



Animal by-products: **A valuable 5th Quarter**



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Animal by-products (ABP) are an important and potentially valuable aspect of the livestock food production chain and are described in many parts of the world as the “Fifth Quarter”.

This description relates to the fact that many animals slaughtered for food (meat) are split into four quarters as part of the butchery process. The fifth quarter is an attempt to describe those parts of the animal that are not directly consumed by humans as food. More accurately these materials are termed animal by-products or ABP for short.

If and when ABP are acknowledged by society, they are generally regarded as a problem. The focal point, for our industry and for the wider public, has for the last 25 years, been centered around the issues relating to the BSE epidemic in Europe. However, from the days at the height of this issue for both animal and human health, between 1992 and 1996, very significant progress has been made to gain a heightened sense of responsibility for our sector. Recognition that the ABP industry is actually an integral link in the

“food-chain”, has made a major difference to attitudes to our sector both from within and outside of our industry.

The industry that processes ABP's are called renderers although they use a variety of processing techniques. Rendering is the main process used by the industry of course, and this involves using heat to stabilize, sterilize, and separate the de-hydrated materials into derived products; namely animal protein meals and rendered animal fats. Currently there are two main two main applications for use of both types of derived product: In the food-chain or as a source of renewable energy.

In the food-chain, uses include as protein, energy and/or mineral ingredients for compound feeds for animals raised for human food production or for companion animals. Renewable energy applications include uses as bio-liquid for steam, raising boilers or thermal oxidisers, or as an ingredient in Biodiesel.

Another process becoming more commonly used by the industry is anaerobic digestion or AD for short. This process also produces two end products: Biogas [Methane], which is used as a renewable fuel to power engines and turbines, or is injected into the national gas distribution network and the digestate which is used as a liquid fertiliser.

ABP Organisations

There are several tiers of organization for the rendering industry, each level built upon a level below.

Starting at the UK level, the individual rendering companies are formed into the FABRA



In turn FABRA is a member of both the European Fat Processors and renderers association (EFPRA), and the World Renderers Organisation (WRO). Their respective roles and foci are as follows:



EFPRA

The ABP sector in Europe is represented by EFPRA and its members are responsible for the collection, processing and use of ABP within Europe and further afield. Over 16 million tonnes of ABP are processed every year, by "rendering". As a result, EFPRA members produce nearly 4 million tonnes of protein meals and 2.75 million tonnes of rendered fats. Since 2002, all ABP in the EU is segregated according to risk and essentially that has dictated the actual and potential uses for the derived products.



World Renderers Organisation (WRO)

WRO was founded in 1999 to represent the international rendering community. Rendering, known to be the world's original recycling business, has been prominent in several civilisations for centuries. Processors from the USA, Canada, UK, Europe, Australia, and New Zealand established

the WRO that now represents more than 20 countries. New country members are always welcome to join the organisation. Following the BSE crisis in Europe in the 1990's, it became essential that renderers engage international regulators with one voice. WRO has become that voice in dialogue with OIE, WHO, FAO, and Codex Alimentarius.

WRO encourages a science-based regulatory framework that will permit the maximum utilisation of rendered animal products in a safe and sustainable manner. Education, research, and advocacy are important features of WRO.

Renderers will play a key role in the future in regard to climate-related issues, international economics, and closing the gap between food (human) and feed (animals) that provide real challenges. WRO members must be imaginative and innovative in their processing methods, and minimise energy use and waste in order to maximise opportunities.

Factoring into this is world population growth, declining natural fish resources, and the global energy situation with limited and costly resources. There is no doubt that now is the time to promote rendering as a responsible and prudent industry that is extraordinarily capable of playing an essential role in our planet's future.

The WRO is the organization that represents the rendering industry worldwide, serving as an exchange platform for education and information amongst its members and with like-minded associations around the world. WRO represents its members in international government and world organization forums debating topics such as food production, animal and human health, and the environment.

The vision of the WRO is to be the principal organisation representing the interests of the rendering industry on a global level, serving as a vehicle for exchanging points of view on rendering issues and, where appropriate, to express positions to governments and world organisations.

The WRO attempts to enhance the contribution of the global rendering industry in improving the

environment and in meeting the growing global needs for feed, food, biofuel, and industrial raw materials in a sustainable manner, without adversely affecting the production of food for human consumption.

Key Areas for Animal by-product processors

Biosecurity

Rendering is a process that ensures a high standard of biosecurity for the livestock industry by the efficient stabilisation and sterilisation of biodegradable and microbiologically containing animal by-products. Renderers are able to achieve high standards of biosecurity by operating their processes to internationally agreed sanitary standards.

Sustainability

Renderers can be considered sustainable in three areas: economic, social, and environmental. Environmental sustainability is especially clear as rendering requires a high level of energy input to operate, and renewable fuels used for both heat and electricity can supplement fossil fuels. Rendering may be described as a truly sustainable industry because many renderers are able to supply renewable biofuels from other processes such as the rendering of non-feed use animal by-products.

Nutrition

Rendered products have supplied the nutritional needs of farmed livestock and domestic (pet) animals for over 100 years. The nutritional characteristics of animal protein meals and fats make them highly sought-after sources of amino acids, energy, and fatty acids. Modern process techniques and formulation programmes ensure that animal proteins and fats can be used to meet the complex demands for specific nutrients that may be needed by specific species of livestock, such as pigs, poultry, and aquatic animals, or by type, breed, or age of domestic animals.

Biofuels

Rendered fats and oils, including Used Cooking Oils (UCO) may be used in two primary ways as sources of biofuel. First as a direct substitute for fossil fuel sources such as oil and gas used in



steam raising boilers or oxidisers. Second as the main ingredient in fatty acid methyl ester (FAME) types of biodiesel that may be used in road and marine vehicles. In both situations, rendered fats and oils can play an important role in achieving significant reductions in greenhouse gas emissions and a reliance on fossil fuels. An even more welcome benefit is that the use of such materials does not influence food policy as these materials are never intended for human consumption.

Industry

The many uses of rendered products – mainly rendered fats – in industrial applications are well known, starting with tallow candles, hard soaps, and as components in lubricants, plastics, and rubber-based products such as tyres. Not so well known are the uses of rendered fat derivatives in consumer products such as cosmetics, paints, polishes, and cleaning products.

Environment

Renderers protect the environment in several ways. First, biological or environmental hazards are prevented by the prompt processing of animal by-products. Second, by processing the raw materials in specialised rendering plants, potentially polluting materials can be captured and treated so as to prevent contamination of air, water, and soil.

Research

This activity has played an important role in taking the industry from the very difficult period of the 1980's and 1990's to where we are today. However the focus on research is now altering, and the potential areas of growth for our sector must be underpinned by further research efforts. Major efforts must be applied according to the utmost



need to add value to the livestock sector via maximizing the value of the ABP within the constraints of all the relevant EU regulations. Risk analysis, in terms of evaluating effects on humans, animals and the environment is fundamental. In particular, risk associated with raw materials, the process envisaged and the use of the products must form the foundations of any research proposal. In addition, the economic viability of the proposed research outcome must be considered before any project is approved. The scope for research is wide and in practice, can cut across many scientific disciplines. This fact alone may make funding somewhat difficult as not one size fits all when it comes to researching ABP!

Nonetheless, some of the most promising areas for research are shown below:

- Maximizing the amounts of edible products harvested from food producing animals, rather than let them become ABP at the point of production in slaughterhouses.
- Consider alternative processing technologies, other than rendering, for the processing of ABP, including the use of anaerobic digestion and use of ABP in organic fertilisers.
- Determine the effect cooling technologies have on ABP, in terms of potential to increase product yields, reduce environmental pollution and produce high quality renewable energy products.
- Develop methods to utilise the low ABP carbon footprint from our industry to assist the mitigation of greenhouse gas (GHG) emissions from food producing animals.

- Animal nutrition research on optimizing nutritional qualities of products for targeted food producing animals (including aquatic species), and therefore allowing substitution for less sustainable feed ingredients such as soya-meal or fishmeal.

In Conclusion

The efficient, sustainable and safe collection processing and use of animal by-products is an essential element of modern livestock agriculture. Animal by-products can make a positive contribution to the meat industry and the "fifth quarter" description often used, is an appropriate one. The current range of possible processes and uses for the products has given a firm foundation for future research to add even more value to the Fifth Quarter.

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