Digitalisation: Unlocking machine potential to meet the global food challenge

With the world's population expected to increase from 7.1 to 9.7 billion people by 2050, feeding everyone will be a global challenge, requiring contribution throughout the complex food value chain. Consumers also want to know where their food has come from and how it has been grown, harvested and processed.

They are also interested in its environmental impact and whether its growers were paid fairly. Until now, the industry has only been able to dream of solutions for providing consumers with food that they can trust. But now, with the opportunities opened up by digitalisation, we are closer to capturing sustainably the food system's full value.
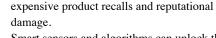
For nutritious food to be available to billions of people around the globe each day, valuable commodities must be transported in bulk, traded, stored, refined and distributed via various channels. And while being transported, they can be exposed to everything, from extreme weather and poor storage conditions, to physical, chemical and biological contamination, as well as intentional adulteration and food fraud.

These, together with a lack of supply chain coordination, can contribute to significant losses in both food value and volume. This is a high price to pay. The FAO estimates that as much as a third of food produced worldwide for human consumption is lost or wasted – approximately 1.3 billion tonnes every year. This avoidable waste of energy, water, labour and land (used for producing that food) is unacceptable, particularly in a world where almost a billion people are starving.

However, digitalisation is inspiring exciting new solutions that can address these issues, enabling processes to be adjusted to optimise yield and save energy, prevent further waste or contamination and remove defective produce.

The LumoVision optical sorter, merges physical and digital technology to provide real-time information about toxin levels in corn (maize) – a staple food relied on by a third of the world's population. It brings together highly advanced cameras, an algorithm for aflatoxin detection and physical sorting technology that removes infected kernels.

Digitalisation has also enabled the creation of apps such as Safefood.ai, which monitors and collects relevant signals from international food authorities, news sources and social media, providing real-time alerts about the ever changing food safety and quality hazards. Early warnings help businesses to lower the risk of food safety incidents and better protect themselves from expensive product recalls and reputational damage.

Smart sensors and algorithms can unlock the potential of food processing machinery, such as those used in nut roasting, extrusion and feed pelleting.

With systems such as ProcessPro, it is now possible to continually monitor the level of bacteria that is being reduced during these traditional processes. Another good example is PreMa, which gathers information about temperature and humidity in silos, and triggers a warning if conditions favour unwanted bacterial growth, to prevent mould infection and mycotoxin contamination.

Digitalisation offers numerous opportunities to improve processes, increase value and reduce food waste and energy consumption. Additionally, digital data storage can enhance transparent communication throughout the value chain.

Digitalisation can also create opportunities for new business models and new digital services, that build greater trust in the food value chain. As a prerequisite for a successful partnership, the exchange channels and data storage must be robust and secure.

If we share information collaboratively, we can all make better decisions going forward. It benefits us all if we embrace this approach. For example, Bühler, Microsoft and Whitworth Brothers, are working together on a pilot project to trace wheat grain "from farm to fork" using blockchain technology, to provide full traceability and transparency.

Having access to reliable contaminant mitigation, trustworthy information and real-time quality monitoring are not new challenges for food producers. However, digitalisation enables the industry to deal with these challenges better than ever, so we are better placed to provide enough healthy food to feed the ever-increasing global population.

To learn more about the digital solutions available from Bühler, visit https://digital.buhlergroup.com/insights/

This issue of Milling & Grain magazine, an exciting new beginning to 2019, also reflects this emphasis on new, innovative technology to help the food industry perform beyond our expectations and needs. "In this issue, Milling & Grain discuss a variety of topics, such as the wheat forecast for 2019, analysis of roller mill rolls, silo fumigation and much more!

We hope you enjoy Milling & Grain's New Year issue!

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