Supporting the vision of a more sustainable agri-food sector

Farmers around the globe are becoming acutely aware that profitability and sustainability must go hand-in-hand – and that achieving both will require better utilisation and management of our existing resources. In true 'keep calm' spirit, the UK is diligently supporting partnerships that bring together experts, like GEA, to help producers forge a more sustainable future.

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Launched in Somerset in late 2018, the state-of-the-art South West Dairy Development Centre (SWDDC) is a working dairy facility owned by the Agricultural Engineering Precision Innovation Centre (Agri-EPI Centre). Its mission is to accelerate the adoption of precision agriculture and engineering technologies to boost productivity across the whole agri-food chain.

Within that, the SWDDC aims to deliver a fresh vision for sustainable milk production in the UK so that it becomes more efficient and profitable.

An innovative environment

Located in one of the UK's most important milk-producing regions, the SWDDC, which is managed by dairy specialist Kingshay, includes a 180 cow dairy set-up. This provides an innovative environment for the development, testing and demonstration of new technologies and techniques to support sustainable, efficient and low-cost milk production.

The smart design of the low-impact building and management systems put great emphasis on animal health and welfare, whilst providing a platform for the industry to trial and review new ideas for the benefit of dairy farmers throughout the UK.

As Duncan Forbes, Ari-EPI's Head of Dairy and SWDDC project manager explains: "We test and try new things here – some of which will fail – so other farmers don't have to."

GEA dairy farming expertise and solutions play a central role at the centre, a key element being GEA's automated feeding technology which ensures that precise amounts of fresh feed or silage are delivered up to 17 times per day.

The feed is taken from three GEA feed bunkers which are filled daily – a task that takes the dairy staff roughly 30 minutes with a telehandler. Beater rollers draw the feed down the bunker into the GEA MixFeeder.

The MixFeeder utilises intelligent Wireless Integrated Control (WIC) software and is directly connected to the raw feed stores and silos, managing the individual process steps – from precise weighing and consistent mixing to delivering perfectly tailored group feed rations and reporting and adjusting following each ration. In more complex set-ups, it can even calculate the shortest route from the filling position to the respective animal group.

At the SWDDC, it is positioned high up within the building to minimise cow disruption. The GEA MixFeeder at SWDDC is proving to be one of the centre's most effective technologies because it:

- Minimises feed wastage – critical for keeping costs down and managing volatility (for example feed price, availability).
- Always distributes feed that is fresh.
- Delivers precise rations throughout the day which promotes better body condition in the cows, improving their fertility and overall health.
- Frees up farmers/staff to focus on overall herd health and tasks outside of the barn.
- Provides updates via the WIC software which managers can access via a PC, touch panel or smartphone, giving them more information and flexibility.

David Simmons, Head of Milking & Dairy Farming Sales, UK, GEA, explained: "Combined, GEA's feed bunker and MixFeeder technology provide farmers with unprecedented feeding accuracy and time savings. Because this solution requires a smaller footprint than a tractor and feed wagon, farmers can build smaller barns – reducing their building costs – and save on energy costs. Precise feeding means healthier cows, better yields and less wastage."

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Holistic cow comfort

The SWDDC is designed to promote holistic cow comfort and ease of movement, whether it is in the calving area, the lying area, at the robotic milkers or in the main feeding area.

When it comes to milking, cows walk to one of three GEA robotic milkers – the sensor worn around their neck triggering the milking gate which opens automatically.

Each cow is recognised, enabling the milker to precisely attach onto the teats, during which time the cow is fed concentrate feed according to her yield.

The gentle robotic milkers also gather data about each cow's milk, including yield and quality.

This system ensures a calm milking routine and incorporates the GEA In-Liner Everything, which manages all processes seamlessly inside the liner, including teat stimulation, cleaning (or pre-dipping), drying, fore-stripping, milk harvesting and post-dipping.

The facility's open plan design means the herd can see the robotic milkers from anywhere in the building so they can easily find their way when they are to be milked. This is important, as cows can be milked several times a day.

This freedom contributes to their ability to relax and is important to their health, whilst ensuring maximum yield.

The fabric roof is translucent which ensures even levels of light across the interior – supported when necessary by state-of-the-art lighting.

Efficient cross ventilation regulates the ambient temperature, which includes a Galebreaker curtained wall which automatically moves up and down, widens or narrows as it adjusts to wind speed, rainfall and internal temperature.

The milk is then sent to a GEA TCool cooling tank which is energy efficient and simple to clean. Tank processes are easily managed via the cool control system, which cools, homogenises and monitors milk yields automatically and provides comprehensive documentation of storage and tank hygiene data.

The Kingshay team manage the operation via GEA's DairyPlan herd management software, which is a flexible solution that can be adjusted to accommodate any farm size. SWDDC has also integrated GEA

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CowScout technology – a device around the cow's neck or leg indicating when they are in heat and if they are eating properly – with their DairyPlan software.

This platform, which is also available for goats and sheep, allows for central herd management including all animal and production data; management functions for milking, reproduction, feeding and animal health; diverse options for individual evaluations and analyses in graph or table form; and seamless integration with custom-made systems for calculating milk yield.

Duncan Forbes added: "Technology and automation have a big role to play in dairy farming and in improving both animal and people welfare. We have the challenge of keeping existing talent in the dairy industry while also attracting new blood; we need to ensure this is a sector where the next generation wants to work."

Feed is one of, if not the highest cost for dairy farmers. While grass is a low cost feed option for dairy farmers, it has generally proved a challenge to implement successful grazing programs with many robotic units.

The SWDDC wants to solve this by using emerging technology, such as hyperspectral imaging and satellite data, to monitor and predict grass growth in its surrounding paddocks. This allows the herd access to four fresh areas per day – a key element to achieving precision grazing.

The state-of-the-art South West Dairy Development Centre (SWDDC).

It works via a network of tracks and flexible paddocks that encourage cow flow between the paddocks and the robotic milkers, via the GEA DairyPlan herd management system which communicates between the cow's sensor and the segregation gates.

This super dairy connectivity is being supported by 5G RuralFirst, a UK initiative that is working through the SWDDC and other centres to explore the potential of 5G in rural environments.

At SWDDC this encompasses the use of cow collars, monitoring health and welfare, digital systems to monitor cow fertility through milk analysis and, eventually, a 'virtual vet' system connecting stock people to a veterinarian via augmented reality.

"When looking for partners, we chose companies and organisations like GEA that understand what we are trying to achieve at SWDDC. We want partners that engage with us in an innovative and off-plan way so that we can further develop and improve the cow's environment," added Duncan.

GEA helps dairy farmers future-proof their operations

With farm credentials that stretch back nearly 100 years, GEA understands that demands on producers have never been higher in terms of quality requirements, production standards, animal health and welfare. And while they may have similar goals, GEA also knows that each dairy operation requires a different solution to achieve profitability to become more sustainable.

Whether it is a pasture-based or a housed operation, a large or a mid-sized herd, an equipment update, a major overhaul or a greenfield project, GEA can help.

Their expertise covers milking, milk cooling and storage, farm management, animal feeding, barn equipment, hygiene and supplies, manure management, as well as young stock solutions. ■