Automating daily calf feeding

Words by: **Tim McVeagh**

Automation of livestock feeding, while requiring considerable capital investment, should need less labour and be a more efficient and more productive means of getting tucker down the throats of animals. But does automatic feeding stack up for calves? They can be fickle with slow drinkers and crookies.

Rearing young calves requires patience and empathy - attributes that women are often regarded as having more of than men but that machines are not renowned for.

If automatic calf feeding is a goer, what does a good system consist of? What will it do, and how well? And what's available to dairy farmers and calf rearers?

Automatic calf feeders range from the basic to quite complex systems. The basic models provide mixed calf milk replacer (CMR) or milk on an ad-lib basis to a pen full of calves.

The most sophisticated systems have individual calf feed mix and ration programs, and monitor feeding and weight gain. And of course cost varies significantly, even between installations of the same system under different conditions.

WHY AUTOMATIC CALF FEEDING?

A successful automated calf feeder will:

- Save on labour by freeing up staff at a busy time and possibly avoid the need to employ casual staff.
- Rear a more even line of better, quieter calves; and quicker. These are claims made by advocates including users, though may draw on comparisons with a manual system that was inefficient and problematic. Better means heavier and healthier; quieter because there is less bullying and speed drinking; and "quicker" means reaching weaning weights earlier. The key to this is that an allocated ration of milk is fed little and often so every calf has the chance to get its daily allocation. The quick drinkers do not get more than their fair share at the expense of the slow ones. It also reduces scouring.
- Provide a safer and easier workplace with less heavy lifting, hot water handling, and vehicles.
- Allow ration size, blend recipe, and feeding frequency to be programmed and changed with age, even on an individual calf basis.

And it can also monitor consumption, drinking rate, liveweight, and absenteeism with alerts to any problems, which often go undetected in a manual system until calves are really sick.

David Reid of Reid Systems said that the company had two calf sheds connected by WiFi to one controller.

"Fifteen single feeders in one shed, six in the other, with approximately 35 calves per feeder. Some pens had three feeders in them. The second shed had a viewing computer with a 24" monitor to show the status of the calves.

"At the peak of the season they would have had around 700 calves in the sheds. They were our early single stalls, which we have redesigned and made them a double unit. Both teats have their own pump so both can feed at the same time".

WHAT'S STOPPING YOU?

- **Cost.** Automatic calf feeders on the New Zealand market start at around $8500. Costs have not been documented in this article. Comparisons would be irrelevant as systems' capabilities vary so much as do installation details.
- Maintenance costs include a scheduled annual check for some models.
- **Breakdowns.** Machinery or power failures mean that a manual feeding system may need to be redeployed until the fault is found and fixed.

MECHANICS AND OPTIONS.

A typical automated calf feeder will consist of five parts:

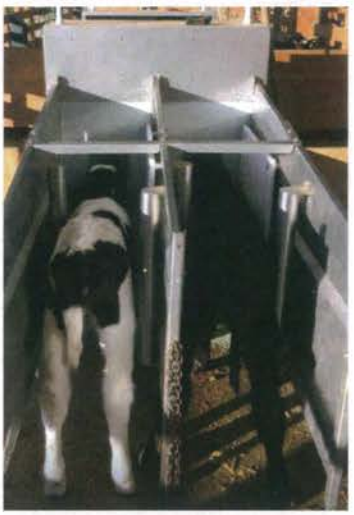
- **Storage.** Milk and colostrum will typically be drawn from the farm calf milk and colostrum vats. CMR will be dumped into a hopper. Other liquid and powder additives may be drawn from containers in the main mixing/dispensing unit.
- **Mixing/dispensing unit.** This allows the feeding regime to be programmed - feeds per day, litres per feed - on a mass, group, or individual basis. It carries out the mixing of CMR and blending with milk, colostrum, or any additives, and dispenses it. It can record individual calf feed consumption, drinking speed, absenteeism, and weight. It controls the cleaning system. Programming, and viewing calf records, may be done either at the unit and/or remotely.
- **Delivery system:** This is essentially tubing from the mixing/dispensing unit to the feeding stalls. While some systems have their feeding stalls as part of the main unit, most have remote feeding stalls allowing them to be sited in separate pens adjacent to the main unit. There are often limitations on the distance between the main unit and the feeding stalls.
- **Feeding stalls:** These may be single units or pairs fixed side by side. Most systems allow four stalls to be served by the mixing/dispensing unit and most allow the four

"The mixing and dispensing unit, set on concrete and well drained. It delivers milk, CMR, or a blend of both to four feeding stalls, each in their own pen. The distance from the main unit to the stalls is minimal. (Photo supplied by Lely).

Table 1: Specifications for calf feeders on the New Zealand market, as provided by their suppliers.

MODEL	De Laval CF 150 X	De Laval CF1000S	rEID Feeder
Made In	Norway	Germany	Timaru
Supplied By	De Laval	De Laval	Reid Systems Ltd
CONFIGURATION, CAPACITY			
Max Stalls per unit	4	4	Up to 21, at least.
Max calves per stall	25	25	Suggested 35
Max recommended calves per unit	100 – 120	100 – 120	Have had over 700.
Teat Withdrawal	No	Optional	No
Number of calves fed simultaneously	4	4	1 per teat.
Max distance from unit to stall	Unit and stall are combined	6m	Clear line of sight wifi connection. Have used 5 single feeders 500m away from controller with another 15 in the shed with the controller.
FEEDS			
Whole milk, CMR, Milk/CMR blend	Yes, and concentrated CMR	Yes, and concentrated CMR	Whole Milk, CMR
Supply	Whole milk and CMR are added to a tank for mixing.	Milk from the farm's calf milk vat. CMR from a 30kg or 50kg hopper.	Milk from the farm's calf milk vat.
Mixing	Manually added to a separate tank and mixed.	Weighed and mixed on demand. Auto calibration of milk and powder.	Manual.
PROGRAMMABLE PARAMETERS			
Type	99 feed plans.		
Litres per feed	Yes	Yes	Yes
Feeds per day	Yes	Yes	Yes
Calf Individualised	No	Same mix for synchronised feeding. Individual through priority feeding.	Yes
CALF ALERTS			
Reduced consumption	Yes	Yes	Yes
Slow Drinking	No	Yes	Yes
Absenteeism	Through use of exception port.	Yes	Yes
CALF MONITORING			
Weight	No	No	
LABOUR			
Labour Requirement per day; (hrs)	Checking and maintaining milk supply. Monitoring calves via the processor.	Checking milk supply, adding powder. Monitoring calves by handheld or App	
SERVICES			
Power Requirement	Single Phase	Single or three phase	Single Phase
Water Requirement	Cold water	Cold water	Cold. Hot for a hot wash.
Concrete Pad with Drainage	Yes	Yes	Preferable
CLEANING			
	Manual, estimated 10 minutes. Additional cleaning of milk tank.	Automatic, 3 times per day. Weekly circulation clean. Additional cleaning of milk tank and delivery lines.	Manual
MAINTENANCE			
	Low; replace milk pump hose.	General maintenance, (tubing). Annual service available.	Considering a yearly fee.
EXTRAS AVAILABLE			
	Combination meal / pellet / muesli and milk feeding system.	Teat sliders to withdraw teats. Liquid or powder additive dispensers. Calf Manager Programme. Calf Cloud App (suppliers app)	
See	www.delaval.com/en-nz/	www.delaval.com/en-nz/	David Reid; 027 2218 516 djreid@outlook.co.nz

	H & L 100, (Holm and Laue)	Lely Calm	PPP Urban U40	Robot Auto Calf Feeder
	Germany	Germany	Germany	New Zealand
	Bell Booth	Lely	PPP Industries	Technipharm
	4	4	4	8
	38	35	30	20 – 25
	150	100 – 140	120	125 – 150
	"Anti-pirate" milk valve.	Optional	As a cleaning option.	No
	2	4	4	
		6m	6m	2m
	Milk. CMR, colostrum; and liquid and powder additives.	Yes, and concentrated CMR	Yes, and concentrated CMR	Milk Powder and whole milk.
	Milk from the farm's calf milk vat. CMR into a 50kg hopper.	Milk from the farm's calf milk vat. CMR from a 30kg or 50kg hopper.	Whole milk or colostrum from the farm calf milk vat. CMR from a 35kg hopper.	
	CMR mixed on demand.	Weighed and mixed on demand. Auto calibration of milk and powder.	Automated mixing and heating. Heated mixing bowl to reduce heat loss.	On demand
				Ad Lib
			Touchscreen	Not Applicable
	Yes	Yes	Yes	No
	Yes	Yes	Yes	No
	Yes	Same mix for synchronised feeding. Individual through priority feeding.	Group feeding.	No
	Yes	Yes	Yes	No
	Yes	Yes	Yes	No
	Yes	Yes	Yes	No
	Forefoot weigh scale, (extra).	Not available in NZ	No	No
		Checking milk supply, adding powder. Monitoring calves by handheld or App	1 to 1.5	20 – 30 mins; cleaning, checking and checking calves.
	Single or three phase.	Single or three phase	Single or three phase	2kW
		Cold water	Cold water	10 litres / minute
		Yes	Yes	
	Milk line & teat cleaned after each feed. Twice daily wash and sanitise.	Automatic, 3 times per day. Weekly circulation clean. Additional cleaning of milk tank and delivery lines.	Automatic alkaline and acid wash twice per day. Weekly circulation clean.	Part auto, part manual.
	Routine calibration by farmer. Annual service.	General maintenance, (tubing). Annual service managed by Lely. Manual exterior clean	Weigh calibration by farmer 4 monthly. Annual service, approx $250	
	Forefoot Weighing. Calf Guide App. Extra feed Hopper.	Teat sliders to withdraw teats. Liquid or powder additive dispensers. Calf Manager Programme. Calf Cloud App (suppliers app)	Smart phone app. Dosing unit for liquid or powder. Automatic teat cleaning.	
	www.holm-laue.de Facebook Robotic Feeders	www.lely.com/nz	www.pppindustries.co.nz	www.technipharm.co.nz



Feeding stalls are either single or doubles like this rEID feeder. (Photo supplied by Reid Systems Ltd).

stalls to feed concurrently. They may include a device like a slide to exclude access to the teat once the calf has consumed its ration. They may also incorporate forefoot scales to record live weight and alert any issues.

- **Cleaning system:** This may be manual, fully automatic, or partially automatic.

The services needed for an automated system are usually single or three phase power, cold water, and drainage.

WHAT'S ON THE NEW ZEALAND MARKET?

Seven systems were found during research for this article. In addition, Calf Smart feeders made by Zeddy in Palmerston North are undergoing a review and will be back in the market at some time in the future. Details of the feeding systems currently available, as provided by their suppliers, are presented in Table 1. As usual, best practice for any prospective purchasers is to ask the reps to arrange for you to visit a farm during feeding. Other considerations that should be made, apart from cost, include on farm modifications needed to accommodate an automated system, technical back-up, and emphasis placed on New Zealand made.