

WHAT IS RENDERING?

Rendering is a cooking or drying process that destroys pathogens and stabilises animal by-products (ABPs) to produce fat and protein meal.

The process and its benefits are described in the factsheet *Rendering – Process and Benefits*¹.

ENVIRONMENTAL CONSIDERATIONS

At its core rendering is a simple process with few consumptions and emissions.

Energy is required to heat cookers and water is used for cleaning and to raise steam. There is a low chemical consumption associated with cleaning, water treatment and various abatement technologies.

All rendering plants emit combustion gases to air and the rendering process is inherently odorous. The wastewater emitted from a site varies according to the abatement technologies used.

Consumptions and emissions are summarised in Figure 1 and further detail is given in the remaining part of this factsheet.

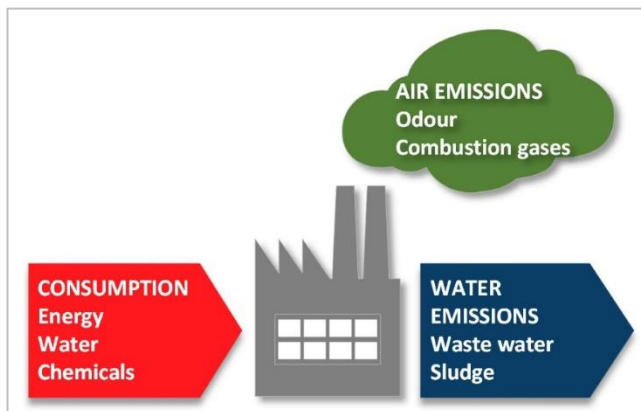


Figure 1 – Rendering consumptions and emissions

All emissions from rendering are regulated under the UK's devolved environmental permitting schemes (see the factsheet *Animal By-products – Regulatory Controls*²).

Because of the variability of ABPs and differences in abatement technologies used, there is no typical mass balance for a rendering process. However, a broad indication of the consumptions and emissions for a Category 3 rendering plant is given in Figure 2.

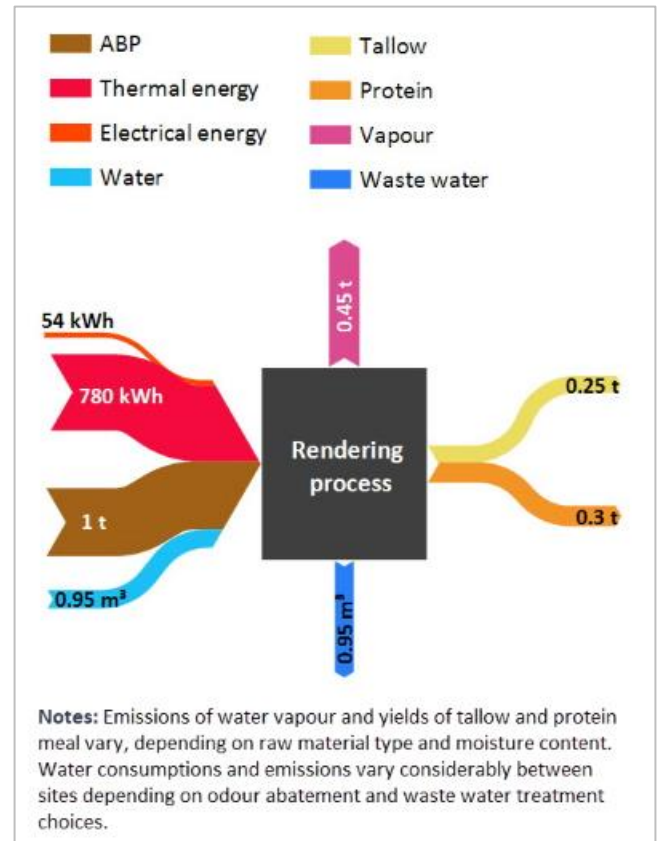


Figure 2 – Average emissions and consumptions per tonne of ABP processed³

RESOURCE CONSUMPTION

Thermal and electrical energy

Rendering processes rely on thermal and electrical energy inputs. The former is by far the larger consumption, with steam being generated to sterilise and dry the ABPs raw material. The amount of heat required increases as the moisture content of the raw material increases and is therefore dependent on the category of material: Category 1 material is wetter than Category 3 material and fatty material contains more moisture than predominantly bones.

Wetter material also produces larger volumes of odorous vapour requiring abatement. Where thermal destruction is used for abatement, the requirement for thermal energy is further increased.

Consumption of electrical energy is far lower than thermal energy consumption at a rendering plant and is generally limited to operation of equipment.

FABRA UK members participate in the UK rendering sector's Climate Change Agreements (CCA) scheme, driving reductions in energy use and linked CO₂ emissions. Most of our members are also required to report their carbon emissions to comply with the UK Emissions Trading Scheme (UK ETS).

Water

Water consumption at rendering sites is primarily for mandatory cleaning of vehicles and equipment and for boiler make-up water in the generation of thermal heat for the process. Steam generation requires a source of clean water – mains water or treated borehole extraction. Recycled process water or rainwater is used for cleaning and abatement systems at some sites.

Chemicals

Compared to some industries rendering uses relatively small amounts of chemicals. Applications include water treatment for boilers and cooling systems as well as disinfectants and detergents used in cleaning. Sites operating wastewater treatment plants or chemical scrubbing systems for odour abatement will carry an additional chemical inventory.

EMISSIONS FROM RENDERING

Air Emissions

ABP raw materials are odorous and the vapour driven off during the rendering process is highly odorous. These odours are generally abated either via thermal oxidation or by the use of condensers with the subsequent abatement of non-condensable gases.

To further reduce the potential for odour emissions, air is extracted from process buildings and abated, for example in a biofilter or scrubber.

Water vapour and oxides of nitrogen, sulphur and carbon are released to air from boilers and oxidisers.

Water Emissions

Wastewater is either treated in an on-site treatment plant, discharged to sewer or sent to specialist facilities for treatment. Treated wastewater may be recycled for use in process operations or may be discharged to surface waters or applied to land in accordance with applicable standards and regulatory requirements.

Sludge from wastewater treatment is applied to land as a fertiliser or sent for anaerobic digestion or composting.

RENDERING IS RECYCLING

Essentially rendering is the recycling and re-use of ABPs that would otherwise be landfilled. Valuable sustainable products are recovered and waste is minimised – see the Animal By-product cycle in Figure 3.

Products derived from rendering are sustainable and carbon neutral, consuming less energy and resources

than their primary alternatives. This gives them a lower carbon footprint and reduces the overall environmental impact of the meat industry.

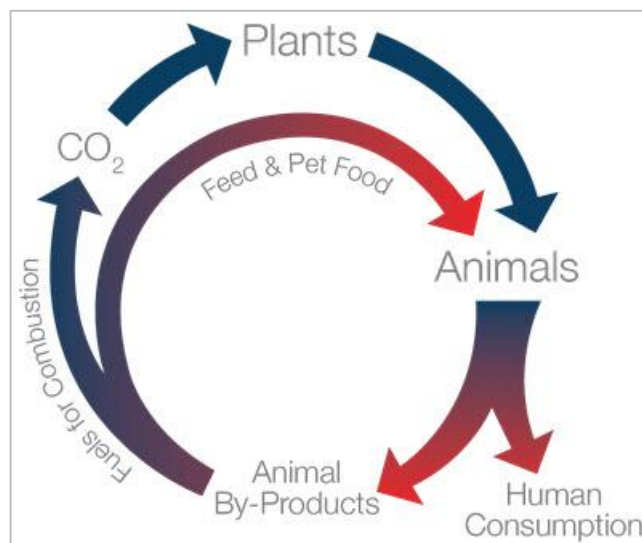


Figure 3 – The Animal By-product cycle

Rendering is also the best option for ABPs under the Food and Drink Waste Hierarchy. See factsheet *The Circular Economy and Animal By-Products*⁴

Rendered products can substitute for some plant-based feeds providing a lower carbon footprint alternative to e.g. soya-bean and palm oil. Therefore, the use of rendered feed products in supply chains can help food manufacturers and retailers to reduce the environmental impact of their operations and move closer towards carbon neutrality.

More details of the applications for rendered products can be found in factsheet *Outlets for animal by-product derived products*⁵

REFERENCES

1. Rendering – Process and Benefits, Factsheet FABRA-FS-002
2. Animal By-products – Regulatory Controls, Factsheet FABRA-FS-006
3. FABRA UK Bref report 2019
4. The Circular Economy and Animal By-products, Factsheet FABRA-FS-004
5. Outlets for animal by-product derived products, Factsheet FABRA-FS-008

This factsheet is produced by FABRA UK, the Foodchain & Biomass Renewables Association and is based on our current understanding only and is subject to change. This factsheet must not be relied upon as reflecting the official UK Gov position and FABRA UK takes no responsibility for the accuracy of this information.

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