

COVER STORY

By Jennifer Nevans

Cover photo courtesy of Mark Wescott, Dairy Lane Systems Ltd.

Modern DAIRY FARMING

Taking a look at the latest barn design features and new dairy technology and equipment

In an industry that's always evolving, Canadian dairy producers are consistently looking for ways to improve efficiencies, take advantage of quota increases and grow their herd.

To do this, many producers are transforming their barns to include the latest barn design features and new and emerging technology and equipment.

Harold House from DairyLogix says building large freestall barns with tunnel ventilation, along with constructing fabric-covered barns, is becoming a trend.

"One very simple innovation I'm seeing in a lot of barns is sawtooth neck rails," adds Jack Rodenburg from DairyLogix. "This is one of those things that when you see it, you wonder why no one thought of this 30 years ago."

Sawtooth neck rails encourage cows to stand and lie straighter in the centre of the stall, resulting in cleaner stalls and less manure pileup on top of the curb at the corners.

Automatic bedding delivery is also finding a home on more Ontario farms as is robotic

milking systems.

Rodenburg says many new barns in Canada are designed for robotic milking, and while this has been the trend for several years on farms with up to 120 cows, producers with larger herds are now considering robotics.

"There aren't many herds with more than 400 cows in Ontario, but several bigger herds are thinking about installing six to 10 robots, primarily as a lower cost alternative to hired labour," Rodenburg says.

Mike van Logtenstein, co-owner of Dairy Lane Systems Ltd., says many producers are considering tunnel or cross ventilation versus natural ventilation, and are trying to design simpler barns.

"Tunnel or cross ventilation allows for new options for barn layouts, which can increase day-to-day efficiencies," van Logtenstein says.

FACTORS TO CONSIDER

When constructing a new barn or renovating an existing one, dairy producers need to consider location, herd size, management and cow comfort,

among other factors.

"Cow comfort needs to be one of the primary goals, especially in light of proAction," House says. "Location is always important if the barn is to be naturally ventilated."

As part of a new barn design, House says producers should also consider plans to further expand the barn in the future.

"Every project should be planned in a way that expanding can be done with minimal changes later," Rodenburg says, who encourages farmers to design their barns for double the number of cows they intended and then scale back from there. This allows the next generation to easily add to the site and layout in the future.

"Bedding type and preferred manure system should be determined right away," van Logtenstein says, adding producers should ensure the manure system can also grow with the farm.

He agrees the new barn should be designed with the future in mind—what producers think the farm should look like in 20 years—and then scale back to ensure they don't limit themselves for expansion. To help determine future growth rates, producers should look at their own past growth rates as an indicator.

The four cornerstones for any project are cow comfort, labour efficiency, cost control and expandability, Rodenburg says.

"With the introduction of proAction standards, cow comfort is more important than ever, but it should always be among the first considerations anyways because happy cows are healthy cows," he says.

Rodenburg says healthy cows give more milk, require less work and live longer, and this adds to profitability.

"I don't think we should short change budget items that improve cow comfort," Rodenburg says, adding new barns would benefit by having better facilities for special needs and handling and treating cows.

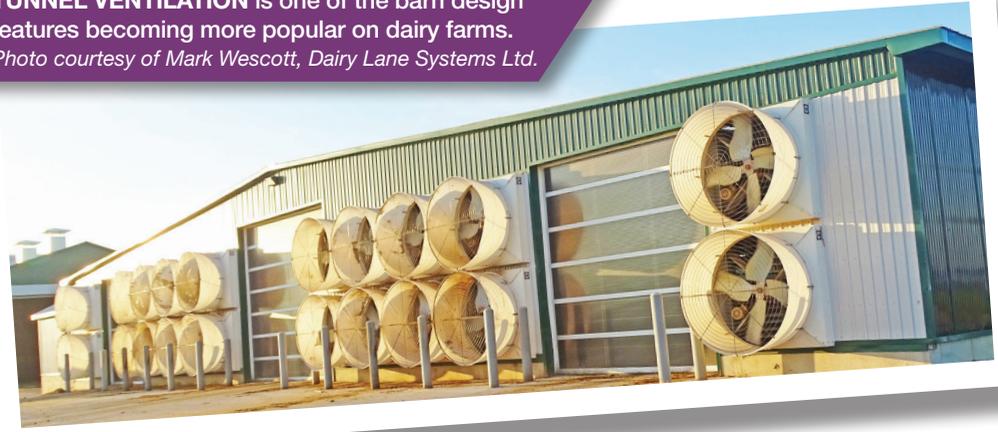
"Design your barn around proven principles," van Logtenstein says. This includes focusing on designing a barn that improves labour efficiency, allowing one person to move the cows and manage the barn efficiently. "Cow flow is critical to make barns truly efficient, and remember, as your milking herd grows, so will heifer and calf numbers."

For those looking to install a robotic barn, Rodenburg says cow comfort and healthy feet have to be priorities in a barn design. It should also include proper separation and handling spaces in order to achieve labour savings.

Producers should look at all areas of their project, van Logtenstein says. For robotics to be efficient, milking, feeding, manure and cow management all have to work together, he says.

TUNNEL VENTILATION is one of the barn design features becoming more popular on dairy farms.

Photo courtesy of Mark Wescott, Dairy Lane Systems Ltd.



PREPARING FOR CONSTRUCTION

Producers should spend two to three years researching and planning a new barn design, but should also be careful not to delay the project, House says.

“If you spend too long planning, the industry will keep changing and you will never start your project,” House says. “Information overload can also be a concern. Sometimes, the more you see and plan, the more you’ll become overwhelmed with choices.”

House advises farmers to visit open houses at new barns, attend meetings, and check out webinars and virtual tours. Along with visiting new barns, Rodenburg suggests farmers visit four- and five-year-old barns to see what has been working.

“It’s fine to spend time agonizing about whether to use sand bedding or a compost pack, but the basic choices about size, layout, milking system, bedding system and manure handling need to be made well in advance so there is at least six to eight months to finalize the engineering and approvals, and purchase equipment,” Rodenburg says.

He suggests farmers consult with people who work in and around the barn, including veterinarians, feed specialists and milk truck drivers about cow handling, feeding groups and truck access.

“Many times, these people know what works well on other farms they work with,” Rodenburg says.

Producers should also discuss plans with their accountant and financial institution to determine a project budget, as well as like-minded dairy producers and stabling, manure and equipment dealers to determine the basic outline of the project, van Logtenstein says.

How long producers spend planning a barn design depends on each individual producer, van Logtenstein says.

“Some producers can sit with me and design their new barn in two hours,” van Logtenstein says. “Some need two years. Each project is unique. You should not feel rushed to make your decision. That is when mistakes are made.”

TO RENOVATE OR RETROFIT?

Many barns might not be suitable for renovating since freestall sizes have increased, House says, and if producers are considering a robotic milking system, the existing layout may not allow for renovating.

“However, if the barn was built in the last 15 to 20 years, it may convert for heifer housing,” House says. “Not that heifers should be given less consideration, but 15-year-old freestalls may be more suitable for heifers than milking cows now.”

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Rodenburg says sometimes it makes sense to build a new barn for cows and use existing facilities for heifers.

“Renovating usually involves making compromises, and I tell producers planning to renovate to make a list so they can reassess them before they start reconstruction,” he says, adding producers can sometimes become focused on overcoming deficiencies they lose sight of the fact building a new barn can still be an option.

When it comes to retrofitting or renovating, van Logtenstein says retrofitting a good barn structure will allow producers to use the structure for many years. Producers should consider dollars invested versus useful service life of the structure. Ret-

rofitting a barn typically costs more than producers first anticipate, he says.

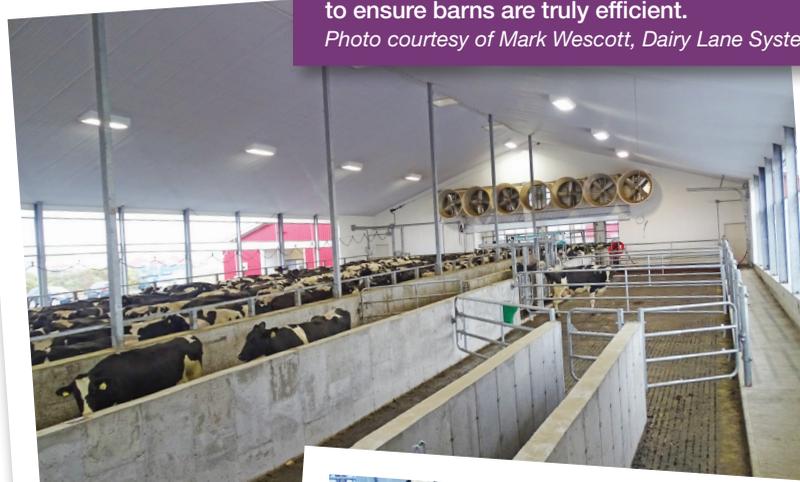
DairyLogix has seen projects range from \$8,000 to \$16,000 per cow space, Rodenburg says. Added features, such as a new milking system, manure storage, feed storage, handling equipment or heifer housing, also affect how much a project will cost.

“The second variable is the size of the project,” Rodenburg says. “Barns for 300 cows typically cost as much as a third less per cow than barns for 100 cows or less.”

The third big variable, Rodenburg says, is how frugal farmers are about avoiding wasted space and unnecessary “bells and whistles.”

PLANNING A DESIGN to optimize cow flow is critical to ensure barns are truly efficient.

Photo courtesy of Mark Wescott, Dairy Lane Systems Ltd.



SAWTOOTH NECK rails encourage cows to stand and lie straighter in the centre of the stall, resulting in cleaner stalls.

Photo courtesy of Mark Wescott, Dairy Lane Systems Ltd.



B.C. DAIRY FARM EMBRACES ROBOTICS

Communication is key when designing and constructing a new dairy barn, says Bernie VanderMeulen, general manager at Corner's Pride Farms in British Columbia.

VanderMeulen, along with livestock manager Justin VanderMeulen and shop manager Brandon Bisschop, had construction and design meetings throughout the process so any small details were dealt with right away and didn't become a challenge or mistake.

With 1,650 Holstein milking cows, the owners rely on technology to keep the farm running efficiently. Today, it is a prime example of what the future of dairy farming will look like. When construction finishes in March 2018, the farm will run 31 Lely A4 Astronaut robots.

The owners started looking into robots in April 2016, and had meetings with four robotic dealers to gauge options available. In August 2016, they began a four-month process of planning and designing their new robotic dairy farm, which would include retrofitting four existing barns and constructing two new barns, starting in January 2017.

During the design phase, they visited other larger farms to see how they were set up and looked at what could work at Corner's Pride Farms.

"As you go along, you will see things you might want to change or hadn't thought of originally in the design," the owners say. "It's much easier to make changes as you go along than after the fact."

The owners say the main motivation behind

installing robots was to try to find efficiencies when it came to labour since the farm consistently experienced high turnover in the milking job. The farm also wanted to take advantage of quota increases and fulfil all available quota. The dairy farm's former double 25 parlour ran 22 hours a day and was at capacity. Now the farm averages 2.9 visits to the robots daily and produces about 36.9 kilograms of milk.

Along with the robots, Corner's Pride Farms installed a bio-link flush system with Slurry Store and

a deck flush in the barns by the robots, as well as Lely robotic Juno feed pushers and a Lely Discovery barn cleaner. The owners say they particularly like the three-way sorting gate designed by West Coast Robotics, which makes it easier to direct each cow through the second gate for footbaths.

The third gate directs cows into the treatment holding pen, if required. Each pen has a treatment area where cows have access to water and can lay down and wait for the herdsman to check her.

All treated cows go to a separate hospi-



CORNER'S PRIDE Farms in British Columbia will have 31 Lely A4 Astronaut robots running when construction finishes in March 2018.

tal pen, which has two robots. Since the farm doesn't have to divert treated milk in the milking pens, the separation allows the farm to maximize milking robots to 60 cows per box, giving the farm the capacity to milk 1,740 cows.

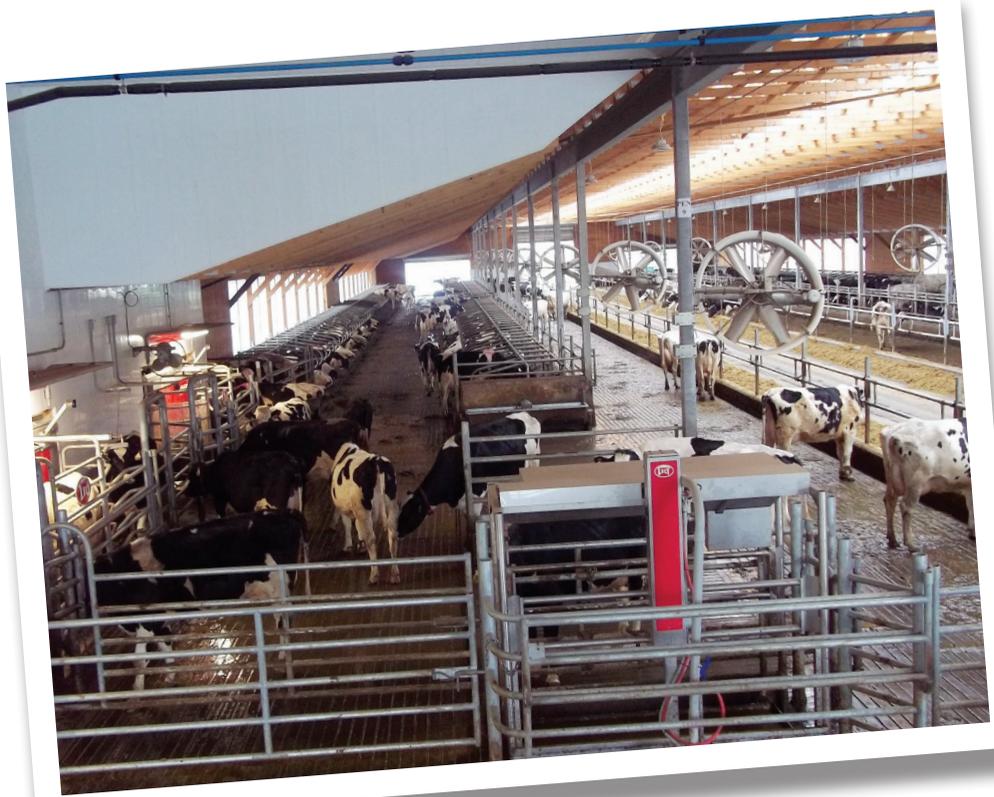
The two new barns aren't much different than the farms' current barns, which are sand bedding flush barns, as well as fans, misters and one stall per cow for cow comfort.

Cow comfort and movement were some of the factors the owners considered when retrofitting existing barns and building new ones. As a result, all robots are at the front of the barns and treatment areas are in front of the robots, allowing cows that are finished milking to go back to their stalls.

"We also wanted to take into account the employees and how it would work best from a human standpoint when dealing with the cows on a daily basis," the owners say.

The massive project is a big accomplishment for the farm, which started in 1968 with just 30 cows. Throughout the years, the farm continued to embrace technology, which allowed it to improve efficiencies and grow its herd to 1,650 milking cows.

In June 2007, the farm completed construction on a new commodity shed, separator slab and new 38,000-square-foot barn. In April 2008, the team expanded the holding and treatment area and built a new herdsman office to ac-



commodate their growing herd and staff.

In March 2009, the farm finished construction on a new hospital/maternity barn, as well as a second 38,000 sq. ft. barn. The farm currently op-

erates in four locations. The main dairy with the cows and parlour is located in Rosedale, B.C., replacement heifers are raised in Popkum, B.C., and Merritt, B.C., and hay is grown in Raymond, Alta.

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STATE-OF-THE-ART DAIRY FACILITY ENHANCES STUDENT EDUCATION

Students studying agricultural sciences at Lakeland College in Vermilion, Alta., can experience the latest barn design features, technology and equipment in the college's new state-of-the-art dairy training centre.

Instructor Blair Dow says construction on the 47,000-square-foot facility started in early 2017 and wrapped up in August 2017.

"The facility was built by Eagle Builders and the main suppliers were Agrai Dairy Mart (DeLaval) and Penner Farm Services," Dow says.

The naturally-ventilated freestall facility can

house 120 lactating Holstein cows, close-up dry cows and pre-weaned calves.

"The centre features a drive-thru feed alley that divides the facility into two milking groups," Dow says. "One side features a voluntary milking system (VMS) with free flow access, the other side features a double eight parlour."

Close-up dry cows and fresh cows are housed on a bedding pack, allowing fresh cows to access the VMS. The VMS has the herd navigator option. The second side of the facility has 60 freestalls where the remainder of the

milking herd is milked in a double eight rapid exit parallel parlour. The herd currently averages 35 litres a day with four per cent fat.

"All cows are fed by a Lely Vector, and forages are stored in four Valmetal boxes in the feed kitchen area," Dow says.

Calves are fed using a CF1000 automatic calf feeder in two self-contained rooms with an 18-by-20-foot pack area, and a third calf room is used as a transition area for weaned calves.

"Automated feeding delivers the partial mixed ration on an as-needed basis," Dow says. "The Vector scans the bunks hourly, while pushing up feed."

The new barn design offers many benefits when it comes to cow comfort. The stalls are equipped with triple foam mattresses with shavings on top. Headlock gates on the feed rail are four per 10 feet, and crossover alleys are 16 feet wide, providing enough space for cows to drink and move from stalls to feed alley.

The Lakeland team started planning the new facility design in the fall of 2014. A partnership with Alberta Milk provided an educational lease on quota for the expansion, as well as design advice through the board's research and extension committee. Lakeland College will be partnering with Alberta Milk to provide dairy-related short courses.

"Animal science students at Lakeland College have been involved in the design process," Dow says, adding the facility was designed under five guiding principles—safe student and industry training, maximum automation and minimal environmental impact, transition cow



DAIRY TRAINING facility at Lakeland College in Vermilion, Alta.



management, cow comfort and animal care, and biosecurity.

With the new facility, second-year animal science technology students (Student Managed Farm—powered by New Holland), along with farm staff, have the opportunity to manage a dairy facility with the latest technology available to the industry, Dow says. First-year students can also receive hands-on training in all aspects of dairy production, including parlour and robotic

milking, calf feeding, and heifer and dry cow care.

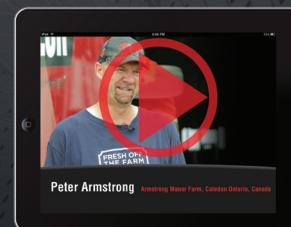
“Technology can change the way you manage and provide labour for your dairy,” Dow says, who advises producers looking to renovate or retrofit their barns visit farms that have been successful at incorporating technology. “Spend a few hours on these farms to get a clear understanding of what is involved on a daily basis to be successful with technology before making your final decisions.”

Jennifer Nevans

is assistant editor of Milk Producer.

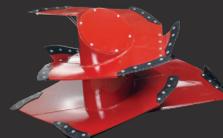


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