Maximising herd productivity with minimum labour

One man, eight robots and 500 cows

He wanted to produce as much milk as possible without taking on any employees, so Marco Verhaar installed milking robots. He also tweaked their settings, despite not being computer literate, and at one stage each robot was milking 85 cows.

text **Jaap van der Knaap**

Marco Verhaar sits in the office of his new farm in Bad Axe, Michigan. It is small office and not suitable for a large group of employees, although that's what you might expect from dairy operation with 500 cows. But a larger office is not necessary, explains Marco, because he is the only employee thanks to the installation of robotic milkers.

"I chose robots in order to make more money from milking – not to give myself more free time," Marco says. "Every additional kilogramme of milk that I get from each robot is profit. That is another way of thinking about working with robots."

He's certainly proof that robots can take a load off your hands. Since spring 2013 he's been using eight to milk 500 cows 'single handedly'.

"When I told my parents that I wanted to use robots, my father was skeptical. He doubted whether I could make money with such a significant 'upfront' investment and always blamed the cell count on my Jerseys. He thought that switching to robotic milking would increase their cell count even further. I feel good that I have proved him wrong on both counts."

Managing milkers

Marco works closely with his parents, John and Anja, who milk 2,500 cows on their own unit just three miles away. Marco works only with the milking herd so that he can look after as many as possible on his own. His parents take care of his dry cows and calves.

Each week he takes a lorry load of dry cows to his parents' unit and brings back a load of fresh-calved heifers and cows. "This is a very efficient way of working for both businesses," he says. "My parents can now expect 10 calvings a day and have dedicated staff to look after them. And I can get the most out of my lactating cows."

At first Marco also cooperated with his parents, mainly on feeding, but six months later he bought his own mixer wagon and tractor to collect feed each day from their bunkers. "Everything goes on the scale," he explains. "We weigh the feed as we harvest it, before it gets put into the shared silo, and the feed I bring back to my unit also gets weighed every day. We make an adjustment for the difference at the end of the year."

He bought the biggest mixer wagon he could find so he could carry the full ration of around 16,500kg for 500-cow herd in one load. "All the cows get the same ration and the robot decides how much concentrate individual cows receive, depending on her yield. The Jerseys don't eat much, so it makes it easy to feed them all the same ration and I only have to make one load of feed."

Jersey fan

Marco is clearly a fan of Jerseys. "The Jersey is a flexible cow. When a Holstein falls over, that's often the end of the story and it's time to take her away. A Jersey can roll on its back, but then cheerfully get up again and carries on. Jerseys are also very curious, which works well with robots. The cows make a lot of visits, too many in fact, and they get turned away an average of eight times a day."

The figures are certainly impressive. Marco started up a completely new unit with four robots in 2011 and, at his peak, was milking 320 cows. Since spring 2014, he has doubled the size of the business and built a similar cow house with another four robots.

Daily output is 13,000kg of milk, with 4.8% butterfat and 3.6% protein. The number of milkings per cow is 2.9 and average daily yield per cow is 26kg. Average daily concentrate consumption, through the robot is 5kg, with a further 2.7kg of mineral/protein mix in the TMR. By US standards, this is a relatively large quantity of concentrate per robot. But, says Marco: "Having plenty of feed in the

Marco Verhaar, Red Mountain Jerseys

With eight robotic milkers and 500 Jerseys, Marco Verhaar, single handedly, produces 13,000kg of milk per day.

Number of cows:	**500**
Daily production:	**13,000kg 4.8% fat 3.6% prot.**
Unit size:	**200 hectares**
Employees:	**zero**

Easy access: the two barns are open on all sides

Curious cows: Jerseys in front of the robotic milkers

Dedicated job: young stock is reared on another unit

Cow comfort: cubicles are bedded with deep sand

robot gives you active cows, and if you give them too little, they get anxious."

If he's milking 500 cows on his own, he must have his work cut out for him. He laughs. "People often tell me I'm putting in far too many hours, but I like working alone. I start at 4.30am and I'm finished at 7.00pm. I like the hours.

"I start in the morning with the heifers and picking out the cows that need to go to the robot and then I clean the cubicles. I'm a perfectionist, so I like to clean the cubicles and rake the sand my way, and if I had workers they'd do it differently. Basically I don't like employing other people."

Tweaking technology

Surprisingly, Marco doesn't begin the day on his PC printing out attention lists. "I'm not a computer fan. I have a quick look on the screen to see which cows I have to run through the robot, but I know most of them already – it's typically the same ones again and again. There are far too many cows on the attention lists."

He appears to have a love-hate relationship with Lely. "I like to challenge the company," he says. "The Lely robot is a great machine and I think the A3 Next is perfect, but the company encourages people to use the standard settings. Of course that's the safe option, but it means that they're not using the robots to their full capacity."

Getting into his stride, Marco gives some examples. "The standard vacuum setting for the robot is 44 kpa, but I think that's way too high. I've gradually lowered it to 38 kpa, which I think is much better for udder health."

Lely advises against changing the standard settings, but Marco played it safe and asked various milking specialists for advice. As a result, he started using square liners. "This type of liner has a faster milk flow, so it makes milking quicker," he says. "You also get better teat condition, they work well at a lower vacuum and your cell count stays low."

Marco also reduced milking length in small steps. "I set the maximum time to five minutes, whereas the standard setting is 20. If a cow hasn't finished milking after five minutes, I pull off the cluster, which saves time and is better for the udder."

But surely the last few kilogrammes of milk have the highest fat and protein content? "All that matters is the total weight of fat and protein that you get from the robot. It's much more economical to reduce the milking time, so the robot can milk more cows."

Marco believes that udder health is the prime consideration, and has allayed his father's fears that Jerseys and robots don't go well together. During the past year, he has achieved an average cell count of 60,000 cells/ml.

No leftovers

Back to the daily schedule, when Marco has rounded up the cows that need attention and cleaned the milking boxes, he scrapes up the manure with a piece of kit that he designed himself. "Because I milk with robots, there are always cows coming and going and you have to push the manure between them. I didn't want an automatic scraper because they don't work well when it freezes in winter."

The feed troughs are empty at 10.00am in the morning. "Jerseys eat everything. I don't have any heifers that can eat leftover feed, so everything has to go. Of course you have to make sure you offer the cows good quality feed and that no mouldy or heat-damaged feed gets into the mixer."

Marco gives all his cows the same ration at around noon each day, based on maize silage, sugar beet pulp and alfalfa. In both cow houses, an automatic pusher moves feed to the fence. "The two Juno pushers were part of the negotiations for the milking robots. I didn't even know they existed, but I couldn't do without them now. Feed pushing is something you can easily forget or put off until later, but when I arrive in the cow house in the morning, that job has already been done."

Next Marco looks for cows that need urgent milking and AIs a couple of others. This latter task is carried out at the feed fence, not in a crush. "Jerseys are very well behaved and curious, and it's rare for a cow to walk off when I'm inseminating her." He chooses bulls with good production traits: "I'd like to breed for fast milking, but there's no breeding value for that in the US."

'Dummy' robot

Building the new cow house has made the farm slightly less intensive and the robots less busy. "I hit 9,000kg a day with four robots, and now have 13,000kg with eight, so my performance isn't that impressive. I have been lucky since I started in 2011 because the milk price has been good and it's still high now. I was getting the equivalent of more than 38ppl."

"I'm currently investing in land so I can become more self-sufficient in terms of feed and manure output, and I also want to keep improving the way I use the robots. I'm thinking about getting a 'dummy' robot and putting it with the in close-up heifers at my parents' farm. They will get used to it and it should save some time when they start to milk."

So what's the maximum number of cows you can milk with one man and a robotic milking set up?

He thinks for a moment. "I don't know, but once the second barn is up to capacity again, and everything is working well, there's no reason why I shouldn't build another one." |