

KEY BENEFITS

Rendering provides the most sustainable processing option for animal by-products under the DEFRA food and drink waste hierarchy. It enables the meat industry to maximise food chain nutrient retention in a way that other options cannot.

WHAT IS THE CIRCULAR ECONOMY?

The Circular Economy model describes a cycle where products are made, used, recycled and used again, usually for a different purpose, as opposed to the traditional linear model of make – use – dispose.

The importance of a circular economy is that it will:

- Reduce waste
- Drive greater resource productivity
- Deliver a more competitive economy
- Help reduce the environmental impacts of production and consumption
- Help to address issues of future availability of natural resources.

This concept is currently driving revisions of EU legislation on waste and sustainability in the form of the Circular Economy Action Plan (CEAP) as part of the European Green Deal¹.

HOW DO ABP MATERIALS FIT THIS MODEL?

The recycling of animal by-products (ABPs) is often overlooked in discussions on food and food waste, but the treatment of these materials is key to the sustainability of agriculture and food production, reducing the overall carbon footprint of the supply chain (see Figure 1).

Value is added to materials no longer intended for food production, such as meat, offal, fat feathers and bones which can be processed into pet food or animal feed ingredients or fertilisers.

Animal based fat can also replace other oils in the manufacturing of oleochemicals, being utilised as ingredients for commodities such as fuel (biodiesel and 'green' aviation fuel), soaps and detergents. These are used as a replacement for petrochemicals and are more environmentally friendly than using palm oil from rain forest areas.

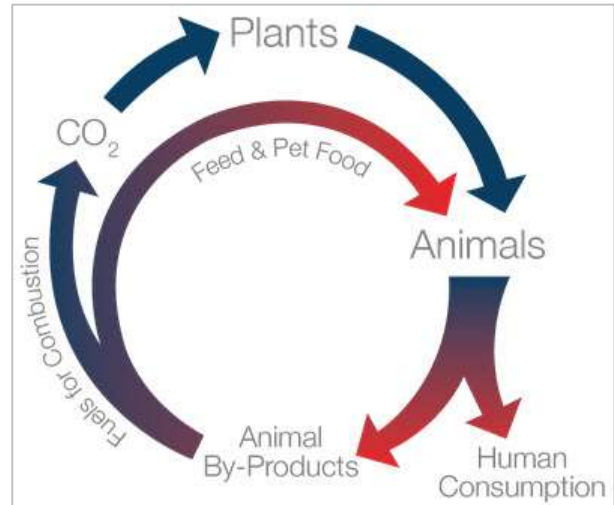


Figure 1 – ABP circular economy

Material that is excluded from the food chain still has a useful purpose in the production of renewable fuels for high energy users, such as cement works and power stations and to replace fossil fuels with biodiesel.

ABP MATERIALS ARE NOT WASTE

ABP materials are excluded from the Waste Framework Directive (2008/98/EC) and covered by Regulation (EC) No 1069/2009 - laying down health rules for animal by-products and derived products not intended for human consumption. However, there is some overlap with waste legislation which restricts valid routes for recycling processed material as fertilisers and soil improvers under the current legislative framework.

The waste hierarchy principle supports re-use, recycling and recovery methods as alternatives to disposal as we work towards Zero Waste. However, it is not as simple as choosing the highest value option for ABP derived products whose applications are subject to strict legislative controls, relating to the risk category of the ABP (1 – higher risk; 3 – lower risk) and the species of the source material.

HIERARCHY OF USES FOR ABP

Our products are used in a variety of applications as shown in the hierarchy in Figure 2. This illustrates the products where most added value is achieved and is consistent with DEFRA's *food and drink waste hierarchy*²

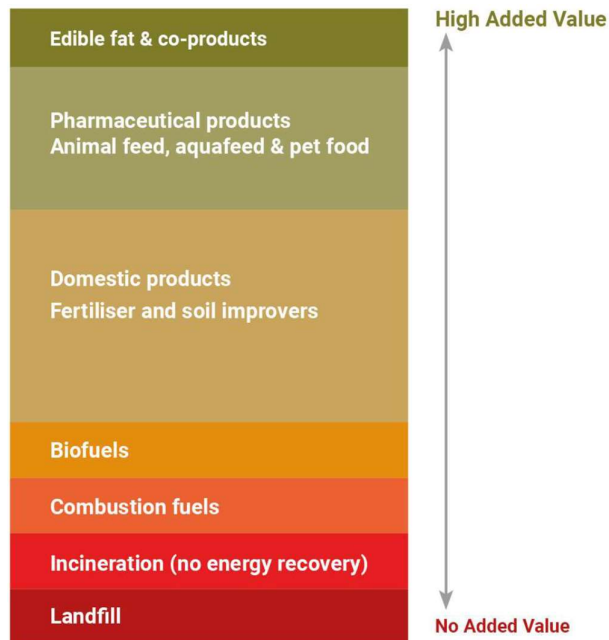


Figure 2 – Hierarchy of uses for ABPs

Under this hierarchy, meat processors maximise the amount of edible product taken from an animal and any unused materials after processing are classed as ABPs.

Rendering is the primary option for maximising value from ABPs and derives feed products for use in pet food and some animal feeds. Most life cycle analysis studies recognise that animal and fish feed have the highest contributory impacts in the supply of meat and fish, but animal-based feeds produce 10% of the greenhouse gas emissions of soya-based feeds and are a much more sustainable option.

Rendered fats used for industrial products such as soaps, biodiesel or cosmetics while protein products have applications in fertilisers.

Other options for ABPs include anaerobic digestion, composting and combustion of biofuels. Incineration with or without energy generation are the least value options above landfill.

NUTRIENT FLOW

The reuse and recycling of ABPs through rendering and fat extraction is also key to retaining nutrient flow³ (see Figure 33).

Meat production is one of the most nutrient-intensive agricultural sectors and rendering maintains the quality of the original nutrients and minimises waste.

After processing meat material for human consumption, end of pipe solutions can recover lost nutrients. Wastewater treatment plants can concentrate and recover nutrients and biomass plants can produce energy and recycled nutrients.

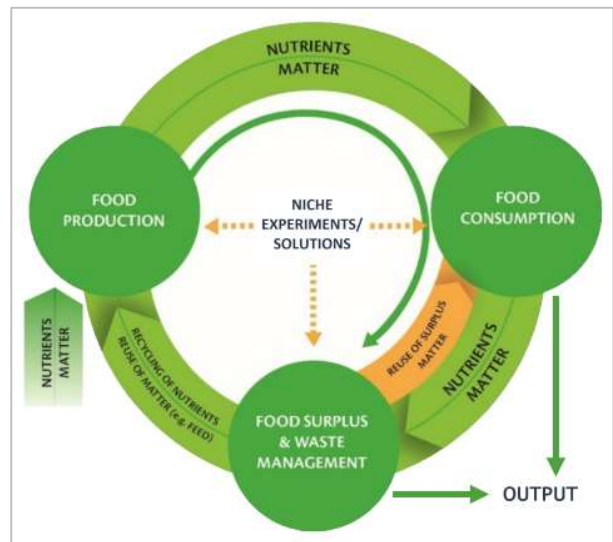


Figure 3 – Food nutrients cycle⁴

Consumers are the final users of foods and the planning of the hygiene and waste systems in society is critical to how nutrients can be managed safely.

Rendering offers an ideal precursor to the end of pipe solutions, recovering valuable nutrients back for animal feed with far less loss, and in some cases incorporating the biomass energy plants to provide safe management of unrecoverable ABPs.

REFERENCES

1. <https://ec.europa.eu/environment/circular-economy/>
2. <https://www.gov.uk/government/publications/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste>
3. Sustainability 2016, 8(1), 69; <https://doi.org/10.3390/su8010069>
4. Transition towards Circular Economy in the Food System - January 2016 - <https://www.mdpi.com/2071-1050/8/1/69>

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