

# Tech Talk

*Digital innovations expanding what's possible.*

by Kindra Gordon, field editor

The global pandemic is being blamed for several negative influences in the world, particularly related to economic and social issues. Still, one positive outcome emerging is the accelerating adoption of technology disruptors to make enhancements to industries, businesses and everyday lives.

Dan Thomson, chair of the Animal Science Department at Iowa State University, points out the world was “going to wait a generation or two before adopting some technology, but now technology is being used.” As a result Thomson says, “It’s made us younger as a country and a world.”

Likewise, international tech guru Aidan Connolly says, “Waiting for [the pandemic] to be over is a mistake.” Instead, his advice to business and industry is “start thinking about embracing change and doing things differently. It’s going to make us better in the end.”

Connolly is CEO of Cainthus, an Ireland-based computer vision technology company that develops products for monitoring feeding events and cow behavior.

The duo shared comments related to the future of livestock technology during the virtual Farm Journal Field Days hosted online in August 2020. They agreed technology is creating a “new frontier of agriculture.”

Connolly points to video conferencing platforms like Zoom as essential tools to communicate,



educate and provide telemedicine services, particularly when the pandemic and other factors prevent in-person visits. Technology to host cattle sales — or buy food for take-out from a favorite restaurant — is also being credited with keeping the world’s economy afloat during the past year. Also, most economists agree these technology changes and different ways of doing business are here to stay.

As well, technologies of the future may help address and enhance supply chain challenges, lack of labor, and individual animal (or acre) management. Here, Connolly highlights many of the technologies being explored within the ag sector.

## On the Horizon

**Sensors.** The use of sensors and wearable technologies are advancing to monitor individual

animals instead of working from herd averages. Wearable sensors on an animal’s ears, neck, legs or tail can now track and manage a cow’s health, detect illness or disease, and monitor cow comfort and welfare. As this technology progresses, the goal will be to circumvent negative effects before they affect performance and production of the animals.

**Artificial intelligence.** Precision agriculture tools have already helped agriculture collect data. However, without the ability to interpret and manage the data, it can be useless. Artificial intelligence is being developed to sort through data and highlight information important for the producer and eventually may have the ability to automate some decision-making based on benchmarks set by the producer. Additionally, facial recognition technology is being explored to

dispense feed and specific nutrients to livestock as they come to the bunk or water trough. Companies like Connolly's Cainthus are developing algorithms to monitor cow activity, feeding, drinking and movement. On the crop side, artificial intelligence is already being used to determine maturity of some fruit crops and could be useful for grain production and harvest.

**Robots or autonomous time savers.** Robotic milking machines are a well-known application for robots in the dairy industry and are increasing efficiencies and replacing human labor needs. Similarly, driverless tractors and equipment are moving toward reality. For the future, as robots are developed for additional livestock sectors, opportunities for medical and health assessments using transponders or sensors are also being explored. Several experts believe because these tools are a labor and time saver, they may get fast-tracked in agriculture.

**3-D printing.** Printing machine parts is likely one of the most anticipated applications for rural producers and small businesses.

**Virtual reality.** Defined as an environment that can be interacted with in a seemingly real way through electronic equipment, virtual reality applications in agriculture include farm tours and veterinary (or employee) training. For instance some veterinary students are using virtual reality to learn the reproductive and rectal tracts of the cow, enabling them to practice fertility examinations such as pregnancy detection or determine reproductive

concerns, which can be safer for both animal and student. Virtual reality films of farms are also becoming more popular, with the potential to allow consumers to better understand where their food comes from.

**Blockchain.** As consumers increasingly become interested in where their food comes from and how it is produced, blockchain can connect the supply chain from producer to consumer and allow for food traceability and safety.

**Drones.** Ag applications for drones include inspecting the herd or fences or aiding in herding cows. Some cattlemen in Australia

are reportedly already doing this. Combining drones with visual sensors can then survey land and measure pasture growth. According to research conducted in Belgium and reported in the *Remote Sensing* research journal, drones outfitted with sensing equipment were accurate at predicting forage height, biomass and quality. Additionally drones with thermal imaging may allow locating cows in fields with dense cover or to track animal temperatures and identify abnormal behavior.

**Augmented reality.** Defined as the integration of digital information with the user's environment in real time, this technology may allow producers an alternative way to monitor and evaluate livestock. For example, wearing specialized

## Virtual fence efforts

Advancements continue with virtual fencing. In Australia, the eShepherd® virtual fence was tested to create an exclusion area to prevent grazing of an environmentally sensitive area within a 34.5-acre pasture. The researchers found cattle remained outside the exclusion 99.8% of the time, even when the boundaries of the virtual exclusion were changed to test the animals.

tech goggles may allow a farmer to immediately see stats relating to each individual cow overlaid through the glasses into the farmer's field of vision. This technology may especially benefit the veterinary field. It also has applications for training employees or even guiding machinery repair. One projection calls for augmented reality to rise from \$2.4 billion in 2018 to \$48.2 billion in 2025. [A](#)

