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SYMBIOMA

Technology Innovations and Business Models for Valorisation of Industrial Waste Biomass in Sparsely Located Enterprises



Legislation concerning food waste and utilisation of side streams in the NPA area

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1 Introduction and background

Companies of food industry have a long tradition to forward their side streams for recycling (for example for digestion, composting or animal feed in the nearest farms), because the production of them cannot be completely avoided. However, the recycling processes used are often those in which the valuable nutrients of the side streams (such as proteins, fats and carbohydrates, as well as minerals and trace elements, such as vitamins) are not recovered or utilized by the most valuable way. It has been noticed that companies find the legislation and terminology of side and waste streams challenging. In some cases, it might be difficult to make and understand the difference between wastes and side streams. In addition, the large and diverse legislation sets a significant number of requirements for recycling and utilisation of those streams but also for them as raw materials of groceries, cosmetics and animal / fish feed. This contributes to the fact that the side streams are not further utilised or processed by the most valuable way.

This report brings together information about EU waste management legislation specialised in wastes and by-products of food and beverage industry. In this case, the materials can origin from agriculture, fishing and fish processing, and food and beverage preparation and processing. The report points out the legislation concerning recycling, processing and refining of the previous mentioned materials but also legislation that sets requirements for the materials used as raw materials of groceries, cosmetics, animal or fish feed (Figure 1).

The legislation has been treated at the EU level by considering the national regulations in Finland, Ireland, Sweden and Norway, too.

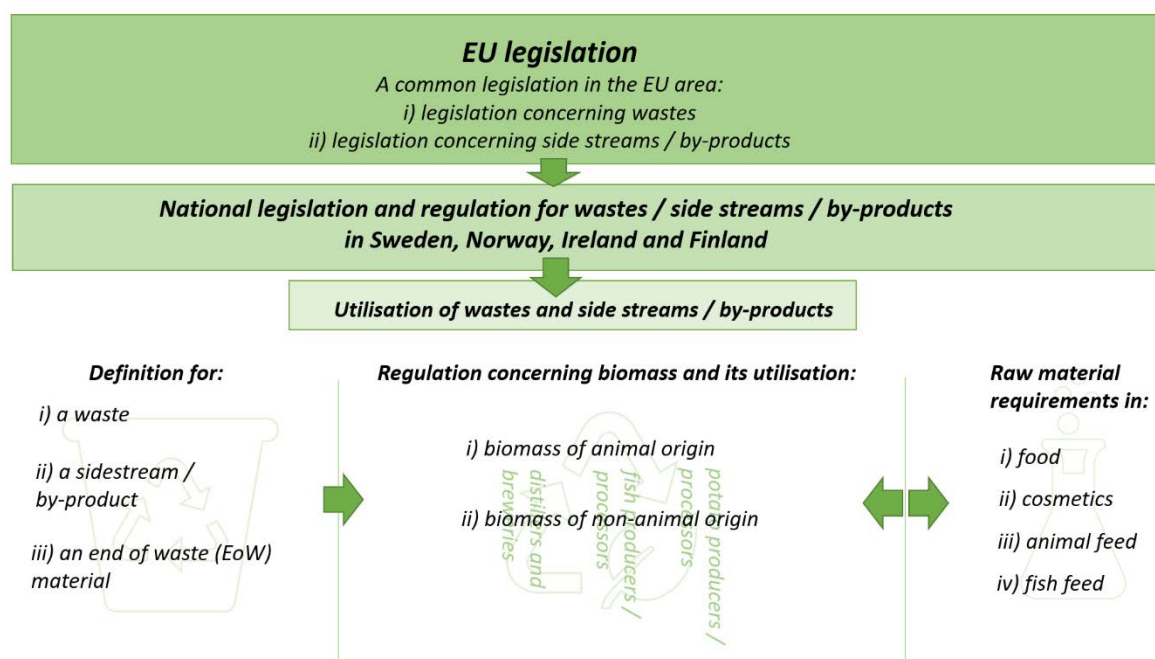


Figure 1. The summary of legislative and regulatory path of side streams/by-products at EU and national level in Sweden, Norway, Ireland and Finland.

The report is delivered by the Interreg Northern Periphery and Arctic funded project SYMBIOMA - Technology Innovations and Business Models for Valorisation of Industrial Waste Biomass in Sparsely Located Enterprises (the project number "352"). The information therefore included in this report focuses on the partner countries of the project, Finland, Ireland, Sweden and Norway.

2 Waste management legislation

2.1 A legal framework for waste management in the EU

EU waste management law establishes a legal framework for treating waste in the EU. It's designed to protect the environment and human health by emphasising the importance of proper waste management, recovery and recycling techniques to reduce pressure on resources and improve their use. [Directive \(EU\) 2018/851](#) had to become law in the EU countries by 5 July 2020 and it amends the original [Directive 2008/98/EC](#) as part of a package of measures on the circular economy. The amending directive strengthens rules on waste prevention.

The original directive 2008/98/EC establishes a waste hierarchy that applies as a priority order in waste prevention and management legislation and policy (Figure 2). When applying the waste hierarchy, Member States shall take measures to encourage the options that deliver the best overall environmental outcome. This may require specific waste streams departing from the hierarchy where this is justified by life cycle thinking on the overall impacts of the generation and management of such waste. In addition, Member States shall take into account the general environmental protection principles of precaution and sustainability, technical feasibility and economic viability, protection of resources as well as the overall environmental, human health, economic and social impacts.¹



Figure 2. Waste hierarchy. Preventing waste is the preferred option and sending waste to landfill should be the last resort.²

¹ EU Waste Management Law, 2008, 2008/98/EC. Available at: <https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX-02008L0098-20180705>. Accessed 31 January 2022.

² European Commission. Waste Framework Directive. Available at: https://ec.europa.eu/environment/topics/waste-and-recycling/waste-framework-directive_en. Accessed 31 January 2022.

The Directive 2008/98/EC makes a difference between wastes and by-products as following:

“Waste” means any substance or object which the holder discards or intends or is required to discard.

“Bio-waste” means biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants.

“By-product” is a substance or object resulting from a production process the primary aim of which is not the production of that substance or object. The substance or object is a by-product only if the following conditions are met:

- further use of the substance or object is certain, the substance or object can be used directly without any further processing other than normal industrial practice,
- the substance or object is produced as an integral part of a production process, and
- further use is lawful, i.e. the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.³

End-of-waste criteria specify when certain waste ceases to be waste and becomes a product, or a secondary raw material. According to the Waste Framework Directive, certain specified waste ceases to be waste when it has undergone a recovery operation (including recycling) and complies with specific criteria, in particular when

- the substance or object is commonly used for specific purposes
- there is an existing market or demand for the substance or object,
- the use is lawful (substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products), and
- the use will not lead to overall adverse environmental or human health impacts.⁴

Animal by-products including processed products (except those which are destined for incineration, landfilling or use in a biogas or composting plant), are excluded from the scope of the directive 2008/98/EC.⁵

³ European Commission. 2008. EU Waste Management Law. Available at: <https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:02008L0098-20180705>. Accessed 31 January 2022.

⁴ European Commission. Waste Framework Directive. Available at: https://ec.europa.eu/environment/topics/waste-and-recycling/waste-framework-directive_en. Accessed 31 January 2022

⁵ European Commission. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives, 2008. Available at: https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en. Accessed 28 February 2022.

2.2 National regulation for wastes in Finland, Ireland, Sweden and Norway

EU countries must report to the European Commission on the implementation of the EU waste laws, including on the achievement of targets for waste collection, re-use, recycling and recovery every year or every two years.⁶

National waste regulation in Finland, Ireland, Sweden and Norway is following:

Finland

Finnish waste legislation covers all wastes except certain special types of waste such as radioactive wastes, which are covered by separate laws. Finnish waste legislation is largely based on EU legislation, but in some cases includes stricter standards and limits than those applied in the EU as a whole. Finland also has legislation on some issues related to wastes that have not yet been covered by EU legislation.

The Finnish general waste regulation covers the following laws and directives:

- Waste Act ([Jätelaki \(646/2011\)](#)), and
- [Government Decree on Waste \(Valtioneuvoston asetus jätteistä \(179/2012\)\)](#).

The negative environmental impacts of wastes are also addressed in legislation on environmental protection:

- Environmental Protection Act ([Ympäristönsuojelulaki 527/2014](#)), and
- Environmental Protection Decree ([Valtioneuvoston asetus ympäristönsuojelusta 713/2014](#)).

The Finnish waste regulations also cover legislation on specific waste types, products, activities, shipments, end-of-life vessels, end-of-waste criteria of specific wastes, monitoring the fulfilment of waste directive targets, landfills and incineration.⁷

Ireland

Irish national waste management policy is governed primarily by the requirements of European law, particularly Directive 2008/98/EC on Waste⁸. Ireland has a Waste Action Plan for a Circular Economy that is Ireland's roadmap for waste planning and management.⁹ The plan outlines the contribution of the sector to the achievement of a number of other national plans and policies including the Climate Action Plan. It also matches the level of ambition being shown across the European Union through the European Green Deal, which encompasses a range of actions supporting circularity and sustainability. The key pieces of the Irish general waste legislation are the following:

- [Waste Management Act 1996 \(as amended\)](#),
- [Waste Management \(Facility Permit and Registration\) Regulations 2007 \(as amended\)](#),
- [Waste Management \(Collection\) Regulations 2007 \(as amended\)](#),
- [Waste Management \(Shipment of Waste\) Regulations 2007 \(as amended\)](#), and

6 European Commission. Implementation of the Waste Framework Directive. Available at: https://ec.europa.eu/environment/topics/waste-and-recycling/implementation-waste-framework-directive_en Accessed 28 February 2022.

7 Ministry of the Environment of Finland. Waste legislation. Available at: <https://ym.fi/en/waste-legislation>. Accessed 28 February 2022.

8 Ireland's National Waste Policy 2020-2025, 86647_dcf554a4-0fb7-4d9c-9714-0b1fbc7dbc1a (1).pdf

9 Government of Ireland. 2020. Waste Action Plan for a Circular Economy. Available at: [gov.ie](http://www.gov.ie) - Waste Action Plan for a Circular Economy (www.gov.ie). Accessed 1 September 2022.

- [European Communities \(Waste Directive\) Regulations 2011](#).

The negative environmental impacts of wastes are also addressed under the environmental protection regulation:

- [Environmental Protection Agency Act 1992 \(as amended\)](#),
- [Protection of the Environment Act 2003 \(as amended\)](#),
- [Environmental \(Miscellaneous Provisions\) Acts 2011](#) and [2015](#).

Legislation also covers regulations for specific waste types (such as electronics and batteries), energy efficiency, climate actions, air pollution and water services.¹⁰

Sweden

The frames of the waste regulation in Sweden are based on the following laws and directives:

- [Miljöbalken \(1998:808\)](#) (Ministry of the Environment), chapter 15,
- Waste Regulation ([Avfallsförordningen \(2020:614\)](#)),
- Waste Directive (Avfallsdirektiv), and
- Guidelines from The Swedish Environmental Protection Agency ([Naturvårdsverket](#)).¹¹

Norway

In Norway, the pollution law ([Forurensingsloven](#)) regulates what is considered to be waste. The waste regulation ([Avfallsforskriften](#)) regulates recycling and treatment of different waste types.¹²

3 By-product legislation

3.1 By-products of non-animal origin biomass

The most common causes of side streams can be divided into four (4) parts:

- Side streams that cannot be prevented, such as the whey produced in cheese manufacturing or the peels of fruits and vegetables.
- Side streams that are food grade, but consumers do not want to buy them.
- Side streams that do not meet the quality requirements of the company. These include packaged and unpackaged products, which today are aimed at recycling and not as waste.
- Side streams that come about exchange matters that come in product exchanges or production starts and stops. The use of exchange matters is difficult due to hygiene and allergy regulations.¹³

By-products of non-animal origin biomass covered by the SYMBIOMA project are especially mash from brewing industry and peels from potato industry.

¹⁰ Roberts, A., Thuillier, M. & Stynes, C.. Environmental Law and Practice in Ireland: Overview. Available at: [https://uk.practise-callaw.thomsonreuters.com/4-503-2701?transitionType=Default&contextData=\(sc.Default\)&firstPage=true#co_anchor_a871998](https://uk.practise-callaw.thomsonreuters.com/4-503-2701?transitionType=Default&contextData=(sc.Default)&firstPage=true#co_anchor_a871998). Accessed 20 September 2022.

¹¹ Sas, D.. Personal contact. E-mail. 30 June 2021.

¹² Halland, H.. Personal contact. E-mail. 25 February 2022.

¹³ Berg, J.. 2016. ETL:n jäte- ja sivuvirtaselvitys 2016. Available at: <http://www.etl.fi/media/aineistot/raportit-ja-katsaukset/etl->

In general, the term by-product is associated only with the product of animal origin. Therefore, there is not specific regulation or legislation for by-products of non-animal origin. But national and EU food legislation, such as food law ([regulation \(EC\) No 178/2002](#)) and hygiene of foodstuff ((EC) No [852/2004](#) and [853/2004](#)), and waste management legislation (([EU 2018/850](#)), can be considered as a part of by-product legislation of non-animal origin and complying when the substances are processed for human consumption. When the non-animal origin materials are used for animal and fish feed or cosmetics comply the feed regulation and cosmetics regulation respectively. More information about these regulations is presented in the Chapter 4 “Legislation concerning side stream derived raw materials’ requirements and their utilization in various applications”.

3.2 Animal by-products (ABPs)

In the EU, over 20 million tons of animal by-products emerge annually. Animal by-products are materials of animal origin that people do not consume. These products include among others:

all parts of an animal slaughtered for human consumption, that are not edible or not placed on the market as food for example the skin, bones, horn and hooves, blood, fat and offal,
bodies of animals died on farm,
bodies of dead pet animals,
materials produced by animals such as manure, guano, eggshells, feathers, wool, beeswax, and former foodstuff of animal origin such as milk, eggs, meat that for some reason is not suitable for human consumption (commercial reasons, quality, production failures etc.).

These kinds of materials bear the risk of transmitting diseases to humans or animals, if not processed properly. Because of this, animal by-products are sorted into three categories being based on their risk level. Although, animal by-products bear some risks, on the other hand, they are mainly of a high nutritional and energetic value and they should be used in the best possible way to preserve resources.¹⁴

Depending on the source and purpose of the animal by-products there are strict rules to achieve safe products. Animal by-products are best valued if they are used as feed for food producing animals or further processed into non-risk derived products or consumables, but measures have to be taken into account to avoid spreading animal diseases or transmitting pathogens to human consumers via the food chain. On the other hand, when the materials are used as fertilizers or soil improvers, the risk is lower, but recycling of unwanted contaminants and pathogens should be minimised. There are also options to use animal by-products as raw materials of incineration or manufacturing of renewable fuels. Hereby the risks are minor because of high temperatures destroying possible pathogens but these methods are suggested to use only for materials that cannot be used safely otherwise.

[Regulation \(EC\) 1069/2009](#) and [Commission Regulation \(EU\) 142/2011](#) are the framework within all handling, collecting, processing and trading of animal by-products take place. The main principles are safe sourcing, safe treatment and safe end uses. This is achieved by traceability and risk based measures to process and use the raw material and the products.

¹⁴ European Commission. Animal by-products. Available at: https://ec.europa.eu/food/safety/animal-products_fi. Ac-cessed 28 February 2022.

The legislation sets:

- clear requirements based on animal by-products' technical standards;
- enforcement measures for a risk-proportionate approach;
- end point in the manufacturing chain for processed and packaged pet food, biodiesel, tanned hides and skins and other products. Reaching the end point means that these products no longer are subject to animal by-product regulation and can be traded without hints in the EU;
- official controls of laboratories of processing and biogas plants handling animal by-products;
- traceability from food production; and
- risk-proportionate solutions for transport, processing, use and imports.¹⁵

“Animal” means any invertebrate or vertebrate animal.

“Aquatic animal” means fish belonging to the superclass Agnatha and to the classes Chondrichthyes and Osteichthyes, mollusc belonging to the Phylum Mollusca, and crustacean belonging to the Subphylum Crustacea

Shells from shellfish from which the soft tissue or flesh have been removed, are excluded from the scope of the Regulation (EC) 1069/2009.

16,17

All EU measures on animal by-products are based on sound, independent and transparent scientific advice given by the European Food Safety Authority and opinions from leading experts.¹⁸

Finland

In Finland, animal by-products are subjected to the EU legislation that is supplemented by national regulation. The national animal by-product legislation follows the next laws and regulations:

By-product law – Law concerning animal by-products ([Sivutuotelaki - Laki eläimistä saatavista sivutuotteista 517/2015](#)); with amending regulation 882/2018, 1070/2021 and 573/2021, and Regulation of animal by-products set by Ministry of Agriculture and Forestry ([Maa- ja metsätalousministeriön asetus eläimistä saatavista sivutuotteista 783/2015](#)).¹⁹

15 European Commission. Food Safety. EU rules. Available at: https://ec.europa.eu/food/safety/animal-products/eu-rules_en. Accessed 31 January 2022.

16 European Union. Regulation (EU) 2016/429. Available at: <https://eur-lex.europa.eu/eli/reg/2016/429/oj>. Accessed 31 January 2022.

17 European Commission. Food Safety. Aquatic animals. Available at: https://food.ec.europa.eu/animals/aquatic-animals_en. Accessed 31 January 2022.

18 European Commission. Food Safety. Scientific advice. Available at: https://ec.europa.eu/food/safety/animal-products/scientific-advice_en. Accessed 31 January 2022.

19 Ruokavirasto. 2021. Sivutuotelainsäädäntö. Available at: <https://www.ruokavirasto.fi/yriytykset/elainala/elaimista-saatavat-sivutuotteet/sivutuotelainsaadanto/>. Accessed 3 March 2022.

Ireland

In Ireland, the principal legislation relating to ABPs is Regulation (EC) No. 1069/2009. EU Regulations are directly applicable in all Member States including Ireland. However, Member States also need to introduce national legislation to enforce the EU rules. The enforcing legislation for Ireland is set out in [a number of Statutory Instruments](#).²⁰

According to the Ireland's National Waste Policy 2020-2025: "The legislation governing by-product determination in Ireland is the European Communities (Waste Directive) Regulations 2011, (S.I. 126 of 2011). Regulation 27 of this Statutory Instrument transposes Article 5 of the 2008 Waste Framework Directive (Directive 2008/98/EU) and sets out the circumstances in which a material can be considered a by-product and not a waste."

Irish Environmental Protection Agency (EPA) has published the draft of the guide to by-products and submitting a by-product notification.²¹ All by-product notifications are available to view on the EPA's [By-product Register](#).

Sweden

The handling of animal by-products originates from the regulation called [Förordning \(2006:814\) om foder och animaliska biprodukter](#) in Sweden. Animal by-products arise, for example, at food establishments that handle raw materials and products containing animal constituents.

The national regulation sets obligations to handle these products by taking into account infection control, environment and integrity, and operators or processors are obliged to comply with the requirements of the legislation. The animal by-products must be separated from the food, sorted, and labelled correctly. The materials can only be received by recipients who are registered and approved by the Swedish Board of Agriculture (Jordbruksverket) and have approved facilities. The recipients must be authorized to use the materials for a specific purpose or be eligible to receive the materials according to regulatory openings. Appointed control authorities (Livsmedelsverket in municipalities) are monitoring that the legislation is followed by companies. The county administrative boards (Länsstyrelserna) shall check that it is complied with the transporters and the Swedish Board of Agriculture (Jordbruksverket).²²

Norway

When using animals as raw material (for instance fish and meat), the by-products from this production is regulated through Animal by-product regulation ([Animaliebiprodukt-forskriften](#)). The regulation carries into effect for Norway Community legislation in the framework of the European Economic Area Agreement on animal health rules in relation with the placing on the market of animal non-edible by-products of animal origin. The competent authority for this Regulation and adopted EU legislation is the Food Safety Agency. The adopted EU Regulations are, among others, Regulation (EC) No 1069/2009 of the European Parliament and of the Council laying down health rules as regards animal by-products and derived products not intended for human consumption and Commission Regulation (EU) No 142/2011 implementing Regulation (EC) No 1069/2009 of the European Parliament and of the Council laying down health rules as regards animal by-products and derived products not intended for human consumption and implementing Council Directive 97/78/EC as regards certain samples and items exempt from veterinary checks at the border under that Directive.

20 Government of Ireland. 2019. Animal By-products – Legislation. Available at: <https://www.gov.ie/en/publication/e7152-animal-by-products-legislation/>. Accessed 21 September 2022.

21 Environmental Protection Agency. 2020. By-Product – Guidance Note. Available at: https://www.epa.ie/publications/licensing-permitting/waste/ByProduct_Guidance.pdf. Accessed 28 September 2022.

22 Sas, D.. Personal contact. E-mail. 30 June 2021.

In the case of using animal by-products as fertilizers complies the Regulation on Fertilizers from Organic Origins ([Forskrift om gjødselvarer mv. av organisk opphav](#)) in Norway.²³

4 Legislation concerning side stream derived raw materials' requirements and their utilization in various applications

Legislation concerning the use of industrial side streams depends on the purposes and end products to be processed. Legislations and regulations referring to side streams used in foodstuffs, cosmetics, animal and fish feed are presented below.

4.1 Foodstuffs

The framework of the foodstuff legislation is based on the [Regulation \(EC\) No 178/2002](#) laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

The EU Food Hygiene Regulation (FHG) is laid out for controlling the handling and use of substances for direct human consumption.²⁴ The FHG also applies when processing by-products or side-streams, for example side-streams of fish processing, brewing and potato processing industry, for human consumption. EU regulation [\(EC\) No 852/2004](#) is on the hygiene of foodstuffs establishes general rules for food business operators in the field of hygiene of food products. It is applicable to all stages of food production, processing subject to all other relevant specific hygiene requirements. The [\(EC\) No 853/2004](#) regulation complements specified for food business operators in the field of hygiene of food of animal origin and processed products of plant where animal origin is used in the preparation. In addition, [Regulation \(EC\) No 854/2004](#) laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption.

Finland

When using industrial side streams or by-products for raw materials of foodstuff, the Foodstuff Law ([Elintarvikelaki](#)) is complied in Finland.

Ireland

In Ireland, the general rules that are applicable to all food businesses comply the EU legislation [Regulation \(EC\) No 178/2002](#).

Sweden

The present Regulation, the Foodstuff Law ([Livsmedelslag](#)), adopted by the Swedish Food Agency, lays down rules regarding food information to consumers, complementing existing EU legislation on the topic. It applies to all foods intended for consumers, including food provided by catering establishments and foods intended for catering. It contains rules regarding the language of food information, packaging, net quantity information, rules for non-prepackaged food, special provisions for veal and potatoes, notification requirements, etc..²⁵

²³ Halland, H.. Personal contact. E-mail. 25 February 2022.

²⁴ European Commission. Food Safety - Food hygiene. Available at: https://food.ec.europa.eu/safety/biological-safety/food-hygiene_en. Accessed 15 September 2022.

²⁵ Livsmedelsverkets författningssamling. 2014. Livsmedelsverkets föreskrifter om livsmedelsinformation. Available at: <https://www.livsmedelsverket.se/globalassets/om-oss/lagstiftning/livsmedelsinfo-till-konsum---markning/livsfs-2014-4.pdf>. Accessed 27 September 2022.

Norway

In Norway, the laws and regulations concerning health and safety of food, drink and by-products from such products intended for human consumption, is supervised by the Norwegian Food Safety Authority (Mattilsynet). The Norwegian Food Safety Authority is a state, nationwide administrative body that helps to ensure consumers safe food and safe drinking water. The Norwegian Food Safety Authority also has tasks related to cosmetics and medicines. The Food Law ([Matloven](#)) regulates health and quality along the value chains for products intended for human consumption. The law concerns all food products in Norway.²⁶

4.2 Cosmetics

The rules for cosmetic products are the same for all countries within the European Union and European Economic Area through EU cosmetic legislation.

Regulation ([EC](#)) No 1223/2009 on cosmetic products and [Regulation \(EU\) No 655/2013](#) on common criteria for claims concerning cosmetic products are the main regulatory framework for finished cosmetic products when placed on the EU market. The regulation (EC) No 1223/2009 strengthens the safety of cosmetic products and streamlines the framework for all operators in the sector. The regulation simplifies procedures to the extent that the internal market of cosmetic products is now a reality. The regulation replaces Directive 76/768/EC which was adopted in 1976 and had been substantially revised on numerous occasions. The (EC) No 1223/2009 provides a robust, internationally recognised regime, which reinforces product safety while taking into consideration the latest technological developments, including the possible use of nanomaterials.

When using chemical raw materials in cosmetics, the EU regulation ([EC](#)) No 1907/2006 relating to the Registration, Evaluation and Authorization of Chemicals (REACH) has to be concerned. Finished cosmetics products are also impacted by the REACH regulation. Chemical raw materials that are used to manufacture cosmetic products have to comply also for the CLP regulation ([EC](#)) No 1272/2008 on the Classification, Labelling and Packaging of substances and mixtures.²⁷

Finland

The EU cosmetics regulation ([EC](#)) No 1223/2009 is valid also in Finland. In addition to this, Act on Cosmetic Products ([Laki kosmeettisista valmisteista](#)) complies in Finland laying down provisions on the implementation of Regulation (EC) No 1223/2009.

Ireland

Cosmetic products placed on the market in Ireland must meet the requirements outlined in Regulation ([EC](#)) No. 1223/2009 on cosmetic products as amended (the 'Cosmetics Regulation') and S.I. 440 of 2013 European Union (cosmetic products) Regulations 2013 ([Regulation \(EU\) No 655/2013](#)).²⁸

²⁶ Halland, H.. Personal contact. E-mail. 25 February 2022.

²⁷ Chemical Inspection and Regulation Service Limited. REACH and Cosmetics. Available at: https://www.cirs-reach.com/pdf/REACH_and_Cosmetics.pdf. Accessed 27 September 2022.

²⁸ Health Products Regulatory Authority. 2014. Regulatory Information. Available at: <http://www.hpra.ie/homepage/cosmetics/regulatory-information>. Accessed 28 September 2022.

Sweden

Sweden has a national cosmetics legislation that takes place when the cosmetic products will continue to offer on the Swedish market. All cosmetic products on the Swedish market that are sold or given away for free, must comply with the EU cosmetics legislation but also national regulation that consists the following:

- The Medical Products Agency's regulations on cosmetic products ([Läkemedelsverkets föreskrifter \(LVFS 2013:10\) om kosmetiska produkter](#)).

Norway

All products intended as cosmetics need to comply with the Norwegian Cosmetics Law ([Kosmetikklova](#))²⁹.

4.3 Animal and Fish Feed

Certain types of food waste, especially from the food industry, can be turned into animal feed.³⁰ The animal feed legislation of EU is based on the following regulation:³¹

- [Regulation \(EC\) No 178/2002](#) laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety,
- [Regulation \(EC\) No 767/2009](#) on the placing on the market and use of feed,
- [Commission Regulation \(EU\) No 68/2013](#) on the Catalogue of feed materials,
- [Commission Regulation \(EU\) 2020/354](#) establishing a list of intended uses of feed intended for particular nutritional purposes,
- [Regulation \(EU\) 2019/4](#) on the manufacture, placing on the market and use of medicated feed, and
- [Regulation \(EC\) No 999/2001](#) concerning the use of animal protein in feeding, [Commission Notice C/2018/2025](#) about Guidelines for the feed use of food no longer intended for human consumption.

The hygiene legislation of the animal feed complies the next regulations:

- [Regulation \(EC\) No 183/2005](#) laying down requirements for feed hygiene, and
- [Commission Notice C/2019/4919](#) about Guidance document on the implementation of certain provisions of Regulation (EC) No 183/2005 laying down requirements for feed hygiene.

There are also specific regulation concerning additives, control and import activities, transgenic feeds and harmful spices and products. When animal by-products are used as raw materials of animal feeds, some additional legislations must be considered. The regulatory framework for handling, collecting, processing and trading of animal by-products is presented in the Chapter 3.2 Animal by-products (ABPs). The framework is determined by Regulation (EC) 1069/2009 and Commission Regulation (EU) 142/2011. In addition, the regulation (EU) No 51/2013 sets analysis methods for the determination of

EU regulation, EC 1069/2009 stipulates that animal by-products may not be used to feed animals or farmed fish of the same species. For example, processed proteins like fishmeal from salmon cannot be used for salmon feed but for cod, trout, sea bass and other fish species.

²⁹ Halland, H.. Personal contact. E-mail. 25 February 2022.

³⁰ European Environment Agency. 2020. EEA Report No 04/2020. Bio-waste in Europe – turning challenges into opportunities

³¹ Ministry of Agriculture and Forestry of Finland. Keskeinen lainsäädäntö rehut. Available at: <https://mmm.fi/elaimet-kasvit/lainsaadanto-ja-suojapaatokset/rehulainsaadanto>. Accessed 27 September 2022.

constituents of animal origin for the official control of the feed.

Finland

As feed law is largely harmonized across the European Union, the EU regulations apply as such without national transposition in Finland³². In Finland, the national regulation complies the following:

Animal Feed Act ([Rehulaki 1263/2020](#)) with amending regulation [18/2022](#).

When animal by-products are used for animal feed the national ABPs regulations presented in the Chapter 3.2 have to be considered, too.

Ireland

EU's feed regulations are applicable also in Ireland. The national Statutory Instruments ([S.I. No. 910 of 2005](#)) and its amendments form a part of the overall food and feed safety legislation and transposes the European legislation covering animal feed, microbiological criteria, specific implementing measures for certain products and transitional arrangements for the introduction of aspects of food and feed hygiene legislation, in Ireland.

Sweden

Residues from the food industry can be used as feed. The person who delivers becomes the feed supplier and must follow the rules for feed. If the residues have animal content, additional rules apply. In order to be able to deliver residues, notification as a feed supplier needs to be made and the plant then ends up under public control as a producer of feed. More information is available from the Swedish Environmental Protection Agency.³³

Norway

All products intended as feed need to comply with the Feed Regulation ([Fôrvareforskriften](#)) in Norway³⁴.

5 Conclusion

EU waste management law has set a legal framework for treating waste in the EU and to protect the environment and human health by emphasising the importance of proper waste management, recovery and recycling techniques to reduce pressure on resources and improve their use. According to this law and principles of circular economy, the primary aim is to prevent and minimize waste production. When it's not possible, the next options are to recycle and recover materials. This also concerns utilization of industrial side streams and by-products. When recycling and recovering materials, it's suggested to use processing methods that makes possible the production of the best valued end products derived from residuals.

EU Regulations are applicable in all Member States. However, Member States also need to introduce a national legislation to enforce the EU rules. In some cases, national legislation might be even stricter and larger than the original EU regulation.

32 Ministry of Agriculture and Forestry of Finland. Keskeinen lainsäädäntö rehut. Available at: <https://mmm.fi/elaimet-kasvit/lainsaadanto-ja-suojapaatokset/rehulainsaadanto>. Accessed 27 September 2022.

33 Sas, D.. Personal contact. E-mail. 30 June 2021.

34 Halland, H.. Personal contact. E-mail. 25 February 2022.

When utilizing or further processing side streams of food and beverage industry, for example fish processing residuals, potato peels or mash from breweries, the legislation varies depending on the end product to be produced and targeted. Depending of the purpose of the processed or delivered end product, the laws of foodstuff, cosmetics or animal and fish feed have to be taken into account. In addition, the waste, environment and hygienic regulations are emphasized in every case regardless of the end product desired.

There is no specific by-product regulation for non-animal origin side streams, but the animal by-product regulations have been laid down. The legislation is more specific and stricter to avoid risks of transmitting diseases to humans or animals when using animal by-products as raw materials for further products. ABPs regulations set the framework within all handling, collecting, processing and trading of animal by-products and derived products not intended for human consumption.

Very often the legislation concerning wastes and side streams are considered complicated and diverse that retards also recycling and commercial further utilization of the residuals (Figure 3). This contributes to the fact that the recycling processes used are those in which valuables, for example nutrients, of the side streams are not recovered or utilized by the most valuable way. Hence, development of legislation and dismantling of bureaucracy are the steps to promote circular economy and sustainable growth.

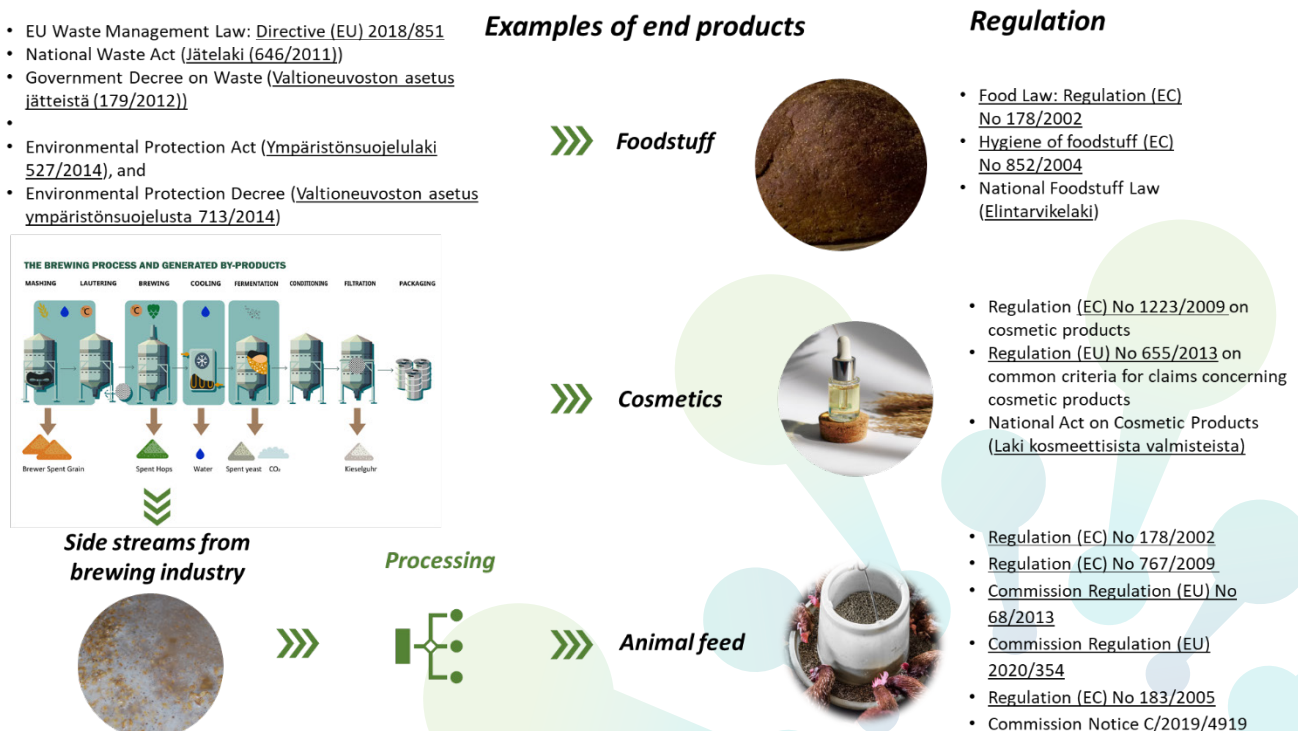


Figure 3. An example presenting the regulations concerning utilisation of side streams of brewing industry in various end products in Finland. The legislation of animal by-products would be also considered if the side stream was animal origin.

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