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IoT technologies enhance supply chain traceability and reduce food contamination risks, says mpro5

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Hospital admissions from food poisoning from salmonella and E coli have reached their highest level in decades in the UK. Hospital admissions for salmonella infections reached 1,468 in England between April 2022 and March 2023, according to NHS data. And hospital admissions for E coli reached over 4,340, equivalent to nine in 100,000 people in 2023, up from three in 100,000 people in 2000, according to recent reports.

In December last year, 30 people were hospitalised with E coli, with the outbreak resulting in one death. Further tragic cases include paralympic hopeful Lizzi Jordan, who lost her sight to E coli after eating a fast-food meal in 2017, which left her in a coma. With new cases continuing to emerge, food businesses are being pressed to do more to safeguard the public and minimise contamination.

Food businesses undoubtedly have a responsibility to ensure food safety regulations and protocols are followed in-house, but food contamination can happen at any point in the production chain. In many cases, business owners have limited control over the storage, transportation and packaging process of their imported produce, it is nearly impossible for them to guarantee food safety standards have been met from beginning to end. This risk has been recognised by the UK government rating supply contamination as four out of five for likelihood in the 2023 national risk register. However, as businesses increasingly embrace digitisation, the implementation of IoT technologies promotes confidence, compliance and thus protection for the whole supply chain.

According to Ruby Whipp, Vice President of Product at mpro5: “The most important step in ensuring food

safety is preventing the occurrence of foodborne illness in the first instant. By leveraging IoT technologies, food companies will benefit from improved supply chain visibility and end-to-end traceability. Radiofrequency identification (RFID) tags, for example, document the complete journey from origin to destination by transmitting location and sourcing data to companies, updating them on the exact whereabouts of each product throughout its journey to them. This way, any issues relating to product recall or batch contamination can be traced back through the chain, identifying locations of potential food safety breaches, such as a facility also handling nut products."

"Installing IoT cameras in manufacturing facilities further enforces quality control by inspecting food products, flagging lapses in improper packaging or the presence of potential contaminants, automating much of the processes behind compliance with food safety practices. Although the upfront cost of implementing such technologies is understandably off-putting, businesses will, in time, reap the benefits of reduced labour costs and improved operational consistency, bolstering their supplier-to-customer relations.

"This is equally important when considering downstream supply chain operations, such as in-country transportation. IoT sensors fitted in refrigerated packaging or vehicles track shipment and courier conditions in real time, automatically alerting drivers to changes in temperatures. If the reason for improper storage conditions proves challenging to rectify, drivers will be redirected to nearby facilities where food products can be temporarily stored when equipment malfunctions to ensure the longevity, hygiene and quality of perishable goods.

"Once in-store, IoT devices installed in storerooms, fridges and display counters provide real-time data on critical factors, including temperature, light exposure and humidity that threaten the safety of food products. With such vast amounts of collected data, businesses can detect patterns, address potential issues and identify risks in their food safety processes to both improve compliance and mitigate potential causes of illness.

"Integrating technologies to create an IoT infrastructure from food to fork presents benefits for all stakeholders, including manufacturers, couriers and business owners. By improving traceability, providing real-time data and ensuring correct storage, waste is reduced, and customer safety is rightfully cemented at the heart of all operations. In doing so, food businesses can maintain compliance with safety standards, identify potential food safety risks within the wider supply chain whilst cultivating customer confidence once the products are in-store," concluded Whipp.