

# 10 cost-effective food safety technologies to safeguard public health



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Reading time 11 mins

## Key Points

- The UK is in the midst of a food safety crisis: Approximately 2.4 million foodborne diseases are reported annually, the Food Standards Agency has a massive backlog of food businesses it hasn't inspected in years, Brexit causes a regulatory divergence, global supply chains have been disrupted, and climate change has led to a rise in pesticide use.
- Food safety technologies and robust diagnostic tools provide efficient and scalable solutions that are quick to implement and will significantly safeguard public health.
- For regulators who are underfunded and short-staffed, these tools ease the burden on inspectors (necessary data can be accessed and monitored remotely) and ensure that public health risks are identified and addressed promptly, even when on-site inspections are delayed.
- For producers and transporters, these technologies help detect potential hazards early and reduce the likelihood of contaminated products reaching consumers.
- Businesses in the food/hospitality industry are usually the last point of contact before products reach the consumer. Food safety technologies help ensure produce is kept in optimal conditions, adequately logged for compliance purposes, and easily traced if issues arise.
- Our top 10 cost-effective technologies for safeguarding public health include wireless temperature and humidity sensors, smart thermometers, and IoT-enabled cameras for quality control. In addition, cloud-based management platforms and subscription-based IoT services help keep implementation costs

low, accessible, and easily adoptable.

**We're here to help develop smart, cost-efficient and scaleable food safety technologies that keep consumers safe.**

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The UK is grappling with a significant food safety crisis. Delays in food hygiene inspections, post-Brexit regulatory divergence, global supply chain disruptions, climate change, and a rise in online food retail have left public health vulnerable to hygiene lapses with grave consequences such as the [E-Coli outbreak](#) in June. Food safety technologies such as smart thermometers and humidity sensors provide low-cost but highly effective and scaleable solutions for food-related industries to:

- Maintain strict compliance with safety standards.
- Monitor conditions in real time to prevent contamination.
- Ensure transparency and traceability across the supply chain (from production and processing to storage, transportation, and retail).

[Health technology](#) and [IoT](#) are key pillars of our work at Ignitec®. We're passionate about providing solutions that support our client's growth and promote the health and well-being of consumers. If you're in the food industry and looking for cost-effective and scalable solutions that respond to the various challenges that regulators, producers, and consumers face, we're here to help. [Contact us](#) for a free and confidential consultation with an expert on our team.

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# How can 'better diagnostic tools' support food safety standards?

Saying that the UK is amid a food safety 'crisis' isn't an exaggeration. The [BBC's analysis](#) of more than 250,000 public records on the Food Standards Agency (FSA) website found that:

- More than 53,000 have not been inspected since 2021
- Nearly 40% of businesses in Scotland - which has a 'pass or fail' food hygiene scheme - were last assessed over two years ago.
- 19% of inspected food businesses in the UK haven't had a follow-up hygiene inspection.
- Around [2.4 million](#) cases of foodborne illnesses are reported every year.

The [chaos in food security](#) during the E. coli outbreak demonstrates how a seemingly harmless—but inadequately checked—ingredient such as lettuce can cause a severe health crisis, endanger people's lives, disrupt business, and erode public trust: within 28 days of infection, two people died, over 120 children were hospitalised, and approximately 249 cases were reported. Food manufacturers had to recall sandwiches, wraps, and salads from supermarkets and retail chains, and investigations to find the root cause of the outbreak with the growers have yet to be concluded.

While many blame this crisis on the [FSA's food hygiene](#) lack of regular inspections, the agency itself

has long expressed concerns over its inability to clear the backlog. There's been a long-term decline in funding for local councils tasked with doing the inspections, a 15% drop in hygiene inspection staff, and a lack of skills resulting in 1 in 10 available posts left vacant.

Furthermore, this is only one in a [series of threats](#) to food safety. Brexit resulted in a regulatory divergence between the UK and EU that caused many legitimate importers to the UK market to withdraw (due to increased costs and paperwork). This created new opportunities for 'unscrupulous' businesses to bring non-compliant foods into the country. In addition, there's been an increase in the use of pesticides as farmers try to deal with climate-related issues and crop failures.

With challenges coming from all sides, innovative, cost-effective, and flexible food safety technologies that can be applied across the entire supply chain are much needed. These solutions assure all stakeholders, from regulatory bodies to restaurants - and we can help you build them! Please call us for more information on what we can do to help.

## This is where food tech comes to the rescue!

If local councils are short-staffed, integrating process management platforms will enable them to access and remotely monitor necessary data in real-time. Better diagnostic tools will:

- Allow for more efficient and accurate monitoring of food safety compliance.
- Automatically analyse critical data, such as temperature logs or pH levels, flagging potential issues before they escalate into serious violations.
- Ease the burden on inspectors and ensure that public health risks are identified and addressed promptly, even when on-site inspections are delayed.

For producers, adopting advanced diagnostic tools provides:

- Real-time insights into their food processing and handling operations.
- Tools that detect potential hazards early.
- Reduced likelihood that contaminated products reach consumers.
- High safety standards across the production line, thus avoiding costly recalls and damage to reputation. For businesses in the food/hospitality industry, food safety technologies help to ensure that - as the last point of contact before the consumers- products are kept in optimal conditions and can be monitored. For example:
- Fridge temperatures can be recorded and timestamped to ensure compliance every 4 hours to ensure food is stored at the right temperature. Food safety inspectors can remotely check if establishments input temperatures correctly, and staff who forget to

log temperatures can be sent automated reminders.

These tools provide consumers with an added layer of assurance that the food they purchase and consume is safe. If you're developing food safety technologies and need expert assistance to create products that can be implemented quickly and cost-effectively, we're here to help! [Call us](#) for more info.

# 10 cost-effective food safety technologies that calm the crisis

From farm to table, the food supply chain can be long and complex. However, these cost-effective food safety technologies can help businesses across the chain - from growers to transporters to restaurants - maintain high hygiene standards while navigating the challenges of reduced inspection frequency.

- 1. Wireless temperature and humidity sensors** ensure that food is stored and transported at the correct temperature and are critical to preventing spoilage and contamination. Wireless sensors provide real-time temperature and humidity monitoring and send alerts if conditions deviate from safe levels.  
**Cost-Effective Benefit:** Affordable and easy to install, these sensors reduce the need for manual checks and prevent costly spoilage.
- 2. Bluetooth data loggers** record environmental conditions during food storage and transportation, providing a timestamped record that can be reviewed to ensure compliance with safety standards.  
**Cost-Effective Benefit:** These devices are relatively inexpensive and can be used with mobile apps for easy data access and analysis.
- 3. Smart thermometers** ensure that food is cooked to the proper temperature, reducing the risk of undercooking, which can lead to foodborne illnesses like E. coli.  
**Cost-Effective Benefit:** These devices are a low-cost investment that can prevent costly health violations and ensure consumer safety.
- 4. RFID Tags** provide traceability for food products throughout the supply chain, ensuring that any issues can be quickly identified and addressed. This is particularly important during times when inspections are less frequent.  
**Cost-Effective Benefit:** RFID technology is increasingly affordable and helps businesses avoid costly recalls and damage to reputation.
- 5. IoT-enabled cameras** for quality control automatically inspect food products for

contaminants or improper packaging, ensuring that quality standards are met without the need for manual inspection.

**Cost-Effective Benefit:** Automating quality control reduces labour costs and improves consistency in food safety practices.

6. **Cloud-based process management platforms** enable remote monitoring of food safety data, allowing regulators to check compliance from afar. They also streamline record-keeping, ensuring that businesses maintain accurate and up-to-date documentation.

**Cost-Effective Benefit:** Cloud-based solutions are subscription-based, making them accessible to small businesses without requiring significant upfront investments.

7. **Smart packaging technologies**, such as embedded sensors or indicators, monitor the freshness and safety of food products, providing real-time information to both businesses and consumers.

**Cost-Effective Benefit:** These innovations offer an added layer of safety at a low cost, helping businesses maintain consumer trust during inspection gaps.

8. **Portable pH sensors** provide quick and accurate measurements, ensuring food is within safe acidity or alkalinity ranges.

**Cost-Effective Benefit:** These devices are affordable and easy to use, making them an essential tool for small food businesses.

9. **Subscription-based IoT services** allow businesses to monitor various aspects of food safety, such as temperature, humidity, and equipment performance, without investing heavily in infrastructure.

**Cost-Effective Benefit:** These services are flexible and scalable, allowing businesses to choose plans that fit their budget and needs.

10. **Simple IoT gateways** aggregate data from multiple sensors and send it to the cloud for analysis, enabling businesses to monitor food safety in real time across different locations.

**Cost-Effective Benefit:** These devices are a low-cost solution for integrating various IoT sensors into a cohesive monitoring system, making managing food safety on a tight budget more manageable.

**Innovation and collaboration are vital to food crisis-**

# navigation

In a time when food safety inspections are lagging, government funding is lacking, and supply chain disruptions are more frequent, integrating these cost-effective technologies is not just a smart move—it's essential.

By leveraging IoT and other innovative solutions, businesses can maintain high hygiene standards, protect public health, and confidently navigate the current crisis. Investing in these technologies now will ensure that food safety remains a priority, even amidst challenging circumstances.

If you're developing food safety technologies and looking for scalable, efficient, and low-cost solutions, we're here to help! [Contact us](#) for more information.

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## Suggested reading

**IoT in agriculture sustainability: Driving eco-friendly and yield-enhancing farming practices**

**Implementing IoT in supply chain management will streamline operations & maximise profits**

**IoT for Environmental Monitoring: Reducing Costs and Enhancing Eco-Protection**

## FAQ's



## **What are food safety technologies?**

Food safety technologies are tools and systems designed to ensure that food is produced, stored, and handled in a manner that prevents contamination and maintains quality. These technologies include sensors, IoT devices, and process management platforms that monitor environmental conditions and detect potential hazards. They play a vital role in safeguarding public health by ensuring compliance with safety standards.

## **Why are food safety technologies important?**

Food safety technologies are essential because they help prevent contamination, spoilage, and the spread of foodborne illnesses. With ongoing challenges like inspection backlogs, these technologies enable real-time monitoring and quick responses to potential risks. They ensure food products meet safety standards and protect consumers from health hazards.

## **How do food safety technologies work?**

Food safety technologies use sensors and devices to monitor critical factors such as temperature, humidity, and pH levels in food production and storage. They collect real-time data, which is analysed to detect any deviations from safety standards. If an issue is identified, alerts are sent to prompt immediate corrective action.

## **Which food safety technologies are most effective?**

Some of the most effective food safety technologies include wireless temperature sensors, smart thermometers, and cloud-based process management platforms. These tools provide real-time monitoring, accurate data collection, and the ability to oversee food safety compliance remotely. They are particularly valuable in ensuring food products are safe from production to consumption.

## **What challenges do food safety technologies address?**

Food safety technologies address challenges such as the risk of contamination, delays in inspections, and the need for consistent monitoring of food quality. They help mitigate the effects of regulatory shortfalls and ensure that food products remain safe despite disruptions in the supply chain. These technologies also improve traceability and transparency in food production.

## **How can small businesses benefit from food safety technologies?**

Small businesses can benefit from food safety technologies by using affordable tools like smart thermometers and Bluetooth data loggers to monitor and maintain food quality. These technologies help small businesses ensure compliance with safety standards and avoid costly recalls. They also enhance consumer trust by demonstrating a commitment to food safety.

## **What role do IoT devices play in food safety technologies?**

IoT devices play a crucial role in food safety technologies by enabling real-time monitoring and data collection across various food production and storage stages. They provide remote access to vital information, allowing businesses and regulators to identify and address potential safety issues quickly. IoT devices help ensure food products meet safety standards from farm to table.

## **Why is real-time monitoring important in food safety?**

Real-time monitoring is essential in food safety because it immediately detects conditions that could lead to contamination or spoilage. This proactive approach enables quick corrective actions, reducing the risk of foodborne illnesses. It also helps maintain consistent quality and compliance with safety regulations.

## **How do cloud-based platforms support food safety?**

Cloud-based platforms support food safety by providing a centralised system for collecting, storing, and analysing food safety data. These platforms allow for remote monitoring and reporting, making managing compliance and identifying potential risks easier. They also facilitate stakeholder communication, ensuring that food safety standards are upheld.

## **Who benefits from the use of food safety technologies?**

Food safety technologies benefit regulators, producers, and consumers by ensuring that food products are safe, high-quality, and compliant with safety standards. Regulators can monitor compliance more efficiently, producers can maintain product quality, and consumers can trust that the food they purchase is safe. These technologies also help prevent foodborne illnesses and protect public health.

## **What are the latest trends in food safety technologies?**

The latest trends in food safety technologies include integrating IoT devices, smart packaging, and cloud-based monitoring systems. These innovations focus on real-time data collection and analysis to enhance food safety across the supply chain and improve traceability, transparency, and compliance with safety regulations.

## **How does smart packaging contribute to food safety?**

Smart packaging contributes to food safety by using embedded sensors and indicators to monitor the freshness and condition of food products. This technology provides real-time information to both producers and consumers, helping to ensure that food is safe and of high quality. Smart packaging also aids in reducing food waste by indicating when products are no longer safe to consume.

## **Why is traceability important in food safety?**

Traceability is important in food safety because it allows for tracking food products from production to consumption, ensuring that any potential contamination or safety issues can be quickly identified and addressed. It helps maintain transparency and accountability within the supply chain. Traceability also enables quicker recalls if necessary, protecting consumers from unsafe food.

## **What impact has the UK food safety crisis had on the industry?**

The UK food safety crisis has led to significant challenges, including a backlog of inspections and increased scrutiny of food hygiene practices. This has highlighted the need for more robust food safety technologies to ensure compliance despite reduced regulatory oversight. The crisis has also driven businesses to adopt innovative solutions to protect public health and maintain consumer trust.

## **How can food safety technologies help during supply chain disruptions?**

Food safety technologies help during supply chain disruptions by providing real-time monitoring and data analysis that ensures food remains safe and high-quality, even when traditional oversight is compromised. They enable remote management of safety standards and allow for quick adjustments to changing conditions, ensuring that food products continue to meet safety requirements throughout

the supply chain.

## **What are the benefits of using smart thermometers in food safety?**

Smart thermometers offer precise and real-time temperature monitoring, ensuring that food is cooked and stored at safe temperatures. They reduce the risk of undercooking or improper storage, which can lead to foodborne illnesses. These devices are cost-effective and easy to use, making them an essential tool for maintaining food safety standards.

## **Why is it important to monitor humidity in food safety?**

Monitoring humidity is important in food safety because excessive moisture can lead to harmful bacteria and mould growth, compromising food quality and safety. Humidity sensors help maintain the correct environmental conditions for food storage and transportation. This ensures that food products remain safe and do not spoil before reaching consumers.

## **How can better diagnostic tools improve food safety?**

Better diagnostic tools improve food safety by providing more accurate and timely detection of potential hazards, allowing quicker responses to prevent contamination. These tools help regulators efficiently monitor compliance, producers maintain high safety standards, and consumers trust that their food is safe. They play a critical role in preventing foodborne illnesses and ensuring public health.

## **Who is responsible for implementing food safety technologies?**

Implementing food safety technologies is a shared responsibility between food producers, manufacturers, and regulators. Producers and manufacturers integrate these technologies into their operations to ensure that food products meet safety standards. Regulators oversee compliance and may recommend or mandate the use of certain technologies to maintain public health.

## When should food safety technologies be used in the supply chain?

Food safety technologies should be used at every stage of the supply chain, from production and processing to storage, transportation, and retail. Continuous monitoring ensures that safety standards are maintained throughout the entire process. This proactive approach helps prevent contamination, spoilage, and other safety risks, protecting both businesses and consumers.

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