

Project Title: Maintaining the quality of medium to high viscosity foods during heat recovery in counter current heat exchangers - AFM 126

Sponsor: DEFRA, EPSRC

Partners: CCFRA, University of Plymouth, Tetra Pak Ltd, HJ Heinz Co Ltd, New Covent Garden Soup Co, Centura Foods, Glaxo Smith Kline, Fluent Europe, CFX International, TA Instruments

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Abstract

Heat recovery using tubular heat exchangers, or regeneration, is used in the food industry for heating and cooling of low viscosity food products such as milk, fruit juices and beverages. In such systems, the hot processed food product is cooled down in the tube inserts by the cold unprocessed food product that, in turn, is heated in the surrounding shell. The processed food product passes through the tube inserts in a direction counter current to the cold food product in the shell. An alternative is to pass the cold food product through the tubes and the hot processed food product in the shell, which is more effective thermally, but in this case it is of paramount importance that the shell-side flows are designed hygienically.

The aim of the project is to design a novel heat exchanger that can recover heat from variable viscosity (elastic or inelastic) food products with minimal quality damage, and with capital costs and thermal efficiencies close to those of exchangers designed for use with low (constant or variable) viscosity products. By removing heat from the hot product, via exchange with the cold incoming feed, the physical size of the exchanger will be smaller. In addition, the heating and cooling energy consumption will be significantly reduced; an important consideration in view of the Climate Control Levy Tax imposed on 1 April 2001

The commercial benefits to heat exchanger suppliers and to food processing companies will be realised from more efficient tubular exchangers by:

- Reduced energy use during the heating stages
- Reduced cooling water use
- Development of new added-value products processed with the improved tubular exchanger
- Improved exchanger cleanability resulting in shorter clean in place cycles and reduced chemical demands.

More information regarding this project can be found in the Food Link News on page 5 at:

http://www.defra.gov.uk/research/LINK/publications/newsletters/foodlink/FoodLink_Issue37.pdf