



Working from farm to fork to increase sustainability, reliability and safety

Brith Isaksson, Global Food and Beverage Segment Manager, ABB, highlights the importance of embracing technology within your supply chain and how even small changes, like the type of motor you use, can make big impacts.

CONSUMERS, GOVERNMENTS and industry leaders worldwide are calling for more efficient and transparent food and beverage production. Meeting this demand will require farms and processing facilities to adopt the latest, most efficient technology.

However, this alone is not enough – extensive transformation requires making changes at every link in the value chain. Decarbonisation and improvements to safety and reliability must extend from the point of production to processing, storage, transportation and beyond.

Calls for sustainability

The pressure on the sector to improve its efficiency comes from many directions. Consumers are increasingly concerned with the way their personal choices affect the climate.

As a result, many people are trying to limit or eliminate the most carbon intensive foods from their diet. At the same, food and beverages that can prove a low- or zero-carbon status are becoming increasingly popular.

People are also demanding more insight into their food's production process for a number of reasons, including those related to ethical, health and social concerns. Consumers want assurances about the treatment of livestock, soil sustainability practices, the distance that their food was transported, and more.

Governments around the world are also pushing for all sectors of society to achieve Net Zero. Today, the United Nations estimates that food production, from farm to fork, is responsible for 34 percent of carbon emissions.¹ To reduce the sector's emissions without sacrificing its output, stakeholders must

invest in making every step of the value chain more efficient.

In addition to wanting to limit emissions, businesses in the food and beverage sector are also keen to achieve financial savings by switching to more efficient equipment. Many also understand that adopting modern technology makes equipment safer and more reliable.

More efficient motors

The electric motor is at the heart of many operations on farms and at food processing facilities. Undertaking this kind of work requires a significant amount of power. In fact, food processing alone accounts for an estimated 28 percent of the total energy use within the European Union. However, many facilities still use older, less efficient motors.

By switching to more power efficient modern motors, facilities can significantly reduce their energy use, and therefore their carbon emissions. In Europe, new motors installed at facilities must be at least IE3 efficiency class. However, more efficient IE5 class motors have 40 percent less losses. If a facility uses older IE1 or IE2 motors, even greater energy savings are possible.

Greater efficiency and compactness are key to advances such as indoor vertical farming where energy and space are at a premium. Vertical farming produces food in small spaces close to the point of consumption, limiting emissions associated with transportation.

Using variable speed

Further reductions in energy use are possible by adopting variable speed drives (VSDs). Without a VSD, a motor runs at full speed all the time, regardless of whether the task requires it. To slow the motor, operators throttle them mechanically. This is like applying the brakes in a vehicle while keeping your foot on the accelerator pedal: it is inefficient and wastes power.

By comparison, a VSD can adjust the motor's speed and torque to match demand. This only uses the power required for a task, meaning that the operator uses less electricity. Even small adjustments in speed can produce significant savings: reducing a motor's speed by just 20 percent uses around 50 percent less power than running it at full speed.

Switching to a motor-drive package reduces energy use by an average of 25-30 percent. Given that electricity is a significant operational expenditure, more efficient motors and drives often pay for themselves in as little as a year.

VSDs can also improve safety. In applications such as mixing, for example, motor blades often continue to spin after a machine is shut down. When the motor is controlled by a VSD, however, it can be brought to an immediate stop. This is safer for employees and reduces the chances that an accident will halt production.

Further electrification

While much of the infrastructure in the food and beverage industry is already electrified, there are still some processes that involve burning fossil fuels. For example, grain drying and transportation are often still carbon intensive. Switching these to electric alternatives could reduce carbon emissions, but only if the electricity comes from a renewable source, otherwise, carbon is still being emitted to generate the electricity.

Fortunately, renewable energy is more



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available and affordable than ever. Solar farms, offshore wind facilities and other sources of clean energy are being installed worldwide. This means that electrification often does correspond directly to a reduction in emissions.

This is also good news for businesses, as electricity is cheaper than fossil fuels. As a result, many businesses have already put plans in place to move to clean electricity. According to data from the Energy Efficiency Movement, 52 percent of businesses across all industries report being on track to achieve Net Zero within five years.²

Embracing digitalisation

In addition to power efficiency gains associated with motors and drives, digital technology enables more efficient processes. Technologies such as artificial intelligence (AI) and automation are key to minimising waste and ensuring that resources are used as effectively as possible. Research by FarmBeats suggests that farms which use digital technologies increase productivity by an average of 45 percent while cutting water use by 35 percent.³

Advances in data and analysis also have significant benefits for equipment at farms and food and beverage processing facilities. For example, Singaporean agriculture business, Olam International, uses remote condition monitoring equipment on its motors. This enables its operators to identify problematic levels of vibration and schedule preventative maintenance, avoiding potential downtime and saving time and money.

A sustainable future for food and beverage

By adopting modern technology, the food and beverage sector can meet sustainability commitments and feed a growing population. This is good for waste reduction, transparency and the environment, and it offers the potential to increase profit at the same time. ■

References

1. <https://news.un.org/en/story/2021/03/1086822#:~:text=Food%20system%20emissions%20were%20estimated,as%20these%20emissions%20kept%20increasing.>
2. www.energyefficiencymovement.com/wp-content/uploads/2022/04/ABB-Energy-Efficiency-Survey-Report-2022.pdf
3. www.microsoft.com/en-us/research/wp-content/uploads/2017/03/FarmBeats-webpage-1.pdf



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Brith is Global Food and Beverage Segment Manager at ABB. She is dedicated to supporting companies which are active in producing food and beverage along the whole value chain – from farm to fork.

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