

Guidance for Food and Drink Manufacturers and Retailers on the Use of Food Surplus as Animal Feed



This guidance provides key considerations for identifying, segregating and diverting suitable food surplus to animal feed in line with relevant legislation.

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Glossary

ABP	Animal By-products are subject to legal definition and requirements associated with their handling and use. They consist of any material derived from an animal not intended, or in the case of surplus food, no longer intended, for human consumption. Examples are bones, skin and surplus milk, eggs, fat, flesh, and blood.
AD	Anaerobic Digestion
AIC	Agricultural Industries Confederation
APHA	Animal and Plant Health Agency: responsible for regulating the safe disposal of animal by-products to reduce the risk of potentially dangerous substances entering the food chain. It works across Great Britain on behalf of DEFRA, the Scottish Government and the Welsh Government.
BLRA	Brewers and Licensed Retailers Association
BRC	British Retail Consortium
By-product	A by-product is an umbrella term for secondary product derived from a manufacturing process or chemical reaction, and encompasses both ABPs and non-animal by-products. Animal Feed is a historical outlet for certain (non-ABP) by-products from the food industry, such as brewers' grains.
CC3	Courtauld Commitment phase 3
Co-product	There is no standard definition of a co-product, but in the context of this document, and as used by some in the food industry, it can be another term for what is defined above as a by-product. The term co-product can also be used to refer to material arising from food manufacture which is not the primary product, but which can be transformed in to other products suitable for human consumption.
COD	Chemical oxygen demand
DARD	Department of Agriculture and Rural Development Northern Ireland, provides the equivalent function in relation to ABPs as APHA in the rest of the UK.
EFFPA	European Former Foodstuffs Processor Association
FeBOs	Food Business Operators
FMD	Foot-and-Mouth Disease
FSA	Food Standards Agency
FSS	Food Standards Scotland
Food surplus	Food surplus or surplus food describes food products, ingredients or part-made products that for a wide variety of reasons cannot be sold into intended end markets.

Former Foodstuffs	Foodstuffs which were manufactured for human consumption in full compliance with the EU food law but which are no longer intended for human consumption for practical or logistical reasons or due to problems of manufacturing or packaging defects or other defects and which do not present any health risks when used as feed.
HACCP	Hazard Analysis and Critical Control Point (HACCP) is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product.
ISB	In-store bakery
RDC	Retail Distribution Centre
TSE	Transmissible spongiform encephalopathies
UKFFPA	UK Former Foodstuffs Processors Association

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1.0 Overview

1.1 Purpose and intended audience

One of the mechanisms to reduce surplus food is to use it as animal feed. This guidance explains what to consider when identifying, segregating and diverting suitable food surplus to animal feed, including what is needed to ensure regulatory compliance.

This guidance is designed to help all businesses across the grocery supply chain, including:

- Food and drink manufacturers and processors
- Logistics providers
- Wholesalers and retailers
- Primary producers and pack houses.

It is noted that surplus food products have been used by the animal feed industry for many years, and that within the UK over 650,000 tonnes of former foodstuffs are currently processed each year to create livestock feed worth some £110 million¹.

1.2 Food and drink material in scope

This guidance document is primarily for food and drink material that was originally intended for human consumption (also referred to as 'former foodstuffs' or 'food surplus'). Certain by-products or co-products may also be suitable for use in animal feed: for example brewers' grains, which have a long history of use in the animal feed sector. The same regulations and principles apply to these sources, however the use of by-products in animal feed is not described further in this document.²

Figure 4 in Appendix 1 illustrates a simplified food and drink waste and non-waste material flow, highlighting the status of animal feed.

1.3 Food and drink material hierarchy

Where food surplus cannot be prevented at source, the food and drink should be used to feed people first, through redistribution networks (either charitable or commercial).³ Any foodstuffs that are no longer suitable for human consumption, for commercial or practical reasons, may be suitable as a source of nutrition for use in the animal feed sector.

¹ <https://www.agindustries.org.uk/sectors/animal-feed/ukffpa/>

² The context of this document is waste prevention and by-products/co-products are by definition not waste (although they can become waste if diverted from their intended channel and for example sent to AD)

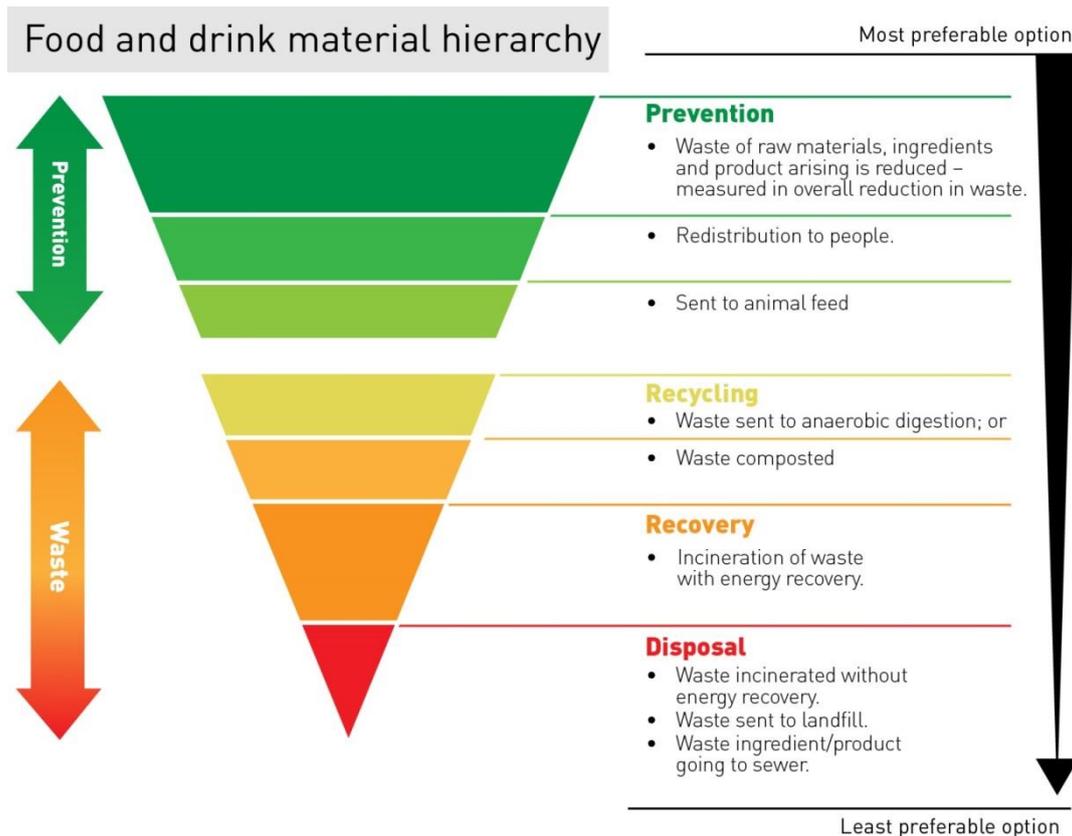
³ More information can be found at www.wrap.org.uk/content/redistribution

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Diversion to animal feed is higher up the food and drink material hierarchy than sending food waste to anaerobic digestion or composting facilities (Figure 1). **Any material that is processed for use in animal feed does not fall within the legal definition of waste.**

Figure 1: WRAP food and drink material hierarchy



1.4 Summary of what the guidance covers

The guidance provides an introduction to food surplus and to the regulatory requirements for sending food surplus to animal feed. It takes readers through considerations for identifying appropriate surplus and guidance on implementing processes and procedures. Appendices, plus a number of supporting documents listed in Appendix IV, provide further details on the business case, benefits and challenges, as well as a number of case studies.

1.5 Legal status

This guidance has been produced to explain the key considerations for diverting food surplus to animal feed and the key principles for compliance. It cannot cover every situation, and you may need to consider the legislation referred to in this document, or seek the advice of the local enforcement agency in some circumstances (which will usually

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be the trading standards/environmental health department of your local authority), or take advice from specialist contractors working within the former foodstuffs processing sector. Further information on animal feed legislation and guidance can be found on the FSA webpages [here](#).

2.0 Introduction: what is surplus food?

The food and drink supply chain (including processors, manufacturers, logistics providers and retailers) generates product that, for a variety of reasons, cannot be sold into the intended end markets. Surplus ingredients, or part-made products, may also arise at manufacturing sites. Common causes may include:⁴

- Production errors that lead to damaged final or part-made products;
- Production errors that lead to incorrect shaping, colouring, flavouring or labelling of products;
- Over-ordering of ingredients, that cannot be used in time;
- Inaccurate demand forecasting / seasonal festivities and sports events (Christmas, Easter, Valentine's Day, World Cup Football);
- Products with insufficient remaining product life to be consumed by the intended end user;
- The logistical challenges of daily delivery;
- Crop gluts, caused by good harvests/ unexpectedly high crop yields; and
- The termination of a food product line.

Products that cannot be sold into intended markets represent an economic loss to any food and drink business. Where food cannot be sold through secondary channels or redistributed for human consumption, diverting food surplus for use as animal feed is an economically beneficial solution for certain food and drink businesses and can result in significant cost savings, when compared with sending material to waste treatment or disposal options.⁵

The term 'food surplus' includes both food and drink and, once collected for processing into animal feed, the material is often referred to as 'former foodstuffs'.⁶ In the UK in 2014, over 650,000 tonnes of former foodstuffs were processed to create livestock feed, worth around £110million.⁷

⁴ Source: based on European Former Foodstuffs Processor Association [EFFPA]

⁵ WRAP have developed a document to outline the business case for diverting food surplus to animal feed. This is being approved and will be published shortly.

⁶ "Former foodstuffs" means foodstuffs, other than catering reflux, which were manufactured for human consumption in full compliance with the EU food law but which are no longer intended for human consumption for practical or logistical reasons or due to problems of manufacturing or packaging defects or other defects and which do not present any health risks when used as feed (European Commission)

⁷ <https://www.agindustries.org.uk/sectors/animal-feed/ukffpa/>

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Processes for the conversion of food surplus to animal feed may include; collection, unpacking and depackaging, mixing, grinding and drying - to create a consistent product of nutritional value for animals. Through safe, effective processing of food surpluses, this material is prevented from being classified as waste.

The two main routes to market are either direct to farm or through processing facilities. The direct to farm route represents a short supply chain and is likely to be more local. Diversion into the processing facilities involves the formulation of different livestock feeds that are then sold in the feed market.

WRAP has developed a number of supporting resources that provide further context for this guidance that can be found in Appendix IV. Further information can also be found on the WRAP webpages: www.wrap.org.uk/content/animalfeed

3.0 Understanding the Regulations

This section gives an overview of the regulations but is not a detailed guide to the law. Links to more detailed information, such as that provided by the regulatory agencies and by Food and Drink Federation (FDF) and British Retail Consortium (BRC), can be found in Appendix IV.

3.1 What is the purpose of the main regulatory requirements?

Controlling the quality and safety of what is sent to animal feed is fundamental to protecting animal health and welfare. The quality and types of former foodstuffs used in animal feed are strictly controlled in order to avoid the risks associated with feed that is unsafe as a result of decay, contamination, or issues associated with animal by-products, such as transmissible spongiform encephalopathies (TSE). Serious outbreaks of disease in livestock can be expensive and have longer-term socio-economic consequences. Furthermore, some animal diseases also present a risk to human health.

In order to prevent the transmission of viruses through animal feed there are strict legal obligations on all entities in the supply chain, including the producer of the surplus food, logistics operators and those processing former food stuffs into feed or feeding livestock on farms.

UK legislation is consistent with EU regulations and covers feed supplied to all farmed animals, pets, equines, zoo and circus animals and animals living in the wild.

3.2 What are the main regulatory requirements?

Regulations are in place to reduce and manage the risk associated with the transmission of viruses and diseases through the feed supply chain. The [EU Animal By-Products Regulation 1069/2009](#), and accompanying [EU Implementing Regulation 142/2011](#), set the

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rules for how animal by-products must be handled, used, transported and disposed of in the UK, including in relation to their use in animal feed and pet food. Separate regulations ensure that feed remains safe and wholesome to use, in the form of the animal feed hygiene regulations.

The Control Regulations, administered by Defra and APHA in Great Britain and DARD in Northern Ireland, are designed to ensure that ineligible ABPs (animal by-products) are kept out of the feed system (both direct to farm or through the processing facilities).

Food surpluses that are diverted from food manufacturing or retail sites and no longer intended for human consumption are automatically classified as low risk (Category 3) ABPs. Certain food surpluses are eligible for use in animal feed but they must not contain, or be at risk of contamination from, ABPs that are excluded from use in animal feed due to the risks posed to animal health⁸. The following are examples of food surpluses from the manufacturing and retail sectors containing (or likely to contain) ineligible ABPs that cannot be fed to animals:

- a) **Raw** meat, fish, eggs and shellfish products.
- b) **Cooked or partially cooked** meat, fish, shellfish and similar ABPs.
- c) Confectionery and bakery products containing ruminant gelatine.
- d) Any catering waste, regardless of whether or not it contains ABPs.

Low risk ABPs that can be fed to animals include milk, cooked eggs, fats, rennet and non-ruminant gelatine. Products containing these ABP ingredients are eligible for use in animal feed, provided that they have undergone processing such as pasteurising, cooking or baking (fully defined within Article 2 of the EU Hygiene of Foodstuffs regulation⁹). Such products also include; bakery products, pasta, chocolate, sweets and breakfast cereals (provided they have not been in contact with the prohibited items above). Some products that have not undergone cooking or baking, e.g. uncooked bread dough and pastries, may still be eligible, providing that the ABP ingredients have been heat treated.

Compliance requirements include secure systems to keep the materials intended for animal feed away from contaminants that might contain ineligible ABPs. These objectives overlap with the more general requirements of the animal feed regulations, where quality and wider feed safety criteria ensure that the surplus is fit for use in feed.

Legislation on animal feed is harmonised at European Union (EU) level. In the UK, the Food Standards Agency (FSA) (and Food Standards Scotland (FSS) are the central competent authorities responsible for implementation of the European animal feed

⁸ This is a complex area of regulation in terms of eligibility of ABPs for use in certain feeds, see APHA site for latest revisions [here](#)
⁹ [Article 2 \(1\)\(m\) of Regulation \(EC\) No. 853/2004 \(Hygiene of Foodstuffs\)](#)

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legislation.. Enforcement of the regulations at local level is carried out by Trading Standards Departments of local authorities in England, Wales and Scotland and the Department of Agriculture and Rural Development (DARD) in Northern Ireland.

The key EU regulations and relevant UK legislation is outlined in Table 1. Links to each piece of legislation can be found in Appendix IV.

Table 1: Key EU and UK legislative requirements

EU Regulation	Purpose	Relevant UK Legislation
<p>Regulation 1069/2009 laying down health rules as regards animal by-products and derived products not intended for human consumption.</p> <p>Implementing Regulation 142/2011 laying down health rules as regards animal by-products and derived products not intended for human consumption.</p>	<p>Regulates the use of animal by-products in feed including banning intra-species recycling (feeding material derived from a species to a creature of the same species) and the feeding of catering waste to farmed animals.</p>	<p>The Animal By-Products (Enforcement) (England) Regulations 2013 (as amended by the Animal By-Products (Enforcement) (England) Regulations 2015).</p> <p><i>Separate but parallel legislation applies in Scotland, Wales and Northern Ireland.</i></p>
<p>Regulation 999/2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies.</p>	<p>The Regulation prohibits the feeding to ruminants of animal protein and animal feed containing such protein. It is forbidden to use processed animal protein, gelatine of ruminant origin, blood products, hydrolysed protein, dicalcium and tricalcium phosphates of animal origin.</p>	<p>Transmissible Spongiform Encephalopathies (England) Regulations 2010 (SI 2010 No.801) (as amended by The Transmissible Spongiform Encephalopathies (England) (Amendment) Regulations 2013 (SI 2013 No. 336).</p> <p><i>Separate but parallel legislation is in operation in Scotland, Wales and Northern Ireland.</i></p>

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EU Regulation	Purpose	Relevant UK Legislation
Regulation 183/2005 laying down requirements for feed hygiene.	Ensures that all stages in the chain are subject to the requirements for feed hygiene; ensuring that the feed is safe and wholesome. Requires approval and registration of feed businesses, and applies to all businesses that make, use or market animal feed.	The Animal Feed (Hygiene, Sampling etc. and Enforcement) (England) Regulations 2015. <i>Separate but parallel legislation is in operation in Scotland, Wales and Northern Ireland.</i>
Regulation 767/2009 laying down requirements on the Placing on the Market and the use of Feed	Regulation 767/2009 sets down requirements for the marketing, labelling and composition of animal feed.	The Animal Feed (Composition, Marketing and Use) (England) Regulations 2015 <i>Separate but similar legislation is in operation in Scotland, Wales and Northern Ireland</i>

3.3 Overview of the key requirements

Food businesses are well suited to adapting their practices to become part of the feed supply chain, as similar processes and principles are applied to animal feed safety compliance as with human food safety. Embedding compliance for the production of animal feed is therefore an extension of how the business currently handles food. These processes and principles in relation to animal feed, which food businesses will be familiar with, are outlined below (adapted from the British Retail Consortium (BRC) auditing guidance¹⁰):

1. **Registration:** to be able to transfer food from the human food supply chain to animal feed, a business must register with their local authority as a 'Feed Business Operator (FeBO). Ensure that the business is registered as a FeBO under EC Regulation 183/2005 on Feed Hygiene and approved to handle Animal By-Products (ABPs) under the ABP Control Regulations where relevant.

¹⁰ BRC Global Standard for Food Safety Issue 7 Voluntary Module 9 Management of Food Materials for Animal Feed



2. **Specifications:** ensure specifications for the food materials used for animal feed are agreed with the customer and the requirements are understood and complied with.
3. **Chemical and physical product contamination control:** ensure appropriate facilities and procedures are in place to control the risk of chemical or physical contamination of products for animal feed.
4. **Hazard analysis and critical control points (HACCP):** ensure a fully implemented and effective food safety plan based on HACCP principles, which considers the risks to the supply of products for animal feed, is in place.
5. **Standard Operating Procedures (SOPs):** ensure written practices and procedures are updated to be fit for purpose for producing safe feed. Define protocols to ensure separation from products ineligible for farm animal feeding during transport, storage and dispatch. A protocol for dealing with package breakages or spillages must also be in place.
6. **Traceability, product withdrawal and recall procedures:** ensure that there is a traceability process in place which covers the production and distribution of food products for animal feed.
7. **Labelling:** ensure legal requirements for the labelling or provision of accompanying documentation for the products supplied are fulfilled.
8. **Training:** ensure that all personnel performing work, including agency staff, are demonstrably competent to carry out their activity and have received appropriate training.
9. **Outsourced production:** ensure that any outsourcing of processing steps and packaging does not compromise the safety and legality of products for animal feed.
10. **Auditing:** the BRC , together with the UKFFPA, has developed a voluntary module for animal feed designed to reduce multiple audits for food business that have become feed business operators by auditing them at the same time as their food safety audit. The *BRC Global Standard for Food Safety Issue 7: Voluntary Module 9 Management of Food Materials for Animal Feed* can be downloaded [here](#).

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4.0 Identifying Opportunities to divert surplus to animal feed

The first step in the process of becoming a FeBO, is working out whether food surpluses might be suitable for use in animal feed. This section provides an overview of the sorts of food surplus within the food manufacturing and retail sectors that may be suitable for use, before describing the procedures that are required for the operation to be fully compliant with the regulations.

There are three main criteria that determine whether or not food surpluses can be used in animal feed:

- (1) whether or not the food surplus is nutritious for animals either on its own or as a component of feed mixture;
- (2) assessment of whether the food surplus is safe for animal feed; and
- (3) identification of ABP risks.

4.1 Is the food surplus nutritious?

The most valuable food surplus is that of high nutritional benefit for use in animal feed and that which requires little or no alteration to be safe for animals to consume. For instance, carbohydrate rich food surpluses, such as bread and cereal products are of high value, whereas, highly liquid surpluses from food processing may be eligible for use in animal feed but may offer low nutritional value and may need further processing or de-watering to be of benefit.¹¹

Animals are like humans insomuch as they may be unable to tolerate certain foods and also have preferences. For example, pigs do not like acidic foodstuffs such as citrus fruits and livestock will not eat spicy food. As a result, some food surpluses have greater value as part of animal feed formulations than others. Some foods, such as those with high salt content, are not suitable for use in animal feed on grounds of nutrition.

Figure 5 in Appendix II provides examples of materials in relation to their nutritional value for use in animal feed.

4.2 Is the food surplus safe to use in animal feed?

All food surpluses sent for use as animal feed must be safe and wholesome for the intended species, and must not be mouldy or contaminated with foreign bodies or waste. Over and above the requirements of the ABP risks (described in section 5), food surpluses must not contain prohibited materials nor exceed restricted ingredients¹², this includes any trace of packaging which can contaminate the resulting feed material when

¹¹ Although it might be technically feasible to dewater more liquid food surpluses, it might not be economically viable to do so.

¹² Prohibit and restricted materials are listed in Annex III of EC Regulation 767/2009

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depackaging surplus food. The FSA operates a de-facto tolerance of 0.15% by weight for the presence of plastic food grade packaging material; however there is a zero tolerance on glass packaging and former foodstuffs in glass packaging should not be used in animal feed. If the food surplus is a product packaged in glass, it cannot be diverted for animal feed, nor can the product be released from its packaging, due to the obvious risks from glass shards entering the feed supply chain.

Additionally, foodstuffs subject to Plant Health Notices should not fall into the surplus food description, unless where explicitly allowed.

4.3 Is the food surplus free of any ABPs prohibited from use in feed?

ABP compliance is an extremely important consideration when determining the suitability of food surpluses for use in animal feed. If a site is handling foods containing ABPs that are prohibited from use in animal feed, as well as those that are eligible, strict segregation of the two is essential. For regulatory compliance, the segregation regime will need to be secure and reliable throughout handling, storage and transfer to off-site transport, so that there is no risk of cross contamination.

Even if there are only trace quantities of non-eligible ABPs in tested samples of food surplus, they will be non-compliant. For certain foods, the exact nature of the ABP content may not be apparent, particularly in relation to ingredients containing ABPs, such as gelatines and collagen from ruminant origin.

For more guidance on ABPs, see <https://www.gov.uk/guidance/animal-by-product-categories-site-approval-hygiene-and-disposal#abp-categories-explained>

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5.0 Guidance on Implementation of Processes and Procedures

Following the three key criteria described in section 4, businesses need to develop systems and procedures that are compliant with both the animal feed regulations and the control of any ABP related risks. Many aspects of compliance with these two sets of regulations overlap and also build on the basic food management systems that all food businesses have in place.

Generally, the adaptation of existing systems will be a simpler task at food manufacturing sites where there is less complexity in the mix of foods and ingredients handled, such as in bakery and cereals manufacturing. The exception is for cases where ruminant gelatines may be present in some bakery products.

At manufacturing sites with multiple lines, SOPs will need to ensure that food surpluses suitable for feed are segregated before any non-compliant ingredients are added, and kept segregated from other materials at all subsequent stages. Similarly, for retailers with surplus products that are permitted in feed, a reliable segregation, handling and storage system needs to be in place within the stores, in the back-hauling operations and within the receiving depots.

The following sections provide an overview of the requirements for manufacturers and retailers.

5.1 Identification and segregation of suitable food surplus

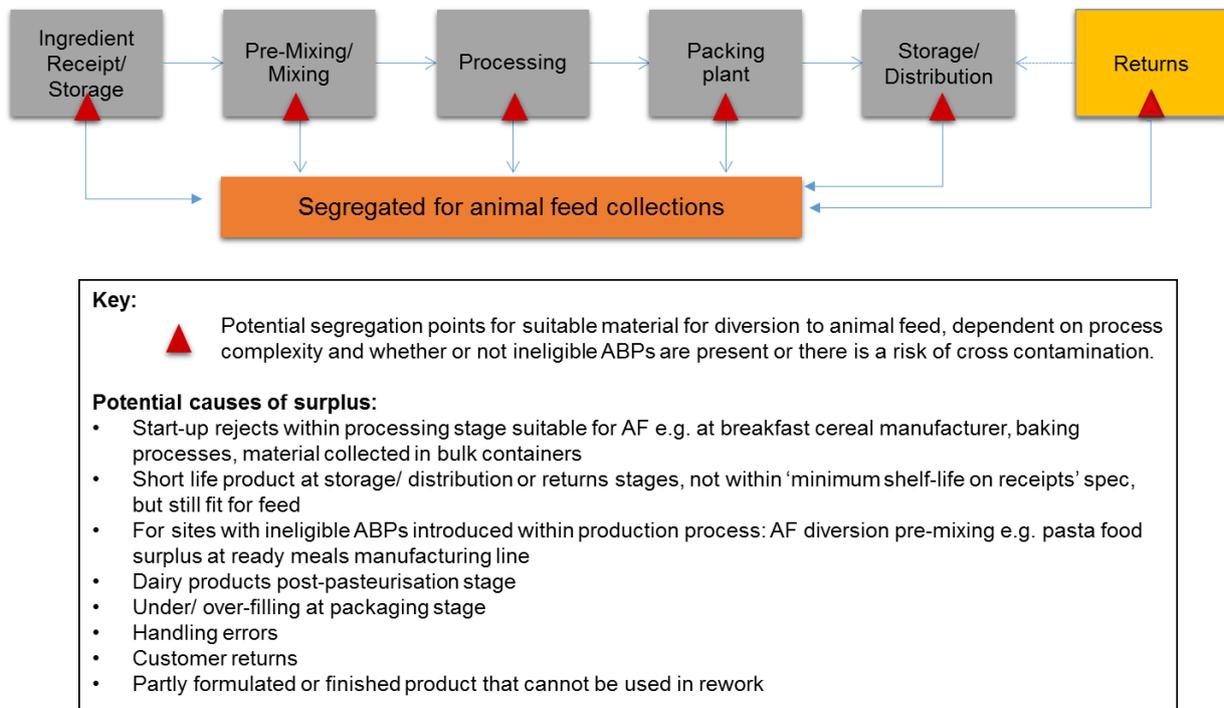
For sites that have identified suitable food surpluses, compliance with regulatory requirements will involve a simple extension of HACCP plans that are in place for food hygiene to include the extra considerations of surplus destined for animal feed.

For manufacturing and processing sites where suitable food surplus has been identified, but where ineligible ABPs are also present, the HACCP will need to include an assessment of possible segregation points across the site and the risks of cross-contamination with restricted product, packaging or other materials that are prohibited from feed. For some sites with multiple production lines, this might mean that only particular 'safe' zones can be used to source food surplus for animal feed, where only eligible ABPs are present. Figure 2 illustrates the possible points of segregation for food surplus suitable for animal feed within food/ drink manufacturing and processing sites. At sites where only eligible ABPs are present, all points of segregation are possible, provided that food surplus does not contain other components that are restricted from use in animal feed.

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Figure 2: Assessment of different segregation points for food surplus suitable for animal feed within food/ drink manufacturing and processing sites



The operation of retailers as FeBOs represents a different set of compliance issues compared to manufacturers. This is because suitable food surpluses mostly arise across a network of stores and it is impractical for former foodstuff processing firms to collect from the stores individually. Although in-store bakery products are not the only sorts of surplus suitable for animal feed generated by supermarkets, it has been the main focus for retailers wishing to divert food that cannot be redistributed. Much of the guidance relating to operational aspects of compliance with the regulations relates to supermarkets backhauling of surplus bakery products to 'returns depots', where the consignments are bulked up and collected by former foodstuff processors. Figure 3 illustrates a basic flow of food surplus from retail store, to depot and into the former foodstuff-processing sector.

The retailer HACCP plans need to meet regulatory compliance for the entire 'reverse supply chain' from store to the final despatch to animal feed processor at the returns depot, including the transport stage arrangements between store and depot.

Retailers therefore need to focus their HACCP plans and operating procedures on

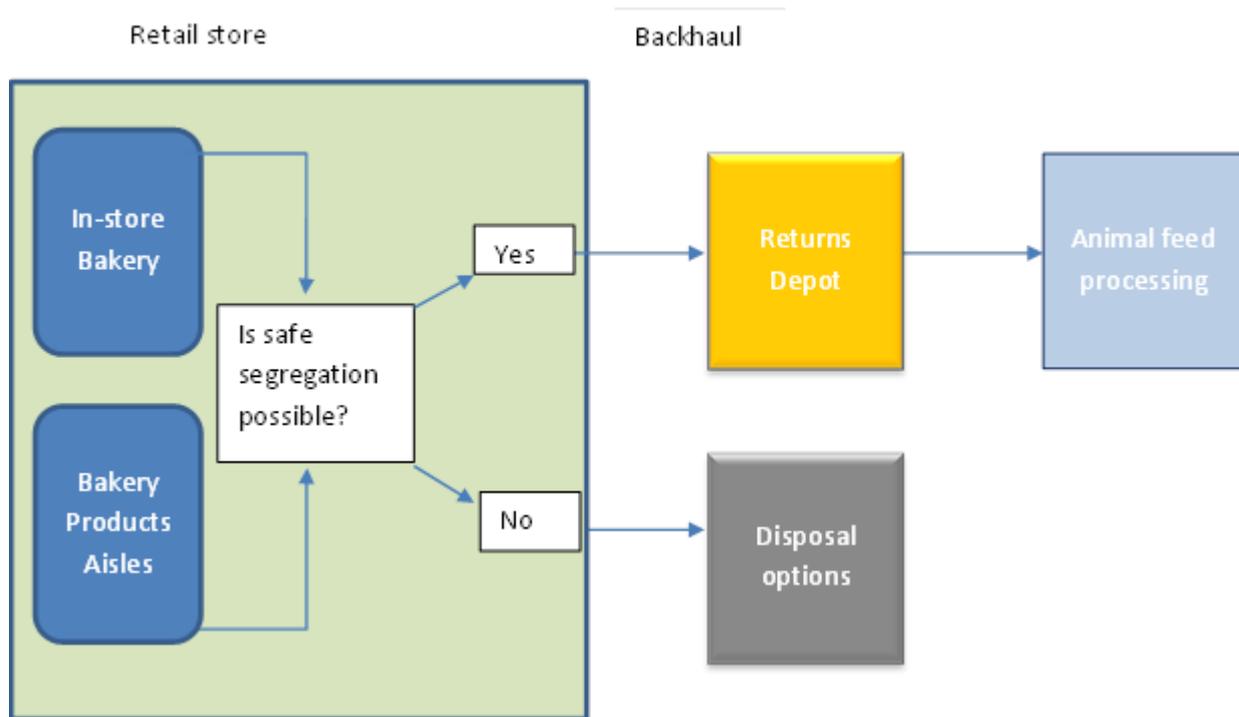
1. Effective segregation in-store and safe storage;
2. Transport of segregated material from store to depot, separated from all other material and waste streams;
3. Safe handling and storage at depots that accept the returns from stores;

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4. Safe transfer to the feed processor collecting from depot.

Figure 3: Basic flow of bakery food surplus from retail store to processing for animal feed¹³



5.2 Compliance at food manufacturing/ processing and retail sites

Registration as a FeBO

- The Feed Hygiene Regulation ([Regulation 183/2005](#)) requires feed business operators to notify the relevant enforcement authority of any establishment under their control, active in any stage of the production, processing, storage, transport or distribution of feed with a view to applying for registration. Registration is with the local trading standards department; so a retailer or manufacturer with multiple sites within a local authority area can submit an application for all relevant sites within the area. In Northern Ireland the relevant authority is the Department of Agriculture and Rural Development.

Specification of food surplus suitable for animal feed

- Specifications for the food surplus for animal feed need to be in place, with a process to ensure that the materials are in compliance with these specifications. These need to be worked out with a particular feed end use in mind, as different specifications will apply to feed intended for different livestock. Advice can be

¹³ This assumes that redistribution to people, which would take priority over diversion to animal



sought from the UK Former Foodstuffs Processors Association (UK FFPA)¹⁴ on technical aspects of the specification in relation to nutritional value, any components to be excluded from the formulation of feed for a particular species and issues relating to depackaging.

Hazard analysis and critical control points (HACCP) and review of feed safety

- A list of the raw materials, intermediate processed products and finished products which contain items restricted from use in animal feed should be developed. The list should be reviewed at least annually and updated when changes are made to the raw materials used and as and when new products are developed. The product development team shall be aware of the restricted products so that any new products containing components unsuitable for animal feed can be identified.
- HACCP plan needs to include controls to ensure separation between products for animal feed and any restricted product. This includes adequate separation to prevent cross-contamination with restricted product or packaging. The HACCP plan shall include the handling and use of appropriate equipment.
- Products that are destined for animal feed should be identified in the description of product use in the HACCP plan and included within the scope of the HACCP. The HACCP plan should include the process steps associated with the production, collation and dispatch of food products for animal feed.

Collection and storage

- There should be dedicated collection and storage facilities (e.g. tote bins, wheelie bins) for products for animal feed which are separate from those for waste. It must be clearly delineated from areas where former foodstuffs ineligible for feeding are stored. The collection and storage facilities should be labelled or otherwise clearly identifiable products for animal feed use. Containers for the collection of animal feed may be identified by a label or colour coded to prevent accidental use for the collection of other waste materials or restricted products. More detailed guidance on how supermarkets can comply with feed collection and storage can be found [here](#).

Standard Operating Procedures (SOPs):

- Written practices and procedures should be updated to be fit for purpose for producing safe feed. Define protocols to ensure satisfactory separation from products ineligible for farm animal feeding during transport, storage and dispatch. A protocol for dealing with package breakages or spillages must also be in place.

¹⁴ <https://www.agindustries.org.uk/sectors/animal-feed/ukffpa/>

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Traceability:

- Records should be maintained to allow the recipients of each lot of food destined for animal feed to be identified. It is accepted that a single lot of food for animal feed is likely to contain a mixture of batches of food products and ingredients.
- The traceability system must enable the recall of each lot of food for animal feed to be made should a recall involving a component of the material be instigated.

Labelling:

- Each lot of food products for animal feed should either be labelled or (for products that are bulked together and wrapped on pallets) supplied with information to meet legal requirements. Evidence is required that the company is aware of its responsibility under Regulation 767/2009 on the marketing, labelling and composition of feeds legislation.

Training:

- All relevant personnel, including agency- supplied staff and temporary staff and contractors, should receive general awareness training on what can and cannot be placed into animal feed. Where there are some specific procedures relating to the management of products for animal feed, the relevant staff shall be training to operate in accordance with the procedure. Best practice is to include awareness of the restrictions on materials which can be included in animal feed within the induction programme for production staff.

Appendix I: Surplus food and drink material flow

Figure 4: Food and drink waste and non-waste material flow

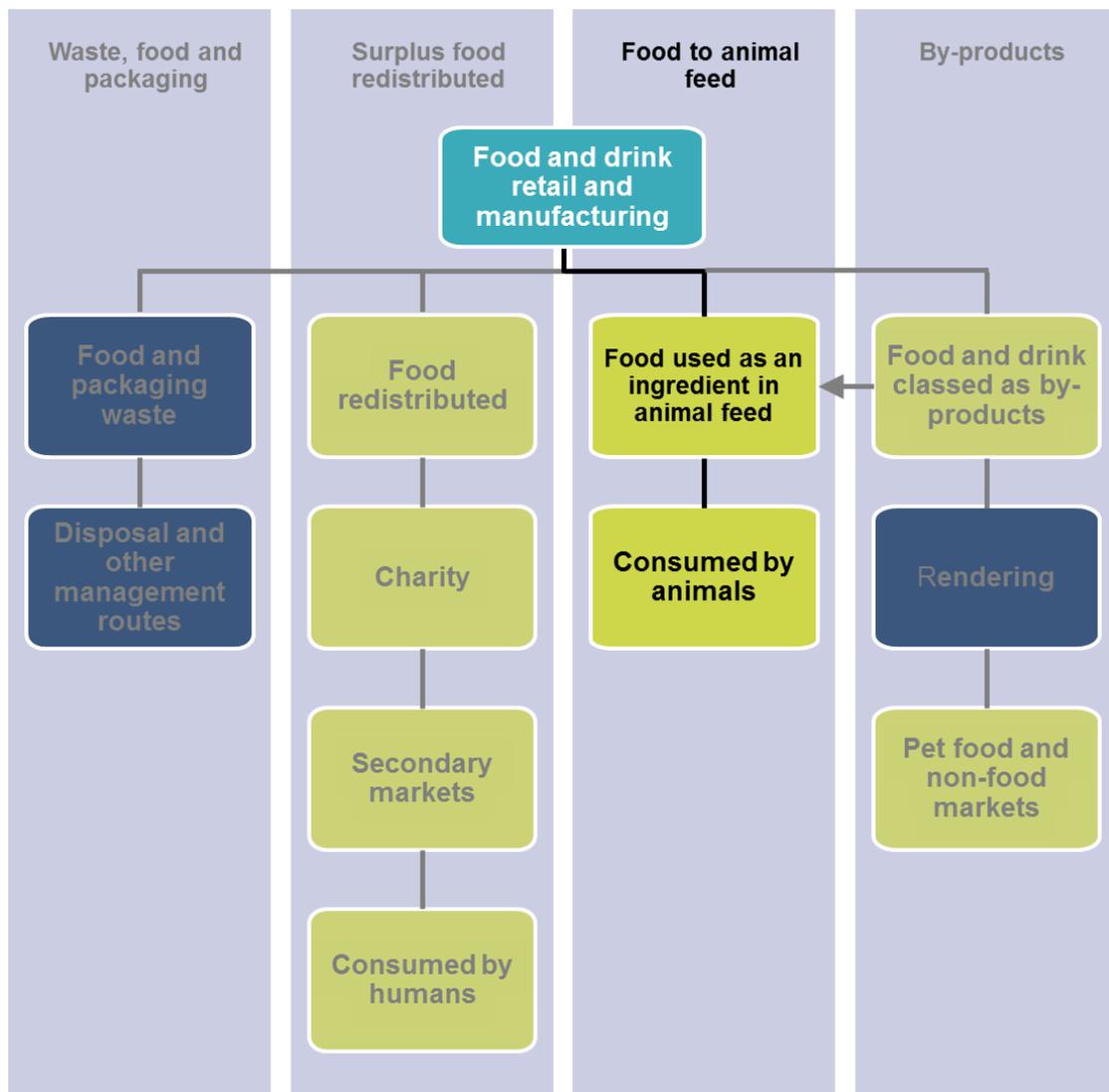


Diagram adapted from: WRAP 2013 Estimates of waste in the food and drink supply chain¹⁵

¹⁵http://www.wrap.org.uk/sites/files/wrap/Estimates%20of%20waste%20in%20the%20food%20and%20drink%20supply%20chain_0.pdf

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Appendix II: The benefits of diversion of surplus to animal feed

Diverting food surplus for use as animal feed is an economically beneficial solution for certain food and drink businesses and can result in significant cost savings, when compared with sending material to waste treatment or disposal options. There are also significant environmental benefits associated with diversion to animal feed; the appropriate use of food surplus saves all of the agricultural inputs (land, fertilizer, water) and environmental emissions associated with crops harvested for feed production. Furthermore, food businesses are well placed to adapt their practices to become part of the animal feed supply chain, given the strict regulation that relates to production, hygiene, handling and labelling of food.

A sound business case is needed to support business practices to divert eligible food surplus to animal feed. Often, the greatest financial benefit is realised through savings made on waste management fees. There are, however, a number of up-front investments, as well as time and resources, needed to set up a fully compliant system to separate out and divert food surpluses.

Retailers and manufacturers that provide food surplus to animal feed typically receive a revenue (£/tonne) for the material, that is subject to commercially driven variation. This revenue generally reflects the quality and nutritional value of food surplus (typically £30-50 / tonne for nutritious food surplus in 2015¹⁶). Figure 5 below presents an overview of the variation in quality of food surpluses as animal feed, with wetter and less energy/nutrient dense food surpluses likely to attract less revenue per tonne than higher energy/more nutritious food surpluses. Despite this variation, the business case will still result in cost savings against alternative management options for surplus food.

¹⁶ There are no published official figures for revenues from the sale of food surplus to animal feed producers. Values will fluctuate for example with global grain prices, but these were typical values stated by industry trade bodies and businesses in 2015. For packaged product, values will be lower.

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Figure 5: Food surplus nutritional value: impact on revenue

		Energy/nutritional value		
		LOW	Intermediate	HIGH
Example food surplus		<ul style="list-style-type: none"> Vegetable processing waste (wet) Highly dilute sources that require dewatering 	<ul style="list-style-type: none"> Vegetables and residues thereof Wheat bran 	<ul style="list-style-type: none"> Cake & cake products (not containing ruminant gelatine) Bread Chocolate bars & crisps Biscuits Dairy Cereals Soft drinks
Characteristics		Food surplus that is eligible but have low nutritional value to the feed sector i.e. may be diluted or less palatable. Nutritional value varies by type of livestock.	Food surplus that contain intermediate nutritional value. Will need supplementing with other feedstock.	Ideal characteristics: Highly concentrated source of nutritious value.
Revenue		May not be revenue generating, but may be a saving on alternative routes e.g. AD, landfill		Easy to make a business case, depending on how scalable. Large scale and high nutritional value

Further information, including on the savings associated with diversion to animal feed, can be found in the case studies linked to in Appendix IV.

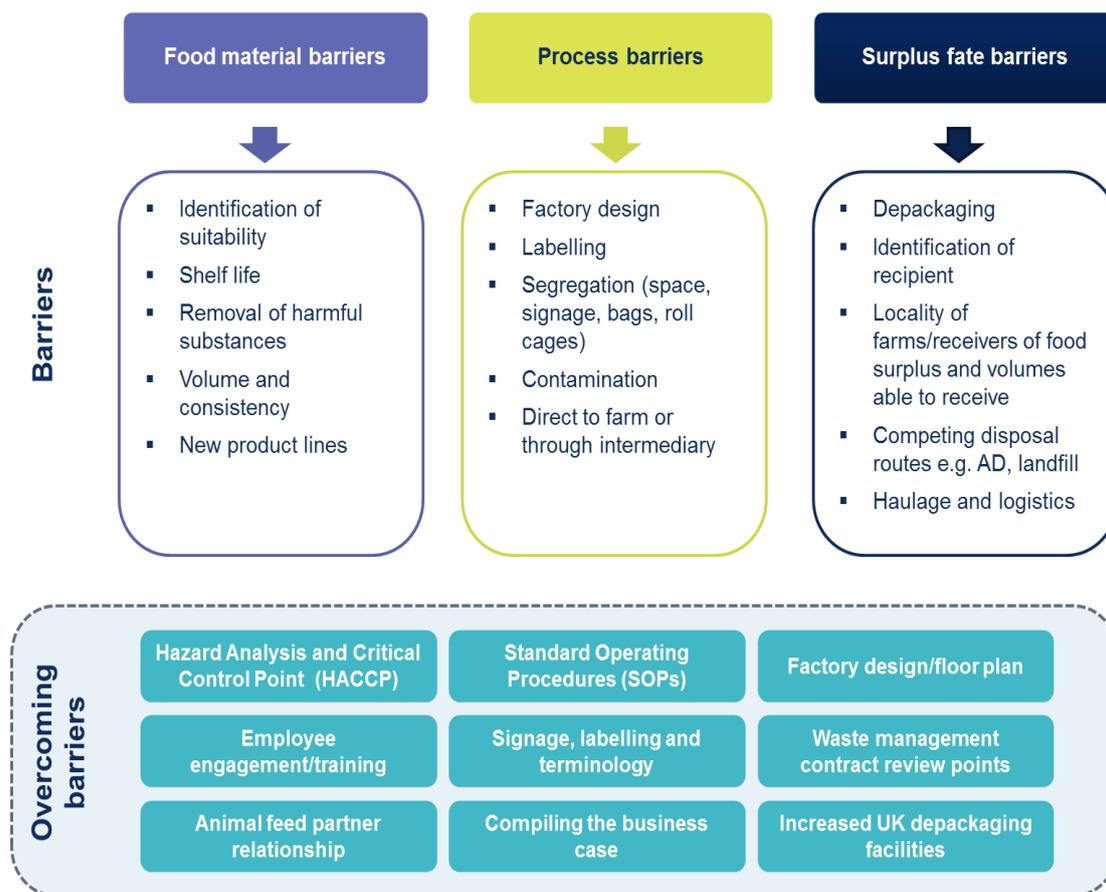


Appendix III: What are the main barriers and challenges?

Many of the challenges and barriers to diverting food surplus to animal feed are related to the identification of food surplus suitable for animal feed, becoming a FeBO, and complying with feed safety, traceability, and hygiene requirements. However, these barriers have clear operational solutions, such as integrated HACCP, adapted SOPs, training and clear signage and labelling.

Figure 6 presents a high level summary of the key challenges and barriers exist to diverting food surplus to animal feed, along with an overview of the potential solutions.

Figure 6: Barriers to diverting food surplus to animal feed and opportunities to overcome them





- **Factory design/floor plan:** factories are often not designed with segregation for animal feed in mind; the available space and layouts are often focused on production and product, rather than the segregation of food surplus and food waste.

Segregation of eligible food surplus from food or other waste can place greater demand on available factory space, particularly as it requires secure storage. Depending on the manufacturing site, some products may be suitable either at raw ingredient level or post mixing/cooking before the final product is packaged. Adding processes and handling at each of these stages to safely segregate eligible materials can be complicated. However, diverting pre-packaged product may be easier than packaged product as the packaging would have to be safely removed.

Despite the investment cost to implement food surplus segregation for animal feed and SOP changes, those that overcome these barriers have seen long term benefits in revenue from becoming a FeBO compared with on-site treatment or off-site waste management. Establishing the business case is a key driver to overcome these initial barriers.

- **Waste management contract review points:** food and drink manufacturers and retailers may not be aware of the opportunities to divert to animal feed, may be tied into waste contracts or may find that relying on waste management companies to deal with their surplus is simpler. There may be the opportunity to explore opportunities to divert food away from the AD/landfill waste stream, to animal feed, at contract renewal or review/break points.
- **Limited availability of UK depackaging facilities:** some products that are suitable for diversion to animal feed may be finished products, which have already been packaged, such as yoghurts or soft drinks. Extracting the food material from plastic or aluminium containers requires specialist equipment, which complies with feed safety and hygiene regulations. All depackaging operations need to ensure that feed does not become contaminated with traces of packaging material. The UK has limited capacity for depackaging food from certain packaging formats, there are limited facilities for Tetrapak, aluminium cans and plastic bottles, pots, tubs and trays. However, this capacity is dispersed at sites operated by specialist former foodstuff processers and less is available for on-farm; capacity is mainly limited to large-scale pig farms in Northern England.

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There is no UK depackaging capacity for steel cans at present and limited capacity to crush specialist sports drinks packaged in aluminium bottles. The lack of facilities for depackaging presents a barrier to diversion to animal feed, through issues like additional haulage costs.

A full overview of the barriers, challenges and solutions can be found in the barriers document and case studies found in Appendix IV.

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Appendix IV: Resource library

WRAP Resources:

Diverting Surplus Food to Animal Feed: the Business Case – coming soon: A summary of the business case for diverting food surplus away from anaerobic digestion and landfill to animal feed.

[Arla Food Case Study: Diverting surplus dairy products to animal feed – and saving money:](#) How Arla diverted surplus dairy products away from Anaerobic Digestion (AD) to animal feed, preventing food waste and saving them money.

[Tesco and SugaRich Case Study: Using surplus bakery products in animal feed – and saving money:](#) Illustrating the process undertaken by Tesco to divert surplus bakery products from In-store Bakeries (ISBs) away from Anaerobic Digestion (AD) to animal feed, preventing food waste saving them money.

[Coca-Cola Enterprises Case Study: Creating value from surplus drink products: redistribution to charities and animal feed:](#) Provides a summary of the approach taken by Coca-Cola to divert surplus soft drink products away from anaerobic digestion to redistribution and animal feed.

[Information Sheet: Animal Feed Guidance:](#) High-level guidance for retailers, distributors and food manufacturers to encourage the diversion of greater quantities of food and drink to animal feed rather than being disposed as waste.

WRAP Food Redistribution pages can be found here:

www.wrap.org.uk/content/redistribution

Useful websites:

Food Standards Agency (England): <https://www.food.gov.uk/>

Food Standards Agency (Northern Ireland): <https://www.food.gov.uk/northern-ireland>

Food Standards Agency (Wales): <https://www.food.gov.uk/wales>

Food Standards Scotland: <http://www.foodstandards.gov.scot/>

UK Former Foodstuffs Processors Association (UKFFPA):

<https://www.agindustries.org.uk/sectors/animal-feed/ukffpa/>

Agricultural Industries Confederation (AIC): Animal Feed

<https://www.agindustries.org.uk/sectors/animal-feed/>

AIC: Traceability and feed hygiene <https://www.agindustries.org.uk/sectors/animal-feed/legislation-and-guidance/traceability-and-feed-hygiene/>

AIC: Marketing, Labelling and Composition of Feeds Legislation

<https://www.agindustries.org.uk/sectors/animal-feed/legislation-and-guidance/marketing-labelling-and-composition-of-feeds/>

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Department of Agriculture and Rural Development Northern Ireland (DARD):

<https://www.dardni.gov.uk>

Animal Plant & Health Agency (APHA):

<https://www.gov.uk/government/collections/guidance-for-the-animal-by-product-industry>

Guidance

Guidance for all UK nations: animal feed legislation and guidance

[https://www.food.gov.uk/business-](https://www.food.gov.uk/business-industry/farmingfood/animalfeed/animalfeedlegislation)

[industry/farmingfood/animalfeed/animalfeedlegislation](https://www.food.gov.uk/business-industry/farmingfood/animalfeed/animalfeedlegislation) . Provides further links to guidance on the page.

Legislation

EU Regulation	
<p>Regulation 1069/2009 laying down health rules as regards animal by-products and derived products not intended for human consumption.</p> <p>Implementing Regulation 142/2011 laying down health rules as regards animal by-products and derived products not intended for human consumption.</p>	<p>The Animal By-Products (Enforcement) (England) Regulations 2013 (as amended by the Animal By-Products (Enforcement) (England) Regulations 2015).</p> <p>The Animal By-Products (Enforcement) (Wales) Regulations 2014</p> <p>The Animal By-Products (Enforcement) Regulations (Northern Ireland) 2015 amending The Animal By-Products (Enforcement) Regulations (Northern Ireland) 2011</p> <p>The Animal By-Products (Enforcement) (Scotland) Regulations 2013 amending The Animal By-Products (Enforcement) (Scotland) Regulations 2011</p>
<p>Regulation 999/2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies.</p>	<p>Transmissible Spongiform Encephalopathies (England) Regulations 2010 (SI 2010 No.801) (as amended by The Transmissible Spongiform Encephalopathies (England) (Amendment) Regulations 2013 (SI 2013 No. 336).</p> <p>The Transmissible Spongiform Encephalopathies (Wales) Regulations 2008</p>

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EU Regulation	
	The Transmissible Spongiform Encephalopathies (Northern Ireland) Regulations 2010 The Transmissible Spongiform Encephalopathies (Scotland) Regulations 2010
Regulation 183/2005 laying down requirements for feed hygiene.	The Animal Feed (Hygiene, Sampling etc. and Enforcement) (England) Regulations 2015 <i>Separate but similar legislation is in operation in Scotland, Wales and Northern Ireland</i>
Regulation 767/2009 laying down requirements on the Placing on the Market and the use of Feed	The Animal Feed (Composition, Marketing and Use) (England) Regulations 2015 <i>Separate but similar legislation is in operation in Scotland, Wales and Northern Ireland</i>

WRAP's vision is a world in which resources are used sustainably.

Our mission is to accelerate the move to a sustainable resource-efficient economy through re-inventing how we design, produce and sell products; re-thinking how we use and consume products; and re-defining what is possible through re-use and recycling.

Find out more at www.wrap.org.uk

Document reference (please use this reference when citing WRAP's work):

[WRAP, 2015, Banbury, Guidance for Food and Drink Manufacturers and Retailers on the Use of Food Surplus as Animal Feed, Prepared by Anthesis (UK) Ltd]



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Front cover photography: Cows enjoying animal feed (source: <http://www.bridgmans.co.uk/products/animal-feed-and-minerals>)
