Key Points:

- Flexibility provides more family time.

- Less physically demanding work.

- Individual cow feeding boosts production.

- No hired labour.

Milk more cows in less hours

Peter and Kathryn Costello and their five children, Tongala, Northern Victoria
By Juan Molfino, Kendra Kerrisk and Lee-Ann Monks

WITH A DATED DAIRY that had reached its capacity and a desire to expand the herd size, an automatic milking system (AMS) offered Peter and Kathryn Costello and their family an option to improve lifestyle as well.

The Costellos were early adopters of robotic milking, with their system operating since November 2010.

Their labour efficiency has improved by almost 50% from 104 cows per full time equivalent (FTE) to 150.

Dairy labour efficiency

	Labour efficiency (cows/FTE*)
Costello family (AMS)	157
Costello family (before AMS)	104
Victorian average	99^
Northern Victorian average	108^

* 1 FTE is defined as 50 hours/week.
^ data sourced from Dairy Farm Monitor Project - Victoria Annual Report 2012/13.

Before AMS

Before converting to AMS, the Costellos milked 170 cows in a 14-aside herringbone that was built in the 1960s and modified in 1999.

The operation required 1.64 full time labour equivalents. Peter worked 12-hour days during the week and about 8-hour days on weekends. Kathryn, the kids and a relief milker also helped out, usually covering one milking a week. On average, milking related tasks involved 6½ hours every day.

Why AMS?

With a young family, Peter and Kathryn wanted more time to spend with their five children. They also wanted to expand the herd which would require a new or upgraded dairy, and they were not keen to employ labour.

They reviewed their options for a new dairy, with two priorities: milk more cows without an increase in labour requirements (either family or employed).

The path to automation

The Costello's path to automation began in 2008 when 100% of the farm was laser graded. In 2013 a third of the farm's irrigation system was automated, dramatically reducing the workload between August and May. The system allows Peter to open and shut bays at pre-set times from the computer at home rather than going down to the paddock each time.

In 2010 they installed three milking robots with two out of parlour feeders. A year later they installed a third out of parlour feeder.

Their robots have integrated somatic cell counters to aid mastitis detection.

A new shed was built for the robots, adjacent to the old dairy.

Case Study

This allowed the Costellos to continue to use some of the existing infrastructure such as the yards and the old herringbone for A.I. and veterinary treatments.

To set the farm up for 3-way grazing, the Costellos added 300m of laneway and re-fenced the existing laneways.

The Costello family AMS

FutureDairy calculated the farm operates with 1.33 full time equivalent staff (FTE) or 157 cows per FTE.

Voluntary cow movement

The Costello's grazing-based AMS operates with voluntary cow movement: the cows move by themselves from the paddock, through the dairy and around the farm.

The Costello's AMS 2013	
Herd	210 cows (at peak) Calving pattern: split ⅔ spring, ⅓ autumn
Farm	Milking area: 120 ha Run off block: 83 ha
Concentrates	1.9 t/cow/year
Robots	3 Delaval VMS 70 cows/robot + 3 out of parlour feeders
Production	7500 L/cow/year (560 kg ms/cow/year)
Labour efficiency	1.33 full time equivalents or 157 cows/FTE

The Costello's farm layout is designed for 3-way grazing to encourage voluntary cow movement. The gates are usually set to give cows access to a fresh allocation of pasture as follows:

Section A: from 8pm

Section B: from 5am

Section C from 1pm

Like most AMS farmers with grazing herds, the Costellos have found that voluntary cow movement relies on very accurate pasture allocation. Over-allocating pasture means the cows are less likely to leave the paddock and move on their own to the dairy. Under-allocating pasture means cows leave the paddock early resulting in lower feed intake (and less milk production) and queues at the dairy.

The farm also has an open feedpad with a 180-cow shade shed which could be used for a fourth feed allocation (silage or hay). The Costellos prefer not to use the feedpad regularly as their focus is on maximising pasture utilisation. Also they feel the feedpad disrupts voluntary cow movement.

A typical day: Peter Costello 2013	
7:00-8:00am morning duties	
Home	• Check the computer, review number of cows in various areas
Paddock	• Fetch cows that have not come up from yesterday's afternoon paddock (section C)
	• Shift fence for next grazing
Dairy	• Change milk filter
	• Clean camera lenses
	• Feed calves
9:00am to 1:00pm General farm jobs	
Dairy	• Hose out and around robots
	• Encourage fetched cows into robots (while hosing)
	• Treat cows in drafting yard (mastitis, AI, lame)
Paddock	• Fetch cows from overnight paddock (section A)
	• Shift fence for next grazing in afternoon paddock
General farm jobs and seasonal tasks	• Feed the herd
	• Fence repairs
	• Spraying paddocks
Dairy	• Clean camera lenses just before lunch
1:30-6:30pm Afternoon duties	
General farm jobs and seasonal tasks	• Feed the herd
	• Feed young cattle
	• Irrigation management
Dairy (4:00-6:30pm)	• Check AMS reports on computer
	• Quick visual check of the dairy and robots
	• Hose out and around robots and main yard
	• Clean camera lenses
	• Feed calves
	• Change milk filter
7:30-8:00pm Last tasks of the day	
Paddock	• Fetch cows (section B)
	• Shift fence for next grazing in morning paddock

Daily routine

On a typical day, Peter's milking related tasks take up about 2½ hours – that's about a third of the 6½ hours/day in the old herringbone.

Peter really likes the fact that he gets up two hours later and still has time to have breakfast with the kids before they go to school.

When he has other priories such as working on the out block or attending industry meetings, the dairy farm can be managed in as little as 1 hour and 45 minutes, provided paddocks have been set up the previous day.

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 almost 24 hours a day. If something goes wrong, the system will generate an alarm. The user can nominate what action to take for different alarms depending on the circumstances and time of the day.

The most serious is a stop alarm, which means the milking system stops until the issue is resolved so someone has to attend to the problem promptly.

Peter says the number of alarms vary throughout the year. If he is not at the dairy, Peter rings Kathryn who gets on the computer at the house to resolve the issue. Most stop alarms can be resolved this way. Peter estimates he receives about one stop alarm a week, which he considers to be acceptable.

In the rare case that Peter cannot resolve an alarm, his dealer can access the computer system remotely, or if a trip to the farm is necessary he is only 40 minutes away.

For a couple of weeks in 2013 the Costellos had recurring stop alarms in the middle of the night. It turned out to be a mouse eating the cables! Rodents can cause problems with electrics so a grain-based bait which was more effective has been adopted.
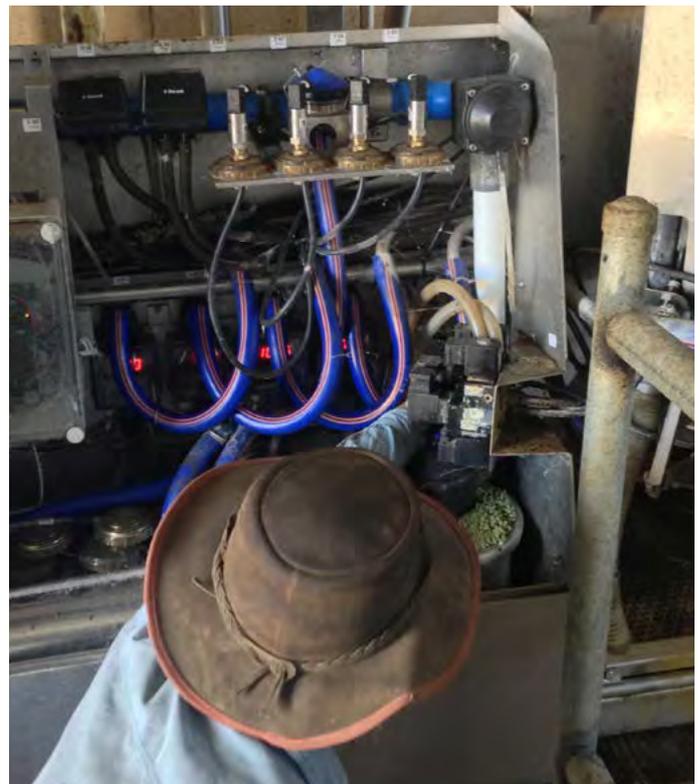
Case Study

Seasonal tasks

The main seasonal tasks that affect workload are:

- Calving (August to October and March/April).
- Mating (November to January and July/August).
- Irrigation (August to May).

Because of the split calving system, some tasks are spread across most of the year:

- Calf rearing.
- Heifer rearing.
- Heifer training for AMS.

During the joining period, Peter spends more time on the computer. Ninety percent of the herd is joined to A.I. with a technician doing the inseminations. A follow up bull is only used after the spring joining period.

Peter uses heat mount detectors ('scratchies'). He checks the cows at various times through the day – when he is at the dairy, in the paddock collecting cows or shifting fences. He sets the computer to draft cows on heat so they can be inseminated the following morning. Kathryn enters the joining dates and preg testing information in the herd management software.

Heat stress

Being located in Northern Victoria, means heat stress can be an issue from November to March. The Costellos have found heat stress disrupts voluntary cow movement. Peter says that in very hot weather, the cows reduce their voluntary walking and production falls. During this time Peter and Kathryn spend more time moving cows to the old yard which has a sprinkler system. They also move the cows away from the dairy to the B grazing area which has a shade shed that can easily be moved from paddock to paddock. This enables cows to stay in the shade and then continue grazing when it cools down. The feedpad is vital for the hot days in summer.

Veterinary visits

In a conventional dairy, holding cows back for veterinary attention is a relatively simple task. For example they can be drafted to a holding yard during morning milking. It's not so simple with an AMS because cows visit the dairy in small numbers throughout the night and day.

Peter says that any job that needs to be done by the vet needs to be planned in advance. He uses the computer system to flag cows to be treated and sets them to be automatically drafted after exiting the robots. This is usually set up so that cows are drafted after milking during the morning.

Getting used to automatic milking

The Costello's AMS was commissioned on the 15th November 2010. At the time, cows were either in the first third of lactation or at joining.

As early adopters of AMS, the Costellos found the first few months of operation challenging, stressful and exhausting. But within five months voluntary cow flow was good, the system was running smoothly and they started experiencing the labour benefits of robotic milking.

Adapting to automatic milking involved a steep learning curve for both cows and people. Training the cows involved very long days for the first few weeks. Their cows took about four visits to the robots to become comfortable with the milk harvesting process but it took longer for them to get used to walking around the system voluntarily. Cows also had to be trained to move as individuals (or small groups) rather than as a herd.

> *"I wasn't used to computers but most of it is as simple as a double click!"*
>
> Peter Costello

The Costellos had not previously used computerised records, so they also had to develop new skills in using the computer and analysing the AMS reports.

In their first AMS season (2010) the Costellos milked 186 cows and by 2013 they had reached their goal (and robot capacity) of 210 cows. They estimate that production in the first season fell by about 20% as the cows and people adjusted to a new way of farming.

The big gains

The benefits of AMS reported by the Costello family fall into three areas: labour, farm business 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.

Labour

Peter describes the farm as a one-person operation now. Because the work is less physically demanding, Kathryn is confident to run the farm if Peter is away. Their eldest son, Travis, is also able to run the farm which gives Peter and Kathryn the freedom to spend time together away from the farm occasionally.

Even though Peter does most of the work, he likes the fact that he is no longer tied to the twice a day milking routine, especially at busy times such as silage making.

Although he enjoyed milking cows, Peter says there are many things he doesn't miss such as rising early, fetching cows on freezing mornings, test buckets, herd testing and paying for a relief milker.

The Costellos no longer need to employ a relief milker, but have a couple of local people trained to operate the farm if they go on holiday. Peter believes that having a 'high tech' dairy makes the farm more attractive to young people and the next generation of potential dairy farmers.

When it comes to employing relief staff, Peter says he looks for people with slightly different skills than he needed with the conventional dairy. For example, he has used a university veterinary student for relief work.

The AMS requires someone who understands both cows and computers. He says it takes a bit longer to train people to work in an AMS.

- ☑ One-person operation.
- ☑ High tech dairy appeals to young people.
- ☑ Different routines/tasks (compared to conventional).

Farm business

Although the Costellos aim to produce as much milk from pasture as possible, they have been impressed by the benefits of a computerised individual feeding system. It allows them to allocate concentrates according to stage of lactation, milk production levels or milk price, resulting in a better production response from their investment in grain. For the Costello herd it means an extra 1000 L/lactation on average.

"I love being able to set the feed rations according to milk production or stage of lactation. When freshly calved cows join the milking herd I can set their feed to slowly increase from 3kg/day to 7 over 21 days. "

Kathryn Costello

Peter says that automating milking has created a more relaxed and quiet environment and the herd has fewer cases of lameness.

☑ Greater return on investment in concentrates.
☑ Quieter, more relaxed herd.
☑ Fewer cases of lameness.
☑ Longer-lasting cows in the herd.

Lifestyle

Peter says AMS has brought about a huge change in lifestyle and extra time to spend with the family.

☑ More family time.
☑ More sociable working hours.

"These days I love having breakfast with the family. Before all I could do was wave to the kids as they walked to the school bus!"

Peter Costello

Future plans

The Costello's long term plan depends on whether any of their children choose to dairy farm.

After reaching their main goal of milking 210 cows in 2013, the Costellos are now focussing on improving the efficiency of their operation, especially maximising production from home-grown feed and refining the farm layout.