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ROBOTS WILL NEVER replace children in the hearts of their parents but they may replace them for doing one of the traditional farm chores often assigned them – feeding young calves.

The first robot in North America created for feeding calves has been installed on a dairy farm near Kerwood in Middlesex County with impressive results.

“We haven’t lost a calf since it was installed,” said Peter Thoma of the robotic system installed in April by German manufacturer Forster Technik.

He and wife Rachel milk 130 cows. Their two young children make sure the water and starter ration pails are full for calves but when it comes to feeding milk, the robot does all the work.

Calves are fed five times a day, with two to two and a half litres of milk replacer freshly made and available to each calf at each feeding. Eight feedings a day are possible as well as the option of utilizing whole milk.

The milk dispensing “arm” moves on an overhead rail, stopping for a maximum eight minutes in front of each individual calf pen. Should the calf drink its allotted milk in less time the unit will move on after it detects no sucking action for a period of one minute.

“The speed at which a calf drinks is more important than the amount it drinks,” said Jan Ziemerink, manager of automatic services for Forster Technik.

That information is recorded on a hand-held computer attached to the automatic milk mixing machine. A calf developing an illness slows down its drinking speed even before exhibiting

signs outwardly so appropriate steps can be take to correct that sooner, said Ziemerink.

He suggested a Holstein calf should drink .9 litres of milk per minute.

Rachel noted that the speed of milk drinking is slightly slower with the robot arm but in one day each calf is ideally drinking from nine to 12 litres.

There is an introductory period of two to three days for getting a new born calf introduced to the system, said Rachel who oversees calf care on the farm.

She reported spending about the same amount of time with the calves as when they were fed by hand in hutches but she can concentrate her labour on different things related to calf care and at differ-

ent, more convenient times.

The entire system represented a \$30,000 investment for raising the 65 to 70 heifer calves the farm produces each year. Peter does not justify that cost to only the labour saved.

He listed improved calf health; improved growth rate so heifers can be bred and freshen sooner; increased lifetime production; reduced veterinarian bills; flexibility in scheduling calf chores; consistency in concentration and temperature of milk being fed.

The Thomases start their bull calves on the system and feed them for one week before taking them to the sales barn. They receive a premium because the calves are already exhibiting earlier



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## TECHNOLOGY

growth.

Robotic calf feeding is very much a work in progress. The heated milk line is currently the limiting factor on how many calves the Thomases can feed. The folding milk line will extend 30 metres on one arm, feeding a row of 32 calves – 16 per side of a central aisle way.

However the automated milk mixer can handle up to four arms while at the same time supplying milk to two feeders in group pens. This allows a smooth transition from individual pens for new born calves to the group setting for older calves, said Ziemerink.

Calves are weaned from milk at eight weeks of age with the weaning taking place gradually over a 14-day period, monitored by RFD tags on calves in the group setting. Amounts of milk made available are gradually reduced from a peak of 12 litres per day at 46 days of age.

“The calves hardly know they are being weaned,” said Ziemerink.

Milk volumes to calves in individual pens can also be monitored either by the positioning of the pen or RFD tag on the calf.

Ziemerink recently returned from the University of Alberta where a second robot calf feeder is being installed by Forster Technik.

There are currently 20 similar systems operating in Germany. The ease of which information on developments/improvements can be transferred allows opportunity for upgrades.

Any software improvements in the system made in Germany can be immediately imported through a port on the side of the hand held computer attached to the automatic milk mixer. “You have a new machine,” said Ziemerink.

With the right configuration of penning and robot arms, one feeder can handle 128 calves. Two such systems are being tested.

Of course varying conditions between

Europe and Canada make some modifications necessary here. For example – even though the folding milk lines are heated by electric cable – the colder climate here may require more modifications.

The Thoma’s unit did work in -10C temperatures in their barn but considerations are being given to heating lines with circulating water.

Heaters have been installed in the shielding surrounding the milk dispensing nipple on modified units in Germany. The only milk in the system is held in the delivery line with the automatic mixing unit refilling the line as required.

The mixing unit calibrates the concentration of milk solids at 150 grams of powder to one litre of water. It is also washed automatically before and after each feeding session with an alarm notifying when detergent levels are getting low.

An optional teat cleaning feature sprays off the teat externally after every calf feeding.

The opportunity for each calf to drink just what it wants is a good feature of the system, said Rachel. She noted that the 10 a.m. feeding has the least response from calves with Ziemerink reporting sim-

ilar reaction from other farms using the system.

At the same time calves do not continue to suck on penning or whatever is handy between feedings, as they were prone to do in the hutch feeding arrangement, added Rachel.

With traceability becoming increasingly important the system allows for collection of extensive data on calf development. The hand held unit will store two day’s worth of data before being transferred to a lap top or personal computer system.

A review of that data at a time and place convenient to the farmer will reveal what is happening with the calves, suggested Ziemerink.

Neither he or Rachel suggested this would replace a person observing the calves on a daily basis.

Interest in robotic calf feeders has begun to grow in Canada. Several dairy farmers have visited the Thoma’s farm to see the system at work while farmers in both Ontario and Quebec have contacted him about the robot, said Ziemerink. **D**



The rail-mounted system, including the wash attachment at lower right . . . . .