.
- Extended grass area required next to shed as calves need access to machine until weaned.
- Less labour requirements than other systems.

Why are we looking at ad-lib?

-  Potential to increase milk yield
-  Impact of daily weight gains
-  Reduction in labour
-  Animal health impacts

Ad-lib feeder details

- Heatwave ad-lib system.
- Allows true ad-lib milk feeding.
- Heats the milk to a specified temperature.
- Labour involved includes topping up milk and cleaning of 200L drums.

Milk allocation for trial

0—42 days	Unlimited milk supplied
43—70 days	Stepdown to 6L/day by 70
At 95kg	10 days gradual weaning to 0L
Weaning	Small groups, based on weight

*when youngest calf reaches age milestone

How does the machine work?



Key learnings

- Increasing the number of teats from one to four reduced competition between calves and reduced gorging.
- Heatwave machine blocked when milk sat in heat coil for too long (at the start when there were only few calves and later when calves spent long times outside not drinking).
- High labour requirements when machine became blocked.

Why was conventional feeding included?

- As a control to compare the ad-lib feeding systems to.
- Allows a comparison to a standard calf feeding system in NZ.

Conventional feeding method

- Fed twice a day.
- Milk offered in open group feeder designed by Milk Bar.
- Milk Bar teats used.
- Labour involves feeding calves and cleaning feeders.

Milk allocation for trial

Birth - weaning	3L twice a day
At 95kg	10 days gradual weaning to 0L*
Weaning	Small groups, based on weight at 95kg

*when youngest calf reaches age milestone

Milk feeder set up



Key learnings

- No reliance on technology eased troubleshooting.
- Labour requirement was high.
- Some calves drank more than others which was possible due to group feeding set up.

Calf feeding trial

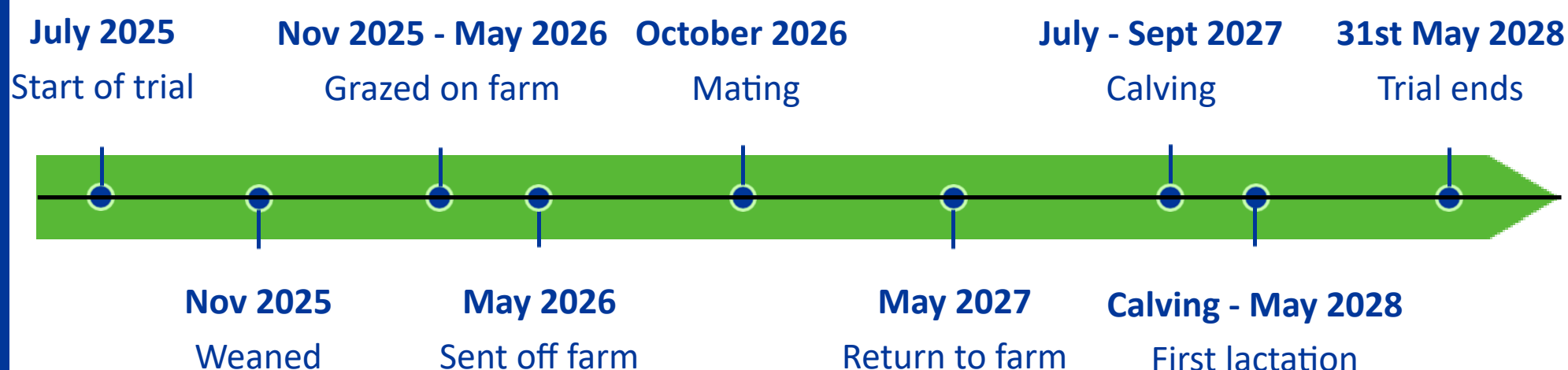
What is the purpose of this trial?

- To test how different calf rearing methods affect future milk production and first lactation performance.
- To examine whether improved first lactation efficiency can help reduce cows' lifetime greenhouse gas emissions.
- To compare labour needs, animal health, and rearing costs across different rearing methods.

Trial design

- Calves receive four colostrum feeds in training pens, then transition straight to calf milk replacer (AnCalf).
- Calves distributed based on birth weight, BW and age.
- Two pens of 24 calves max. per treatment.
- Calves are replacement heifers, born from cows inseminated with sexed semen.
- Calves are weighed weekly.
- Outdoor access begins once youngest calf in pen reaches 7 days old.

Timeline



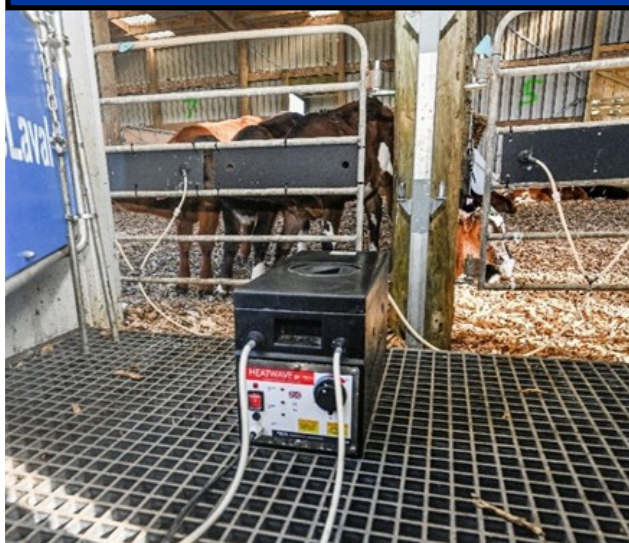
Automatic-feeder calves (Förster-Technik (DeLaval) feeder)



Offered individual milk allocation every 2 hours before it reduces towards weaning.

Monitored via Calf Cloud app.

Ad-lib fed calves (Heatwave calf feeder)



No intake limit before pen allocation reduces towards weaning.

Milk intake measured as a pen.

Conventional (manual) feeding



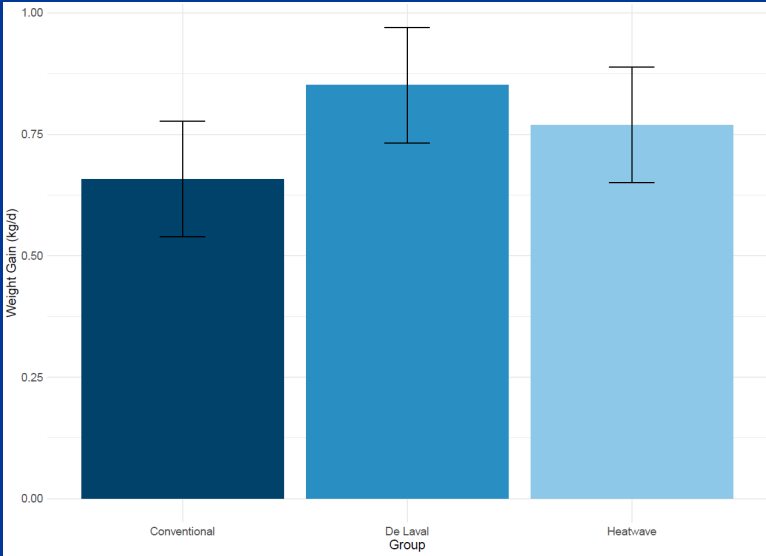
Calves fed 6L twice a day - morning and afternoon.

Milk allocated as a pen.

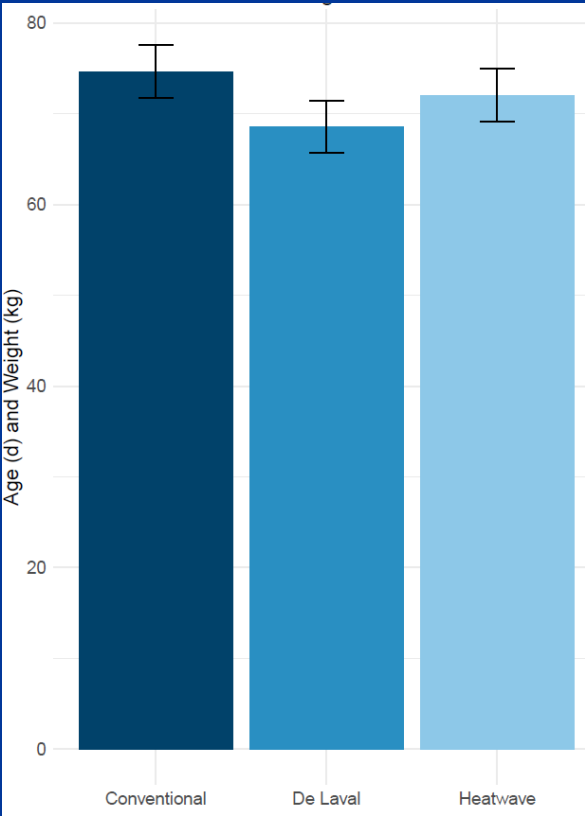
Calf feeding trial



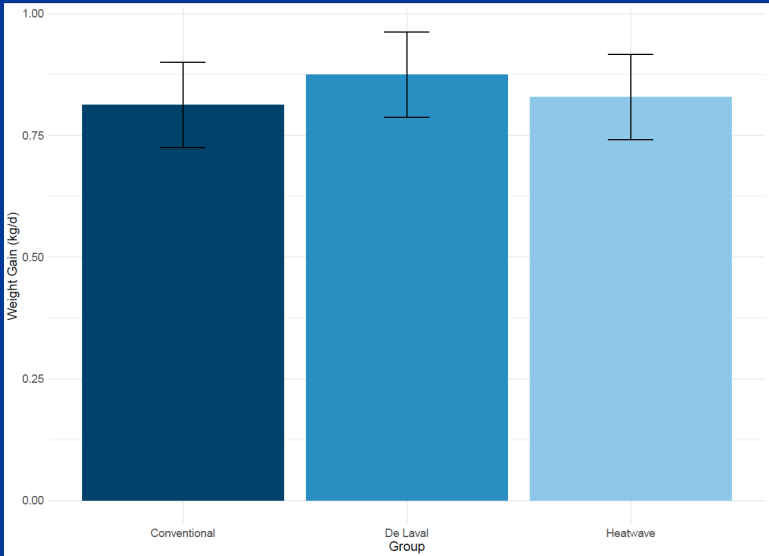
Daily weight gain to 42 days



Calf age at 95kg



Daily weight gain from birth to 6 weeks post weaning



Average daily weight gain:

- Automatic feeder 836 g/d
- Ad-lib feeder 820 g/d
- Conventional 678 g/d

Average age at 95 kg:

- Automatic feeder 69 days
- Ad-lib feeder 72 days
- Conventional 75 days

Average daily weight gain:

- Automatic feeder - 878 g/d
- Ad-lib feeder - 867 g/d
- Conventional - 862 g/d

Key performance insights

- Automatically-fed calves grew the fastest during the ad-lib phase, reaching weaning weight at a younger age.
- From birth to 6 weeks post-weaning, overall growth was similar across all systems.
- Ad-lib feeder calves had intermediate growth.

Key financial insights

- Conventional had the lowest cost per kilogram of weight gain.
- Ad-lib feeder was the most expensive per unit of weight gain.
- The automatic feeder has the highest equipment cost, affecting total system economics.

Milk and meal intake and cost per kilogram of liveweight gain (kg LWG) until 6 weeks post weaning

	Milk L/kg LWG	Milk powder \$/kg LWG	Meal kg/kg LWG	Meal \$/kg LWG	Total \$/kg LWG	Equipment cost/calf*	Labour
Automatic feeder	5.51	\$4.72	0.75	\$0.87	\$5.59	\$433	○
Ad-lib feeder	6.39	\$5.47	0.85	\$0.98	\$6.45	\$71	●
Conventional	5.13	\$4.39	1.02	\$1.18	\$5.57	\$38	●

*Prices may vary depending on existing farm infrastructure