Food-feed competition concepts to demonstrate nutrient efficiency in feed production
Who is FEFAC?

- European Association of Compound Feed Manufacturers
- Based in Brussels, Belgium
- Founded in 1959
- Represents 28 National Associations in 27 European countries
Livestock sourcing in feed in the EU+UK (825 mt. in 2020)

- Forages; 549,4
- Industrial compound feed; 164,9
- Feed materials used on farm; 110,9

Source: FEFAC, DG AGRI
Agenda

• Non-human edible feed
• Non-food grade feed ingredients
• Circular feed
• Further optimising nutrient cycles through animal nutrition
FEFAC perspective on sustainable feed production
FEFAC Feed Sustainability Charter facilitating commitments to action at national level
FAO sets the record straight—86% of livestock feed is inedible by humans

Ambition 2

Foster Sustainable Food Systems Through Increased Resource & Nutrient Efficiency

UN Strategic Development Goals

12 RESPONSIBLE CONSUMPTION & PRODUCTION

13 CLIMATE ACTION

14 LIFE GREEN WATER

15 LIFE IN LAND

EU Green Deal objectives

Reducing the excess of nutrients
Boost a circular bio-based economy
Reduce food waste

OG AGRI will contribute to the development of an integrated nutrient management action plan, together with Member States, to address nutrient pollution at source and increase the sustainability of the livestock sector.
Role of the livestock sector in harnessing nutrients in a circular economy

[Diagram: Role of livestock farming in sustainable agri-food systems]

Figure 1. Role of livestock farming in sustainable agri-food systems

Resource efficiency champions

Co-products, an essential part of animal nutrition

[diagram of co-products for animal feed and human consumption]
**FAO Study (2017) on Human inedible feed**

FAO sets the record straight—86% of livestock feed is inedible by humans.

<table>
<thead>
<tr>
<th>Feed material</th>
<th>Human-edible</th>
<th>Competes with food-crops for land (opportunity cost &gt;0)</th>
<th>Examples of materials</th>
<th>Feed conversion ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not derived from human-edible product</td>
<td>Produced on currently or potentially arable land</td>
<td>No</td>
<td>Yes</td>
<td>Grass, fodder and silage from grasslands convertible to cropland, cotton seed cakes</td>
</tr>
<tr>
<td></td>
<td>Produced on non arable land</td>
<td>No</td>
<td>No</td>
<td>Grass and fodder from grasslands unconvertible to cropland, synthetic amino acids, limestone, fish meal</td>
</tr>
<tr>
<td>Derived from human-edible product</td>
<td>Human-edible</td>
<td>Yes</td>
<td>Yes</td>
<td>Cereal grains, soybeans, pulses, cassava</td>
</tr>
<tr>
<td></td>
<td>Not human-edible, main driver of land use (EFA&gt;2/3)</td>
<td>No</td>
<td>Yes</td>
<td>Soybean cakes</td>
</tr>
<tr>
<td></td>
<td>Not human-edible, not main driver of land use (EFA&lt;2/3)</td>
<td>No</td>
<td>No</td>
<td>Cakes from rapeseed, canola and palm kernel, corn gluten feed and meal, brans, straws and stover, pulp, molasses</td>
</tr>
</tbody>
</table>

**Fig. 1.** Feed classification methodology.
Share of human inedible feed at EU level?

- FEFAC commitment in Feed Sustainability Charter 2030 (September 2020)
- Methodological challenges raised by FEFAC members
  - Land use is a factor in the FAO paper but not an inherent part of the ‘human inedible feed’ concept
  - Large majority of cereal grains used in feed not considered ‘human edible’
  - There is a logic to have soybean cakes on the ‘negative side’ of the spectrum, but not considered ‘human edible’ in FAO paper
- Shift to “non-food grade feed ingredients” to focus on quality aspect of feed ingredient (direct consumption-competition perspective)
Assessment on use of “non-food grade feed ingredients”

- **Food grade**
  - Cereals surplus (5%), SMP/whey (50%), Former foodstuffs (50%)
  - Not necessarily negative! Clear cases of food waste prevention while using a high-quality feed ingredient
- **Separately addressed where “feed use is the main driver of the land use”**
  - Not necessarily negative either! Feed crops can make best use of marginal lands or be part of a rotation system
Potential for the concept of “circular feed”?

- In principle, the less arable land used for the production of a feed ingredient, the more likely it’s a product of the circular economy.
- Positive elements
  - Allows to directly qualify the origin of a feed ingredient
  - Allows to step away from a binary approach. Land-requiring feed ingredients are not ‘zero circular’
  - Possibly giving the most science-based approach to nutrient efficiency, with possibly a connection to environmental footprinting (economic allocation)
- Geographic boundaries? Or can transport distances be modelled into the concept?
- Goes against well-established resource efficiency parameters such as feed conversion ratio? Room for co-existence?
From ‘food-feed competition’ concepts to practice – solutions for the future?

- These concepts are driving discussions about the potential of using feedstuffs currently not allowed in feed for food-producing animals.
- EFSA project to map changes in risk profile of feed in relation to circular economy (in line with Farm to Fork Strategy ambitions to reduce nutrient losses).
- The age of Farm to Fork: Right time to do horizon scanning to have an inventory of potential future bio-resources and identify legal and non-legal hurdles, while always respecting feed safety.
- Scientific community can help industry to explore the boundaries.
Potential for further optimizing nutrient cycles through animal nutrition?

• Take a bio-economy perspective and look into indirect solutions as well
  ▫ Potential of ‘intermediate organisms’ (insects, algae, micro-organisms) to upcycle bio-resources currently not allowed in feed for food-producing animals
  ▫ End-of-waste criteria in feed ingredient sourcing?
• Extreme caution to conflate this exploration with ‘catering waste’
• Example of acceptance of former foodstuffs show that (market) perception is a key element in these discussions
Some examples of today and tomorrow

Forage focus: Would you feed your cattle bread and cake?

Sunflower meal an unappreciated source of protein, fiber

Tannin-free sorghum: normal for EU countries

Tech that turns CO2 into animal feed gets funding boost
Some examples of today and tomorrow

In the processing part of the food chain, new technologies and methods have shown to enable the recovery of high-value seafood waste products (both proteins and oils). In order to increase the profitability of this process, it is recommended to open the regulatory framework for a wider use of these products as feed products in aquaculture.

Calcium phosphate from sewage sludge ash by "Ash2Phos" process

IPIFF position paper on the use of insect larvae as feed for food producing animals

ALG-AD completes experimental trials to test microalgal biomass grown on digestate as a fish feed
Competition in the bio-economy for ‘residual flows’ between feed/bioenergy/bio-based materials production?
Thank you for your attention

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