

# X-rays Find Foreign Objects in Meat Products



Tulip



Preventing foreign objects like small pieces of plastic, metal, or glass in food is in high focus at Tulip. The food corporation already operates X-ray equipment in order to disclose unwanted objects in its products, and the interest is high both in combining X-rays with other methods and in developing improved X-ray techniques.

“As we ship a container, just one unfortunate finding will often lead to the loss of the entire content. This may amount to a well above a 10,000 Euro loss,” says Senior Engineer Tommy Guldborg, Tulip.

“Even worse though is the risk of consumers becoming sick from foreign objects in our products. As a company known for its high standards we need to do everything in our power to prevent this situation.”

## Keen on further progress

Tulip operates ten factories, hereof seven in Denmark. X-ray equipment is standard, just as is metal detectors capable of immediately finding i.e. pieces of production equipment accidentally dropped into minced meat or other products. But this just the beginning, according to Tommy Guldborg:

“When producing millions of items, you cannot eliminate the risk of errors altogether. Thus you need to be able to identify foreign

objects before the products are shipped from the factory. The earlier in the chain of production you detect the problem, the better.”

“Compared to previous levels, we are able to prevent three out of ten foreign object complaints. Obviously, this is a significant progress and we pride ourselves in being among the leaders in the field. Still, we are keen to limit the level of foreign object complaints still further.”

## Why plastic can be tricky

A part of this quest is Tulip’s involvement in the NEXIM project (NEw X-ray Imaging Modalities for safe and high quality food). Supported by the Danish Council for Strategic Research the project develops advanced X-ray techniques.

“Current standard X-ray techniques are forceful in identifying foreign objects which differ significantly from meat in their shape or density. Also pieces of bone are identified fairly easily. However, certain types of objects continue to pose challenges. An example is tiny pieces of see-through or bright plastic,” Tommy Guldborg remarks.

Several pathways may lead plastic into meat products. For instance meat or other ingredients are frequently wrapped in plastic folia or stored in plastic boxes. A similar problem is small chunks of glass, which may origin from a glass container with a spice



*Compared to previous levels, we are able to prevent three out of ten foreign object complaints. Obviously, this is a significant progress and we pride ourselves of being among the leaders in the field. Still, we are keen to limit the level of foreign object complaints still further.*

Tommy Guldborg, Senior Engineer, Tulip

having been dropped some where in the chain of production. Also tiny pieces of wood are hard to distinguish from meat when using a standard X-ray source.

### Fast scans, please!

Experiments in NEXIM are promising when it comes to identifying plastic, glass, and tiny wood chips in meat.

Still, the senior engineer does not imagine for Tulip to send its own samples for analysis at the scientific facilities in Lund:

“Our portal to these facilities will be the Danish Meat Research Institute (DMRI) in Roskilde. We fully support the efforts by DMRI and the universities in developing even more advanced techniques. We also encourage a focus on the practical side of these methods. When operating a plant which produces, say, up till 60,000 units per hour, having accurate scanning techniques available is not enough in itself. You also need a high throughput. DMRI understands the practical challenges that we face. We value the cooperation highly.”

## New Horizons Are Opening to the Food Industry

World leading facilities within neutron and X-ray scattering, the ESS and MAX IV, will open in the Oresund region over the next few years. However, there is no need to wait for these facilities to open. Scientists at Technical University of Denmark and University of Copenhagen are already in gear for X-ray and neutron scattering projects. These could either be full research projects in their own right or preliminary projects leading up to projects at existing or the coming large scale facilities. Contact the universities to learn more about what they can offer you.

### University of Copenhagen

Søren Jønsson Granat  
The Niels Bohr Institute  
Juliane Mariesvej 30  
2100 København Ø  
Phone: +45 3532 0605  
E-mail: granat@nbi.ku.dk  
www.nbi.ku.dk

### Technical University of Denmark

Henning Friis Poulsen  
Imaging Industry Portal  
Fysikvej, Building 307, Room 021  
2800 Lyngby  
Phone: +45 2339 6938  
E-mail: 3dimaging@dtu.dk  
www.imaging.dtu.dk/industriportal

