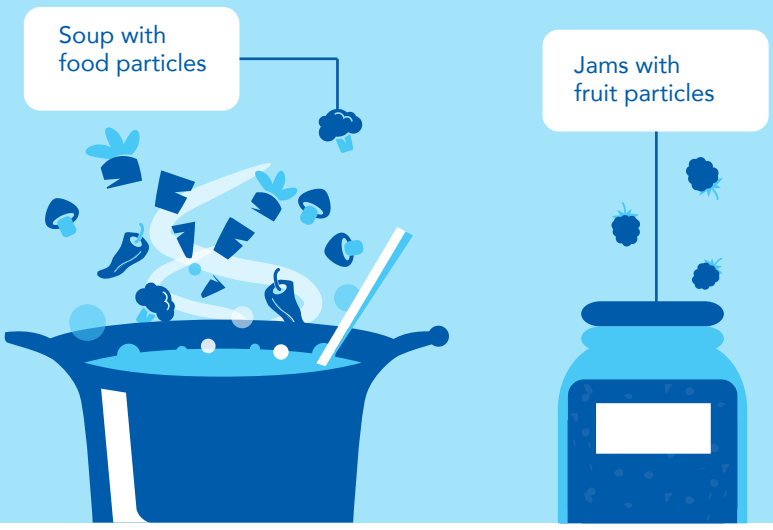
Tetra Pak

Cracking the code of heat treatment for food with particles

A new model to optimise the processing line for food manufacturers

CONSUMER DEMAND

57% of global consumers are expanding their diets to include more natural, fresh foods. This trend finds them seeking fresh, natural and minimally processed foods[1].



MANUFACTURERS' CHALLENGE

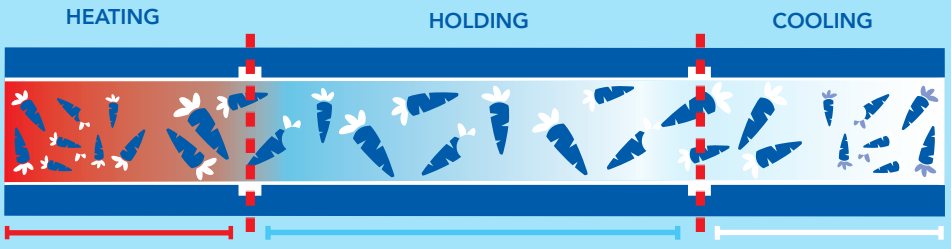
The heat treatment of food is complex, and even more so when different particles are brought into the recipe. Manufacturers face the challenge of balancing guaranteed food safety while ensuring best quality in taste and particle appearance.

THE PUZZLE

STANDARD APPROACH

The two main challenges are understanding how the presence of particles improves heat transfer from pipe wall to product, and how heat transfer between carrier liquid and particle surface changes, depending upon the properties of particles and liquids.

Particles disturb the boundary layer at the heat transfer surface (pipe wall) and the rotation and linear movement of particles increases agitation in the fluid.



THE 3 PARTS TO PROCESSING FOOD

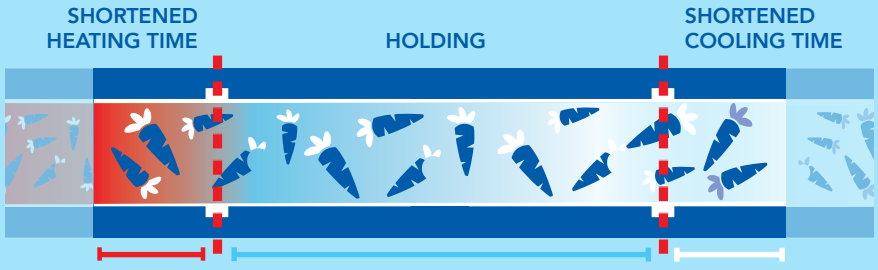
STEP 1
HEATING OF THE PRODUCT
Ensuring the right temperature for pasteurisation/ sterlisation

STEP 2
HOLDING TUBE
Here the product is pasteurised/sterilised. Time and temperature is designed for optimal food safety

STEP 3
COOLING OF THE PRODUCT
The time taken to cool the product down

WE'VE CRACKED THE CODE

Heating and cooling are faster with the new tailored model allowing for faster overall retention time.



OUR TAILORED APPROACH

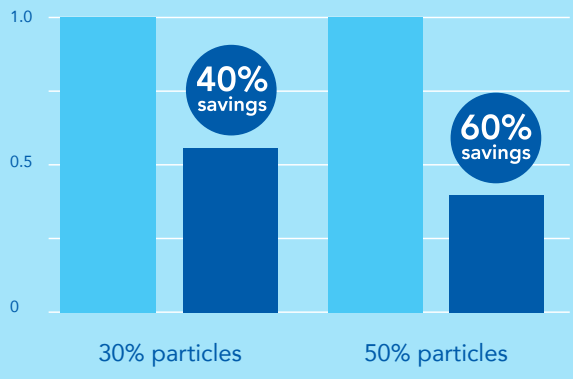
Following extensive experiments over two years our experts have cracked the puzzle's code and created an optimal solution model that ensures a consistent, accurate and predictable heat treatment system.

This improved heat transfer coefficient enables shorter total retention time, while maintaining holding time, for processing food with particles without impacting food safety.

THE RESULTS

SHORTER RETENTION TIME SAVES MONEY AND PROTECTS THE FOOD QUALITY.

The result of calculating the heat transfer area, excluding holding time, using a standard approach versus our tailored model:



Key:

- Old heat transfer model
- New heat transfer model

Pasteuriser: 5000Kg/h Nata de Coco 25-99-30 C.

MANUFACTURERS' BENEFITS

EXAMPLES OF OTHER BENEFITS TO THE FOOD PROCESSING INDUSTRY[2]:

Operating and maintenance costs reduced by

20% per year through:

- ✓ Reduced product losses
- ✓ Less water usage
- ✓ Less electricity usage
- ✓ Lower maintenance costs

Reduced environmental footprint

COD[3] reduction **40%**

Carbon footprint reduction by **10%**

LEARN MORE ABOUT OUR BREAKTHROUGH FINDINGS ON OUR WEBSITE.

1 Nielson Global Health Report 2015. **2** Scenario based on a typical Prepared Food production scenario (European cost base 5000 l/h, 1 person shift, year around production) Phyical model: Tetra Therm Aseptic Visco.
3 COD – Chemical Oxygen Demand. For more information: http://www.tetrapak.com/uk/about/cases-articles/heat-treatment-of-particulate-foods