

Time for Technology

The many faces of robotic milking

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After a fairly slow start twelve years ago, robotic milking is quickly becoming mainstream technology in North America today. Until a few years ago, I tried to keep track of how many systems were operating in various regions of Canada and the USA, but new installations are going in much faster than I care to count now. Up to this point, two companies dominate the market. Lely appears to have the biggest market share and DeLaval is not far behind. While the technology offered by these market leaders has some clear differences, it could be argued that the overall approach is fairly similar. Both have taken the "single box" approach with one robot positioned beside one cow, and until the recent introduction of the Lely A4, that cow came and went by a very similar route. Both companies will tell you they have better udder prep, better software, and better in line monitoring capabilities, and if you are shopping for a system you have some choices to make. Their healthy competition in the marketplace has meant better support, and service and more competitive pricing for you, the customer.

If you are looking for equipment that comes with local experience and a proven Canadian track record the right choice will likely still be red or blue for several years to come. But for the more adventurous, the number of options is expanding, and when one explores what is happening world wide it is clear that there will soon be a few more approaches to robotic milking to choose from. One of these is robots in a parlour application, specifically the DeLaval AMR featured at major trade shows in Europe and the USA. This internal rotary platform, which stops and starts, allowing 2 or 4 robot arms to prep and attach the milking equipment and one to disinfect post milking. This system will likely be launched for distribution in North America sometime in 2013. At a predicted throughput of 90 cows per hour, and many of the same milking techniques and components as the VMS single box system, DeLaval expects the AMR to milk up to 500 cows three times per day or 800 twice a day . There is little doubt that many large dairies will be watching this technology closely, especially in the USA where access to low cost labour is getting more difficult. If you want to see the AMR in action there are many good YouTube videos to choose from including one at http://www.youtube.com/watch?v=-e_AOeOC4s . Different technologies also come with new and different challenges. For the AMR one of those challenges will be developing practical ways to bring a much bigger number of cows from much farther away to the milking area, either voluntarily or with practical labour efficient alternative approaches.

At the other edge of the "many faces of robotic milking" we find Roboleo. Developed by Rovibec, in Quebec , this robotic milking stall travels up and down the alley between the cows in tail to tail tie stall barns, positions itself against the curb behind the cow, and guides her onto the milking platform while she remains chained to the single head rail tie stall. At roughly \$350,000 for a single stall this is a substantial investment, but for many dairy producers it avoids the \$700,000 plus investment required to

build a new freestall barn, or the \$200,000 plus needed to convert a tie stall facility to freestalls. Currently there are 10 of these systems milking on 8 dairies in Quebec. Rovibec has plans to make it available in Ontario in 2013. Their experience to date shows a capacity of up to 70 cows for twice daily milking at fixed 12 hour intervals and 50 cows for 3 times milking. As a lifetime advocate for freestall systems this would not be my choice of technologies but I have to concede that applying individual cow focussed automation is potentially easier to do in tiestalls than in a freestall setting. In Europe, some countries are set to ban tiestall housing due to consumer concerns about animal welfare. Long term this may be the biggest threat for Roboleo, but for Rovibec, a moderate sized Canadian company, marketing and supporting this successfully is a noteworthy achievement. If you want to see "Leo" milk cows , go to <http://www.youtube.com/watch?v=IMwsBerw80c>. Unless you are bilingual you can keep the sound off, but the picture is quite impressive on its own.

Three other "systems of interest" are at various stages of capturing the attention of the North American market. Many dairy producers will already be familiar with the Insentec Galaxy system, which offers an industrial type robot arm that is floor mounted between two milking stalls. Since it can work alternately to its left and right, one robot and two milking stalls have a milking capacity that approaches that of two single stall systems, at a lower cost. The Galaxy is already milking cows on three Ontario dairies, and the fourth will be Schouten Farms near Richmond, who have built for 10 milking stalls and 5 Galaxy robots. To watch the Galaxy at work, go to <http://www.youtube.com/watch?v=a44nY7xPARg&feature=related> . Milking on two sides of the room means barn design options are more limited, and there are fewer possibilities for separating cows for handling or for milking more than one group in one stall. These issues can be partially overcome with designs that direct exiting cows to a return lane. As we gain experience with these systems we will also gain a better understanding of the importance of traditional sort capabilities and whether or not the alternatives offered with this system can work as well.

A new entry in the North American market arriving next summer is the GEA Mlone, being installed at Kie Farms in St. Mary's, in a new barn being built next year. The Mlone platform looks a great deal like the Prolion system which made a brief appearance on the Ontario market as the AMS Liberty a decade ago. That technology did not impress here or in Europe, and prompted many observers to conclude that multi box systems were not the answer. But early reports about several GEA systems in Holland suggest the Mlone is working well. With up to 5 tandem milking stalls served by a single robot, travelling on a track from stall to stall, this system will require less capital investment, especially in larger herds. Because the location of milking stalls is fixed, multibox systems offer less flexibility in barn layout. With this approach, sorting cows on exit depends on giving them access to the robots via a permanent commitment pen. Research has shown that, especially with robots running near capacity, this can be stressful for timid cows that enter the commitment pen and get stuck there because more aggressive cows continually butt in, and keep them out of the milking stalls. It may also take a little more training to teach heifers to use the sort lanes. One very different feature of this system is that it preps and dips in the milking teatcup. The Kiestra's will start with 2 GEA milking stalls next year, undoubtedly with a lot of interested observers keeping tabs on their experiences. There are several good videos of the Mlone on YouTube but none in English. You can get the idea at <http://www.youtube.com/watch?v=C0HP1KGYtco&feature=related> .

Last and likely for the immediate future also least, is a new entry in the single box market from Bou-Matic. They have put the arm behind the cow and are attaching from the rear, as shown on video at <http://www.boumaticrobotics.com/products/mr-s1-milking-robot> . On the plus side, this stall has entry and exit gates on both sides, which will make it the simplest stall for accessing and exiting from two groups. With traditional single box systems, a second group of fresh cows or separation cows can be housed behind the robot, but in most layouts these cows enter through a commitment pen, and they have no view of the robot from their feeding and resting areas. But in many barns Bou-Matic's long building will make it difficult to place and orient the system effectively. One could speculate that the potential for milking from behind, in future applications on external rotaries may have played a role in this company's development plans. In their video, they call robotic milking from behind, "an entirely new concept" . It is perhaps ironic that the very first experimental robotic milking system I ever saw in North America, was installed at the University of Maryland research farm in 1993 and it milked from behind. Perhaps an illustration that technology development follows unpredictable paths and for robotic milking there will undoubtedly be new and interesting turns in the road ahead as well.