What do I Need to Consider before Investing in a Robotic Milking System?

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More and more dairy producers are considering investing in automatic milking systems (AMS) around the United States. Producers all around the world have been adopting robotic milkers to allow for more freedom in their daily lives and to replace labor. No longer is the producer committed to two or three milkings each day. While their day may be less structured, some changes need to be considered when it comes to the day-to-day management of the dairy herd.

Before Installation

Before installation of the AMS, Jack Rodenburg, DairyLogix, stresses management practices that need to be considered. The first is the housing type. Two different types of systems are common with a robotic milker. The first is a free flow system. In a free flow system, cows are allowed to roam freely around the barn with unlimited access to the AMS, feed bunk, and housing. On the other hand, guided systems force the cow to enter one area before another. The most common is for the cow to enter the AMS before going to the feed bunk. This provides an incentive for the cow to milk. Neither system is perfect. In a free flow system, cows average two milkings per day compared to 2.6 in a guided system. However, cows in a free system average 12 meals a day compared to only 3.9 in a guided system. The number of fetch cows, cows that do not come to the AMS voluntarily, is also affected by the system type with an average of over 16% of cows needing to be fetched in a free system, with less than 9% in a guided system.

In either system, by considering space during the building process, the producer can decrease fetching. Limited space, both for the cow and around the AMS, can increase the number of fetch cows. An AMS system can handle around 60 cows. More cows per robot than that leads to more fetch cows and lower milking frequency. Free space in front of the robot is critical. If space is tight, timid cows will not come up to milk as often, as dominant cows push them out. Anything that attracts cows, such as brushes, needs to be placed at the opposite end of the barn, to relieve traffic to the AMS. If a barn contains multiple robots, robot orientation should be the same for all units. Cows are habitual creatures and if most of the herd decides they like one robot over the other it will build traffic and lower milking frequency. Placing robots in the same orientation also relieves exit and entry traffic from the robots. Easy traffic flow makes for easy fetching.

Besides easy fetching, other aspects of the barn need to be considered to make management less laborious. When building the barn, Rodenberg stresses, try to make every job a one-man job. Consider how the barn design will affect scraping, cow management, or herd health and reproductive checks.

Herd Health and Reproduction

Dr. Stephen LeBlanc, Ontario Veterinary College, suggests there has been some concern with potential issues of unit attachment and teat cleaning with an AMS. Farms that follow the NMC guidelines for milk prep are consistently better at teat prep than a robot. A cow entering the AMS with clean teats is more important than it would be in a parlor because the robot follows the same procedures every time where a human will spend extra time with a dirty cow. Robotic milking herds tend to have a higher SCC than conventional herds. Herds with a SCC between 200,000 and 250,000 tend to increase where herds over 300,000 tend to decrease after adoption. One reason for the increase may be due to the increase in milk production that comes with adoption of the AMS.

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LeBlanc points out other herd health factors do not see much of a change from conventional to an AMS. Both reproductive success and metabolic health tend to be no better or worse after the adoption of robotic milkers.

Even though change in herd health is minimal to non-existent, the potential an AMS system has to monitor the health of individual cows can be a major benefit. An AMS can provide 120 pieces of information per cow per day. Data provided is consistent and objective allowing the producer to track changes in the cows' data output. As more research is completed on the data and patterns it creates, producers will be able to set alerts when cows go outside of their daily routine.

Nutrition

Dr. Alex Bach, Institut de Recerca i Tecnologia Agroalimentàries, suggests an AMS gives the producer the opportunity to structure more to a cow's individual needs compared to a complete TMR. Concentrate provided by the robot is used to entice cows to enter the AMS. However, a large amount of concentrate provided by the robot does not make it more enticing for milking. If too much is provided the cow will not eat all of it leading to more cleanout by the producer. Two to three lbs. of concentrate should be provided per milking. A TMR balanced for one cow leads to an unbalanced ration for another. An AMS can allow for selective concentrate feeding but a producer can run into the same problem of a batch TMR by feeding only one type of pellet. Bach suggests by investing in multiple concentrate boxes, a balanced concentrate can be offered to meet individual cow needs.

Economic Investment

Adoption in an AMS by most producers is for a lifestyle change and to replace labor. Producers that have invested in a robot see a 10% to 29% reduction in labor. The value of an AMS is just shy of $200,000. Dr. Jim Salfer, University of Minnesota, suggests the cost of labor is a major variable in determining the value of the AMS. When number crunching, the producer must consider wage inflation. Labor wages will change while a robot is going to stay constant. For every $1 increase in the annual labor the profitability of the robot increases by $4 and for every additional year of life of the robot the value increases by approximately $16,000.

Salfer advises the other variable that plays a large role in the profitability of an AMS is cow throughput and milk production per robot. A robot can be more profitable than an underutilized parlor, which is common for the small dairies that adopt them. After adoption, producers should cull cows that do not adapt to the robot or have long milk out times. This will allow the AMS to run more efficiently and have a greater throughput.

Final Take Home Message

Perhaps the biggest consideration is how labor use will change. None of the other considerations will be beneficial without the change of labor. Milking labor should now be management labor. Producers should now spend extra time managing their herd, from retrieving fetch cows and fresh cows to examining alerts from the data provided by the AMS. The robot allows producers to manage the cow's individual needs. In order to reap all the benefits of the AMS, the producer must shift from manual labor to management labor.