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Smart Monitoring Systems for Food Safety

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Smart Monitoring Systems for Food Safety

How food suppliers, restaurants, cafeterias and other food services can implement reliable, low-cost monitoring solutions to ensure food safety.

Introduction

In 2015, an enormous foodborne illness outbreak hospitalized 165 people and four deaths were reported in California, Oklahoma, Texas, and Arizona. The outbreak affected Californians the most with 232 people becoming sick, 38 states in total were affected. After investigation, cucumbers imported from Mexico were a likely source of the outbreak. This prompted two recalls of potentially contaminated cucumbers which cost the company over \$10 million, excluding brand damage and loss of sales.

48% of food companies surveyed can perform a recall within a few hours, this is accomplished by using modern technology to meet the requirements of food traceability compliance. The other 52% can take days or weeks to properly execute a recall and are still using paper-based or partially automated systems to meet traceability regulations. These regulations include the Bioterrorism ACT and the Food Safety Modernization Act (FSMA).

The Internet of Things (IoT):

The network of physical objects ("things") embedded with sensors, software, electronics, and network connectivity, which enables them to collect and exchange data.



Food Safety Modernization Act (2011): The FSMA establishes a new regulatory framework for all members of the food industry, such as farmers and producers, importers, wholesalers, manufacturers, and transporters to prevent food-borne illnesses. This law gives the Food and Drug Administration (FDA) authority to enforce mandatory recalls and establish a food product tracing system.

Bioterrorism Act (2002): Authorizes the U.S. Department of Health and Human Services to take appropriate action to protect the nation's food supply against the threat of international contamination by requiring food processors to identify the origin of all food and ingredients received. If requested, the information must be provided to the FDA within 24 hours.

Many companies within the food industry are facing significant challenges with meeting the requirements of the FSMA. A main component of FSMA regulation is temperature control and tracking food as it is prepared, stored, and transported. The FDA will hold foodservice organizations accountable for not only properly controlling food temperatures, but also monitoring and recording them through the entire process from farm to fork.

Preventing Recalls

If your company is the manufacturer of a recalled product, government agencies will want to inspect records and general operations for safety violations. The consequences other than negative publicity are fines and penalties. In severe cases, daily operations may be shut down until expectations are met. The average cost associated with recalling a product is \$10 million. Combining the direct expenses of a recall, lost sales, damaged reputation, and lost consumer confidence can put foodservice organizations with recalled products in very hot water.

Recall Types

Class I - Dangerous or defective products that predictably could cause serious health problems or death. Examples include: food found to contain botulinum toxin, food with undeclared allergens, a label mix-up on a lifesaving drug, or a defective artificial heart valve.

Class II - Products that might cause a temporary health problem, or pose only a slight threat of a serious nature. Example: a drug that is under-strength but that is not used to treat life-threatening situations.

Class III - Products that are unlikely to cause any adverse health reaction, but that violate FDA labeling or manufacturing laws. Examples include: a minor container defect and lack of English labeling in a retail food.

Source: https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm049070.htm

Recalled Products – All FDA Centers Fiscal Years 2011 – 2016



The U.S. Department of Agriculture's Food Safety and Inspection Service (FSIS) issued almost 100 Class I recalls involving serious health hazards related to meat, poultry and egg products in 2015, a 130 percent increase from 2010. Class II recalls involving remote risks of health hazards in those products rose by about 70 percent during that period. Class I actions accounted for most FSIS recalls in the last five years.

Source: https://www.fda.gov/downloads/ICECI/EnforcementActions/UCM540606.pdf

Ditching the Clipboard

The first rule to implementing a reliable system for food traceability is to eliminate paper methods. Producing products in high volume can make it very difficult to accurately track information using paper methods. On top of not being able to see real-time insights on products, but locating and organizing the proper documents during a recall could take weeks to sort through. With the standards in place today, food service organizations are expected to take action within hours when it comes to food safety and potential recall. The FDA requires records within 24 hours if requested or fines and other civil penalties are possible.

With the added regulatory pressure to achieve food safety accountability, 55% of food companies surveyed plan to implement electronic traceability systems by 2019. The Internet of Things (IoT) is helping manufacturers reduce the impact of a recall and meet FSMA requirements by providing detailed record keeping for commercial food producers and suppliers to ensure the safety of food upon arrival at its destination.

Monitoring Food In Transit

There have always been high percentages of food spoilage occurring during transportation. In recent years, the food service industry has made significant progress when it comes to shipping perishable goods across the United States. Regardless of how fast a product can be shipped, it still does not prevent spoilage from happening due to moisture loss, increased temperatures, or other causes. Costs associated with overall food waste add up to more than \$35 billion a year. Over 25% of fruits and vegetables produced end up going bad before consumption.

The Internet of Things (IoT) makes it possible for food producers, transportation experts, and food service providers to stay connected at all times and guarantee safe food throughout the entire process. With IoT solutions in place, companies across the supply chain gain the visibility needed to ensure food is of the best quality, delivered on time, and prepared in the optimal environment. This also makes the FDA happy, there is now proof of quality at each checkpoint during the entire cold chain and shipping process to ensure there has been no disruption to the food's safety.

Example: Farms that use internet-connected equipment (or Monnit wireless sensors on non-loT machines) can confirm food quality when it is transported to a factory or warehouse. Fleet managers can then check wireless sensors to ensure temperature sensitive and perishable goods do not spoil while in transit. Any temperature fluctuations will trigger alerts that notify the driver and food supplier, who can replace damaged goods before they arrive at an end users dock for final preparations.

Becoming Safer, More Efficient, and Sustainable with Monnit

Food service organizations are always looking for new ways to increase efficiencies, reduce costs and ensure compliance with food regulations across the entire supply chain. Companies using Monnit wireless sensors can confidently monitor, control, plan and optimize operational management processes in real-time.

Most restaurants and food service providers still preform manual checks of the conditions in storage areas. These routine inspections require recording the temperature and/or humidity, which typically happens every three hours during the day. Monnit offers an alternative solution to the time-consuming, paper-based temperature/humidity recording process. Automated sensor systems can monitor areas of your business that were previously tracked by hand. Wireless sensors are able to record temperature or humidity levels every 10 minutes and captured data can be accessed from any internet-enabled device. This frees up manpower and time, allowing employees to focus on more important job responsibilities.

Monnit remote monitoring systems are a reliable and cost-effective solution for any company. Installation is easy, a complete wireless network can be set up in only 15 minutes. Data begins recording immediately and users can export data readings to remain compliant with CFR 21, part 11. Never worry about poor data or bad response times regarding potentially dangerous conditions again! Receive email, text, or voice call notifications should conditions fall out of safe levels, allowing for an immediate response and significant savings.

How the Monnit Solution Works



The Monnit Solution

Monnit products consist of wireless sensors, gateways, and software to offer a complete remote monitoring solution. Wireless sensors are used to monitor various environmental aspects of a business and are able to integrate with existing equipment, such as coolers, appliances, equipment, etc. to record data in real time. Wireless gateways act as a communication bridge between wireless sensors and the iMonnit online monitoring software, which allows users to view sensor information anytime through a computer, tablet or smart-phone. The iMonnit software can also alert send alerts to any internet enabled device via email, text message, and/ or voice call should conditions fall out of safe thresholds.

Monnit's wireless sensor network can be expanded from a single local area to a multi-site network with sensors anywhere in the world, as long as the sensors are connected to a Monnit gateway. The gateway will then transmit the data to iMonnit (cloud-based software) which allows users to configure, monitor, and manage all of their locations from one network.

Monnit has over 50 different wireless sensor types, all have unique characteristics depending on their application and solution provided. Monnit also offers different gateway communication options. These include cellular, ethernet, USB and serial MODBUS, providing a variety of ways to connect your devices to iMonnit secure cloud software. In addition to viewing all data in iMonnit, users can also opt for Monnit MINE which pushes all of the sensor data recorded to any other software application written in C# or Java. If Monnit's current offerings are not exactly what is needed, our engineering team is happy to invent a completely custom solution specifically tailored to any need.

Features and Benefits

- · Easy to setup and use
- Reliable, proven technology
- Low cost
- Low power/long life
- Exceptional wireless range
- 50+ sensor types

- Scalable / Expandable (100 sensors per gateway)
- Global RF frequencies
- Cloud-based monitoring software
- Provides alerts by text message, email, or phone call
- Accessible 24/7 from anywhere
- Custom sensors available upon request

Affordability

A major concern for most food service companies is lack of funds required to implement an IoT strategy to meet and/or exceed FSMA regulations. More than 90% of food manufacturers have less than 200 employees, many of those organizations are still performing manual safety checks due to the high cost of advanced technology solutions. These small food manufacturers are being held to the same standards as larger organizations, which puts a lot of pressure on them to keep up with an ever-changing industry.

Monnit's remote monitoring systems can assist any sized food company to effectively manage time-consuming tasks associated with food safety for a low-cost. All of Monnit's sensors can be integrated with each other and Monnit gateways are able to support up to 100 sensors each. This allows companies to custom tailor a solution specifically for their needs. A typical set up for monitoring food safety levels would include temperature and humidity sensors. For a single warehouse or storage unit, a combination of 1 gateway (ethernet or cellular) with 5-10 sensors (coin cell or AA) would be under a \$1,000. There are literally hundreds of sensor/gateway combinations that can be pieced together based on your specific needs that can be purchased for under \$1,000. All of our products are available our website: www.monnit.com

"Having a walk-in refrigerator fail really cost our business. It's not just the cost of repairing the unit, it's all of the food inside. Monnit's wireless sensors were a breeze to install and the monitoring system is top notch. Now I get a text message whenever there's an issue, so we can correct it before it impacts our business. If you run a restaurant, this is a no-brainer purchase!"

- Brian C., Restaurant Manager

Key Takeaways

- A number of regulations and processes are mandatory within restaurant and food service establishments to ensure food safety.
- Manual documentation is time consuming, resource intensive, and prone to human error.
- Monnit's automated system can properly track and record temperature critical processes such as food storage and preparation temperatures.
- Monnit systems can protect food inventories, preventing spoilage due to cooler or freezer failures by immediately alerting staff of any potential issues.
- Restaurants can save money by tracking power consumption of coolers, freezers, appliances, HVAC systems, and more.
- Monnit's reliable remote monitoring solutions provide peace of mind 24/7 and send instant notification alerts to any internet enabled device should an issue arise.
- Implementing the Internet of Things in any business is easy and affordable!

As regulations and competition grow, food suppliers and restaurant owners cannot afford to take risks when it comes to food safety. Suffering the loss of stock due to spoilage or spreading foodborne illness is an expense that a business may not overcome. Monitoring food temperatures will help prevent waste and provide safer and better-tasting food.



About Monnit

Monnit bridges the gap between industry and technology through the Internet of Things, empowering businesses with easy-to-use, low-cost remote monitoring solutions. Monnit solutions can be used to remotely monitor a variety of "Things" (i.e. temperature, motion, humidity, energy use, etc.), alerting you by text, email, and/or phone call when user-defined conditions are met. Our goal is to save you as much time, money, and stress as possible, by preventing issues with inventory, infrastructure, and more.

As a Global Top 50 innovation leader in The Internet of Things (IoT), Monnit's technology has significantly expanded the frontier of both what and how "things" can be connected, monitored and controlled. It is almost impossible to identify an asset, process or solution, from SMB to Enterprise, indoors or outside, commercial to industrial, that cannot be uplifted by one of Monnit's 50+ reliable, affordable, tiny, powerful, wireless monitoring solutions.



For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com



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