



Time is money in a robot barn

Dairies install robotic milkers to save on labor . . . but several factors play a role in whether or not they really get the biggest bang for their buck.

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PEOPLE often list the need for less hired labor as a reason to go to robotic milking. Freedom from rigid milking times and more free time are other common goals of farms with robotic milking. How well do these expectations hold up to be true?

In early 2014, we developed and delivered a field survey about labor efficiency in milking robot barns. Since we design such barns, we wanted to understand how they work in practice and how they are actually being used. The survey was done on 44 farms in Finland, Sweden, Denmark, Holland, and the United States. Survey farms had one to eight robots (or milking places) represented by five different brands.

The survey was done during morning chores. We basically walked behind the people working in the barn, measuring labor time consumption for different tasks and documenting steps taken. We also measured the location of the neck rail, amount of bedding in freestalls, amount of the light in the barn, and many other things.

In some of the barns, we did time-lapse videotaping. After morning chores were done, we went through a detailed questionnaire asking about animal treatment practices and tasks that are not done on a daily basis. We also asked why they went to robotic milking and their opinions about barn functionality.

Measuring minutes per cow

There was wide variation in labor time per cow. The most efficient farm used only 1.8 minutes per cow where the least labor efficient one used 14.7 minutes. The average was 5.2 minutes per cow. Included in these numbers are the time it took to do daily tasks for cows, heifers, and calves divided by number of milk cows.

There wasn't any clear reason for the variation in labor per cow. On

some farms, most time consuming was pushing cows to the robot that did not visit voluntarily; for others, it was cleaning the stalls. Most farms cleaned the stalls while finding and fetching nonvoluntary cows. On one farm, cleaning stalls and fetching took almost 2 minutes per cow, which was about a quarter of their total daily labor time. On average, farms used about 40 seconds per cow for cleaning and fetching.

Having young stock in old renovated barns increased daily labor time in some cases; for some, calf and heifer labor time was almost the same as for the milking cows. So, when building a new labor-efficient robot barn for the milking herd, don't forget to think about young cattle facilities. Whether you are building new or renovating, time spent on calf and heifer care impacts your operation's overall efficiency.

Turning time into milk

One of the main numbers collected in this research was how much milk was being produced per man-hour. We calculated this number using the amount of total milk in the bulk tank and total daily labor hours. Variation was also very significant in this number, from approximately 300 pounds to 2,100 pounds (140 to 930 liters). In barns with one robot, it was about 300 pounds to just over 1,000 pounds (140 to 470 liters); in the two robot barns, it was 500 pounds to about 2,100 pounds (220 to 930 liters); and on

bigger farms, it was almost 800 pounds to a little more than 2,000 pounds (350 to 900 liters).

Based on this information, it appears that optimal efficiency can be achieved with two robots. In other words, the labor part of production cost is not necessarily lower in bigger robot herds. One reason is that it could be difficult to organize working days for employees to make a full labor shift, while owners can work shorter or broken up days.

On large farms, everything is more spread out, so there is also more walking. In some barns, workers walked 3.7 miles (6 kilometers) in just a morning shift. Another reason there was not a benefit in labor efficiency on bigger farms was that there were more routines done every day compared to the smaller farms.

In the surveyed farms, daily milk production per cow was 52.4 to 102.5 pounds (23 to 45 liters), with an average of 72.9 pounds (31.7 liters). When we looked at this number and compared it to used labor time, we didn't see any connection. In other words, more milk did not result from working more hours.

In a labor efficient barn, milk production can be high. Farmers who make routines efficient have more time for management decisions, analyzing results, and developing production strategies. We noted, though, that some low labor farms also had low production. In these cases, farmers chose to run the farm that way, and labor time was their limiting factor.

The cornerstone in a milking robot barn is that cows go to the robot voluntarily. Fetched cows raise labor time. Finding these cows, fetching them, and in some barns observing them until they enter the robot can take up to 5 minutes per fetched cow. This work is being done at a minimum of two times a day.

The number of fetched cows varied a lot on these farms, from 0.3 to 16 cows per robot. On average, there were 4.8 fetched cows per robot with an average of 55 cows assigned per robot.

To help limit fetch cows, it is very important that cows have free access to the robots. There needs to be open space in front of the robot, a limited number of cows standing in the alleys, and the appropriate number of cows per robot.

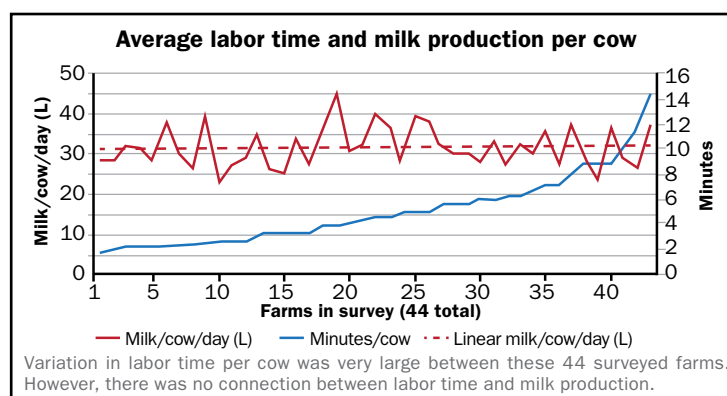
Start with the right barn

A well-designed barn and properly sized freestalls lower stall cleaning time and elevate cow comfort and health. Simplify barn layout with straight lines and make alleys easy to drive through. This is very important for the addition of bedding to freestalls. On some farms, there was not access to the alley due to a manure collection ditch, and bedding needed to be added manually.

Also, easily accessible walking routes for animals and people were a problem in many barns. Often, this was the result of a lack of man passes and gates, or the man passes and gates were made incorrectly or were located in the wrong place. A short walking route often became long due to poorly placed gates.

"Why does a cow barn need to be custom designed? Why can't we just copy existing layouts?" These are questions we hear a lot. This survey convinced us that there really is a need for custom-made barn design. Farmers with similar-type barns worked in different ways, and the method of getting work done needs to be taken into account in the design phase.

Planning ahead has a big influence on how efficient your barn will be. Instead of getting stuck on one design layout, it is important to challenge yourself to think more specifically about your farm before a single line is drawn on paper. Instead of running faster in a barn, let's think how we can walk shorter. 🐮



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