Sustainable dairy production in a life cycle perspective

To make sure coming generations can meet their needs in the future...

Global Sustainability
Since the 1880’s, dairy farmers have joined together to form cooperatives.
More **farmers** and **colleagues** have joined

As we grow so will our **responsibility**
Arla Foods 2014
Facts & figures

- Revenue: 10.6 bn EUR
- Milk volume: 13.4 bn kg
- Employees: 19,155
- Owners: 13,413
- Products sold in 100+ countries
- Largest producer of organic dairy products

Owners in 7 countries: Denmark, Germany, Netherlands, South Africa, United Kingdom, United States, and Australia.
We will continue to create *growth* and we *care about how* we do it.
Arla Foods Environmental Strategy 2020

**Sustainable farming**
- Sustainable dairy farming strategy
- Sustainable sourcing

**Climate**
- 25% greenhouse gas emissions for processing, transport packaging
- 30% greenhouse gas emissions per kg milk at farm level

**Energy and water**
- Energy and water efficiency
- 50% of energy at sites from renewable sources

**Zero waste**
- 0% waste to landfill from sites
- 50% reduction of product waste
- 100% recyclability of packaging
Sustainable Dairy Farming Strategy 2020

**ANIMALS**
- All suppliers comply with Arlagården requirements to animal welfare
- The average cell count in weighed-in milk is in the best class

**CLIMATE**
- Total carbon footprint per kg milk from Arla farms will be reduced by **30%** compared to 1990

**RESOURCES**
- Reduced feed consumption per kg milk
- Reduced energy use per kg milk
- Targets set in 2016

**NATURE**
- Arla and Arla farmers participate in and support biodiversity promoting projects
- A **sustainable feed** supply
Carbon Footprint of Arla Food’s total production

Greenhouse gas emissions ‘from cow to consumer’

Reducing food waste will save emissions in all upstream activities (stippled area is total ‘unnecessary’ CO₂e emissions due to food waste)

-30% per kg milk (compared to 1990)
-25% in absolute numbers (compared to 2005)
Operation, transport and packaging

Environmental data for carbon footprint, energy and water are available at www.arla.com
Energy and water
Various initiatives

- Mapping of water and energy at sites
- 3% energy and water annually at sites
- 50% of energy at sites from renewables
- 1% fuel annually for transport

50% renewables in 2020

2010

2020

Diagram showing energy sources: Fossil, Renewable, Nuclear, Energy savings.
Development at site level

Environmental data for carbon footprint, energy and water are available at www.arla.com
Zero waste

0% waste to landfill from sites

50% reduction in food waste

100% recyclable packaging
Sustainable dairy – how do we work
‘From cow to consumer’

- Reduce use
- Reuse/Recycle
- Right choice
- Mapping
- Follow up
- Acting

Energy – Water – Waste – Packaging – Other resources
Focus areas for improvements

- Feed efficiency
- Resource efficiency (energy, nitrogen etc)
- Manure management
- Feed additives to reduce enteric methane?

- Recyclable packaging
- Food waste
- Fuel efficiency
- Alternative fuels
- Energy & water efficiency
  - Renewable energy
  - Waste
  - Packaging
Vandprojekter Arla er involveret i

- Vandeffektivt mejeri
- Vandkortlægning
- Arla Global Water Group
## Results of watermapping

Select data you need

<table>
<thead>
<tr>
<th>Sum af Volume</th>
<th>Kolonnenavne</th>
<th>Ground water</th>
<th>RO permeate pasteur 95C 15 sec</th>
<th>Hovedtotal</th>
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</thead>
<tbody>
<tr>
<td>Rækkenavne</td>
<td></td>
<td></td>
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<tr>
<td>Cheesery</td>
<td>157 m³/week</td>
<td>3.707 m³/week</td>
<td>2.238 m³/week</td>
<td>6.102 m³/week</td>
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<tr>
<td>Flex</td>
<td>34 m³/week</td>
<td>609 m³/week</td>
<td>378 m³/week</td>
<td>1.021 m³/week</td>
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<tr>
<td>Line1</td>
<td>123 m³/week</td>
<td>1.586 m³/week</td>
<td>1.860 m³/week</td>
<td>3.569 m³/week</td>
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<tr>
<td>PIWC</td>
<td>250 m³/week</td>
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<td>250 m³/week</td>
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<tr>
<td>Sealwater</td>
<td></td>
<td>1.261 m³/week</td>
<td></td>
<td>1.261 m³/week</td>
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<tr>
<td>Skummesal</td>
<td>3.516 m³/week</td>
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<tr>
<td>Mælkebehandling</td>
<td>1.945 m³/week</td>
<td>1.395 m³/week</td>
<td>3.340 m³/week</td>
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<td>PIWC</td>
<td>54 m³/week</td>
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<td>54 m³/week</td>
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<tr>
<td>Syre kultur</td>
<td>165 m³/week</td>
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<td>165 m³/week</td>
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<tr>
<td>Vallesbehandling</td>
<td>1.352 m³/week</td>
<td>1.110 m³/week</td>
<td>2.462 m³/week</td>
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<tr>
<td>Terminaler</td>
<td>366 m³/week</td>
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<td>366 m³/week</td>
<td></td>
</tr>
<tr>
<td>PIWC</td>
<td>366 m³/week</td>
<td></td>
<td>366 m³/week</td>
<td></td>
</tr>
<tr>
<td>Hovedtotal</td>
<td>157 m³/week</td>
<td>7.588 m³/week</td>
<td>4.743 m³/week</td>
<td>12.488 m³/week</td>
</tr>
</tbody>
</table>

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Select data you need
Water usage in the different departments
CIP vs. Production
Water usage in the different departments

Data shown in different ways
Arla Food Global
Water Group

Arla Foods’ mission
To secure the highest value for our farmers’ milk while creating opportunities for their growth

Arla Foods’ vision
Creating the future of dairy to bring health and inspiration to the world, naturally

Water Group Vision
Arla is the dairy company with the lowest water use ratio* globally, counted from intake to distribution

*Ratio
Water Consumption, compared to raw materials
Water Consumption, compared to products
## Water Project: High lights

### Why

**SC Board Ambition Water:**
We have respect for water resources by reducing consumption and aiming for the “closed water loop.” The goal is to at least ensure the ambition in Arla Foods Environmental Strategy 2020 to reduce water consumption by 3% within operations annually.

- **Cost Savings for purchased water and less waste Water**
- **Develop Water Plan 2014**
- **Develop and Implement Activity plan Water 2014 - 2017**

### What

**Assignment from SC Board**
Sponsor Dan Kolding

**Included**
- Reduce water consumption at sites within processing and production

**Not Included**
- Arla Farm
- Waste Water Treatment

### When

<table>
<thead>
<tr>
<th>Milestones</th>
<th>Tool for follow up in place &amp; daily reports are available at site level. Definition of all water streams</th>
<th>Watermapping completed. Ambition of Environmental Strategy fulfilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td><strong>Watermapping tool develop and implementation of water-mapping startet</strong> Stakeholder well engaged and involved</td>
<td><strong>Reduktion 3% per year</strong></td>
</tr>
<tr>
<td>2017</td>
<td><strong>Stakeholder well engaged and involved</strong></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td><strong>Tool for follow up in place &amp; daily reports are available at site level. Definition of all water streams</strong></td>
<td><strong>Watermapping completed. Ambition of Environmental Strategy fulfilled</strong></td>
</tr>
</tbody>
</table>

### Who

- **Sponsor Dan Kolding**
- **Project Manager**
  - Helle Nielsen Global QEHS (E)
  - Denmark
- **Global QEHS (Q)**
- **OPEX**
- **CIP Focus Group**
- **BG (AFI, CDK, GCO, CCE, CUK)**

**Cost Savings for purchased water and less waste Water**
methodology of water footprint network

was introduced in 2002 and is based on the virtual water concept

three categories of water:

green water: evapotranspiration of rainwater during plant growth, which is especially relevant for agricultural products

blue water: volume of ground and surface water that evaporates during production

grey water: theoretical water volume for diluting polluted water to an acceptable standard from a regulatory point of view

the method **accumulates all quantities of water** that have been consumed along the production chain of a product

from presentation of M. Preidl
Water Stress Index (WSI)

from ‘the Growing Blue tool’ (www.growingblue.com)
Water Footprint of different foods

source: Barilla Center for Food & Nutrition
However, different methods gives different results!

Water footprint (?) of beef

Hoekstra and Chapagain (2007): ~17,000 L water / kg beef
Beckett and Oltjen (1993): ~1,800 L water / kg beef
Peters et al (2010): ~460 L water / kg beef
Foran et al (2005): ~210 L water / kg beef

Source: based on presentation of S. Lundie, 2010
Dairy initiatives
Why focus on water

The International Dairy Federation (IDF) has previously developed a guide on carbon footprint calculations and are now developing a guide on water footprint.

- An action team is established
- Literature review is conducted
- Base work on life-cycle approach
- Base work on existing knowledge
- Have a first draft, but not yet published

IDF Work on Water Footprinting in the Dairy Sector

- “Livestock sector has an enormous impact on water use, water quality, hydrology and aquatic ecosystems” (FAO Livestock's long shadow, 2004)
- “The water used by livestock sector exceeds 8 percent of the global human water use. The major part of this is water used for feed production” (FAO Livestock's long shadow, 2004)
- Water is essential for dairy production
- In some regions decreasing water availability is a risk for a livestock sector