PRESS RELEASE

The scale of the global food waste problem is staggering. According to reports, 1.6 billion tons of food are lost or wasted every year, equating to a total value of $1.2 trillion being wiped from the supply chain. With one-third of the total amount of food produced globally being misused, the industry needs to look towards innovation and digitalization to combat this ever-growing trend.

Through embracing technology and digitalizing the food supply chain, a move can be made towards
reducing the amount of food waste and loss within the industry. Not only that, but it can also help
ensure there's enough resource to sustainably support the future global population.

With the UN's Sustainable Development Goals setting a target of halving food loss and waste by
2030, I've looked at how the digitalization of the supply chain could help decrease global food waste.

The need for innovation to reduce waste

Although food waste is evident across the entire supply chain, the vast majority comes at the very
beginning (during production) and at the very end (during consumption).

The former of these is more common within developing countries, where the infrastructure is of a poor standard and cannot handle the food thus creating waste, whilst the latter is more pronounced in developed countries with waste being caused by both retailers and consumers.

According to the Boston Consultancy Group (BCG), the amount of food waste created in the supply
chain is set to rise 1.9 per cent from 2015 to 2030. You may think this is a small rise, but when put
into perspective with the current 1.6 billion tons wasted every year, this figure will increase by 30.4
million tons.

To combat this increase in waste, the food supply chain needs to go under a digital

transformation.

From production and processing to the retailers themselves, systematic changes are required in food
supply chain management to help everyone utilize this precious resource more efficiently and cut back on the amount of waste we're creating as a society.

Utilizing IoT in the supply chain

Through having better levels of communication across the supply chain, the amount of food waste
produced can be reduced. Each aspect of the supply chain must be in constant contact with one another to ensure our resources are managed efficiently.

This is where the Internet of Things (IoT) can support and improve supply chain efficiencies. Based
on having interconnected and interrelated systems and processes, IoT allows each aspects of the food industry to have access to key data around the supply, production and management of produce, which can help reduce the amount of waste created.

Without the wider adoption of IoT in the food supply chain, the levels of food waste could increase by 50-90 per cent as a result of several combined factors, such as the increase in food demand due to the ever-growing population.

By allowing all stakeholders within the supply chain access to key data shared across integrated systems, processes can be optimized further along in the chain to maximize how the produce is handled.

For example, a bad batch of apples with a high percentage of internal browning would require a specific equipment set up and would need to be fine-tuned to ensure the maximum value can be extracted from the apples. It is believed having this connectivity could save the supply chain up to $60bn in waste.

Through having this pre-warning of any information regarding a batch of produce, farmers can not
only optimize their yields by reducing the risk of waste, but the other stakeholders can also plan accordingly to try and prevent the cause of waste.

Having this ability to share data through IoT can also help reduce waste from a consumer standpoint. Retailers could use the real-time data in stores to showcase when the produce

was harvested or picked and offer insights into the projected "sell by date".

This can educate consumers further on how long they have to eat the produce, thus helping reduce food waste through the implementation of technology.

Using innovation to improve current infrastructure

As well as utilizing IoT, the supply chain can also use digitalization to help improve the infrastructure
it currently has in place.

Cold chain plays a huge role in the food industry creating waste, mainly due to poor infrastructure – in India, for example, $14bn is lost every year through poor cold chain facilities. However, implementing innovative and efficient systems can go a long way in addressing the food waste issue – particularly in developing markets.

By deploying more advanced cold chain solutions within the emerging markets, which share the data across the supply chain through IoT, it could prevent large-scale food loss and waste.

The conditions can also change in cold storage, and temperature affects many sorting technologies, so the ability to link cold storage sensors to packing equipment can enhance performance.

But this is nonexistent in many emerging markets, creating poor food storage and transportation conditions early in the value chain that lead to large-scale food loss. Deploying more-advanced supply chain solutions — including cold chain in developing markets — could reduce the problem by $150 billion annually.

Investing in efficient sorting and grading systems is a key approach in helping the supply chain
reduce the food waste created earlier in the supply chain.

We want to know everything about the produce. Everything from the weight and size through to the external properties and defects, and even the internal chemical composition to predict ripeness and longevity.

But there are only two points when you can gather information on individual pieces of fruit: when it's picked and when it is sorted. These are the critical data acquisition points.

KPIs need to be based around understanding the types of defect types and classes/grades per batch, to help create a complete map and total view of the produce. This, in turn can help build up big data, meaning every batch gives you new insights and allows you build a bigger picture, creating the ability to make even more informed data-driven decisions.

Where appropriate, data can be shared and augmented to 'context', such as weather data or geo-tagging.

The final step is to layer artificial intelligence to start to understand previously unseen patterns and even more efficient ways of working.

Although these KPIs tend not to be designed to help limit the amount of waste produce, utilizing sorting and grading technology can automatically support a waste sensitive environment by recovering any produce and reusing it for another purpose, such as cattle feed or pet food.

This means that rather than creating food waste, an alternative, more suitable use is found. Lower quality fruits can be used for juices or pulped to become products such as guacamole or apple source, whilst starches can be used for medical purposes. All of these help us reduce waste and put the lower quality produce to better use.

Going digital to fight food waste

With the ever-rising stats around food waste, now is the time for the industry to adopt a more
digitalized approach across the supply chain.

Implementing integrated and innovative systems will allow all key stakeholders, from field

to fork, to efficiently manage food and reduce the risk of waste at loss.

Digitalization won't just help from a sustainability aspect, but also help businesses drive their own profitability by improving processes and efficiencies. It becomes the answer to the push-pull paradox for commercial benefit and combating global food waste.

At TOMRA, we're committed to creating sensor-based sorting and grading systems to help the supply chain win the battle against food waste.

Through our systems, we aim to help food businesses maximize yields and ensure any produce can be recovered and reused, increase productivity with high capacity sorting and provide consistent high-quality food assurance.

We also understood that we must take the next steps. TOMRA Insight is our answer to connect our sorting and grading systems, extract valuable information on the sorting performance and the produce, and make it transparent to the food businesses. Incorporating this further into a digitalized supply chain will help to close the link from farm to fork in the future.