European rendering industry overview and the concept of circular economy at SARIA Group

Manfred Gellner
Member of SARIA Management Board

Overview
World meat production 2012

Source: FAOSTAT

Non-renewable
Renewable

Category 1
TSE-material, SRM, material with indeterminate risk, pets, zoo/circus and laboratory animals, material with residues such as material collected when treating waste water (contamination of the environment).

Category 2
Material, that contains the risk of infection with diseases (i.e. fallen animals), material with residues such as drugs or inhibitors.

Category 3
By-products of slaughtered animals, which are fit for consumption and not affected by any signs of diseases communicable to humans or animals.

Manfred Gellner - SARIA
Material from categories 1-3
Possible applications

<table>
<thead>
<tr>
<th>APPLICATIONS</th>
<th>CAT. 1</th>
<th>CAT. 2</th>
<th>CAT. 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustion and thermal exploitation</td>
<td>✔</td>
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<tr>
<td>Landfill</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Technical fats</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Biodiesel</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Biogas</td>
<td>✔</td>
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<td>✔</td>
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<tr>
<td>Composting</td>
<td>✔</td>
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<td>✔</td>
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<tr>
<td>Fertilizer</td>
<td>✔</td>
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<td>✔</td>
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<tr>
<td>Proteins for feed / petfood</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Fats for animal feed (no ruminants)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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</tbody>
</table>

Source of animal by-products

<table>
<thead>
<tr>
<th>Slaughtered animal</th>
<th>human consumption (%)</th>
<th>by products (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken</td>
<td>68</td>
<td>32</td>
</tr>
<tr>
<td>Pig</td>
<td>62</td>
<td>38</td>
</tr>
<tr>
<td>Cow</td>
<td>54</td>
<td>46</td>
</tr>
<tr>
<td>Sheep / Goat</td>
<td>52</td>
<td>48</td>
</tr>
</tbody>
</table>

Farm animal meat and by-products
Proportions by categories

- Cattle 400 kg
- Pig 110 kg
- Broiler 2 kg

Easing of feed ban in EU

- Since 06-2013
Europe EU-20
Processed animal by-products from 2000 to 2012

Europe EU-20
Processed animal by-products in 2012

Animal fats and meals in the EU-20
Utilization in 2012

SARIA Bio-Industries
and the concept of circular economy

Treatment and processing instead of disposal
Processed animal proteins as fertiliser and a preliminary product for pet food - Output: 770,000 tonnes/year

Target groups: agricultural, pet food and biodiesel industries as well as various industrial users

Grinding
Heating (50 minutes at 120 ºC)
Drying
Removal of fat
Pressing and milling

Fish residues
Meat residues
Input total: 2,200,000 tonnes/year
Skins and hides: 600,000 a year

Output: 340,000 tonnes/year
Output: 330,000 tonnes/year
Output: 180,000 tonnes/year

Animal meals as feed
Grinding
Sterilisation (20 minutes at 133 ºC and 3 bar)
Drying
Removal of fat
Pressing and milling

Animal fat as a preliminary product for biodiesel
Output: 330,000 tonnes/year

Animal fat as a technical fat and preliminary product for biodiesel - Output: 180,000 tonnes/year

Target groups: power plants, cement works and the biodiesel industry

Risk material from the meat industry and agricultural farming

Materials from livestock owners and slaughterhouses

Category 1 & 2
Food
Pharmaceuticals

Collection and exploitation of food leftovers and used cooking oils
New Energies
Biodiesel and Biogas
Cooking fats, ribs or natural casings
Heparin
Chondroitin sulphate
Hyaluronan
Glucosamine

Fallen animals
High-risk abattoir waste such as the brain and spinal cord from cattle
Input total: 1,000,000 tonnes/year

Output: 770,000 tonnes/year
Output: 330,000 tonnes/year
Output: 180,000 tonnes/year

Target groups: automotive and furniture industries
SARIA Bio-Industries
ReFood: Yesterday’s food waste is tomorrow’s energy

Services: collection of food leftovers and used cooking oil

Production residues from the food industry
Input total: 500,000 tonnes/year

Grinding
Hygienisation (1 hour at minimum 70 ºC)
Removal of fat
Fermenting

Fat as a preliminary product for biodiesel
Output: 25,000 tonnes/year
Biomass for biogas plants
Output: 460,000 tonnes/year = 160,000 MWh of electricity
Organic fertilisers containing nitrogen, phosphorous and calcium
Output: 380,000 tonnes/year
Target groups: biodiesel plants, biogas plants, agricultural sector

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Input
Production
Output

Kitchen and food waste
Fruit and vegetables
Bread and bakery products
Unpackaged and packaged food
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Removal of fat
Fermenting

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Thank you for your attention!