Collaborative R&D and commercialisation of OAL Steam Infusion (advanced heating and mixing) for the provision of healthier food products (soups, sauces, ready meals, drinks)

Jake Norman - OAL Group, UK

FDF AWARDS 2014 WINNER

Innovate UK

Shell Springboard

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Let’s talk change

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Food manufacturing today

Traditional soup / sauce production

- OAL supply processing systems from ingredient feeds to filling.
- Chilled, frozen ambient food manufacturing.
- UK chilled food at c£10Bn, most developed in the world.

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Steam Infusion Technology

The Vaction™ unit

Uses steam as the motive force:

Very efficient heating.
Mixing and entrainment.
Functions as a pump.

Simultaneously!

Offers opportunity to reduce processing stages.

Levers opportunities in starch hydration and flavour transfer.

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Link to heat up times whitepaper: http://bit.ly/1wjUar4

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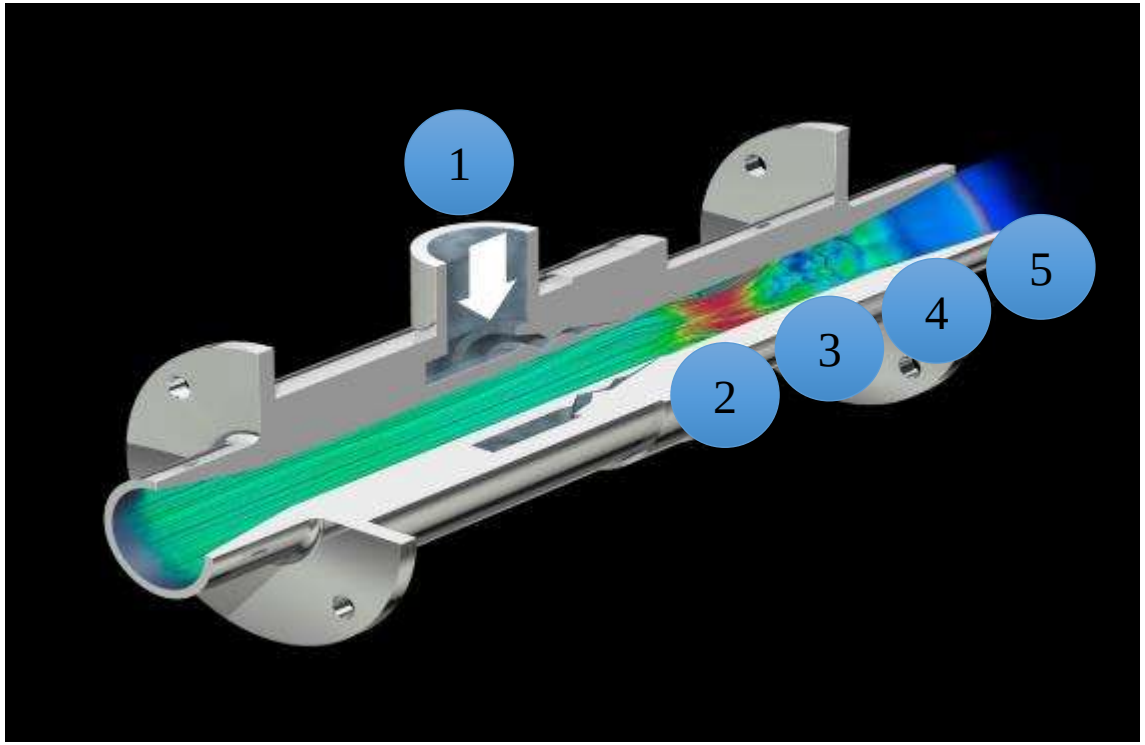
Steam Infusion Technology

Vaction™ unit operation

1. Steam is introduced into the annular conditioning chamber.
2. Steam is then injected into the process flow, creating momentum transfer.
3. Vaction™ unit geometry forces the steam to become supersonic, forming a controllable shockwave.
4. Mixing and heat transfer takes place in the controllable low pressure supersonic region.
5. The Vaction™ unit allows control of the supersonic zone and control of the unit capabilities.



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P1: Nutrition for Life Heating & Mixing

Advanced Heating, Mixing and Cooking

Aim: Improve the nutritional benefit of food products whilst minimising production costs.

- Understand operating envelope.
- Rank and improve existing products.
- Develop new products that do not currently exist.

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In action: Maize hydration for maheu

Dairy Gold Ltd. - Zambia

- 15,000 litres per hour system.
- Vary product characteristics.
- Highly energy efficient.
- Less labour intensive than traditional technologies.

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Link to system video: http://bit.ly/1PWvqPN

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P2: Improving Supply Chain Efficiency

Advanced Cooking & Rapid Cooling

Aim: Resolve major issues effecting food quality, nutritional values, productivity and waste.

- Rapid cooking + rapid nitrogen cooling.
- Step change in supply chain efficiency for ready meals, soups and other sauce based food products.

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In action: Syn Free Frozen Ready Meals

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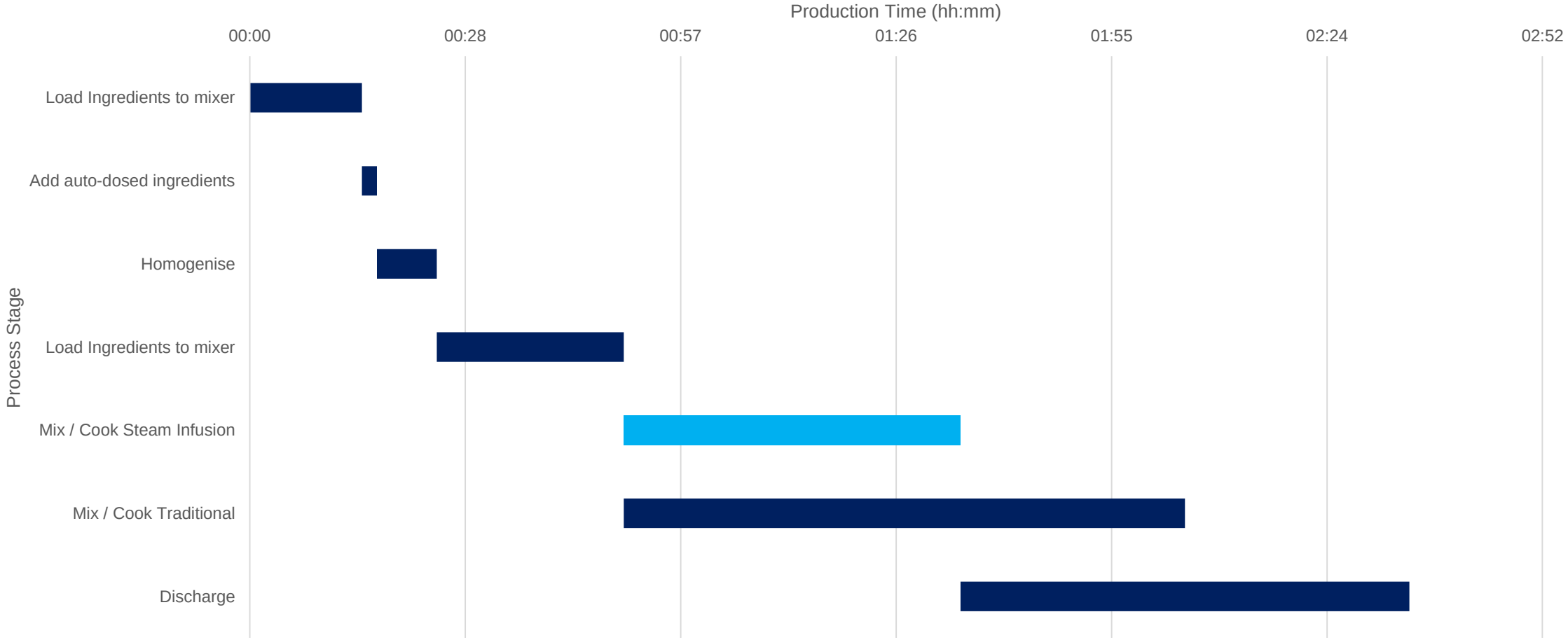
Targeting the bottlenecks



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Inherent challenges

Incremental has limitations.

- Utilisation - homogeniser c3%.
- Pipework and valve matrices.
- Labour intensive.
- Poor yields – losses c5% to 10%.
- Quality challenges.
- Effluent waste.

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What if?

Flexible manufacturing.

Emulating how a chef cooks on an industrial scale.

Manufacturing cells that are:

- Modular.
- Flexible.
- Unmanned.

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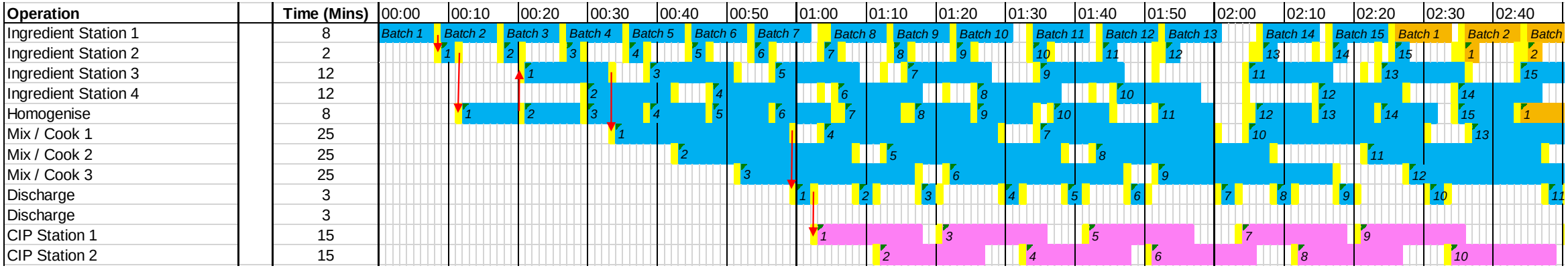
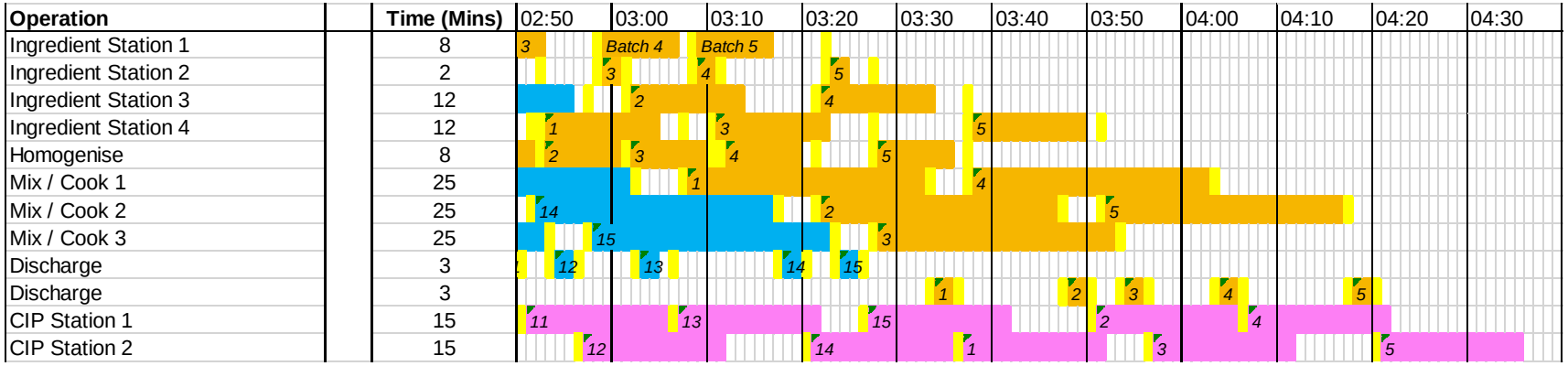
Linear to parallel process

Flexible manufacturing





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Making it a reality

- New development at the National Centre for Food Manufacturing, UK.
- Dedicated food grade hall for system, to be operational December 2015.
- Food is life open innovation.

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Opportunities

Staying ahead of the curve

- Collaborative research.
- Commercial opportunities.

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