Time for Technology

Look through the eyes of the cow to make the most of technology.

Jack Rodenburg, DairyLogix

Dairy nutrition, genetics, reproduction, and health management have always been the cornerstones of dairy production, but during the last decade, "cow psychology" has attracted considerable attention as an emerging herd management tool. Here in Ontario, cow videographers like Doug Young and Dr. Neil Anderson have helped us make great strides in understanding the interaction between the cow and the stall, the feed manger and the water trough. Drs. Dan Weary and Marina Von Keyserlingk and the animal behaviour team at the University of British Columbia have done a great deal of work both on the farm and in the lab to quantify what the rest of us see in the field. In Europe, veterinarians Drs. Jan Hulsen and Joep Driessen are taking this a step further by training farmers and their advisors to sharpen their observation skills through workshops and a very popular 'CowSignals" book series. I have had the pleasure of working with all of these people and I am very grateful for what they have taught me about observing and learning from cow behaviour. Although it is not something that comes naturally to me, and although I have to work at it systematically, I have learned that looking at your barn and management "through the eyes of the cow" can often make you a lot of money.

Robotic milking as a technology is highly dependent on the cooperation of the cow. If she shows up on her own for milking 4 times per day the first 3 months after calving and 3 times per day the rest of the lactation she will produce a substantial amount of extra milk and require very little labour. On the other hand if she only arrives when fetched by the farmer both production and labour efficiency go down the drain. As a consultant on facilities design for robotic milking I would like to use this column to illustrate two examples of how consideration for the cow's perspective can make this technology and facilities work better.

On the equipment side both Lely and DeLaval have recently introduced new robotic milking concepts. The DeLaval Automatic Milking Rotary, which you can check out on their website at www.delaval.com/en/About-DeLaval/DeLaval-Newsroom/?nid=2718, represents a completely new concept in automation. This is an exciting and very new development that will undoubtedly challenge cow behaviour specialists with new opportunities to visualize how cows will interact with this technology. With the official launch of this equipment taking place at the Eurotier show in November 2010, look for more on this in a future column. At the other end of the spectrum, Lely has just released the A4 milking robot, as a refinement of the well established single box robotic milking concept. Check it out on their website at http://revolution.lely.com/en/home Cow behaviour has clearly played a major role in this redesign. In terms of cow phsychology,

walking straight in and straight out of the milking stall should create greater ease of movement, and both the actual open space in the stall and the perception of openness resulting from the elimination of solid panels in front and behind are attractive features from the cow's perspective. Monitoring the positioning of the cow using infra red 3D camera technology is an interesting innovation that eliminates both the need for the butt plate used in other systems and the weight sensors used in the previous model. The fact that the feed bowl disappears also sends a clear message to the cow that there is no reason to hang around after milking is completed. Barn planners and farmers will also find some features they can appreciate, particularly the shorter box length which will make placing a footbath easier, and there is also greater flexibility in washing and vacuum systems for multi robot installations. But the cow is clearly the big winner in this redesign which caters to her comfort, ease of movement and contact with the rest of the herd.

On the barn design side, cow psychology should also be given priority. An example of this, also drawn from the realm of robotic milking is the "split entry" fetch pen or holding area. I first saw this used at Ferme Sessink, a Quebec dairy owned by Jean Keurentjes, and the concept is now used in many robotic milking herds around the world. The split entry involves a fetch pen that is located beside the robot room to the rear of the milking stall. A short lane from the fetch pen with a free swinging gate allows equal access to cows from the main herd and from the fetch pen. A good illustration of how this works and the cow psychology involved can be found on my website at http://www.dairylogix.com/SplitEntryHoldingArea.pdf. The timid cow in the fetch pen cannot be molested by the boss cow that enters the robot directly from the main group. While the timid cow has nothing to fear in the holding area, eventually she does have to act on her own to get back to feed and water and a place to rest. With this system there is no need to reset gates after milking the fetched cows. Just close the entry gate to the holding area behind the last cow fetched. In other designs that do require gates to be opened after fetched cows are milked, there is great potential for bad cow psychology, because a farmer waiting for stragglers is highly likely to chase them in, reinforcing the bad habit of waiting to be fetched.

A 5 foot gate, hinged to the back corner of the robot room can be used to direct unfamiliar and unwilling cow toward the robot. At the first milking for a new heifer you may need to use this gate and push her in. At a second milking you could use the gate to squeeze her in the entry, chain the gate behind her and wait for her to take the last step on her own. As a third step the heifer is left on her own in the fetch pen. Because the rear gate on most robotic milking systems opens out from the stall, the cow in the fetch pen has a slight advantage over the more aggressive cow entering from the main herd. This uses cow psychology to advantage by allowing the cow to learn the desired behaviour of entering voluntarily, in progressive steps.

The split entry holding area also makes it possible to provide access for a second group of cows housed behind the robot. If this area is used for close up, calving, fresh and lame cows in bedding packs, many of the cows that benefit from preferential access due to either inexperience or difficulty getting around have the benefit of a preferred route to the milking stall. One final bit of cow psychology: when cows and heifers that calved in a

pen behind the robot are put in the main herd a few days after calving, they will come looking for their calf where it was born, and that brings them back to the fetch pen and to the robot for milking.

While these examples of using cow psychology share a rather narrow application specific to robotic milking, there will be opportunities to benefit from "looking through the eyes of the cow" in every housing system and every technology we employ. Consciously taking the time to look at our barns and management practices with a critical "bovine" eye, might very well help us discover other novel ways to make the lives of our cows less stressful and more productive.

Fig 1. The split entry holding area permits access from either the main herd and the fetch pen at the same time.

Fig 2. This squeeze gate is useful in training unfamiliar cows.