

## Automation in Agriculture Series: Livestock

Since 1944, when Franklin D Roosevelt proclaimed it, the third week of September is National Farm and Safety Health Week. While the declaration came about to recognize farmers' contribution of providing our soldiers nutritious food during World War II, the concept is still just as important today, and to remember every day. Livestock farming can be dangerous, and much of it is back-breaking, time-consuming, manual work. Yearly, about 33% of farmers are injured during the course of their duties, while 600 suffer a fatal accident.



The everyday maintenance of a farm and the animals on it, as well as when the weather starts to turn, preparing for the colder months ahead, make fall the perfect time of year to recognize our hardworking farmers and those who work with them side-by-side to ensure the food supply continues to be healthy, uninterrupted, and able to supply in an ever-increasing possibility of food shortages. The livestock farming industry greatly benefits from robotics and automation, the use of which is expected to increase. Technology that limits manual jobs is going to be fundamental in addressing humanity's concerns about keeping the population of the world fed.

The agricultural robot and drone market is anticipated to eclipse \$35 billion soon. In fact, within the next several years it should happen, according to a report from IDTechEx. As these tools advance, the expense of owning, managing, and running a livestock farm is expected to go down. This will ease the financial burden of farmers, which ranks as one of the top concerns of them trying to stay in business, survive, compete, and make the venture profitable.

Livestock agriculture receives tremendous benefits from employing automation. In addition to the intense labor, which traditionally has mostly been manual, the tasks are relatively standard and repetitive, making them a perfect candidate for automation. Many duties – from monitoring the herd by drone to cleaning – align with the abilities of technology. For this feature article, we will be focusing on one innovation for the dairy farm industry.

## Automatic Milking Systems (AMS)

Automatic milking systems (AMS), in use since the early 1990s, are probably the most well-known application of automation on a livestock farm, and their worldwide popularity has increased ever since. The benefits of their use over manual milking is clear – reduction of injuries (back, neck, and shoulders especially), milking available on a consistent schedule regardless of workers' personal issues that otherwise may affect the timetable, and cost savings. The reduced expenses are from fewer manual laborers, as well as increased health of the animals (meaning fewer veterinary bills).



The ASTREA 20.20 (pictured) is equipped with 20.20 laser, robotic arms, scanning technology, and is made of stainless steel for easier cleaning and disinfection. Prior to milking, the udders are stimulated and cleaned, and milking settings are chosen, including what type of livestock (dairy cows or goats, for example). Each udder is evaluated separately to determine the proper milking speed, actual milk flow, and when removal of the milking device would be appropriate. The milk is then pumped and flows to a cooling tank, if the quality is acceptable

Research shows that the use of AMS makes the milking process easier on cattle, as the machines allow for consistency, and less stress and anxiety during the process. The psychological state of an animal producing milk is actually quite important. It can affect the production of stress hormones like adrenaline, which in turn can alter milk flow and quality. With an automated milking system, milking doesn't have to happen at the traditional early morning and evening times, and the animal can go to the station to be relieved of her cargo when she feels it is time. Udder health is also improved with the continued use of AMS, because more frequent milking means less time for bacteria to grow. The quality of milk extracted by utilizing automated systems is the same or better than using manual methods.

Unlike milkers on livestock farms, machines can do the same job, the exact same way, day after day, using consistent pressure and force on udders, during hot and cold seasons, without needing a break or a visit to the chiropractor for back pain, and don't run late or need a sick day. As we mentioned above, farm work is very difficult, and while we respect those who do it, the case for automation is very strong. The tasks that go into manually milking livestock results in dairy workers experiencing back pain, and neck and shoulder pain, at 40% and 30%, respectively, according to studies. And there's a good chance of overlap, meaning some dairy workers have discomfort and chronic pain from the base of their head all the way down to their waistband.

**Automated milking systems are just one example of the implementation of automation in livestock agriculture. While they represent only a single innovation, it is definitely the most ubiquitous, beneficial, and useful for a dairy farm. Look for more applications of automation in the livestock industry in our future updates and articles.**

## About Delta Technology:

Delta Technology has been the integrator and the manufacturers' strategic partner of choice for robotics, automation, and custom manufacturing solutions since 1997. We are proud to employ Industry 4.0 methodologies to creatively and expertly design, engineer, and build custom industrial automation solutions to solve the most complex manufacturing challenges.

We partner with our customers to clearly identify their challenges and understand their goals. Based on our findings and our extensive experience in manufacturing, we design and engineer the best custom solutions for them.

We specialize in:

- Design, engineering, fabrication, and assembly of custom industrial automation and robotics solutions
- Cutting-edge and modern lean automation and lean robotics
- Machine-control software development
- Integration of automation equipment
- Vision-guided robotics, inspection systems, and adaptive controls