Industry initiatives to reduce food waste

Progress towards zero waste in the EU potato processing supply chains

Jolanda Soons-Dings – Chair EUPPA Sustainability Committee

FUSIONS European Platform Meeting

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EUPPA: 6 national associations & 13 companies
Represents >90% EU market (based on potatoes used for processing)
Our Vision

“As the European Potato Processors Association, feeding millions of people every day, we want a Europe where our businesses and suppliers can innovate and flourish in a sustainable way.

Where we engage pro-actively with our consumers to inspire and help them to make healthy lifestyles their first choice, where we collaborate with our communities and stakeholders to accelerate the changing consumption and production patterns.

Together we want to co-create the solutions for a sustainable future, promoting social, environmental and economic wellbeing across our supply chain.”
2014: EUPPA survey - collecting initiatives

- Understanding initiatives to reduce waste in EU potato processing supply chains
- EU potato processing sector adopts total chain approach to reduce food waste
- Companies work with local supply chains reducing food losses starting at the farm

<table>
<thead>
<tr>
<th>Potato Processing Industry – good practice to prevent food waste</th>
<th>% of businesses currently adopting this best practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme of new variety development, to improve disease resistance, reduce input requirements (water, fertiliser, plant protection products) and increase the usable portion of the potato for processing</td>
<td>80-100</td>
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<tr>
<td>Better understanding of soil type, plant spacing and soil nutrition resulting in improving marketable yield per hectare</td>
<td>80-100</td>
</tr>
<tr>
<td>De-stoning soil before planting</td>
<td>40-50</td>
</tr>
<tr>
<td>Limit mechanical potato damage during harvesting and minimising drop heights at unloading, post-harvest</td>
<td>100</td>
</tr>
<tr>
<td>Effective sprout control and air quality management to reduce losses during long term potato storage</td>
<td>100</td>
</tr>
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2015: EUPPA position - reduce, reuse, recycle or recover

EUPPA members valorise all potato processing by-products into food, feed, bio-based materials, fertilizer and/or bio-fuels. We target zero waste to landfill.

• **Continuous process improvements and product innovations:**
  - Co-product lines to produce dehydrated potato flakes and/or chopped & formed products (made from small parts and whole potatoes not suitable for frozen potato products);
  - Potato specialties (like potato wedges, cubes or slices), from undersized potatoes not suitable for French fries. This is mainstream practice throughout the industry.

• **Efficient cooking techniques**, together with sophisticated oil recovery systems enable utilization of cooking oil > 98%. When no longer usable, locally turned into biofuel.

• **Inedible raw potato waste** (peels, slivers) preferably turned into animal feed, partly composted into natural fertilizer and/or digested (bio-digesters) to produce biogas.

• **Tare soil** – arriving with potato deliveries at the factories – is cleaned (stones and small potatoes removed) and reused to increase lower level fields / improve soil quality.

• **Surplus finished products** – donated to local food banks and other charities.
• **Stimulating** members to **share data and best practices**
  - you can only manage what you measure, learn from best practices
  - understanding differences in waste management strategies

• **EUPPA members apply different strategies** to tackle (food)waste
  - different decisions driven by country policies (e.g. more green energy) and company strategies

• **Past company investments** strongly influence future (food)waste destinations
  - companies need payback on their investments … ‘use it or loose it’

• **Market circumstances define future opportunities** to change strategies
  - raw material shortage and price will drive ‘by-product’ destinations up on food waste hierarchy

• **Policy makers can positively influence** change by using proper instruments
  - balance need for potential (former) food by-products turned into feed vs green energy production

• **Businesses need to assess volume & value** of waste streams
  - Look at economic and environmental perspective when re-assessing business policies & plans
### 2016 - Valorisation by-products & waste streams
examples EUPPA members

<table>
<thead>
<tr>
<th>Type of by-product / waste stream</th>
<th>Company 1 (5 plants)</th>
<th>Company 2 (4 plants)</th>
<th>Company 3 (1 plant)</th>
<th>Company 4 (7 plants)</th>
<th>Destination by-product / waste stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>By-products (peels, raw slivers, frozen shorts, batter crumbs, outdated products )*</td>
<td>86.5%</td>
<td>72.9%</td>
<td>5.6%</td>
<td>79.3%</td>
<td>Reused as certified cattle feed, daily collected on-site by dedicated animal feed companies / farmers</td>
</tr>
<tr>
<td>White (native) potato starch*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Recycled into bio-based materials for technical industry (wall paper glue, drilling mud, bio-plastics)</td>
</tr>
<tr>
<td>Organic waste digested ** (partly unsuitably for certified feed)</td>
<td>13.5% turned into biogas</td>
<td>27.1% turned into biogas</td>
<td>94.4% turned into biogas</td>
<td>20.7% turned into biogas</td>
<td>Recovered in onsite bio-digester (producing biogas as renewable energy for own plant or sold to grid)</td>
</tr>
<tr>
<td>Organic waste composted ** (not suitable for certified feed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Recovered / recycled into compost (by external companies OR fermented in onsite bio-digesters)</td>
</tr>
<tr>
<td>Used / spilled cooking oil ** (not suitable for certified feed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Recovered, used as bio-fuel (e.g. for steam boilers in local horticulture, or biofuels for transport)</td>
</tr>
<tr>
<td>Struvite (minerals recovered from wastewater)</td>
<td>0.6%</td>
<td>0.0%</td>
<td>n.a</td>
<td>0.0%</td>
<td>Reused as natural fertilizer (suitable for horticulture and arboriculture)</td>
</tr>
<tr>
<td>Wastewater treatment sludge</td>
<td>5.1%</td>
<td>8.7%</td>
<td>23.1%</td>
<td>7.3%</td>
<td>Recycled into natural fertilizer though composting</td>
</tr>
<tr>
<td>Clean (tare) soil from potatoes</td>
<td>15.3%</td>
<td>17.7%</td>
<td>8.8%</td>
<td>19.0%</td>
<td>Reused as soil on local land (at approved area’s)</td>
</tr>
<tr>
<td>Paper/ Cardboard</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.4%</td>
<td>Recycled into cardboard</td>
</tr>
<tr>
<td>Plastic / PE film</td>
<td>0.1%</td>
<td>0.4%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>Recycled into lower grade plastics</td>
</tr>
<tr>
<td>Metals</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>Recycled into metals</td>
</tr>
<tr>
<td>Mixed company waste (non food)</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.3%</td>
<td>Incinerated by dedicated waste companies</td>
</tr>
</tbody>
</table>

* Green coloured categories are NOT considered food waste according to the FUSIONS definitional framework

** Orange coloured categories are technically considered food waste according to the FUSIONS framework

** Black coloured waste categories are non-food and excluded from total, before calculating food waste volume or percentages
EUPPA examples – Lamb Weston / Meijer
Zero waste to landfill, 0.2% waste incinerated

Waste streams by destination
- Reuse (feed)
- Reuse (soil)
- Reuse (fertilizer)
- Composted (fertilizer)
- Composted (fertilizer)
- Recovery (bio fuel)
- Recovery (bio fuel)
- Recycling (biobased materials)
- Recycling (materials)
- Recycling (materials)
- Recycling (materials)
- Incineration (mass burn)

99.8% of all waste streams get a usefull destination
~325,000 MT / year

271,000 MT are organic materials (potato processing by-products)

937 5 926 15 759 2 633 7 850 1 151 24 276

114 754
Valorization of processing by-products and other waste streams

"Our key challenge for waste is not to reach our 100% reuse or recycling target, as we are almost there with 99.7%. It’s how to get more value out of our residual waste streams from both an environmental and economic perspective."

By-products and waste streams divided by type

- Native potato starch: 3.2%
- Used cooking oil: 0.2%
- Paper: 0.3%
- Plastics: 0.1%
- Metals: 0.1%
- Mixed company waste: 0.3%
- Hazardous waste: 0%
- Clean tare soil: 14.2%
- By-products (peels, slivers, starches, etc): 64%
- Organic: fermented on-site: 9.5%
- Organic waste: composted: 1.6%
- Wastewater treatment sludge: 4.6%
- Struvite: natural fertiliser: 0.8%

Lamb Weston
Seeing possibilities in potatoes
Food Losses & Waste - mass balance
Baseline for future opportunities (farm-2-fork)

Food losses & Waste - Mass balance model

Harvest potential post harvest to storage / factory
Row sorting
Processing potatoes into fries and other products
(pooling-cutting-blanching-drying-frying-freezing-sorting)
Packing product
Finished goods ready for shipping to customers

Batter/oil
Potato
Edible to food
Edible to biobased
Edible to feed
Not edible to feed
Edible wasted
Water evaporated
Non-food (soil, stones)

"Half of the original (edible) mass is lost between the potato field and frozen products shipped to our customers, but only a few percent is spoiled and considered food waste"
Tackling (food)waste is a company priority

Key learnings:
1. Make tackling (food) waste a company priority and communicate your commitments
2. Understand economic & environmental impact (volume & value) of all your waste streams
3. Define KPI’s, set targets and measure - then manage what you measure
4. Create roadmap to valorise your by-products, assign time & resources, stay focused
5. Look at total value chain, explore opportunities farm-2-fork, collaborate with others
6. Creativity, persistency, analysis and learning are key for continuous improvement
EUPPA examples - McCain
Zero waste to landfill, 0.3% waste incinerated

McCain tackling food waste across the value chain

• 30% (90 million tons) of food is wasted per year in Europe while 15% of the continent depends on food aid
• Food waste occurs at every step of the value-chain

Left-over in the field
Out of specifications
Food waste in plants
Distribution (Retail & FS)
Consumers - on the plate

Good agriculture practices
Pilot gleaning project 2013
Gleaning with McCain employees 2015

Zero food waste in manufacturing plants

Let’s reach them!
EUPPA examples – Farm Frites Poland
Zero waste to landfill, 0.3% waste incinerated

- Organic rest streams converted into biogas in nearby bio-digester, FFP has onsite WWT
- Production of green energy to meet national carbon emission reduction target
- Farmers located (too) far from company and not interested in potato based animal feed.

Organic by-product streams converted into nearby bio-digester to produce bio-gas

Potato Flake line: potatoes and short pieces sorted out of French Fries lines processed into flakes
Company Environmental Goals 2020: Waste management

Waste

Zero organic waste sent to local landfill

22% was sent in 2012

Local Landfill: only mixed communal waste (max. 10 tonnes / month)
THANK YOU!