Protein market and feed safety requirements

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Deputy Secretary General

FEFAC
FEFAC in a nutshell

• Created in 1959
• Represents industrial compound feed and premixtures manufacturers
• 33 Members:
  – 24 Member Associations from 23 EU Member States
  – 3 Observer Members (Turkey, Serbia, Russia)
  – 6 Associate Members (Switzerland, Norway (3), EMFEMA and EFFPA)
EU-28 Livestock sourcing in feedingstuffs - 477 mio. t in 2013

Forages
Home-grown cereals
Purchased straight feedingstuffs
Industrial compound feed

Source: FEFAC / EU Commission
EU-28 compound feed production development per category +0.2% in 2013 vs 2012

EU-15 as from 1995, EU-25 as from 2004, EU-27 as from 2007, EU-28 as from 2013
Feed material consumption by the EU-28 feed industry in 2013

Feed cereals 48.5%
Cakes & Meals 27%
Co-products from Food Industry 11.5%
Oils & Fats 2%
Pulses 1%
Dairy products 1%
Dried forage 1%
Minerals, Additives & Vitamins 3%
All others 5%

Source: FEFAC
Share of soya proteins in the feed use of proteins feed materials rich in proteins in the EU-27 in 2011/12

Source: PROLEA
Evolution of global compound feed production

(Index 100 = 1999)

Source: FEFAC / Alltech / Feed International

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Evolution of market share of global SBM equivalent imports (source: USDA)
Evolution of EU protein supply dependency (%)

Source: PROLEA
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Protein sources alternative to imported soya

Drivers to look for alternatives

- Dependency in protein supply is a risk
- Sustainability (deforestation, LULUC)
- EU no longer most important customer for soya
- Capping of biofuels
- Asynchronous GM authorisations
Protein sources alternative to imported soya

Parameters to consider

- Nutritional value (amino acid profiles, energy value, antinutrients, etc.)
- Safety (toxins, heavy metals, dioxin, etc.)
- Compliance with legislation (process, feedstocks, etc.)
- Sustainability (CFP, land use, etc.)
- Sufficient volumes
- Stable quality
Protein sources alternative to imported soya

Which alternatives?

<table>
<thead>
<tr>
<th>Alternative</th>
<th>+</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU produced soya</td>
<td>High nutritional value</td>
<td>Min 5 t/ha yield required</td>
</tr>
<tr>
<td>Rapeseed/sunflower</td>
<td>Well known</td>
<td>No growth potential, sustain.</td>
</tr>
<tr>
<td>Legumes (peas, etc.)</td>
<td>Used in 80es/90es</td>
<td>Diseases, low protein content</td>
</tr>
<tr>
<td>Krill</td>
<td>High protein content</td>
<td>Sustainability</td>
</tr>
<tr>
<td>PAP from pig and poultry</td>
<td>Highly digestible protein</td>
<td>Social acceptance, volumes</td>
</tr>
<tr>
<td>Insect proteins</td>
<td>High yield/ha; high protein</td>
<td>Legal hurdles</td>
</tr>
<tr>
<td>Seaweed</td>
<td>No land required</td>
<td>Low digestibility; high harvesting costs; drying</td>
</tr>
<tr>
<td>Duckweed</td>
<td>No land; availability of feedstocks (manure); quick growth</td>
<td>Harvesting costs; drying; contaminants; poor in Met and Trp</td>
</tr>
<tr>
<td>Microalgae</td>
<td>Low CFP; availability of feedstocks; quick growth; high protein quality</td>
<td>Harvesting costs; drying; contaminants; volumes</td>
</tr>
</tbody>
</table>
## Crop and protein yield per hectare

<table>
<thead>
<tr>
<th></th>
<th>Protein content</th>
<th>Yield in EU conditions (DM/ha/y)</th>
<th>Protein yield (ton/ha/y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat (reference)</td>
<td>11%</td>
<td>10 tons</td>
<td>1.1 tons</td>
</tr>
<tr>
<td>Oil seeds – soybean</td>
<td>40%</td>
<td>1.5-3 tons</td>
<td>0.6-1.2 tons</td>
</tr>
<tr>
<td>Oil seeds – rapeseed</td>
<td>25%</td>
<td>3 tons</td>
<td>0.75 ton</td>
</tr>
<tr>
<td>Oil seeds – sunflower</td>
<td>23%</td>
<td>3 tons</td>
<td>0.7 ton</td>
</tr>
<tr>
<td>Legumes (pulses) – peas/beans/ lupine</td>
<td>17-35%</td>
<td>4-6 tons</td>
<td>1-2 tons</td>
</tr>
<tr>
<td>Legumes (forage) – lucerne</td>
<td>19%</td>
<td>13 tons</td>
<td>2.5 tons</td>
</tr>
<tr>
<td>Leaves – grass</td>
<td>12%</td>
<td>10-15 tons</td>
<td>1.2-2 tons</td>
</tr>
<tr>
<td>Leaves – (e.g. sugar beet leaves)</td>
<td>12%</td>
<td>4.5 tons</td>
<td>0.5 ton</td>
</tr>
<tr>
<td>Cereals – oat</td>
<td>12-15%</td>
<td>3-5 tons</td>
<td>0.4-0.75 ton</td>
</tr>
<tr>
<td>Pseudo cereals – quinoa</td>
<td>12-18%</td>
<td>3 tons</td>
<td>0.4-0.5 ton</td>
</tr>
<tr>
<td>Macro algae - seaweed</td>
<td>10-30%</td>
<td>25 tons</td>
<td>2.5-7.5 tons</td>
</tr>
<tr>
<td>Micro algae</td>
<td>25-50%</td>
<td>15-30 tons</td>
<td>4-15 tons</td>
</tr>
<tr>
<td>Duckweed</td>
<td>35-45%</td>
<td>30-40 tons</td>
<td>10-18 tons</td>
</tr>
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</table>
### Carbon footprint (CO2-eq./kg 88% DM) delivered at a Dutch farmer

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>SBM (South America)</td>
<td>622</td>
<td></td>
</tr>
<tr>
<td>SBM (Ukraine)</td>
<td>574</td>
<td>544</td>
</tr>
<tr>
<td>SBM (Netherlands)</td>
<td>544</td>
<td></td>
</tr>
<tr>
<td>Sunflower meal (S-A)</td>
<td>554</td>
<td></td>
</tr>
<tr>
<td>Sunflower meal (Ukraine)</td>
<td>711</td>
<td></td>
</tr>
<tr>
<td>Sunflower meal (France)</td>
<td>686</td>
<td></td>
</tr>
<tr>
<td>Poultry meat &amp; bone meal</td>
<td>326</td>
<td></td>
</tr>
<tr>
<td>Luzerne</td>
<td>1588</td>
<td></td>
</tr>
<tr>
<td>Maize DDGS</td>
<td>895</td>
<td></td>
</tr>
<tr>
<td>Meal worms</td>
<td>3347</td>
<td></td>
</tr>
<tr>
<td>Algae (oil for bio diesel)</td>
<td>348</td>
<td></td>
</tr>
<tr>
<td>Upstream CFP fully allocated to biodiesel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single cell proteins</td>
<td>3989</td>
<td></td>
</tr>
</tbody>
</table>
EU feed legislation: new framework structure in 2014

- General food law
  Regulation 178/2002

- Feed Hygiene Reg.
  Regulation 183/2005

- Feed & food official controls
  Regulation 882/2004

- Marketing and use of feed
  Regulation 767/2009

- Undesirable Directive
  2002/32

- Feed Additives
  Regulation 1831/2003

- Medicated feed
  Directive 90/167

- GM feed&food
  Regulation 1829/2003

- Animal by-products
  Regulation 1069/2009

- TSE
  Regulation 999/2001

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Key principles of General Food Law (R178/2002) and Feed Hygiene (R183/2005)

- Status of feed business operators for all people producing, handling, storing, processing etc. feed
- Responsibility of individual operators for safety
- Traceability obligation (one step back- one step forward)
- HACCP for all feed business operators (except farmers being primary producers)
The Supply Chain is Complex

- Food & biofuel Processors
- Additive Manufacturers
- Grain Farmers
- Livestock Farmers
- Feed Merchants / Traders
- Feed Manufacturers
- Premix & Supplement Manufacturers
- Feed Material Suppliers
- Home Produced
- Imported
- Home Produced
- Imported
- Home Produced
- Imported
- Transport and Storage
- Grain Farmers
- Additive Manufacturers
- Feed Material Suppliers
- Premix & Supplement Manufacturers
- Feed Manufacturers
- Home Produced
- Imported
- Home Produced
- Imported
- Home Produced
- Imported
- Transport and Storage
Key areas of risk: Feed ingredients

- Experience has shown that many feed / food scares are the result of contamination of feed materials or feed additives. Such contamination can have wide geographical impact.

- Prime examples are:
  - Prions in animal proteins – BSE
  - Bone fragments in plant feed materials
  - Dioxins in feed materials and additives
  - Heavy metals in feed materials and additives
  - Pharmaceutical waste (MPA)
  - Melamine
  - Pesticide residues
  - Salmonella - food poisoning
  - Aflatoxin in maize - milk
Notifications to the EU Rapid Alert System Feed and Food (RASFF) 2013 – by type of feed

Notifications in 2013 by type of feed

- Compound feed: 56
- Feed additives/premixtures: 22
- Feed materials: 14
- Petfood: 180

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Notifications to the EU Rapid Alert System Feed and Food (RASFF) 2013 – by type of contaminants

Notifications in 2013 by type of contaminant for feed for farmed animals

- Microbiological: 114
- Aflatoxins: 2
- PAPs/bone fragments: 10
- Dioxins/PCBs: 14
- Heavy metals: 22
- Prohibited substances / overdosage: 9
- Non EU authorised GMO: 15
- Pesticides/biocides: 2
- Others: 29

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Supply chain pyramid: primary testing at supplier level

Best control point to minimise food / feed crises

Feed Material Suppliers & Processors

Intermediaries: Store keepers & Hauliers

Compounders & Home Mixers

Increasing number of operators

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Conclusions

• Need to find alternatives to soya
• Criteria for alternatives are several
• No « magic » alternative
• Potential for microalgae
• Need to know more about safety / contaminants
• Need that suppliers feel like feed operators
Thank you for your attention