

# Food inspection technology could kill waiter jokes

**New inspection X-ray technology developed by European researchers is helping to ensure that the only thing in people's dinners is the food itself.**

Finding a snail in a salad, a fish bone in a supposedly boneless fillet or opening a soup packet to reveal mouldy contents is an unpleasant – and potentially unsafe – experience. Small foreign bodies and packaging defects are frequently not detected by food producers, but a new X-ray inspection technology developed by European researchers is ensuring that the only thing in people's dinners is the food itself.

For consumers, a more effective method of inspecting food products before they reach supermarket shelves means better-preserved and cleaner food on their dinner tables – and a reduction in the risk of food poisoning.

An improved inspection system also means producers can offer better quality produce, reduce the risk of spoilage, and gain a competitive edge over rivals.

Already in use commercially, the technology developed by the Modulinspex project uses low-energy X-rays to produce highly detailed images of food products and packaged goods. The images are then scanned via inspection software that can automatically detect any irregularities accurately and quickly.

The system can be used to check seals on food wrappers, locate packaging defects and find foreign particles of any size in any kind of food, from maggots in apples to grains of sand in bread.

Even in an era of high food standards and sterilised packaged produce, those problematic foreign bodies and packaging flaws are more common than most people realise, says Jørgen Rheinländer, the managing director of Denmark-based InnospeXion, which helped develop the technology. Rheinländer was the project coordinator for Modulinspex.

“Go down to your supermarket and pick up a package of dried pasta,” he says. “About one in ten will have pieces of pasta trapped in the seal that can let air and moisture in and spoil the product.”

Rheinländer notes, for example, that some bacteria may spread on poorly sealed produce and go unnoticed by consumers until they end up spending the next day on the toilet or at the hospital.

## **Lower energy, higher definition**

Until now X-ray inspection technology used by food processors was dominated by high-energy intensity systems not unlike those used to scan luggage at airports. These are able to detect a pebble in a package of corn but lack the resolution to pick out a grain of sand in a bag of flour.

The higher-resolution alternative, low-energy X-rays, had not been used because it took too long to scan the produce and would slow the rapid pace of production in modern processing and packaging plants.

The European researchers working in the EU-funded Modulinspex project have brought both greater speed and accuracy to the table.

By attaching a CMOS chip to the crystal that detects the X-rays in a low-energy system they have been able to build a detector capable of taking 300 images per second, enough to capture a crisp image of products moving on a conveyor belt at half-a-metre per second.

The X-ray images have a resolution of 0.1 millimetres – 16 times better than existing high-power systems, making it possible to detect objects as small and fine as a herring bone.

### **Modularity for easy adoption**

The system is also modular, allowing hardware and software components to be adapted to suit the needs of any producer in the food industry.

“Most X-ray luggage scanners at airports are virtually identical because one type works anywhere,” Rheinländer explains. “In the food industry, however, everyone has different requirements depending on the speed of the production line, the type and size of products being scanned and hygiene regulations.”

The consortium of companies involved in the project has already sold three of their systems to companies in Spain, the United Kingdom and Denmark. The systems were bought after the project partners held a demonstration at the Scandinavian Food-PharmaTech exhibition last November in Denmark.

The Modulinspex system, known as MCIS, also received the exhibition’s award for innovation.

### **Enormous market beyond food**

Curiously, none of the three systems that were sold are being used in the food sector, confirming, in Rheinländer’s view, the broader range of applications for the technology.

In the UK, for example, the system is being used by a company to inspect filters delivered by an outside supplier, while in Denmark it is being used to check the quality of fur used to make coats.

“The market for this technology is truly enormous,” he says. “In the food industry alone we can expect growth rates in excess of 20%... and we also see a market for using it in manufacturing, to inspect seals on car components, for example, or to check for counterfeit products.”

Meanwhile, Rheinländer foresees demand in the food sector being driven not only by producers who want to offer better quality products but also by increasingly stringent food safety regulations in Europe and elsewhere

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