Stephen J James.

26.06.07 retail workshop

Fostering the Development of Technologies and Practices to Reduce the Energy Inputs into the Refrigeration of Food CX0511

University of BRISTOL

Food Refrigeration & Process Engineering Research Centre

Aim

The overall objective of this project is to identify and stimulate the development and application of more energy efficient refrigeration technologies and business practices for use throughout the food chain whilst not compromising food safety and quality

Main topics in work programme

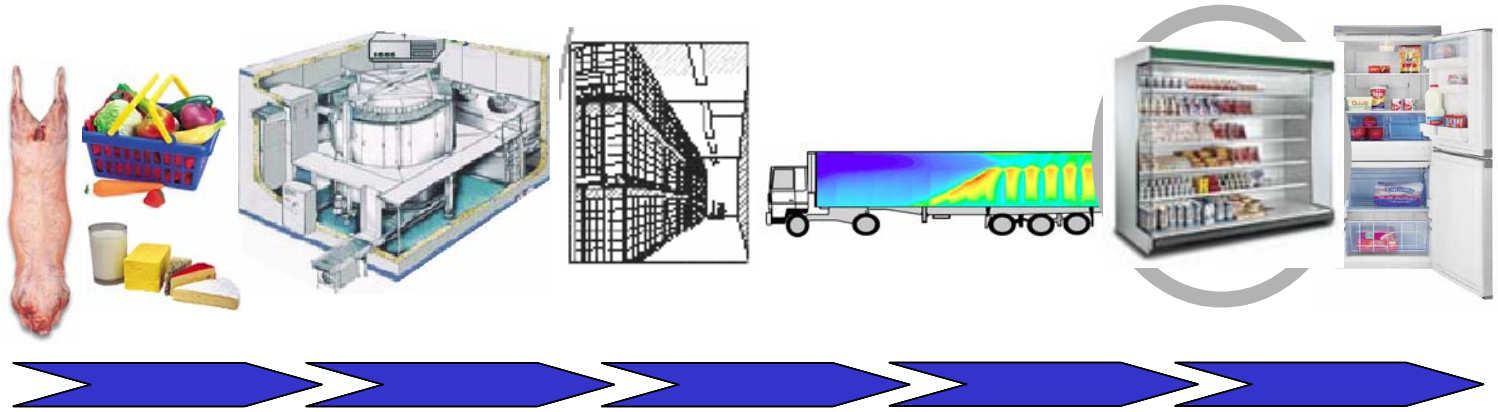
1. Mapping of energy use.
2. Identifying new technologies and business practices.
3. Feasibility studies on promising technologies and business practices.
4. Continuous interaction with food and refrigeration industries

Mapping of energy use

Objective

Identify and rank 10 ‘operations’ (process/food combinations) in order of the potential by the use of improved technology and enhanced business practice to reduce energy usage in food refrigeration.

Cold chain



Whole cold chain:

Primary Chilling - Freezing, thawing & tempering - Secondary chilling - Chilled & frozen storage - Transport & distribution - **Retail** - Domestic handling

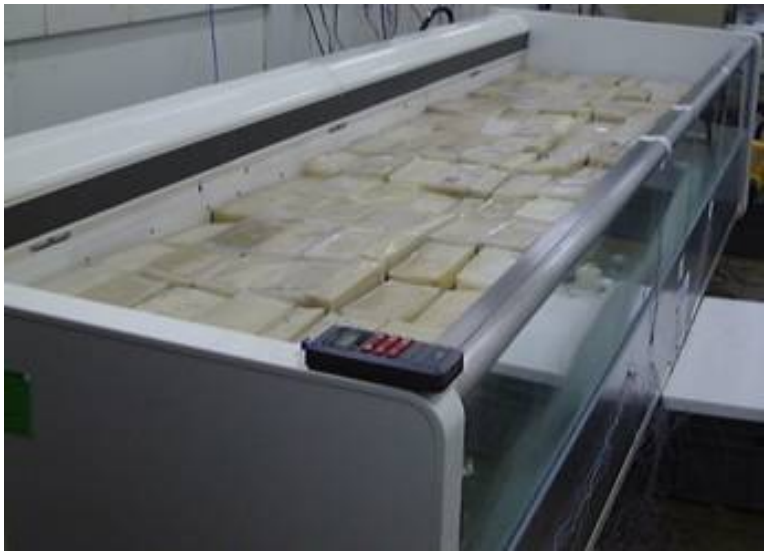
Retail display

- **Clearly a major use of refrigeration energy**
- **Current efficiency and scope for improvement needs quantifying**

Controlled test conditions

Information on the operation of a large number of cabinets

Large differences in energy per m^2 display area.



Display for the 21st century

- Optimisation using existing technology
  - What is an optimum cabinet?
  - Current state of knowledge
  - Further work required
- Retail display in 2020
  - Virtual
  - Home delivery
  - Intelligent or the same as now?

Optimum retail display

- Minimum energy/m^2 ?
  - Refrigerant
  - Design - system and cabinet
- Maximum display life of food
  - Temperature/velocity/humidity
- Maximum customer appeal
  - Appearance
  - Convenience
  - Accessibility