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# Processed Meat Heating Experiment by X-ray CT

## About the sample: Processed meat

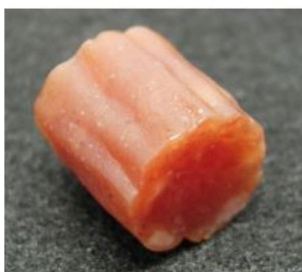
Meat products processed to improve their taste or shelf life include various components such as fat, protein, air, water, and salt. Their distribution not only can change the taste and texture but also can influence the shelf life. Processed meat products can be sliced and the internal content can be visually inspected. Alternatively, X-ray CT ([computed tomography](#)) can be used to reveal three-dimensional structure in micron resolution. The resulting image can be easily [segmented](#) into different materials to quantify their characteristics.

## Analysis procedure

1. In this example, a piece of salami was heated up to 200 C and scanned *in-situ* using a high-speed-CT scanner, [CT Lab GX](#).
2. The resulting image was segmented into solid and air using the [thresholding](#) technique.
3. The change of the void volume was observed from 30 C to 200 C.

## 1. CT scan

About half an inch slice of salami was heated up to 200 C. The sample was scanned at different temperatures to produce the 3D grayscale CT image. The sample before and after heating are shown in the figure.

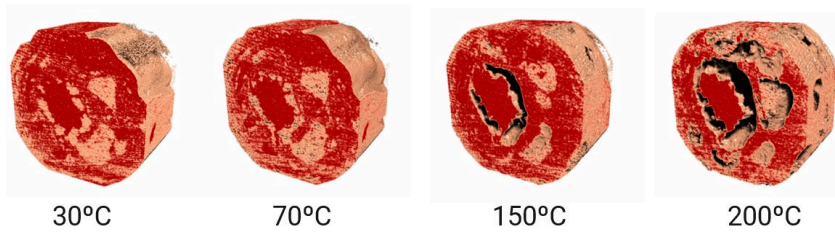


Before heating



After heating

The 3D rendered scans are shown in the figure. The red and cream colors indicate protein and fat components, respectively. At 150 C, voids start to show where fat is and expand at 200 C.

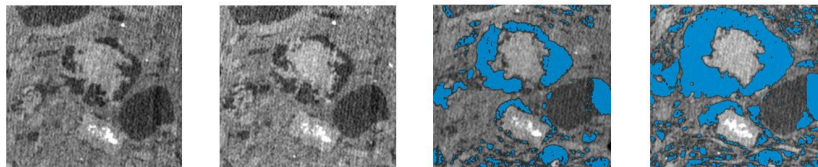
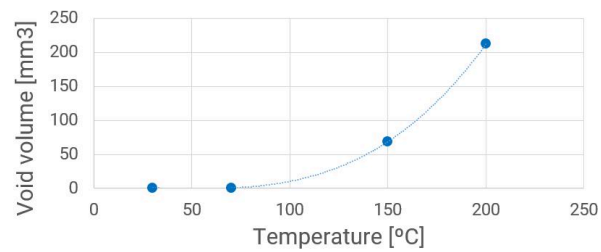


## 2. Segmentation

The resulting images were segmented into solid (grayscale) and air (blue) by the [thresholding](#) method.

## 3. Volume fraction analysis

The void volume was plotted against the sample temperature. The void volume starts to increase rapidly at 150 C.



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## Related products



### CT Lab GX

High-speed, stationary sample microtomography of medium-size samples