



Labour Case Study

AUTOMATIC MILKING SYSTEMS



Key Points:

- 200-cow dairy farm operates with less than one full time equivalent.
- Heavy reliance on remote monitoring.
- Labour efficiency double the Tasmanian average.

Converting a run off block to dairy without added labour

**Crowden family: Marcus and Zed; Denis and Sheryl.
Western Creek and Caveside, Tasmania**

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THE INSTALLATION of robotic milking units enabled the Crowden family to convert a run off block into a highly profitable dairy without any extra labour.

The 80ha property (50ha milking area) supports 205 spring calving cows, with the potential to increase to 240 soon. The operation involves less than one full time labour unit: 0.75 full time equivalent (FTE). Web cameras and remote computer access enable monitoring and some management to be performed from the home farm 5km away.

Dairy labour efficiency	
	Labour efficiency (cows/FTE*)
Crowden dairy farm A (AMS)	273
Crowden dairy farm B (conventional milking before building AMS)	75
Tasmanian average [^]	137

* 1 FTE is defined as 50 hours/week.
[^] data sourced from Tasmanian benchmarking (27 farms)

Before AMS

Marcus Crowden and his wife Zed dairy with his parents Denis and Sheryl, operating two properties at Western Creek and Caveside, near Deloraine in Tasmania.

Until 2012 the 110ha home farm was used for the milking herd and the run-off block was used to raise replacement stock and beef cattle.

At the home farm, the 320-cow, spring-calving herd was milked in a 14-aside herringbone dairy. The operation was run by Denis, Marcus, Zed and an employee, equating to 4.28 FTE or 75 cows/FTE. On average, two people were involved in milking related tasks, for 5½ hours each. On a typical day, Marcus and Denis worked 8½ hours each and Zed worked 6½.

Why AMS?

The Crowdens were interested in an AMS because it offered them the ability to convert their run off block into a profitable dairy farm without hiring any additional labour.

The path to AMS

In 2006 Marcus attended a Young Farmers' field day at the Warren's AMS farm in Victoria. He was impressed with the system, and the AMS seed was sown in his mind.

By 2011 the Crowden's home farm was reaching its capacity and the family began considering options for expansion. They were raising extra heifers with the view to expanding their milking operation.

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Because it was partially irrigated, the Crowdens felt the run off block had the potential to be converted to a dairy farm. They considered building a herringbone dairy but were not keen on employing extra people.

The flexibility of an AMS appealed because they would not have to be at the new dairy farm at fixed times and could monitor the herd and do some of the management from the home farm through remote computer access. As their local dealer was already servicing an AMS in the area, the Crowden's were confident support would be available when needed.

In 2012 the Crowdens converted the run off block to a dairy farm by installing two AMS units and three out of parlour feeders. They milked 140 cows in the first season. Within a year they added another robot and three more out of parlour feeders to allow for an increase in herd size and increasing the level of concentrate feeding.

An automatic yard flood wash system was also installed. Because it was a Greenfield site, the Crowdens had to install laneways, fencing and 16ha of perennial ryegrass under irrigation.

The Crowden family AMS

By 2013 the AMS herd had grown to 205 cows. Marcus runs the AMS farm although Denis, Zed and the worker from their other farm can fill in if needed.

FutureDairy calculated the farm operates with 0.75 full time equivalent staff (FTE) or 273 cows per FTE.

The Crowden's AMS 2013

Herd	205 cows Seasonal calving (1 Aug - 31 Oct)
Farm	Milking area: 48 ha Total AMS farm area: 80 ha
Stocking rate	4.25 cows/ha (increasing to 5.0 in 2014)
Concentrates	2.5 t/cow/year
Robots	3 DeLaval VMS 68 cows/robot
Production	550 kg milk solids/cow/year
Labour efficiency	0.75 full time equivalents or 273 cows/FTE

Remote access

A key to the Crowden's success has been the ability to monitor and manage much of the operation remotely, through the computer at the home farm, or the mobile phone. Two web cameras enable Marcus to see what's happening at the dairy.

The software that came with the robots gives Marcus remote control of the robots, smart gates, feeding system and herd management system.



Daily routine

The main seasonal tasks that significantly affect workload are similar to all seasonal calving dairy farms. Most mornings Marcus checks the AMS farm reports so that he knows the situation before he milks at the home farm.

“When I’m playing football I can organise the AMS farm so I only need about half an hour there on the weekends – 15 minutes each in the morning and afternoon.”

Marcus Crowden

Marcus normally visits the AMS farm three times a day: once or twice in the morning (depending on cow traffic and work load) and once in the late afternoon.

On weekdays, Marcus spends about 3 hours at the robotic farm, but prefers to work longer on Friday and Monday to allow him to have most of the weekend off.



Alarms

One difference between labour requirements for a conventional milking system and an AMS is the need for someone to be on call with an AMS.

This is because an AMS runs for almost 24 hours a day. If something goes wrong the system will generate an alarm. The system allows the user to nominate what action to take for different alarms. For example, some alarms can be deferred until the morning if they occur in the middle of the night and the demand on machines is expected to be relatively low.

Marcus receives 0-2 alerts each day but most simply advise him of an event such as a cow being drafted. Most alarms that require a response can be dealt with via the phone or computer.

The most serious is a stop alarm which means the milking system stops until the issue is resolved so someone needs to attend the dairy to fix the problem promptly. Marcus estimates that about once a month he has to get out of bed during the night to deal with a stop alarm.

In the worst case scenario, if Marcus needs help, the local technician can access the system remotely, or if needed, be on the farm within an hour.

“Even though I have more free time and enjoy the flexibility of robotic milking, I don’t like the fact that someone needs to be on call 24 hours a day, 7 days week”

Marcus Crowden

A typical day: Marcus Crowden 2013

6:00am

- Home farm**
- Check AMS reports on computer and review how many cows are at each section
 - Milk at home farm

7:30 - 8:30am Morning duties

- Dairy**
- Quick visual check of dairy and robots
- Paddock**
- Fetch cows that have not come up from yesterday’s morning paddock
 - Shift fence for next grazing
- Dairy**
- Hose out around robots
 - Encourage fetched/extended interval cows into robots while hosing down
 - Clean camera lenses
 - Treat cows in drafting yard (e.g. mastitis, A.I., lame)
 - Change milk filter

10:30 - 11:30am Regular tasks

- Dairy**
- Treat drafted cows (mastitis, A.I., lame).
 - Main hose of the day (robots, dairy and all yards).
- Herd**
- Feed the herd.
 - Calf rearing, mating, calving.
- Paddock**
- Fetch cows that have not come home from yesterday’s afternoon paddock.
 - Shift fences for next grazing.
- Farm**
- Fence repairs, spraying paddocks etc.

11:30am - 4:30pm Flexible hours

- Home or AMS dairy**
- Whatever tasks need doing on the day eg. seasonal activities, fence repairs, spraying paddocks

4:30 - 5:00pm Afternoon duties

- Paddock**
- Fetch cows, shift fence for next grazing in night paddock
- Dairy**
- Treat cows in drafting yard (e.g. mastitis, A.I., lame)
 - Hose out around robots
 - Clean camera lenses
 - Change milk filter
 - Check and wash milk vat

Evening review

- Home**
- Check AMS reports on computer and review where cows are
 - Flag cows for drafting in following days

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Seasonal tasks

The main seasonal tasks that affect workload are:

- Calving (August to October).
- Mating (November to January).
- Calf rearing (August to December).
- Heifer training for AMS (August to November).
- Pasture renovation (February to March) and hay/silage harvest (November).

When silage is being fed out in the paddock, it is organised in two runs per week: on Monday for the week days and on Friday for the weekend.

Denis helps during the mating period. He inseminates the cows that have been automatically drafted, attending the farm once or twice a day depending on the number of cows on heat. The A.I. program runs for four weeks followed by mop up bulls for eight weeks. The bulls do not move around the farm with the cows. A bull is allocated to each of the three pasture sections.



Farm layout/voluntary cow movement

The farm is set up to allow 3-way grazing, a key to achieving voluntary cow movement and efficient robot utilisation. The feedpad provides a fourth fresh allocation of feed which Marcus uses to encourage cows to leave the paddock in the middle of the night, a time when grazing cows are typically less active and less likely to go to the dairy to be milked.

Marcus has programmed the gates to allow access to fresh feed allocations four times a day as follows:

1:40am–8:30am:	45% of daily pasture
8:30am–4:30pm:	35% of daily pasture
4:30pm–11:00pm:	20% of daily pasture
11pm–1:40am:	feedpad (brewers grain or silage)

The Crowdens installed the out of parlour feeders to encourage voluntary cow movement. Cows have access to them after milking, so they encourage cows to leave the robots as soon as milking is completed.



Getting used to automatic milking

Within four months of starting the AMS farm, the Crowden's system was running smoothly.

As with any new dairy, the first weeks involved long days, training the cows until they became comfortable with the robots and moving around to the dairy and around the farm on their own. Because it is a seasonal calving herd, 130 cows needed to be trained in the first seven weeks. This was only the case in the first year. After that, only the heifers need training as the mature cows are used to the system from the previous season.

"The cows adapted to robotic milking much faster than we expected. Just four months after commissioning our system was running smoothly and we were enjoying the benefits of AMS."

Marcus Crowden

The training program began a couple of days before cows calved. Small groups of cows were walked through the smart gates and robots where they received a small amount of concentrate.

Once they calved, Marcus kept a close eye on milking records and made sure each cow was milked twice a day. Marcus estimates it took about three months for the first cows to completely adjust to voluntary movement, and the later calving cows about six weeks (as the more experienced cows trained the fresher ones).

The first few months were particularly challenging because the Crowdens had 250 cows calving at the home farm at the same time.



The big gains

The two keys to the Crowden's success has been the ability to run a dairy farm with a low labour input and the ability to monitor and manage much of the operation remotely. Additional benefits relate to farm management, labour, and lifestyle. Many of these benefits are due to the flexibility that arises when the system is no longer based around milking twice a day.

Farm business

The flexibility of the AMS has allowed the Crowdens to expand their dairy operations to two farms without employing additional labour. For example, if Marcus is running late, he can use the phone to delay a gate change.

Marcus says the AMS has allowed him more time and energy to focus on managing the dairy business. The reports from the AMS software enable him to monitor and analyse herd and system performance at a completely different level to the home farm where the same level of data simply isn't available.

The combination of the out of parlour feeders and herd management system enable Marcus to match concentrate levels to individual cow production. Marcus believes this has boosted the milk production response to concentrate inputs, especially in high producing cows.

Although the amount of contact between cows and humans has decreased, animal welfare has improved. Marcus believes the AMS enables better management of mastitis.

The robots measure the conductivity of milk in each quarter. Cows with indicators of mastitis are drafted for early detection and treatment. Marcus reports that lameness is a rarity in the AMS herd. And he has also noticed the cows are more relaxed and calm which he believes is due to the absence of herding.

- ✓ More profitable response from concentrate inputs.
- ✓ More time to focus on business management.
- ✓ Improved animal health and welfare.

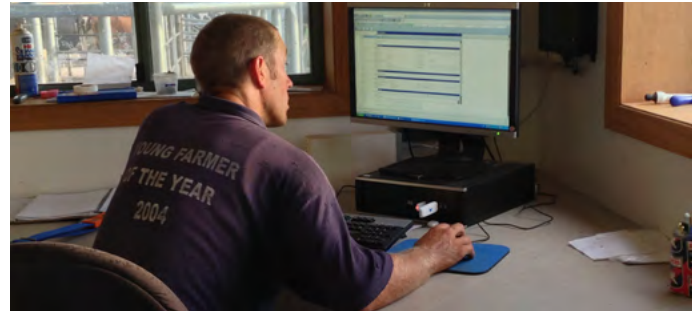
Labour

In terms of labour, the Crowden's AMS farm (273 cows/FTE) is more than three and a half times as efficient as their conventional milking farm (75 cows/FTE).

While the robots mean very little time spent on milking related tasks, Marcus has developed processes and routines to ensure the whole operation is as labour efficient as possible. For example, cows that do not suit the AMS are promptly relocated to the conventional dairy at the home farm. If the Crowden's didn't have this flexibility they would probably preserve for longer, but admit it would affect labour efficiency.

Marcus and Zed recently had a baby, and the flexibility of the AMS meant that Zed could perform less physically demanding tasks while pregnant.

- ✓ Massive improvement in labour efficiency.
- ✓ Less physically demanding tasks.



Lifestyle

Marcus enjoys the flexibility of the AMS routine. Most tasks can be conducted up to two hours earlier or later if needed. He especially likes the option to spend a little more time on Mondays and Fridays to free up his weekends for sporting activities such as football and water skiing.

What Marcus doesn't like is being on call 24 hours a day, 7 days a week, even though he doesn't need to be physically at the farm.

- Flexible routine.
- Time for sport and fun on the weekends.
- Option to sleep in.
- On-call 24/7.

"AMS has allowed us to increase our combined herd from 320 to 450 cows with the same amount of labour."

Marcus Crowden

Future plans

The Crowdens intend to continue herd expansion. In the 2014-15 season they aim to milk 240 cows in the AMS and 260 on the home farm, making a combined herd of 500 cows.

They are currently assessing the value of investing in a centre pivot to increase the irrigated area on the AMS farm, with the aim of producing 20 tonne/ha of home-grown feed and increasing milk production.

Since installing the AMS the Crowdens have placed more attention on udder conformation when making breeding decisions.

The dairy at the Crowden's home farm will need replacing in the next 5-8 years. Marcus says robots will be the first option they consider.

FOR MORE INFORMATION

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