

Wireless technology set to change the face of food safety monitoring

by Dr Martin Nash, product manager, Elektron Technology.

In the UK, it is estimated that each year around one million people suffer from foodborne illnesses. Some 20,000 are hospitalised and the cost of foodborne illnesses is around £1.5 billion per year.

Food safety has become a high profile issue publically and many diners now take into account the cleanliness of a restaurant, using websites and social media to check reviews and reputations before going in.

The Food Standards Agency (FSA) is one of the sources that make information on food hygiene ratings public. The FSA uses HACCP based food safety management systems that include a series of checks and procedures to control the processes and sensitive points in the food chain. The HACCP system has been recognised as an international standard for safe food production and the World Health Organization (WHO) has adopted it as the most effective means for ensuring food safety.

Traditionally, these HACCP checks are done manually; but now wireless technology can be used to help streamline HACCP procedures and significantly reduce the human error associated with traditional pen and paper checks.

Preventative approach

HACCP (Hazard Analysis Critical Control Point) surprisingly started life in the 1960s as a food safety program developed for astronauts and space travel but is now widely accepted as the de-facto preventative approach to food safety that addresses physical, chemical, and biological hazards.

In 1994, the international organisation HACCP Alliance was established to assist with implementing HACCP and its membership has spread over many professional and industrial sectors.

HACCP can be used by any organisation directly or indirectly involved in the food chain including:

- Farms, fisheries and dairies.
- Processors of meats, fish and feed.
- Manufacturers of bread and cereals, beverages, canned and frozen food.



Elektron's new Checkit wireless food safety monitoring solution.

● Food service providers such as restaurants, fast food chains, hospitals and hotels and mobile caterers.

HACCP can be easily adapted to suit all types and size of food business and comprises seven principles:

- Conduct a hazard analysis.
- Determine the critical control points (CCP).
- Establish critical limits.
- Establish monitoring procedure to control the CCPs.
- Establish corrective action when monitoring indicates the CCP is not controlled.
- Put in place procedures for verification/confirm that the HACCP is working effectively.
- Retain documentation for all procedures and records.

Accepted globally

HACCP is accepted by international authorities as the most effective means of controlling foodborne diseases. In the UK the 1995 Food Safety Amendment Regulations, for the first time required manufacturers and providers to adopt HACCP to ensure food safety.

Other regulatory bodies have recognised the usefulness of HACCP and its 'principles'

as they have been incorporated into legislative requirements by both the EU, the General Hygiene regulations for managing food safety (93/43/EEC), and the United States Federal Drug Administration (USFDA) (CPR - 123).

In Europe, under Article 5 of Regulation (EC) 852/2004, food businesses must put in place, implement and maintain a food safety management system based on Hazard Analysis Critical Control Points (HACCP) principles to ensure the food produced from their premises is safe to eat.

Meanwhile in the US, HACCP is set to have an increased role as a result of the pending FDA Food Safety Modernization Act (FSMA), which President Obama signed into law in 2011. While many companies already have HACCP plans in place, the FSMA goes further and will also require a preventive control plan along with a corrective action plan in place should this fail.

The FDA will also be looking at better ways to access and review an organisation's records prior to an inspection. These requirements make it even more critical to have an automated food safety system that can also manage and maintain records.

Food safety

Two of the main causes of foodborne illness addressed by HACCP are poor hygiene processes and inadequate temperature control when storing and serving raw and cooked products.

For most restaurants, food producers and other food service outlets, food safety monitoring requires manually checking food storage conditions including temperature and humidity as well as recording the temperature of prepared foods and the completion of food hygiene checks. These checks are typically performed at regular 3-4 hour intervals each and every day.

This work is often carried out by employees who may be inadequately trained in food hygiene, while a high turnover of staff and inexperienced managers, combined with the constant pressure to reduce costs, can lead to corners being cut.

In a typical restaurant, it can take over an

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hour for sous chefs or line cooks to complete manual line and quality checks and to complete the necessary paper-based reports. However, technology is now coming to the rescue with a new generation of paper-less HACCP solutions that harness the latest wireless monitoring technology.

Smart systems

Smart wireless sensor-based systems can be used in refrigerators and other food preparation and holding areas to provide continuous automated 24/7 monitoring of temperature, humidity and door status.

Associated wireless handheld sensors can also be used collect food temperature and hygiene check data at the press of a button, dramatically speeding up the process and reducing the risk of human error.

All data is user-authenticated, time-stamped and downloaded wirelessly to a centralised PC-based system and stored in a secure database, which automatically generates food safety compliance reports, along with a full audit trail in case of site inspections or future investigations.

In addition to automating the process of food safety monitoring, wireless technology can be used to send alarms to your PC, tablet or smartphone, providing immediate notification if there is a problem with cold



storage and food temperatures to ensure food safety and to prevent costly food spoilage in the event of a hardware failure.

To see the value of this service, you need only look at a recent case of the restaurateur whose chef left the door of a walk in refrigerator open overnight. He returned the next morning to find that all his specialty foods, meats and proteins had gone bad, costing about £25,000 in food alone.

Wireless technology is inherently flexible and a modular system can be used for any type of food operation and scaled from a single local site through to multi-site operations, using web-based software to configure, monitor and manage the complete network from one location.

For example, Elektron's new Checkit wireless food safety monitoring solution is completely paperless, simple to install and can be up and running within 30 minutes to protect any hot or cold food preparation and storage area.

Facing increasing cost pressures, competition and compliance demands, restaurants and foodservice businesses can no longer afford to take risks with their food safety monitoring. A food borne illness or failure to meet HACCP requirements does not just damage reputations; it can lead to costly litigation and, in extreme cases, closure.

Wireless technology will not eliminate the problems, but can make a major contribution to mitigating the risks. ■