

X-rays ensure bone-free chicken fillet

The installation of two Ishida X-ray inspection systems at the Rose Poultry factory in Skovsgaard, Denmark, has fully automated the previously manual process of checking chicken fillets for bones and enabled up to 10 operators to be re-deployed elsewhere in the factory

Rose Poultry is Denmark's largest manufacturer of chicken products, processing around 290,000 chickens a day at its three factories. The company is both quality- and traceability-orientated. For example, the history of every bird can be tracked back through four generations.

Bone fragments can seriously impair the consumer's enjoyment of products such as chicken fillets, and in extreme circumstances can lead to medical problems and legal action. To prevent this, Rose Poultry used, until recently, a painstaking manual/visual inspection approach on its chicken fillet line. This was labour intensive and physically demanding, and required careful management to minimise repetitive stress.

Rose has now installed an Ishida IX-GA-2475 X-ray inspection system on each of its two frozen chicken fillet lines at its Skovsgaard plant, near Aalborg, in the north of the country. This development followed consultations with Ishida and its local agent, and has resulted in better quality assurance coupled with major reductions in the cost of processing.

A major advance in safety for the food industry

While a metal detector would pick up fragments of metal in the fillets, the IX-GA can detect metal as well as a wide range of contaminants such as bone, glass, shell, grit, plastic and hard rubber.

Fragments as small as 0.3mm in diameter can be detected, well below the range of likely manual/visual detection. The sensitivity of the IX-GA has been established in an independent evaluation of six leading X-ray inspection systems, conducted by a major European meat research institute.

Unlike a metal detector, the IX-GA pinpoints the exact location of the fragment, enabling an operative to rapidly remove it with the minimum of cutting or deformation of the chicken fillet.

Other uses of the Ishida IX-GA include detection of product defects such as cracks, voids, lumps or wrongly-shaped pieces. Advanced masking capabilities allow items that form part of the packaging, such as metal clips, to be ignored, thus reducing false

alarms. The system can also calculate piece and product weights, using volume and density information from scans.

Thus, the IX-GA can be used to improve product quality, and to protect the consumer as well as food manufacturers, their customers and their brands.

Maximising the reliability of bone fragment detection

When the characteristics of a contaminant are known, as is the case with chicken bone fragments, a technique called "evolutionary image processing" can be used to set up an X-ray detection system so that it is, in effect, more sensitive to that contaminant.

With most systems, the setting up process requires help from the manufacturer or another expert. By contrast, Ishida's GA (genetic algorithm) image processing allows an ordinary



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operator to quickly generate the optimal sensitivity settings and achieve good image clarity.

"The Ishida X-ray system is much easier to use and we can set it up ourselves," explains factory manager Per Alan Jensen.

Faster checking, fewer manual interventions

The two IX-GA systems at Rose Poultry are now carrying out more comprehensive bone fragment checks than were previously possible, and at far faster speeds: Up to 160 fillets per minute per line.

When fragments are detected, the rejected fillets are transferred to a separate conveyor which takes them to a manual inspection station where, with the aid of the X-ray data, the fragments are located and removed. The completely deboned fillets are then returned to the packing system.

"This means that we now only have to manually inspect around 10% of production whereas before we had to check 100%," says Mr Jensen.

By fully automating the inspection system, Rose Poultry has thus been able to re-deploy five operators previously involved in manual inspection on each line, a total of 10 people.

Readily accessible information

Operation logs and inspection results are automatically stored, with a time stamp on each image. This provides a reliable bank of information for quality and traceability purposes, which can be linked by Ethernet connection to the overall system. CF cards can also be used for information transfer.

Safety features

The IX-GA system and the curtains which guard entry and exit to its inspection tunnel prevent all possibility of radiation escaping to the outside during the brief period for which each item for inspection is irradiated. Any intrusion or interference with the curtains will prevent irradiation from taking place, or halt it immediately.

Inspected products receive only small doses of radiation, far below the threshold needed to cause change or denaturation. As an extra precaution against overexposure, any product in the inspection tunnel at start-up is rejected. The touch screen displays X-ray output level to the operator at all times, helping to eliminate the possibility of machine error. **FBA**



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