



Bill and Kyle look on as the cows make their journey in and out of the cow box. As each cow goes into the box, the gate closes and locks as the computer reads each cow her specific ration of feed. The cows have full access to this process 24 hours a day.

M Robotic MILKERS

Cows Eat, Milk Free Choice With Lely Astronaut A3 Robotic Milking System

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Dairy farming is in the flesh and blood of the Johnson brothers who operate the Bill Schrage farm (officially known as Villa Rosa Inc.) in Greenville, Ill. Kyle and Kurt Johnson manage the milking of 90 Holstein cows with the Lely Astronaut A3 robotic milking system. The system was installed last year and milking became totally automated on Dec. 8, 2009.

The system allows the dairymen much more time for family and they can manage and optimize their business as each cow determines for herself when she will eat and be milked. All cows wear a transponder around their necks and when one walks into the milking stall the

bushels. Everything is dryland, with none irrigated. Soybeans run anywhere from 45 to 60 bushels per acre across the board the last few years. They haven't calculated silage yields, but they're in line with yields in the area.

They round bale a little alfalfa and some clover. They wet bale much of it and wrap it in white plastic for haylage which gets used up in a year, with the cattle eating it free choice.

Progression To Robotic Milkers

While their grandfather was milking two cows at a time with two units, Kyle and Kurt knew there was a better way.

"We milked 16 cows at a time, sounds like a lot; and it really took us a long time because it involved 16 cows in and 16 cows out," Kyle reflected. "You're as fast as your slowest cow. Basically about a year and a half ago, our parlor



Passing on the dairy farm he began in 1956 is, Bill Schrage (center) shown with his two grandsons, Kyle Johnson (left) and Kurt Johnson (right). The milking became totally automated with the Lely Astronaut A3 robotic milking system in December 2009.

system reads the transponder, identifies the cow, delivers her portion of feed, cleans her, attaches the teat cups and milks her. Then it detaches from her, sprays her bag, washes the teat cups and sends all information to a computer at the farm office where records of each cow and her production are stored.

It wasn't always this way at the Schrage farm. Bill Schrage grew up in St. Rose in Clinton

County where his parents and grandparents operated a dairy. His grandfather milked about 19 Holsteins, and his father continued the tradition with about 30. After serving two years in the army, Bill moved to Greenville in 1956, purchasing land from his father who first bought it back in 1948. He set up a milking parlor and started milking a dozen cows by hand.

"Then we bought a half a dozen bred heifers, and a half a dozen more the following year," Bill said. He raised his own replacements to complete the herd. "I guess the most cows we had was 110-120 in the late 1960s."

With the help of his wife and children, and some occasional teenage helpers, he continued that way a few years without milking machines. Later he went to two-unit milkers, selling Grade A milk to the St. Louis market.

Back then he recalls a heifer produced 20 lbs. at milking and an older cow averaged 60 lbs. a day.

"We had one cow, that pretty much produced 130 lbs.," he said. An average for the herd at that time was around 18,000 pounds of milk per cow per year.

He increased the herd to 110 cattle with the yields staying about the same. With his children and grandchildren living just four miles away, he gradually began turning the operation over to them.

"I felt that they were doing the work, and they wanted to do some long range planning so they needed to have control," he said.

When he first started dairying he raised all his own crops and feed, often selling a little soybeans and wheat.

"In 1957, we had one 13x30 silo and when we built a three stall barn in 1968 we put up a big silo, 24x65, and installed an electric unloader," he recalled.

Among his six children, two sons and four daughters, it was his daughter who took an interest in the farm. When his grandsons started helping, they were as concerned as he was about the dry weather and whether the crops would bear.

Bill is still involved in the farm, stopping in to help out every day, although he struggles with Parkinson's.

Today the farm has grown to 500 acres in all, nearly doubling the 280 acres purchased in 1956. Some is pasture, some is timber, and the rest is farmland.

"We started out putting corn in the silo in the summer or fall, and then in spring the first cutting of alfalfa," he said. "The last years we got away from chopping hay into silage and now we just use corn. The unloaders work much better with the corn."

Some corn and soybeans they sell. They don't have a combine, they hire custom harvesting. They still do the planting, and silage chopping themselves with their own machinery.

Kyle, 30, the oldest of the Johnson brothers, joined the farm in 2003 after receiving his degree in general agriculture from SIUC-Carbon-

dale. Kurt, 27, joined the farm in 2005, after also receiving his degree from SIUC in general agriculture, with a minor in animal science.

However, their memories of the farm begin long before that.

"My earliest memory is feeding calves when I was knee high," he recalled. "I came out here and I remember helping whomever, my mom, my aunt or my uncle or somebody, help them carry the buckets or the bottles out to the calves, feeding the calves. This was our day care, so when mom and dad had to work, we were out here helping."

"We had a small old Massey tractor, I'd ride in grandpa's lap and we'd feed the calves, just old memories like that," Kyle said.

Kyle and his wife, Kristy, live in the farmhouse with their son, 3-year-old Kaleb. His grandfather, now widowed, remodeled an apartment in the barn so he could remain close. Already, the tradition is continuing with the next generation.

"Oh yea, Kaleb was helping me this morning, we took cows into town to the sale barn," Kyle said with enthusiasm.

The farm is now a three-way partnership that includes Bill Schrage, Kyle and Kurt Johnson. Kurt was married in April to Whitney.

Automation had already become a part of milking cows when the boys first became involved, so there remained nothing about hand milking. They just loved to be helping on the farm with Grandpa and Grandma.

Kyle and Kurt have been on the farm for basically 25 years now.

"The early days it wasn't full time," Kyle remembered. "It was evenings and weekends but what I learned in those years was more than anything I learned at college; just life lessons that I learned here on the farm."

"I played soccer when I was growing up so I didn't come out as much after school as Kyle did," Kurt said, "but I was here every weekend and all summer long we'd be here every day."

As one would expect, there are disagreements, but they always manage to work them out.

"We're always in contact with each other," Kurt said. "There's always a constant conversation about what's next or what's on the plate for the day. We share all responsibilities, there's not one thing that only one of us does. We always just do whatever needs to be done first."

Their day runs from 5 a.m. until 8 p.m. most of the time, although they trade days on weekends.

"Like, he'll take Saturday off and I'll take Sunday or visa versa," Kurt explained. "When it's rainy, like it is today, we'll go from 7 in the morning till 5 or 6 at night."

Field work usually finds Kurt on the planter while Kyle is on the field cultivator. Kyle does all the chopping silage, and Kurt runs the wagons.

"I'll bring the wagons in, unload silage in the silo and bring them back to him," Kurt said.

Mainly they raise 100 to 150 acres of corn, 80 acres of alfalfa and 150 acres of beans. The rest is in clover which they graze and also bale.

"We need at least 150 acres of corn for chopping and grain," he added.

Corn yields run anywhere from 150 to 170

versity of Wisconsin in Platteville, Wis. There, they had an older model of a different brand robotic system and Kyle visited to look at them.

"We talked to the herdsman and he really didn't care for the system they had. The technology just really wasn't great," Kyle said.

"When we were up there he wanted us to look at a farm that was within a half mile of the Platteville farm that had the Lely milking robots," Kyle continued. "He had never been there himself so he went with us. Before we went to that farm I asked him 'if you were me would you build a traditional parlor or would you go with the robots?' And he said 'definitely go with the traditional parlor, technology is not there.'"

"So we visited the other farm, and this farmer was milking 200 head with four robots," he said. "We went into his robot room and everything was working fantastic. We were sitting there talking with this guy. The cows were coming in on their own, nobody was doing anything, and I was pretty much amazed. And I asked the herdsman from the Platteville farm what he thought about this one and he said 'forget what I told you; go with this.'"

"So basically, I came home just giddy as a school girl," he continued. "This is what I wanted and I told my brother about it, and he wanted to see it for himself. So he took a trip up there, looked at them, and he basically came home as amazed as I was. From there we arranged the financing, and contacted a dealer here in this area to take on the dealership. And once we had that all in line, we started building the building and Dec. 8 of this last year we started milking with our new robots."

The Johnsons introduced Gary Arentsen to the system, and they became his first customers. Arentsen had been handling various dairy supplies including milk replacers, and he has now taken on the Lely dealership in this area. He attended several weeks of training to become a dealer.

The future looks brighter now that they have used the milkers for six months.

"Our goal right now is to max these two machines out," Kyle said. "Each machine will do 60 cows, so we've got room to grow up to 120 cows. That's our goal for now. This past couple of months we bought about 15 bred heifers to add to the herd and we have quite a few of our own heifers that are coming into the herd, so we hope to be reaching that point very soon."

While they would have liked to raise all their own heifers, that would have taken time, and the new equipment requires the cow numbers in order to be economical.

"To make these robots pay, it really is justifiable to have 120 cows," Kyle said. "It's like paying a guy to milk 120 cows but he is only milking 90."

The cows also get forage in a paddock, the size of which changes as the forage is available.

"Like this spring when the grass is really growing green and lush, they are in a very small paddock," Kyle said. "Now that the pastures are starting and they are eating them down we give them a little bit more."

However, they also need to keep the pasture intake in line with the daily ration provided in the milking stall.

"Basically we have to correlate the pasture with the robots so that the cow isn't getting too much out in the pasture so she can come in for milking. It depends on what that pasture is at that certain time of the year."

The transponder on each cow identifies the animal with the robot. If she hasn't come in to feed within so many hours that will show up on the computer and the Johnsons will check it out.

"Basically that's the first thing we do in the morning when we come out here," Kyle said. "We check the computer, see who's late, and that's the last thing we do each night."

The cows that don't come in are generally the heifers that are just freshened and they don't know any better. They are in a training mode. Or they are cows that are drying off and they don't have the energy demand for the feed, so they really don't need to come up that often. Typically it's only about 3 or 4 cows in the evening that don't come in to feed and milk.

"The computer basically feeds them according to their milk production. Cows milking 100 lbs. get more feed than the cows that are milking 40 pounds. That feed is dropped as the cow comes in throughout the day."

"My 100 lb. producing cows are coming in seven or eight times a day," Kyle said. "That feed doesn't get dropped all at one time, it's throughout the whole day when she comes in here."

Milk yield has increased about 10 lbs. per day per cow with the new system. The milk is all Grade A, and it is sold to the Southern Illinois, St. Louis market.

"Today it's going to Chester. Basically it stays in this region," Kyle added.

Kyle and Kurt can't praise the system enough and look forward to the future with it.

"We've fallen in love with it," Kyle said. "We both decided that if we had to go back to milking in the milk parlor the cows would be gone. We both realized how many other things we were missing, whether it be managing the farm or spending time with friends and family."

"We like where we are and when we get to that 120 cows I think we'll be happy," Kyle continued. "I think maybe 5, 10 years down the road we may add a new free stall barn, and slowly keep expanding. Maybe if land prices go down we might pick up a few acres. Every year we just try to do a little bit more."

The Johnsons really appreciate their grandfather's counsel, his opinion.

"Basically we've tried to operate this farm the way he did it," Kyle continued. "These robots, he urged us to look at these. We try to work side by side and, like my brother said earlier, we might not always see eye to eye but we value each other's opinion."

The system is expected to pay for itself in about seven years.

"It saves a lot of labor," Kyle summed. "The equipment has kept labor costs down." Δ

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The teat detection system scans the utter bottom to detect each individual teat. A full scan is made and the back teat cup is put in place. Another 3-beam laser scan takes place and each teat location and cup are then put in place.



To ensure optimal pre-treatment the utter and each teat is brushed with the mechanical brush system not just water. This process begins right after the cows enter the cow box.

