

# Cattle shelter adds flexibility to grazing system



## Farm systems transition case study

### Farm location

Haybrook Farm, owned by Jodie and Colin Hay, is a 1,091ha property located in Wee Wee Rup, North-central Victoria.



### Farm history

The farm comprises three main parts: the main property (879ha) located 5km south-east of Cohuna, leased blocks (109ha) situated just across the Murray Valley Highway from the main property, and an outblock at Mount Hope (103ha), 11km south-west of the main property.

Colin's parents commenced dairying on the main property in 1967 with a small Jersey herd. At the time, the farm comprised just 51ha. The story of the farm is one of progressive expansion and development, "in big chunks" as Jodie describes it.

- In 1988, the neighbouring farm of 74ha was purchased, laser grading of the grazing area was completed and pastures changed from all perennials to 50 per cent perennials and 50 per cent annuals, and the herd changed over to Friesian-Jersey cross.
- In 2012, much of the farm's irrigation system was changed from flood to pipe and riser.

- In 2014, a dryland block at Mount Hope was purchased for cropping.
- In 2015, two neighbouring properties were purchased (73ha and 65ha).
- In 2020, a neighbouring corporate farm of 539ha was purchased that included flood irrigation and seven centre pivots.
- In March 2023, a nearby 57ha creek frontage property that the Hay family had been leasing for 2 years was also purchased, and two other neighbouring creek frontage properties totalling 121ha are also now leased.

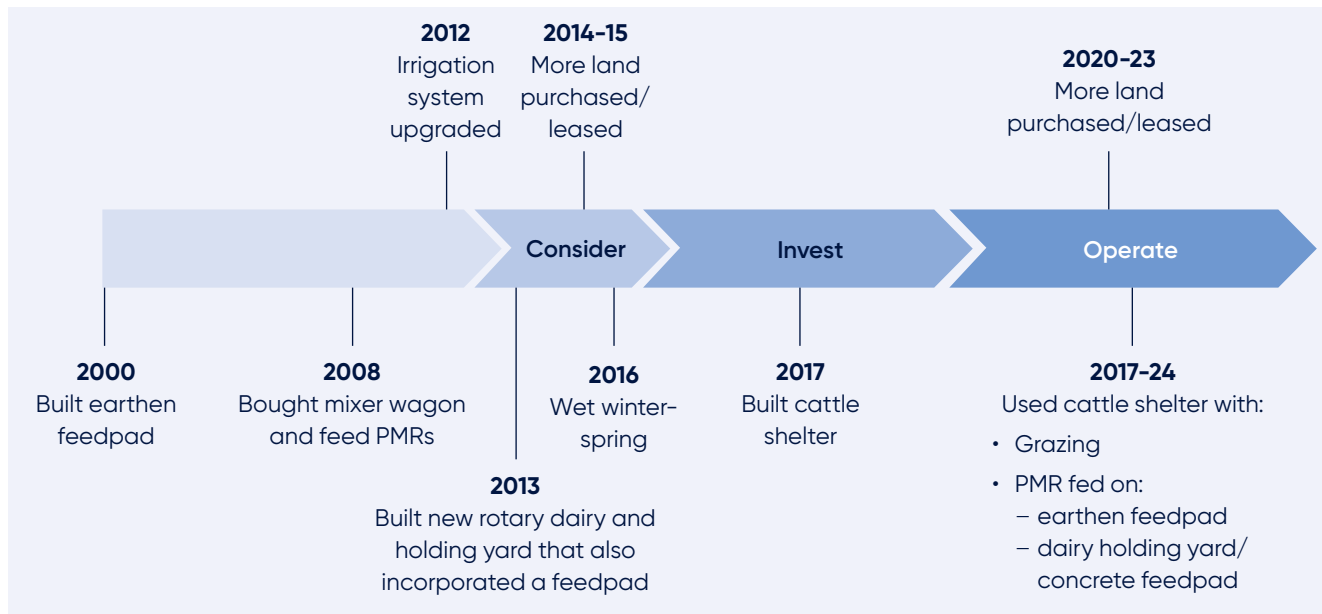
Despite having acquired more land over the years, the Hay family have chosen to continue to milk 400 cows, mainly Holstein-Friesians with some crossbreds and Jerseys, as this herd size fits well with their dairy holding yard and parlour. They feed their cows well to produce 9,000–9,500 litres per cow per year and are not inclined to push production much higher. They calve half the herd in autumn and half in spring.

In 2000, Jodie and Colin built a feedpad comprising modular concrete troughs on an earthen surface, and fed out silage and hay using a silage cart.

In 2008, they invested in a mixer wagon and began preparing and feeding more complex mixed rations which included silages, hays, grain and canola meal. In 2013, they purchased a second-hand 50-unit rotary platform and replaced the original 14-unit swing over herringbone dairy with a new parlour.

The faster throughput through the new dairy parlour enabled the Hay family to increase their herd from 200 to 400 cows without cows standing more than 60-90 minutes in the holding yard pre-milking. Simultaneously, Colin and Jodie built a larger holding yard incorporating two rows of concrete troughs to enable their cows to eat a partial mixed ration before and after milking.

## Timeline



### Consider phase

In spring 2016, the Hay family, like other farmers in the region, faced significant challenges managing their herd during and after a very wet winter and spring.

The wet conditions caused significant damage to the family's grazing paddocks and laneways, and their attempts to provide the cows with a dry, comfortable loafing area using bark chips were only partly successful.

This experience motivated the family to consider constructing a new facility as soon as possible to address several issues, such as providing cows with a more comfortable loafing area between milkings, supporting feed intakes and milk production, and improving working conditions for family members and employees. Additionally, they wanted to retain the flexibility to continue grazing cows when good quality pasture was available within a reasonable walking distance from the dairy and ensure that the cost of building the facility did not prevent them from financing other farm developments for years to come.

To make an informed decision, Colin and Jodie visited farms in Victoria and South Australia that had already invested in various facilities. Ultimately, they chose to build a cattle shelter with a solid pitched roof and a composted bedded pack. The shelter would be situated near the earthen feedpad and within 100m of the dairy, allowing cows to have easy access to a mixed ration while using the facility.

### Invest phase

The Hay family designed a cattle shelter to manage their herd during extreme weather conditions and to improve their working conditions. The shelter measures 72m by 40m (2,880m<sup>2</sup>), providing 7.2m<sup>2</sup> per cow. It is oriented SSW to NNE and has four rows of eight steel pillars, with the sides being 5m high and without eaves.

The roof is pitched at 22 degrees and has a cap over the centre ridge vent. The two ends of the shelter remain open.



To ensure smooth movement of machinery, the Hay family designed the shelter without any tight spaces.

"The most important thing you need to ask yourself is: Can I get a tractor into this part of the shed to manage the bedding?" Jodie said.

They opted for relocatable concrete panels (3m long by 1m high) along three sides of the shelter and left one long side open, allowing cows to move freely between the shelter and the feed and water troughs.



To reduce energy costs, the family recently installed a 100kW solar panel system and an evacuated tube solar hot water system on the roof of the shelter and dairy parlour.

## Operate phase

The Hay family has successfully managed their cattle shelter for the past seven years. Colin is highly meticulous about tilling the bedding twice a day to maintain dryness and ensure the cows' comfort while loafing.

Jodie emphasises the importance of proper bedding management.

"There are no shortcuts, and getting it wrong can lead to an unpleasant situation," she says.



Colin explains that their primary goal is to manage the dry matter level and turn over the manure on the bedded pack. Ploughing the bedding takes only 20 minutes, which is comparable to the time it takes to bring cows in from the paddock.

The harrows are Colin's most crucial equipment, as they allow them to fluff up the bedded pack with dry material, occasionally using straw, when it becomes too damp.



However, the Hays rarely use the shelter during winter months, preferring to graze their cows whenever possible. The open side of the shelter can be closed off with electric fence tape to prevent cows from accessing the adjacent feedpad in extremely wet weather when the earthen pad becomes muddy due to the lack of a well-compacted base. Instead, cows obtain a mixed ration from the feed troughs on the concrete in the nearby dairy holding yard.

Overall, the Hay family's approach to cattle shelter management has been highly successful. It has allowed them to sustainably maintain their cows' comfort and productivity, while reducing their energy costs through solar panels and a solar hot water system.



## A flexible option

### "For us, flexibility is king."

The Hays' philosophy is that flexibility is king, so their dairy holding yard also serves as a concrete feedpad. It is equipped with two rows of concrete troughs where cows can eat a partial mixed ration before each milking while they wait 60-90 minutes to enter the dairy to be milked.

During milking, each cow receives a small amount of grain mix. As they exit the dairy, they have another chance to eat from the concrete troughs. The backing gate progressively moves up the centre of the yard, providing more feeding space for already-milked cows. On hot days, the sprinklers in the yard are left on for up to two hours after milking. Cows can decide when to leave the yard and go to a designated night paddock or an adjacent sacrifice paddock. After morning milking, cows may go to a designated day paddock and then make their way to the cattle shelter and feedpad. The holding yard is flood washed using recycled effluent after each milking.

### "We let the cows decide where they want to feed and rest."

Jodie and Colin are pleased with their integrated system, which includes the cattle shelter, earthen feedpad, and dairy holding yard incorporating a feedpad.

They appreciate how the system offers multiple opportunities each day for all cows to feed without aggressive interactions, provides a comfortable environment for cows and staff during hot weather, and minimises pugging damage to pastures and laneways in wet weather.

To prevent excessive pressure on the shelter's compost bedded pack, the Hays use a nearby sacrifice paddock for overnight cow loafing. As a result, the shelter is typically only used during the day, and the stocking density of one cow per 7.2m<sup>2</sup> is easily managed.

Colin and Jodie believe in letting their cows make decisions regarding where they want to go. They do not feel compelled to use the cattle shelter. Their view is that they have already paid it off, and the cattle shelter is not used unnecessarily, but they find it to be especially useful during hot weather, providing a comfortable environment for cows and staff. They are satisfied with the natural airflow through the facility and do not feel the need to install fans at this stage.

## What would you do differently?

Colin mentioned that if they were to construct the shelter again, they would opt for a clear-span design, as he pointed out a post that had been accidentally damaged by the tractor.

In addition, the Hay family would include specific design features to prevent heavy rain from the south or north from wetting the bedded pack.

These include cladding on the shelter ends from the top of the pillars to the centre ridge vent, retractable blinds between the three side pillars closest to the SSW corner, and eaves extending at least a meter from the shelter's sides. These improvements could be easily installed on the existing shelter in the future.

## Next steps

Colin and Jodie are satisfied with the performance of their cattle shelter and believe that their investment of A\$300,000 has been recouped. As a result, they feel financially liberated to pursue additional farm development investments.

### For further information

Visit [dairyaustralia.com.au](http://dairyaustralia.com.au) and search 'National Feedpad and Contained Housing Guidelines'

Visit [dairyaustralia.com.au](http://dairyaustralia.com.au) and search 'Farm Systems'

Visit [dairyaustralia.com.au/farmsystemevaluator](http://dairyaustralia.com.au/farmsystemevaluator)

### Acknowledgement

Thank you to Colin and Jodie Hay for agreeing to share their knowledge and experience.

## Overview

Farm			
Farm size (ha)	1,000		
Grazing area (ha)	200		
Cropping area (ha)	891		
Production system	Grazing based, with: <ul style="list-style-type: none"> <li>• Cattle shelter</li> <li>• Two feedpads for PMR feeding</li> </ul>		
Dairy type	50-stand rotary		
Climate (BoM historical data for farm locality)			
Mean annual rainfall (mm)	372		
Mean no. rain days/year	75		
Mean no. days/year $\geq 35^{\circ}\text{C}$	25.4		
Mean no. days/year $\geq 40^{\circ}\text{C}$	4.7		
Mean annual daily solar exposure	16.9 (MJ/m <sup>2</sup> )		
Conditions over summer	Dec	Jan	Feb
Mean temperature ( $^{\circ}\text{C}$ ) at 3:00pm	27.6	29.7	30.0
Mean Relative humidity (%) at 3:00pm	33	31	32
Mean Temp. Humidity Index at 3:00pm	73	75	75
Mean wind speed (km/h) at 3:00pm	13.6	12.9	12
Mean daily solar radiation (MJ/m <sup>2</sup> )	27.5	27.7	24.6
Herd			
Milking cow numbers	400		
Breed	Holstein-Friesian, some crossbreds and Jerseys		
Calving pattern	Split (50:50 autumn:spring)		
Production per cow per year (L)	9,000–9,500		
Infrastructure and equipment			
Infrastructure	<ul style="list-style-type: none"> <li>• Cattle shelter with solid, pitched roof and compost bedded pack</li> <li>• Formed earthen feedpad with modular concrete troughs</li> <li>• Dairy holding yard with troughs serving as all-weather concrete feedpad</li> </ul>		
Equipment	<ul style="list-style-type: none"> <li>• Mixer wagon and tractor</li> <li>• Tractor and field cultivator</li> </ul>		
People			
Full time equivalents (FTEs)	5		
Cows per FTE	80		

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#### Disclaimer

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