Dairy Farmer Response to Storm and Floods 2021/22

Investing in shelter and refuge

Overview

- *Dairy farms need to understand their individual risk from severe climate events and should consider design and construction of appropriate facilities to mitigate these.*
- *Two case studies are presented below:*
  - *A) Use of a loafing barn to provide protection from extreme weather and flexible feeding when pasture is limited.*
  - *B) A dairy prone to severe flooding reviews use of a "flood-mound" to protect cattle, machinery, and feed from inundation.*

Table 1: Williams Dairy Information

Milking platform (ha)	Total farm size (ha)	Herd size (Avg.)	Annualised stocking rate	Kg of MS/305-day lactation
300	300	327	1.3	432

“Williams Dairy”: Providing a refuge for extreme weather

David and his brother Peter Williams, operate the last remaining dairy in Vacy in the lower Hunter Region of New South Wales. The farm is frequently impacted by flooding from the Paterson River as well as being exposed to El-Nino driven droughts. This, combined with both the normal heat of summer and the wet from East Coast low events, drove the brothers to improve protection for their herd of Jersey cows and their paddocks from an increasingly challenging climate.

To do this, the Williams’s invested in an **all-weather loafing barn**. Before commencement of construction, David and Peter visited other barns for design ideas. Settling on a “stock standard” barn, they were able to reduce costs by doing their own land levelling and concreting the feed pad area. Contractors then erected the barn and an electrical system for lighting and fans. With support and co-operation of both council and neighbours, the construction process went smoothly. With a total cost of $750,000, the loafing barn was completed in 2019 and now provides shelter and the ability to feed the herd during the heat of summer while also protecting the cows and the paddocks from extended wet periods and floods. The compost bedded pack area is 100m x 40m and can fit up to 350 cows with 11 m^2/cow, but the Williams family cap their stocking at 340 cows to optimise animal well-being and keep the compost drier. To maintain the compost, they till the compost every 12 hours when in use and only top up the pack when it appears “sticky”.

“Maintenance of the shed depends on the frequency of use, how long the cows are there for, and stocking density. If you are going to do it, don’t cut corners. Do it right!” -David Williams

In the heat of summer, cows return from early morning grazing to have access to shade and loafing areas in the barn. They then return to the paddock at night to continue grazing. They don’t provide any supplemental forage in the barn during the summer as they feel their pastures are sufficient with reliable irrigation. This allows the Williams to make the most out of their pasture base while also giving opportunities for the cows to keep cool in the shelter of the shed during the hottest parts of the day. Forages are only fed in the shed during extreme wet, drier times or on seasonal change over between winter and summer pasture systems when pasture availability is limited.

The relentless wet of 2022 saw the shed truly come into its own. The swampy nature and poor drainage on both the

The loafing barn feed bunk and compost bedded pack

Heifers accessing the laneway of the loafing barn for shade.

farm's slopes and flats saw waterlogging continue for up to 6 months. During this time David and Peter **prioritised paddock recovery** and kept cows out of paddock maintaining them in the loafing barn for four months with breaks as conditions allowed. This reduced "pugging" and sped recovery and David believes this decision allowed them to return to grazing much quicker than if they had kept the cows in the paddock.

The loafing barn similarly proved itself in the wet autumn conditions in 2024 with the cows having 3 continuous months in the barn but paddocks and grazing recovering strongly in early spring.

The shed is also occasionally used for weaned heifers for shade in the summer and refuge from wet weather. It also provides safety from wild dogs which can be a problem in the area at times.

David acknowledges the versatility of the loafing barn and feels that it integrates well with their predominantly grazing based system. It has allowed them to get more from both their pasture and cropping programs as well as their cows.

For further information on approaching a dairy development on your farm and key considerations please see the following tools:

- Farm System Evaluator (DA): www.dairyaustralia.com.au/feeding-and-farm-systems/farm-systems/farm-system-evaluator
- NSW Dairy Development and Environmental Guidelines (2024). Available on the DPIRD dairy webpage www.dpi.nsw.gov.au/animals-and-livestock/dairy/dairy-developments/nsw-dairy-development-and-environmental-guidelines

Table 2. Kenarie Jerseys Informationon

Milking platform (ha)	Total farm size (ha)	Herd size (Avg.)	Annualised stocking rate	Kg of MS/305-day lactation
32	101	120	4.3	298

"Kenarie Jerseys": Response to extreme loss of machinery and animals due to flood water heights

Pat, Trish and Jen McDonald milk a herd of purebred Jersey cows near Murwillumbah on the Far North Coast of New South Wales. Situated on low-lying flats and surrounded by tributaries of the Tweed River, the property is prone to flooding. In 2017, they experienced the "cyclone Debbie Flood" which dropped 800 mm in 24 hours with extreme water heights and flow rates. Again, in March 2022, the property was completely flooded following the "rain-bomb" that hit the region. With over 1200 mm of rain in two months the event proved devastating. The dairy shed was inundated and out of action for 4 days. Plastic water troughs and silage bales were lost, as well as some cows being washed away in the initial flood peaks. Cows that could be retrieved were brought to the flooded dairy where (although standing in water), they had firm footing. Calves were relocated to the raised milking platform but were partially immersed in shallow water. Tools, machinery and personal items were lost or damaged as flood water impacted sheds and farmhouses reaching heights above the knee.

Flood mound from several angles showing the access point for cows and machinery.

The losses and conditions extracted a heavy physical and emotional toll on the McDonald's and Jen still reflects on the guilt she feels from not being able to get the heifers and dry cows in time due to the lack of warning of the dangerous rising waters.

"This is not our first flood, and it won't be our last"

While the normal pattern of floods affecting the low-lying property see waters rise rapidly, they also recede and become trafficable fairly quickly. The sudden and extreme nature of the 2022 floods were unprecedented and demonstrated the exposure to the risk of more severe events that appear to have become increasingly common. With the safety of the herd a priority, the McDonald's committed to investing in

and **constructing a large "flood mound"** creating a temporary refuge for animals, machinery, and feed.

The McDonald's selected an area away from normal heavy "water flow zones" where waters tend to backup. Jen explains that "the flood mound location was selected to allow for easy access of machinery and animals."

To allow construction to commence, they applied for a "disposal of fill" permit from Tweed Shire Council. Once approved, council and other private contractors began to deliver fill from another regional riverbank reconstruction project. Some of the fill was also used to restore laneways. After 18 months and with over 1000 loads of fill arriving, a 30M x 30M refuge eventually rose to stand 3-4m high from the plain. With Jen spending over 80 hours spreading and leveling, the total cost of the project including fuel, leveling and earthworks was over $25,000.

The mound is yet to be tested in a major flood and there are some finishing touches still to be applied. There are plans to widen the base with a gentler angle to decrease erosion. An additional $5,000-$10,000 needs to be spent on yard fencing that will safely contain all stock groups. Water trough access will be added to each yard. When funds allow, a cover to protect feed and machinery will be added, and Jen would love to add some concrete areas for feeding and keeping cattle out of mud.

For further information on flood mounds please visit your local council website to apply for disposal of fill and visit the DPIRD dairy website below for more information on refuge mounds.

www.dpi.nsw.gov.au/emergencies/emergency/community/before-an-emergency/refuge-mounds

The current angle of the base with plans to widen it with a gentler incline.

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