DAVIESWAY
Est. 1911
IDEAS TO FARM. EVERYDAY.

TO HOUSE COWS, OR NOT TO HOUSE COWS? THAT IS THE QUESTION

Resting cows perfectly located in stalls with a chopped straw bed and well-ventilated barn is testimony to the planning.

Cows confidently eating at a feed wall which includes self-locking head bails.

IF YOU'RE GOING TO DO IT… DO IT ONCE…DO IT RIGHT

One sure thing in modern-day dairies is that there are many ways to farm – and no one way is necessarily right or wrong. Perhaps, the more important question is: ***"Is it right for you?"***

If you are considering housing cows, there are some common mistakes that can be easily avoided. That's because "cow comfort", and all that it entails, is a big subject today.

100% AUSTRALIAN OWNED

NICO POLATO
DAVIESWAY

SUE HAGENSON
iNBARN SOLUTIONS

The days of abundant water and predominantly pasture-based farming are gone in various inland Australian areas.

Our next generation has exciting technology at their fingertips, but they are also faced with many more decisions and options when it comes to caring for cows.

And the reality is, what often starts out as a pad to conserve feed, leads to putting a roof over it, which inevitably progresses to a barn.

EASY? NOT ALWAYS

Daviesway's Nico Polato and his associate from inBarn, Sue Hagenson, form one of the industry's most experienced teams when it comes to helping make these decisions a reality.

They worry that the basics are still being overlooked in Australia.

They point to the lessons the USA learned the hard way, and advise Australian dairymen to tap into specialists in this complex conversation if they want their final results to match their expectations.

Nico has worked with Daviesway for 21 years. He has four decades of direct experience in the mechanical, electrical, refrigeration, construction, plumbing and waste-management arenas. He has been exposed to the best operations and technology in North America and his project-management skills have been an integral part of many of Australia's most successful builds.

Sue is inBarn Solutions' Senior Dairy Consultant. Born in New Zealand and now living in Canada, her extensive résumé includes working and living in Uruguay and China, where she has driven and designed big operations. Sue's understanding of the Australian landscape, and her unrivalled specialist knowledge of ventilation and cooling cows, makes her a valuable and trusted industry resource.

iNBARN – HIGH-PRESSURE FOGGING
Reduces ambient temperature in barns and dairies

In Australia, many farmers begin the transition to housing cows by putting in an outdoor feed pad with a loafing pad each side. This pad is correctly oriented east to west

Australia is increasingly following the northern hemisphere's lead on some inland farms where the summers can be brutal. This naturally ventilated free-stall barn is sited in northern Victoria; it has an east-to-west orientation, flood-wash alleys and sand bedding

iNBARN – Wide-opening headlocks offer a wide top and bottom opening, allowing more room to enter and exit the headlock (430mm). It's one of the most flexible headlock solutions for bigger cows, or for those who aren't used to headlocks

IDENTICAL MESSAGE

Nico and Sue have an identical message for Australian dairymen looking at barn design: do your homework, don't cut corners and always have the bigger picture in mind.

Nico says today, in a tight economy, it is logical for dairymen to progressively work towards housing cows using a modular design as they can afford it, or want each new addition. But, he says, it is important to plan for the entire facility at the get-go, so that everything is accounted for.

DON'T PLAN FAILURE

One of the first errors people make is their barn orientation, while the second is not planning for that ultimate finish line.

Nico says, *"Every revenue-earning barn in North America runs east to west.*

"If you put the cows under the roof for 24 hours a day, then a north-to-south orientation is capable of having a serious negative impact on cows in an afternoon. There is nowhere for them to get away from the sun. They'll potentially be in 50-degree Celsius heat.

"The US dairy farmers made those fundamental mistakes 25 years ago because they were the pioneers of this technology. Why do we need to go through the pain barrier they went through if we don't have to?"

BEWARE FALSE ECONOMY

Sue agrees that getting the barn design right up-front is critical. It can ultimately save money and, in extreme cases, catastrophe. She warns that most DIY efforts in barn design are a false economy that, more often than not, end badly.

"Australians and Kiwis have a 'can-do' attitude and they often think that getting a professional experienced person in barn design is too expensive.

"Is it? Or is it the best money you will spend?

"It will be interesting down the track to see what the lost opportunities were for some of those guys that made the DIY decision.

"I've often seen farmers install cheap fans so they feel better because they've done 'something'. Then I've seen their cows standing not two metres from those fans covered in flies. They were clearly not doing their job. It has cost the farmer what he paid for the fans, the wasted electricity, and a multitude of negative implications for the cow.

"Bigger fans, bigger HP [horse power] motors may be more expensive per fan, but you need less of them, it takes less electricity to run them, you spend less money on regular maintenance and your cows will pay you back in so many ways if their environment is right."

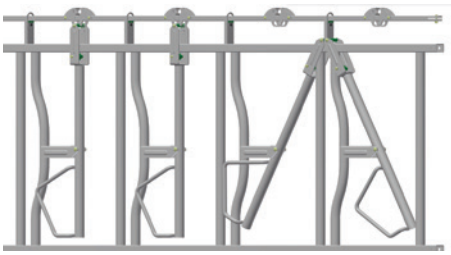
SILENT THIEF

Nico concurs, saying poor design is the *"silent thief"* in barn design. He also says it comes down to awareness.

"I worked with a guy 30 years ago, who used to say, 'you don't know what you don't know', and I think that remains such a relevant point still to this day.

"We often see people repeating the same behaviour, and they don't know that those mistakes continue to cost them money. There's actually a lot you can do about managing cow comfort in a hot climate – and some of them are pretty simple and cost effective.

"It's just getting the mindset, and accessing the science. But you do need a plan."



iNBARN'S – WIDE OPENING HEADLOCKS

When stalls are well designed, cows voluntarily lie down for longer periods – increasing their productivity and health

SPACE AND AVOIDING THE HEAT

For confined housing, that plan includes allowing either one bed per cow in a free-stall barn, or a minimum of 12 square metres of space per cow in an open-pack barn for high-production Holsteins.

The two experts have seen as little as 4.5m^2 per cow allowed.

In confined housing situations, it is recommended that cows need a minimum of three metres per second of wind speed moving over them, and a minimum of 10cm (lineal) of surface water trough area per cow.

Nico says, *"Cows are among the most sensitive to heat stress of any domestic animal. They drink 200 litres a day per cow, and the most comfortable temperature range for them is between five and 16 degrees Celsius. High-producing dairy cows can exhibit mild heat stress at 18 degrees.*

"People shouldn't judge a cow's body temperature by their own. It is quite different."

Radiant heat under a barn roof remains a major concern if the roof is less than 4.5m above the cow.

Sue says, *"If a roof is too low, there is often no room to solve it by effectively ventilating the area with fans. Fans may be able to be placed in there, but they'll most likely be inefficient, because there isn't an optimum way for the air to move around the cow."*

"Dead spots", where heat spikes in sections of a barn causing heat stress, can happen if the wind direction, turbulence and velocity is incorrectly calculated for comfortable oxygen exchange.

Sue acknowledges that incorporating ventilation, air movement and water cooling in barns naturally increases the investment, but says it is a vital important component that can be handled with forward planning and budgeting.

"Fans are only part of the cooling solution. The fans create the turbulence and they create the wind-chill factor to a degree. But the most effective way to cool a cow is to wet her, and to add fans.

"Feedline soakers, soaking cows in the holding yard, or high-pressure fogging are all options. If you want to use water, you have to make sure you have enough water, and the ability to collect and manage the additional water coming off the barn."

The most effective way to cool a cow is to wet her, and to add fans. Feedline soakers fully soak the cows, and the natural and forced air flow can then give the maximum cooling impact

ANSWERS LIE IN SCIENCE

Nico says proven science, together with practical application, holds the answers.

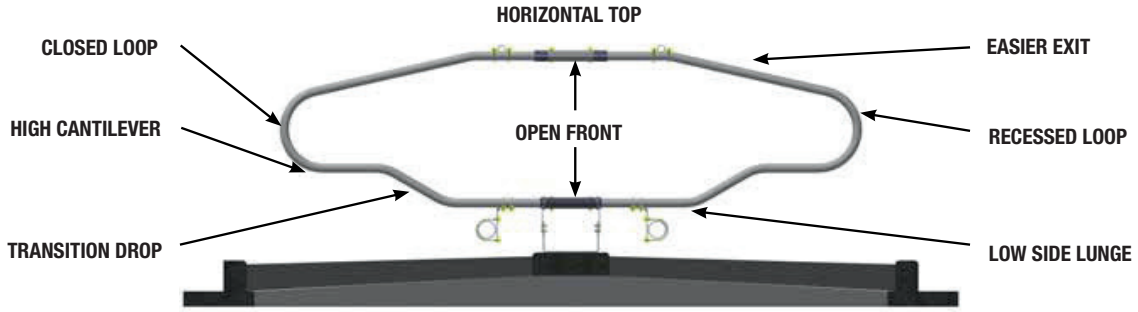
"Everything has to do with how much air you get over the cows, and also how we control the fans with variable-frequency drives to control windspeed, velocity and air exchange, and conserve power according to the ambient conditions or conditions within the barn.

"We can add all types of automation to these systems that take into consideration outside temperature and wind speed, and inside temperature and airspeed, and relative humidity in a free-stall or pack barn.

"We work with Sue and inBarn, because they have an enormous amount of experience in Canada, the US and China. Wherever animal housing is, that's where inBarn are. Their fan design and strategic placement gives our clients' barns the right outcomes for oxygen exchange, cow comfort and the condition of the environment year-round."

Visiting barns is a great way to decide what is right for your operation. Pictured is a barn which includes ventilation, loops and sand bedding. The width of the beds, walk ways, and the feed areas are all critical considerations

iNBARN – STALL DIVIDERS



iNBARN – PANEL FAN

Every barn has different features, and this Canadian example is no exception. The head-to-head free-stalls on the right are for the cows to rest on mattresses with wood shavings or chopped straw as a top dressing.

An alley scraper passes through without interfering with the cows eating. The feeding surface has not been cleaned for several years, and has maintained itself

BEDDING CHALLENGE

Bedding is another challenge in confined cow housing – and comes with plenty of misunderstandings.

Nico says it is a mistake for Australians to use rice hulls, bark chips and/or a combination of straw in compost barns; however he says kiln-dried sawdust is the ideal product to achieve the carbon-to-nitrogen ratio necessary to make a compost pack generate the heat needed to kill pathogens, evaporate excess moisture and to keep the biological mass active.

"It's fair to say that a big percentage of people in Australia are potentially looking at making mistakes in bedding. And I think some of that comes back to misuse of the words 'compost barn', because many instead want a 'resting pack' or a 'manure pack', not a 'compost barn'. I would like to see more widespread understanding of what a 'compost barn' actually is.

"A compost pack is an active biological mass. We're looking for 50-55% moisture – as soon as they reach in the high 50% to low 60%, we have bedding sticking to the cows and then we have a much higher bacterial load on the cows. Without the compost pack working at the right temperature, we're increasing the chances of a bacterial load and mastitis outbreaks – and we're talking about a mastitis that is very hard to manage, and to treat."

Nico says compost barns need permanent mechanical ventilation.

This compost barn in Kentucky in the USA proves dry matter does not stick to the cows when the compost pack is well-managed

These single-row comfort stalls in Canada self-clean in an ingenious way. The extra sawdust at the front of the stall is deliberate. Cows naturally pull fresh sawdust back when they get up and move away, taking the old sawdust with them into the alley, effectively keeping the stalls cleaner and drier. The stalls also have cow mattresses

PLANNING AND EXECUTION

Nico also stresses not to underestimate permit, power and effluent solutions. While these are all seemingly obvious considerations, they are often overlooked.

"It sounds obvious, but without those we won't be getting much done."

As in all buildings, Nico says that the quality of the foundation dictates the finished article.

"If the fundamentals are done right, the next stage of the development doesn't have to be a poorly sited 'add-on'.

"Good design won't cover poor management, but poor design and poor management is a disaster."

TAKE THE TIME

Nico's primary take-home messages for his clients who are considering intensive dairying has always been simple. *"If you are failing to plan, you are planning to fail."*

He has six touchstone points to guard against that.

"People can get themselves into a lot of trouble and spend millions of dollars to build a facility that doesn't work correctly because they didn't pay attention to those six points," Nico said.

"They seem simple, but they are important. A project grounded in well-planned and sound financial and resourced foundations results in outcomes which are very predictable.

"I generally run through those key points with our clients before we do anything, just to see if they are in the right headspace.

"If they are taking short cuts early in the conversation, I'm worried because there is a seventh point – pain – and I've seen it on peoples' faces. Those six points make sure that seventh point never happens."

INTERPRETING INTERNATIONAL BEST PRACTICE

Nico says it has been exciting to watch Australia gradually develop its own interpretation of international best practice.

"I think a lot of younger people will be the ones who will gain the most over a longer period of time from housing cows.

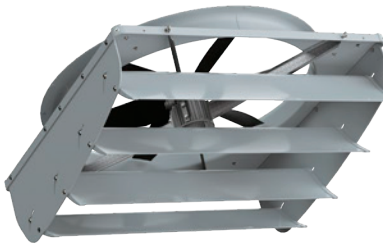
"Because as a dairy farmer in Gippsland said to me years ago: 'Dairy farming is like a marathon. If you want to be a sprinter, go buy some beef cattle.'

"I agree with him that success in dairy farming comes from a long-term commitment, and to invest in housing cows you need to take a longer-term view and understand the additional workload and management that goes with putting cows under a roof.

"I see the industry continuing to change and evolve, and our goal is to make sure no facility holds any of our producers back because of its design."

INBARN – CYCLONE FAN

Bigger fans (more horse power) are often the more economical and effective long-term solution because less are needed, it takes less electricity to run them, they achieve more cooling, and cows give more milk when their environment is right, according to inBarn's Senior Dairy Consultant, Sue Hagenson.



This free-stall barn in Wisconsin in the USA features longer stalls to allow for maximum cow comfort in summer. The cows are under fans, sitting on mattresses with chopped straw, and with the luxury of flush alleys.

World's best
Barn comfort solutions

inBarn

inBarn is a collective of dairy experts dedicated to finding the solutions that improve productivity and profitability.

inBarn's products are built tough and built smart to create a stress free and comfortable barn environment.

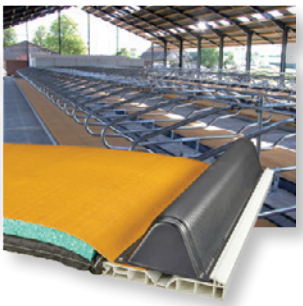
Quality products include: *Free Stalls, Headlocks, Gates, Ventilation, Cow Cooling, Lighting, Water Troughs and Fencing equipment.*

promat

The Leader in Animal Comfort

PACK MAT

PASTURE MAT



Mattress solutions that facilitate natural movement by the cow, allowing her to get up and down and providing optimal comfort while lying down.

Result – improved lying time, rumination and ultimately more milk.

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