



Rentokil

The Experts in Pest Control

PEST CONTROL AND THE POWER OF DATA

A new era for food safety

How data-driven insights can enhance pest control for the food processing sector

THE COMPLEXITY OF FOOD SAFETY CHALLENGES

The world is facing rapidly evolving pest control and food safety challenges on which billions of lives and livelihoods depend. This is a fact as much recognised by authorities as it is by the food industry.

The World Health Organization estimates that food pathogens result in 600m cases of food-borne disease worldwide. According to the same source, this leads to approximately 420,000 deaths a year.¹

Other statistics show how these outbreaks also impact economies. The research² undertaken by the Ohio State University, for instance, found the annual cost of food poisoning to be \$52–78 billion in the United States alone.

The challenge of controlling pests and the food safety breaches they can cause is clearly significant. But there are additional emerging issues – the rising global population, increasing urbanisation and a complex modern supply chain – that make food safety more and more difficult to manage.

In this whitepaper, we explore one way that food processing businesses can address pest challenges by collecting data gathered from connected devices and thousands of site inspections worldwide.

intelligent interrogation, however, so we also look at how to analyse these sources to turn the data into actionable insights that can help develop new prevention methods. In particular, we look at how Rentokil is unlocking the power of data insights for pest management with new levels of efficiency and control to ensure food safety.



Food pathogens result in 600m cases of food-borne disease worldwide.¹

¹<http://www.who.int/news-room/fact-sheets/detail/food-safety>

²Journal of Food Protection, State Estimates for the Annual Cost of Foodborne Illness. Journal of Food Protection, 2015, Robert L. Scharff

Rise of the machines: how data can be collected

THE INTERNET OF THINGS

Organisations across commercial and industrial sectors can generate huge volumes of data – known as big data – much of which is being gathered by connected Internet of Things (IoT) devices.

IoT can be defined as the global network of devices, vehicles and industrial appliances that are embedded with sensors that communicate with each other and with centralised computing systems.

Typically, IoT helps to drive business change in two main ways.

1. By helping organisations to remotely monitor in real time the activity of machines, systems, humans, animals or environmental systems more efficiently than using manual recording methods or human observation.
2. By generating huge volumes of data that can be interrogated to provide new insight on how operations or systems can be improved.

How IoT is being applied to pest monitoring and food safety

Various contributors to the food production supply chain already use IoT devices and data to achieve new efficiencies. Adoption is still developing, but all organisations involved in the food industry now have the option to deploy remote sensors that enable continuous, 24/7 monitoring of all pest activity as part of ongoing food safety efforts. Such systems are readily available and usually consist of connected traps that detect, capture or kill pests.

These devices can be fully integrated with online customer portals, which can provide 24/7 access to pest-management reporting, including trends, recommendations and analytic tools to support pest-control audits.

The number of global, active IoT devices is expected to grow to 22 billion by 2025.³

³IoT Analytics, State of the IoT & Short-term outlook 2018

Mining for gold:

THE PROCESS THAT TURNS DATA INTO ACTION

Every year, pests cause huge economic losses in the food and beverage processing industry.

Pest infestations can disrupt the production process and threaten health, safety and sanitary compliance. Outbreaks can also compromise brand reputation, so food processing facilities must adopt comprehensive, integrated pest management (IPM) plans tailored to their individual needs.

As part of our IPM offering, Rentokil's IoT solution – PestConnect – has a global ecosystem of over 80,000 connected devices. By using infrared and wireless technology, these devices provide 24/7 monitoring of premises that include food processing facilities, and can be integrated into our online customer portal – myRentokil.

Our connected devices continually gather new data that augments the information collected manually by pest control technicians, dramatically

increasing the volume of data in the process. The data is then automatically fed into digital pest-management systems where it can be analysed.

When this data is mined it can reveal valuable insights, such as the Rentokil data illustrated in Figure 1 which shows that there is an ongoing need to address problems with flying and crawling insects in food processing businesses.

Research – commissioned by Rentokil and carried out by the Centre of Economics and Business Research – also found that food processing businesses spent an average of \$9,000 every year dealing with flies. This puts a monetary figure on the cost flying insects cause to businesses and supports the need to investigate the extent of the problem.

Mining the data for the sources of flying and crawling insect infestations showed that the factors that lead to infestation stem from building integrity and sanitation over and above other issues (see Figure 2).

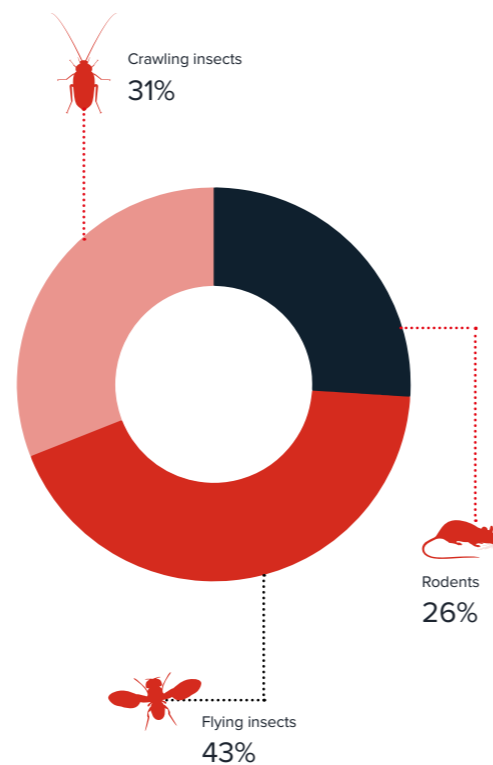


Fig. 1 - Infestations by type

The data itself does not, and cannot, provide a solution here, but it can highlight areas that require further attention. Our technicians can take this insight and draw on their expertise and years of experience to find effective solutions. In the case of crawling insects, our expertise tells us that it's specifically how the key factors in Figure 2 can provide

ample harbourage for pests such as cockroaches that makes them a pest risk, and so prevention and treatment methods should be targeted at reducing those harbourage opportunities.

Such insights, therefore, are the result of using collected data, analysis, expertise and experience together. This powerful combination

makes it possible for new thinking that can lead to the development of innovations for preventative pest management – and it's one that Rentokil continues to explore and invest in to protect businesses now and in the future.

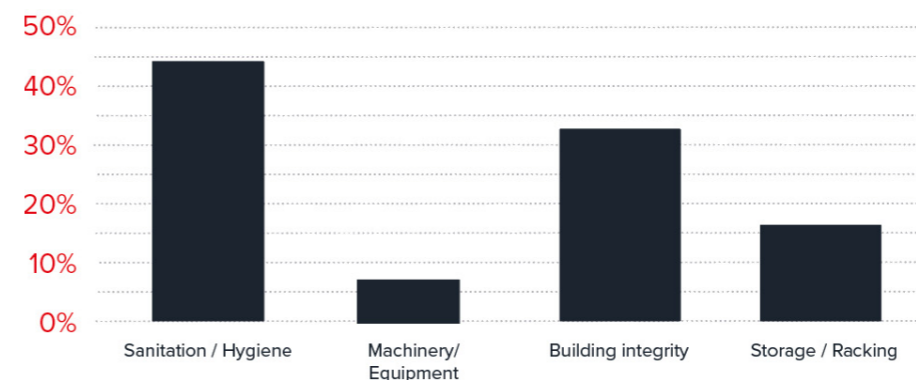


Fig. 2 - Issues identified

We can draw upon Rentokil's extensive data-sets to generate new insights to inform pest management.

USING DATA TO ITS FULL POTENTIAL

There is no doubt about the full scale of challenges facing food processing businesses which now, more than ever, need to proactively mitigate risk to improve food safety.

These challenges are significant. However, there is also clearly an opportunity for organisations to overcome them more effectively than they have done in the past by leveraging data.

This data, collected via connected devices and thousands of worldwide manual inspections, is helping the food industry and pest controllers to improve real-time reporting, be more responsive to changing patterns and record pest-control activity for regulatory and audit purposes.

What's also clear is that data becomes most useful when it's analysed or aggregated with other information and used to create actionable insight. For instance, data can be cross-referenced with other data sources – such as temperature, rainfall and site proximity to water – in order to carry out predictive analytics and identify areas particularly vulnerable to infestation.

This method of predictive analytics, which compares historical and current data trends to make informed estimations, can effectively forecast pest outbreaks before they occur. Pest controllers can then proactively use this knowledge

to take targeted precautionary measures and deliver significant business benefits across the food processing sector.

Aggregating data from different sources can therefore drive innovation and allow measurable, tangible and proactive improvements in pest management and its impact on food safety.

As we move further into the twenty-first century – and continue to address all the issues the food industry must overcome to deliver a safe and secure supply of food for the world's growing population – it is the companies that embrace this realisation fully that will stand the best chance of mitigating food safety risk effectively and efficiently.

'Connected pest control devices are a natural extension to our tool box for delivering world class pest management. However, it's a combination of IoT, big data and our expertise at a local and global scale that make us the experts in Digital Pest Control.'

Paul Donegan, Digital Innovation Director



Rentokil

The Experts in Pest Control

Why Rentokil

Rentokil is the global leader in pest control, bringing expert, reliable and professional service to commercial and residential customers in over 80 countries worldwide.

Rentokil understands that protecting the health of your employees and customers also protects your reputation. As the experts in pest control we work with you to do the following.

Safeguard your reputation

We take a dual approach, incorporating both preventative and responsive strategies to enhance protection for your business with a consistent, continuous pest-control programme.

Provide global insights with local expertise

With over 14,000 qualified technicians worldwide, we have extensive experience across a wide range of industry sectors. Our experts work proactively in partnership with you to minimise the threat of pest infestations in your local business.

Keep you one step ahead of pests

Our holistic, digital solutions use connected technology to help you predict and report all pest issues across your food processing operations. We use unrivalled insight, data and reporting to help you to proactively manage and prevent infestations, allowing you to concentrate on your business with the confidence you have pests firmly under control.