

# Four factors we see with successful robot retrofits

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## AT A GLANCE

To make the switch from conventional parlor milking to including automated milking systems in an existing barn, design and planning are keys to a successful outcome.

Milking in a parlor is hard work. It is fixed on certain times and requires a great deal of labor. For that reason, both small farms and large farms are looking at options to automate milking. A more flexible lifestyle and an interest in more data are points of interest with automated milking systems as well.

The most obvious solution would be a new robot facility – but in the current financial situation, very few find it to be economically sustainable. On the other hand, many farms have good housing facilities, and it would be a waste of resources not to use them. Therefore, looking at converting an existing barn to robots can become a viable option.

As designers and consultants, nearly half of the projects we do are

retrofits (using existing barns in a robot adaption), and this number is increasing. We are seeing successful retrofit projects. For example, in one farm, the switch from 2X parlor milking to automation yielded a 10% to 15% increase in milk production per cow, while also cutting labor time in the cow barn in half. But there are also farms which haven't been so successful. Some even regret moving to robots.

The biggest general mistake we see in retrofits is: There is no design, not a good plan. Robots are just dropped into an existing barn. Very often, these farms just want to get rid of the parlor milking – and yes, that can be achieved, but there will not be labor savings. The labor just transitions from milking cows to fetching them to a robot. For some farms this is enough, but for us, it tells that investment hasn't been successful.

In our surveys of robot barns and in particular, labor efficiency, from 2014, we discovered a large variation in labor efficiency in automated milking system farms. A robot is a milk harvesting machine, and buying it doesn't guarantee labor efficiency. Anyone moving to robotic milking should rethink

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the management of cows first. If management of cows with robotic milking is new to you, find yourself a partner who can help you make the right choices with transition cow management, for example. Then ask yourself what kind of facilities you need to fulfill the requirements. Robots must be located in a place to best support those needs.

## 1 Look beyond building time

An important rule in retrofit projects is to look beyond the building time. It is a big temptation to locate robots in a way that disturbance for running a dairy during building time is as easy as possible. It is true that building time is sometimes challenging and temporary problems may occur.

But that time is and must be short. If a decision about robot orientation is made based on that short period, it can cause problems as long as robots are in use. Thus, it is much better to sacrifice two months of building time production and labor rather than having running costs and problems for 20 years. The old wisdom “pay now and save later” is an excellent principle when retrofitting existing barns to robots.

## 2 Consider extending the barn

If a site and budget allows you to extend the barn, it is likely the best option. This way, building doesn't disturb cows, and robot orientations and separation and handling areas can be designed according to the management plan as they were new.

The most common problems in these kinds of retrofits are integrating manure-handling systems like scrape alley lines into the expansion. Also, milk pipe length can be a challenge if existing milk utility rooms are being used. Fortunately, many robot companies are now allowing longer milk line lengths.

## 3 Robot configuration

The most typical configuration for retrofits is to locate robots to a side, and often with sideways installation. This is easy to build and can be located in the corners of existing cow pens. The biggest challenge is where to locate separation and handling areas. If the retrofitted barn has natural ventilation and sidewall curtains, long robot rooms on the sides block a big area of the barn without air



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inlets. With tunnel ventilation, this is not an issue.

Robots can also be installed inside cow pens. This is easiest with two-row, head-to-head or three-row systems. This works when there is enough space, or if it is feasible to remove; however, it also can be the way to fit pen stall size to robot capacity – for example, decreasing stall numbers from 140 to 120 and using 20 stalls for robots. Though building time can be challenging inside of a cow pen, the types of retrofits can work well. These types of retrofits can work well.

## 4 Keep cow comfort a top priority

One important thing to remember in retrofits is this: The robot switch doesn't solve cow comfort. Existing barns need to have enough good alley space and appropriate stall dimensions. In a well-working robot barn, cows must lie down in stalls so that alleys are open for cows to walk voluntarily to robots. In general, it is reasonable with retrofits not to expect as high results as in a new barn if a barn is old and dimensions are not good. Of course, it is useful during a robot switch to update existing cow areas as much as possible. The focus should be in getting cows to lie down in stalls more and also look at ventilation and cooling.

Allowing adequate time for the design phase is key, as it is in retrofit cases. With good design, functionality can be as good as in new ones. But to gain it, it needs more changes to a layout than just dropping a robot into a barn. The design must be done just in the same way when building new. And it all starts with management. Robotic milking is not just a new way to milk the cows; it is a new way to manage cows.

Robot retrofit is a big opportunity to a dairy farm to climb up to a next level. So set a high target. Don't accept just a switch of milking systems. When designing everything well, significant labor savings can be achieved. ☺

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