New products and solutions for a changing planet

- Food & Water Division
Innovation driving factor for Food & Water

- New customer tastes, preferences and trends
- Getting more out of natural resources
Getting more out of less...
– Good for business and the environment

- Traditional – maximize yield, minimize water & energy consumption
- New – turning waste, bi-products into food for animals and humans
Taking traditional methods to new levels...
- Some innovations launched lately

**Alfa Laval ThinkTop®**
- 90% less CIP
- 10M litres reduction
- 100K euro annual savings (Dairy, UK)

**Alfa Laval G3 VecFlow™**
- 10% less polymers
- 20% lower energy consumption
- 170K euro annual savings (Waste water plant, Chile)

**Alfa Laval Brew 750 eMotion™**
- Increased yield
- Up to 75% energy reduction
- 250K euro more beer annually
- 234 Mw less annual energy consumption (Brewery, Poland)
Global demand for protein...

- Factory using 100% of fish for human food consumption

Customer challenge
Closer relationship
Jointly developed process
Macro drivers
- Optimizing current protein sources and finding new sources

Environment
CO$_2$ emissions from meat production are driving the development of alternative proteins.

Lifestyle
Increased end-user awareness of functional proteins for health and pharmaceutical use.

Urbanization
Urbanization and a growing middle class in Asia and developing countries are driving demand.
Global trends in protein

Global meat production is projected to increase by 15% in 2027 compared to the past decade.

Global fish production will continue to grow, albeit at a much slower pace compared to the past decade.

The vegetable proteins market is expected to increase, with pea proteins taking a larger market share to meet demand.

The alternative proteins market is small but fast growing, with significant investments in cultured meat and insects.
Customer interest in alternative proteins

Alternative Proteins Gain Market Share as Meat and Seafood Consumption Slows

The Alternative Protein Landscape Diversifies in the Coming Decades

80% of growth

Source: Lux Research Inc.
## Three sources of alternative proteins

<table>
<thead>
<tr>
<th>Meat substitutes</th>
<th>Soy, chick pea and canola</th>
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</thead>
<tbody>
<tr>
<td>Insect proteins</td>
<td>Insect proteins</td>
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<tr>
<td>Lab-grown meat products</td>
<td>Cell-cultured meat</td>
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</table>
Alfa Laval presence in protein
- From traditional to new sources of protein explained

>50 years
Getting more out of less
From bi-product to human food grade

>10 years
Soya beans etc
New vegetable sources – growing market

<3 years
Algea, insects
Scale up - industrialize
Insects can close the loop in the food value chain

- Alternative proteins
Insect protein processing
- Our scope of supply

Alfa Laval scope Centri-Insect

- Breeding
- Washing
- Cutting
- Drying
- Grinding
- Protein meal
- Lipids/fat
- Pet food
- Feed

New partnership
## Protein solutions and equipment

- Using core technologies for new applications

<table>
<thead>
<tr>
<th>Systems</th>
<th>Fluid handling</th>
<th>High speed separators</th>
<th>Decanters</th>
<th>Food heat transfer</th>
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<tr>
<td>Process sections and plants</td>
<td>Agitators and mixers</td>
<td>Stickwater concentration</td>
<td>Decanters</td>
<td>Scraped surface</td>
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<td>Boilers</td>
<td>Centrifugal and positive displacement pumps</td>
<td>Fat and oil purification</td>
<td>Membranes</td>
<td>Gasketed-plate-and-frame</td>
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<tr>
<td>AlfaVap</td>
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<td>Blood separation</td>
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Alfa Laval has a wide range of solutions for extraction, concentration, purification and hydrolyzation of nearly all animal and vegetable proteins, fats and oils.

Our equipment and process solutions are based on several decades of industry experience and application know-how.

Our solutions for the protein industry contribute to food sustainability by reducing waste and increasing the utilization of raw materials.
A biobased future...
- Algae for e.g. renewable feedstock, food and feed products
EU funded projects
– Developing solutions for the future

PRODIAS project (closed)
– new efficient processes to facilitate competitive use of renewable feedstocks (algae a subset)

‘Algae Coop’ EU Project (approval pending)
– chlorella algae to make food and feed products
New products and solutions for a changing planet

- Get more out of less through continuous innovation
- New partnerships and application knowledge to meet new demands
- Invest in future growth areas to develop our portfolios