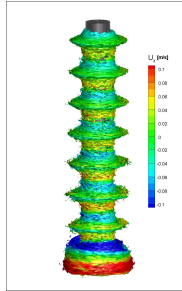


**BlueBEAR** provides a substantial computing resource that properly supports the research work of research staff and students at Birmingham. It provides a cost effective facility that optimises the effectiveness of research and ensures the University continues to be a world-class academic learning and research environment.

## An experimental and numerical fluid dynamic study of a Pin - Stirrer Heat Exchanger



### Challenges

Tackling obesity in modern society requires advanced technology. New engineered healthier food can be obtained by rethinking the formulation. This opens the way to a new and exiting discipline, Food Engineering. The primary challenge is to replace the unhealthy constituents with designed alternatives, without altering the sensory perception of the product.

### Background

A way of achieving this, is to gain a deeper understanding of the current food processing technology and it's effect on the final food properties.

The Pin Stirrer Heat Exchanger (PSHE), is the standard for the production of margarine, although very little is known about the internal extremely complex mixing structures.

### Results

BlueBEAR offered the unique opportunity to use an extensive computational capacity to simulate with Ansys CFX the entire PSHE. Furthermore, because the simulations were intended as a shortcut to screen different PSHE designs, experimental validation was needed. Custom developed MATLAB codes were used under BlueBEAR to process the large amount of data obtained from Position Emission Particle Tracking experiments (PEPT).

As a conclusion, thanks to this study we are able to improve food processing and to extend the use of PSHE to the production of more complex, demanding and healthier foods.



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### Product Used

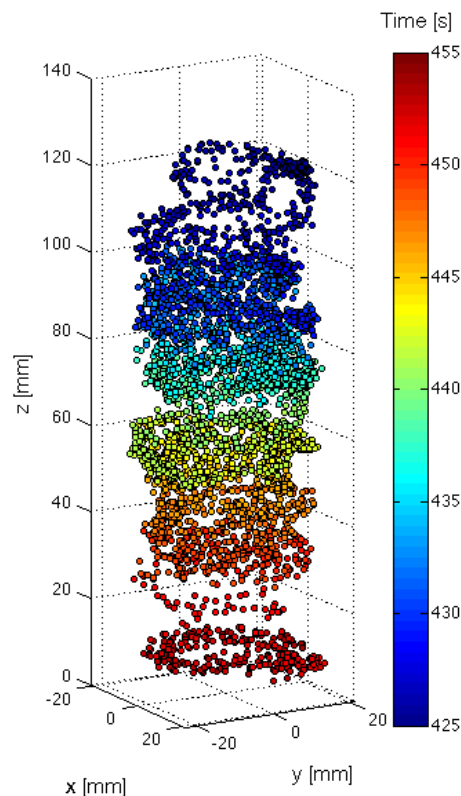
Ansys ICEM  
Ansys CFX  
MATLAB

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