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# Regulation of the food waste measuring in the EU in the light of the need of counteracting the food wastage

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## Keywords:

Food losses and wastage, food waste, Delegated Decision, Waste Framework Directive

## Abstract

The paper presents the analysis of the guidelines of the European Union, adopted in May, 2019, on the common methodology and quality requirements for the uniform system of measuring the food waste levels in the EU Member States. The Waste Framework Directive obliges the Member States to monitor the generation of food waste and to take measures to limit their production; however, a lack of uniform, reliable method for measuring the food waste levels in the EU causes that it is difficult to evaluate the scale of the problem, its sources and the related tendencies in time. The food waste is generated across the whole food supply chain; so, it is especially troublesome to determine the level of the discussed waste. The food waste with different characteristics, different source and different reasons for its generation is produced in each stage of the chain. The current data on the food wastes do not specify their quantities. In connection with this fact, a separate legal act was developed, that is, the Commission Delegated Decision (EU) dated 3 May 2019, focusing on the measuring of food waste, which is harmonized with the existing systems of data collection and provides a framework for further measures of the Member States in respect of the quantitative determination of the food waste that is generated.

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## 1. INTRODUCTION

Food production and its processing, distribution and consumption are connected with the use of natural resources and generation of contaminants. The main resources that are used in the discussed process include: the resources of soil, organic and inorganic substances, water and energy; in particular, the energy that is connected with the fuels employed in agriculture and transport. The environmental impact of this part of the system is, therefore, dual, that is, from the side of the use of natural resources and from the emission of contaminants. The second one is connected, in particular, with the process of waste generation. In the case of the streams of food products, passing throughout the whole agri-food chain, from the producer to the consumer, it means food waste. The category of food waste was defined in the Waste Framework Directive 2008/98/WE; it obliges the Member States to monitor the food waste that is generated and to take measures aiming at limitation of its production. The measurement and monitoring of food waste as a separate category of the waste may be carried out by different quantitative and qualitative methods; the practice in this respect is different in various countries.

It should be distinguished from the bio-waste on which the data are collected for the purpose of recovery of the biodegradable fraction from the stream of wastes and for the needs of organic recycling. To gain the reliable data in the EU countries and to ensure their comparability, the European Commission developed the guidelines, published in May, 2018 in the form of the Commission Delegated Decision (EC) supplementing Directive 2008/98/EC of the European Parliament and of the Council as regards a common methodology and minimum quality requirements for the uniform measurement of the levels of food waste. The question of measuring and systematic monitoring of the quantities and kinds of the food waste in the particular stages of the agri-food supply chain has not only the methodological and technical nature; it is directly connected with a comprehensive problem of food losses and food waste and the necessity of counteracting these problems due to the aims and principles of the permanent and sustainable development, adopted at the global level. This article presents the analysis of the guidelines and the strategic and legal conditions of the question of measuring and counteracting the food wastage at the global, European and national level.

## 2. THE GLOBAL, EUROPEAN AND NATIONAL GUIDELINES

The document, dedicated to the problem of the food losses and food wastage, adopted by the World Organization for Food and Agriculture (FAO) and published in the frames of Global Initiative on Food Loss and Waste Reduction (GIFLWR) emphasizes that the mentioned problem (Food Loss and Waste – FLW) has an impact on the following problems: food safety, regional and national economy, natural resources, the stream of the waste and environment; they are 3 important aspects of the sustainable development: social, economic and environmental [FAO 2014]. In turn, the Food Loss and Waste Accounting and Reporting Standard – FLW Standard, was developed by the Food Loss & Waste Protocol Partners organization, with the aim to determine the requirements and the guidelines for the governments, enterprises and other entities, interested in the identification of the sources of the food losses and the food waste generation, their quantification, monitoring and effective management in order to limit their production and reduce their impact on the environment. The goal of the discussed system is to enable the measuring and monitoring of the particular substances throughout the food supply chain and tracing of their destination place [World Resources Institute 2016]. The FUSIONS Project, as implemented within the frames of 7. Framework Programme in the years 2012–2016, was the comprehensive research project, dedicated to the elaboration of the methodology of measuring and targeted counteracting the food losses and the food wastage in the EU countries. According to the results of the mentioned project, about 88 million tons of foods per year are wasted in the EU countries; the related costs are estimated at 143 billion EURO [FUSIONS 2016]. In the case of Poland, there is a lack of detailed and actual estimates of the scale of the food wastage. According to the Eurostat data of 2006, c. 9 million tons of food are wasted in Poland. As calculated into a statistical inhabitant, Poland occupies the 5th place in the European Union in respect of the wasted food (235 kg/person/year). There is, however, a lack of detailed information about the scale of food wastage in the particular stages of the food supply chain [Justification... 2018].

At the global level, within the frames of sustainable development targets, the General Assembly of the United Nations (in 2015) adopted the aim to decrease by half the food wastage per inhabitant until 2030 in the segment of the retail sale and consumption of the households and to reduce the food losses throughout the whole food chain. The European Union and its Member States committed to reach the mentioned target at the appointed time. At the level of the EU, the conception is focused on the problems of food losses and food wastage, and by this, the generation of food wastes. It is the conception of the Circular Economy. It was presented in the Communiqués of the European Commission, submitted to the European Parliament, the Council of the European Economic and Social Committee and the Committee of the Regions: 'Closing the loop – An

EU action plan for the Circular Economy' [COM 2015] and in the Communication 'on a monitoring framework for the circular economy' [COM 2018].

The Resolution of the European Parliament of 16 May 2017 stresses the urgent need of limiting the quantity of the wasted food and the improvement of the effectiveness of the resources' use in the EU in all stages of the food supply chain, including primary production, processing, transport, storage, retail sale, placing on the market and consumption. The Member States are called on to adopt the measures necessary for reaching the limitation of the quantity of the food wastes in the EU up to 2025 and 50% reduction until 2030 as compared to 2014 [The Resolution... 2017]. The discussed Resolution called also on the European Union to examine, until the end of 2020, the possibilities of the binding EU targets as regards the limitation of the food waste quantities for the years 2025 and 2030 on the grounds of the calculations, carried out in accordance with the common technology. The EU Member States became obliged to monitor and introduce the measures, limiting the food wastage.

Any separate legal regulations as regards counteracting the food wastage have not existed until now. In Poland, only one facility in respect of the discussed problem includes the rules, introduced in 2009, on the exemption of the donations of the food producers from the tax on goods and services; since 2013, the mentioned rules have also covered the distribution of food. The aim of the Act on counteracting the food wastage, adopted in July 2019, was to determine the rules of the food handling and the duties of the food sellers, with the aim to counteract its wastage and the resulting negative social, environmental and economic consequences [The Act...2019]. The discussed Law introduced a mechanism, consisting of a free transmission of the unsold food products to the non-governmental organizations, preventing, in this way, their wastage and generation of the food waste. The mentioned Act applies to the trade units with surface above 250 m<sup>2</sup>, where the incomes from the sale of foodstuffs constitute at least 50% of the total incomes from the sale of all goods. The measurement of the food waste is not, however, the subject and the aim of the discussed legal regulation; therefore, it does not consider the mentioned problems, including the guidelines, connected with the methodology of their measuring and adopted in the Decision of the European Commission.

## 3. FOOD WASTE

The Waste Framework Directive 2008/98/EC obliges all Member States to monitor the generated food waste and take measures aiming at the reduction of their production. The mentioned Directive requires preventing their generation and limitation across the whole food supply chain, commencing from the primary production, processing and production on a retail level and during the whole food distribution, in restaurants and food service and also, in the individual households.

According to S. Corrado and S. Sall, most of the studies on measuring of the food waste are based upon the literature data and statistics, which may undermine the representativeness of the diagnoses, made on the grounds of these data [Corrado, Salla 2018]. The tests and the direct methods are most reliable; they allow obtaining the data, reflecting the real amount of food waste generated in the particular stages and in the specified links of the agri-food supply chain. The aim of the data collection should be a decisive element of the method for measuring of the food waste, although the adopted definitions, terminology and limits of the measured streams of the wastes are also significant [Corrado, Caldeira, Erikson 2019].

A lack of uniform terminology and methodology of measurement of food waste made the assessment of the scale, sources and identification of the trend changes difficult. The solution of the problem of measuring is an important step towards gaining the representative data and understanding the problems of food wastage, its scale and reasons and, ultimately, developing and introducing a systematic monitoring of the wastage level and food waste generation as well as designing the effective measures, counteracting the processes unfavourable for the environment and the societies. The system of measuring and monitoring should include all links and stages of the agri-food supply chain: the primary production, processing, distribution, food trade and food service and the households. On May 3, 2019, the Commission delegated Decision (EC) was published supplementing the Waste Framework Directive as regards a common methodology and minimum quality requirements for the uniform measurement of the level of food waste in the EU Member States (being called hereinafter 'Decision'). Its justification indicates that the difficulties in developing the coherent methodology of measuring come from the fact that each stage of the food supply chain differs in a type of the food waste and in respect of the reasons and determining factors [The Commission Delegated Decision 2019]. The discussed document is based upon the results and guidelines of the mentioned FUSIONS Project.

In the development of each methodology, the definitions of the basic descriptive categories and terms play a key role. According to the cited Commission Decision, the common methodology contains a binding definition of 'food' as specified in Regulation (EC) No 178/2002 [The Regulation 2002] and definitions of 'waste' and 'food waste' as specified in the Waste Framework Directive. In the mentioned Directive, 'waste' is defined as 'any substance or object that the holder discards or intends to discard or is required to discard' [Directive 2008]. The following products are excluded from the discussed Directive, and by this, from the definition of the waste:

- animal by-products, including the processed products, with the exception of those that are intended for heat treatment, disposal in a landfill or are to be transformed into biogas or composted [Official Journal 2009];

- animals that died other than by being slaughtered, including the animals that were killed for eradication of epizootic diseases and that are eliminated in conformity with the Regulation (EC) No 1069/2009;
- substances intended for feeding purposes.

Pursuant to Art. 2 of the Regulation 178/2002: 'Food' (or 'foodstuff') means any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans. On the other hand, 'foodstuff' shall not include feed and live animals unless they are prepared for placing on the market for human consumption and also, plants prior to harvesting. Definition of 'food' as specified in the regulation (EC) No 178/2002 covers food as a whole, across the whole food supply chain, from food manufacture to its consumption, without differentiation whether all parts of food are intended or not intended for consumption. Hence, food waste may contain the parts intended as well as the parts not intended for consumption, edible and inedible. According to Art. 3 (4) (a) of the Waste Framework Directive 'food waste' mean any food consistent with the definition contained in Article 2 of the Regulation (EC) No 178/2002, that became waste.

The present collected data on the waste and in particular, those gained for the needs of the waste statistics, do not contain detailed information on the quantities of the food waste. It is caused by the fact that the discussed waste is collected in a form mixed with other types of waste. The mentioned data do not also cover the products and substances discarded outside the organized system of waste collection. According to the Regulation (EC) No 178/2002 food waste shall not include the losses in those stages of food supply chain where certain products have not become food yet, for example, such as plants that have not been harvested. Definition of 'food' as specified in the Regulation 178/2002 covers also drinks. Water as being intentionally added to food during its manufacture, preparation or processing is treated as food. However, in the situation when water is utilized in food manufacturing processes due to other reasons such as cleaning or cooling down as is further transferred together with food waste, shall not be qualified as food waste. The measurement of food waste shall also not include non-food waste, which they are mixed with (e.g., soil, packages). The measurement of food waste shall be limited to material, which in conformity with the Directive is considered as waste. Hence, the material, which is excluded from the scope of the Directive, that is, agricultural material as referred to in Art. 2.1 (f) of the Directive, food destined for feeding purposes (acc. to Art. 2.2 (e) of the Directive, and animal by-products (acc. to Art. 2.2 (b) of the Directive, shall not be included to the process of measurement and monitoring of food waste. Also, by-products coming from processes of food manufacture and distribution, as defined in Art. 5 of the Directive shall not be qualified as food waste.

**Table 1.** The methods for the measurement of food waste in relation to the stages of food supply chain

Stage of the food supply chain	Methods of measurement				
Primary production	Direct measurement	Mass balance		<ul style="list-style-type: none"> <li>– questionnaires and interviews</li> <li>– coefficients and production statistics</li> <li>– waste composition analysis</li> </ul>	
Processing and manufacturing					
Retail and other distribution of food			Waste composition analysis	Counting/scanning	Diaries
Restaurants and food services					
Households					

Source: The Project of the Commission Delegated Decision (EU) supplementing Directive 2008/98/EC of the European Parliament and of the Council (Waste Framework Directive) regards a common methodology and minimum quality requirements for the uniform measurement of levels of food waste

#### 4. THE METHODS OF MEASURING THE FOOD WASTE

As it is reported by S. Corrado, C. Caldeira et al., the current experience in respect of measuring of the food waste shows the significant discrepancies in the approach and the adopted methodologies of their measurement. It is reflected in a meaningful uncertainty of the obtained data and incomparability of the results [Corrado, Caldeira, Erikson 2019]. It restricts their suitability for the representative estimates of the food waste generated, and undertaking the remedial measures and monitoring of the progress in their reduction.

The adopted Commission Delegated Decision recommends monitoring of the amounts of the food waste, as generated at each stage of the food supply chain. It is also recommended to systematically run the analyses of the proportion of the food chain in the total quantity of the waste, at least once per 4 years. The Decision enables the application of many methods for measuring and analysis of the level of the food waste that is generated, performance of the studies and utilization of the data, gathered for the needs of other systems, including for the need of the waste statistics or the duties of reporting by the enterprises.<sup>1</sup> The methods recommended by the European Commission within the uniform methodology, including their assignment to the particular stages of the agri-food chain are given in Tab. 1. On the other hand, Annex III to the Decision contains the description of the particular methods, as presented in Tab. 2.

The direct methods consist of a direct physical access to food waste and their physical measurements. The mentioned

methods include: direct measuring, scanning and counting, waste composition analysis and running the diaries. When there is no direct (physical) access of food waste, or when the direct measurement is not possible, the EU methodology recommends the application of indirect methods, which include mass balance and use of coefficients.

The most universal and recommended method in the EU for all stages (links) of the agri-food supply chain consists in the direct measuring and analysis of the composition of the waste. All the discussed definitions have been given in Tab. 2. From among the other methods of direct measuring at the initial stages, that is, the primary production, and processing, the survey methods and interviews are also recommended. In the case of indirect methods, the application of the coefficients is preferable. The remaining direct methods for the middle and final stages, that is, food trade and distribution, gastronomic units and the households, scanning and counting of the mass of the food waste and running the diaries are recommended.

The Decision shows that measurement need not include the food wasted in scarce quantities such as waste coming from cleaning of the streets. The measurements shall not cover the following items:

- agricultural material referred to in Art. 2 (1) (f) of Directive 2008/98/EC,
- animal by-products referred to in Art. 2 (2) (b) of Directive 2008/98,
- food waste residues collected together with packaging waste (classified under waste code '15 01 – Packaging' in the European list of waste),
- food residues collected with the waste classified under waste code '20 03 03 – Street cleaning residues'
- non-food materials that are mixed together with food waste when collected, to the extent possible,
- food waste drained as or with wastewater,
- substances that are destined for use as feed materials referred to in Article 2 92) (e0 of Directive 2008/98/EC.

<sup>1</sup> It refers to the available data having a social-economic nature such as statistics concerning population, production and trade, information on scientific studies and consumer studies.

**Table 2.** Direct and indirect methods for measurement of food waste

Name of the method	Description of the method
<b>Direct methods</b>	
Direct measurement (weighing or volumetric assessment)	It consists of use of measuring device to determine the mass of food waste samples or fractions of the whole food waste, conducted directly or on the basis of their volume. It includes measurement of separately collected food waste
Scanning/Counting	Assessment of the number of items that make up food waste, and use of the result to determine the mass
Waste composition analysis	Physical separation of food waste fraction from other fractions in order to determine the mass of the fraction sorted out
Diaries	An individual or a group of individuals keeps a record or log of food waste information on a regular basis
Surveys and interviews	It consists of the development of the surveys (questionnaires) in the range of the quantitative and qualitative data and gaining appropriate information from the respondents
<b>Indirect methods</b>	
Mass balance	Calculation of the amount of food waste based on the mass (weight) of 'inputs' and 'outputs' of food into and out of the measured system, considering processing and consumption of food within the system
Coefficients	Use of previously established food waste coefficients or percentages being representative for a food industry sector or for individual business operator. Such coefficients or percentage shall be established through sampling, data provided by food business operator or by other methods.

Source: The European Commission Delegated Decision supplementing Directive 2008/98/EC of the European Parliament and of the Council (Waste Framework Directive) regards a common methodology and minimum quality requirements for the uniform measurement of levels of food waste

The Member States shall have the possibility of extending the scope of collection and reporting data connected with the food waste with the differentiation of the following items:

- edible fraction;
- fraction of waste coming from primary production, processing and manufacture, retail sales; and of the remaining points and forms of food distribution; restaurants and catering service – being drained or removed together with waste;
- products redistributed in order to prevent food waste;
- food further processed as feed, including foodstuff in compliance with the definition referred to in p. 3 of part A of Annex to the Commission Regulation (EU) No 68/2013 of 16 January 2013 on the Catalogue of feed materials.

The methods and the guidelines, recommended by the European Union, provide a relatively wide spectrum of the choice of the methods, considering the specificity of a given stage in the agri-food chain as well as of the object concerned. They have the non-restrictive and flexible nature, oriented to the practical application. It is supported by the fact of eliminating the food waste produced in very

small quantities, the other mentioned above exclusions and admission of the facultative (optional) types of the data, collected by the Member States as well as of the supplementary indicators, given in Tab. 3.

## 5. THE FOOD WASTE MEASUREMENT REPORTING

The reports concerning measuring of the food waste shall be communicated to the Commission in accordance with the reporting outline as specified in Article 37 par. 7 of Directive 2008/98/EC. The data being collected under the Regulation (EC) No 2150/2002 on the waste statistics do not allow a precise identification of the food waste within the total system of collecting and reporting the data concerning the waste generation. Similarly, the list of the waste referred to in Article 7 of the Waste Framework Directive, as being established in Annex to the Commission Decision 2000/532/EU does not enable the univocal identification of the food waste. According to the Waste Framework Directive, the Member States shall communicate the quantities of the generated food waste in the annual scale. Apart from the data submitted



in conformity with Article 5, the Member States shall send the reports concerning the quality of the monitored or estimated data. The report shall include the following items for each stage of the food supply chain:

- the employed methods for measurement as regards the methods specified in Annexes II and III, the additional assumptions used in calculations and any eventual modifications of the adopted methods in relation to the previously used ones,
- description of the measures used in order to assure the appropriate quality of the measurement results;
- identified sources of uncertainty and their probable impact on the reported results.

As the types of wasted food and the factors contributing to their generation differ considerably between the particular stages of the food supply chain, it is recommended in the Decision to monitor them separately. Assignment of the food waste to different stages of the food supply chain should be carried out in conformity with the EU statistical classification of the economic activities in the European Union, established by the Regulation (EC) No 1839/2006 of 20 December 2006 as 'NACE Revision 2' ('NACE Rev. 2') and, in the case of lack of the appropriate Classification NACE Rev. 2, using 'households' as referred to in Annex I section 8 point 1.2 to the Regulation (EC) no 2150/2002 [Regulation 2002] on waste statistics. In Annex I to the Decision Project, the codes NACE Rev. 2 (Statistical Classification of Economic Activities in the European Union; commonly referred to as NACE for the French term: 'Nomenclature statistiques des activités économiques dans la Communauté européenne') were indicated for the first four stages; in the case of the households, the reference was made to Section 8 point 1.2 of Annex I to the Regulation (EC) 2150/2002. To each stage of the food supply chain, appropriate codes of waste are assigned, identified in the process of measurement of the amount of food waste and generated in the individual stages. They are presented in a form of tables in Annex IV to the Commission Decision and include the codes of waste as contained in the European list of waste for the types of waste that usually contain food waste [Decision of the European Commission 2000].

In the case of measurement of food waste in the reference periods, in which the data concerning the total amount of the said waste are unavailable, the Member States should utilize social-economic data relevant for particular stages of the food supply chain. Calculation of the food waste should be based upon the newest data on the amount of food waste, generated in a given stage of food supply chain, and the difference between the year of the last measurement of the quantity of the food waste in a given stage and the present reference period, for one or greater number of social-economic indicators. In Annex IV to the Decision, each stage of agri-food chain has the assigned indices, which should be monitored for the need of reporting (Tab. 3).

**Table 3.** Indicators supplementing the measurement of food waste in the particular stages of the food supply chain

Stage of the food supply chain	Wskaźnik Indicator
Primary production	Food production in agriculture, fishery and hunting
Processing and manufacturing	Production of processed food – based on PRODCOM4 data.
Retail and other distribution of food	Turnover of food products Population
Restaurants and food services	Turnover Employment (in Full Time Equivalents)
Households	Population Households disposable income

Source: Project of the Commission Delegated Decision (EU) supplementing Directive 2008/98/EC of the European Parliament and of the Council as regards a common methodology and minimum quality requirements for the uniform measurement of levels of the food waste in the EU Member States

The Member States may also use additional indicators if they are better correlated with generation of food waste in a given stage of the food supply chain.

## 6. SUMMARY

Adoption of uniform and consolidated methodology for the measurement of the amount of wasted food at the level of the EU is the important step towards the systemic approach to solving the problem of food losses and wastage and generation of food waste. Its first step is to assess their real quantities. It has a meaning from the economic, social and environmental viewpoint. It will allow more effective management of natural resources; the increase of the level of availability of food for the people, especially for those less wealthy and the reduction of negative impact of environment caused by wastage and contamination emitted to environment and atmosphere. The mentioned activity is contained in the aims of permanent and sustainable development, in particular, its operating conception, that is, circular economy, striving at preventing waste generation, including food waste, and at obtaining the possible highest level of recovery of valuable raw materials and their secondary economic utilization in the system of production and consumption.

The methods for measurement and monitoring of food losses, wastage and food waste as well as the definitions of key categories and terms connected with the discussed

problems are numerous. It was demonstrated by the results of the research project dedicated to the mentioned issue, that is, FUSIONS Project. Proposal to unify the methodology in this matter as submitted in the Commission Delegated Decision supplementing the Waste Framework Directive as regards a common methodology and minimum quality requirements for the uniform measurement of levels of food waste in the EU Member States will facilitate the standardization of activities in respect of the measurement and monitoring of food losses and food waste and obtaining better coherence and comparability of data, making easier their later aggregation on the regional, the national and the European level.

## ACKNOWLEDGEMENT

The article was prepared within the project: "Development of a waste food monitoring system and an effective program to rationalize losses and reduce food waste", acronym PROM implemented under the STRATEGIC SCIENTIFIC AND LEARNING PROGRAM - GOSPOSTRATEG financed by the National Center for Research and Development in accordance with the provisions of Gospostrateg1 / 385753/1/2018

## REFERENCES AND LEGAL ACTS

- The Act of 19 July 2019 on counteracting the food wastage, Official Journal of Laws, 2019, item 1680.
- COM (2015) 614 final 02.12.2015.
- COM (2018) 29 final 16.01.2018.
- The Commission Delegated Decision (EU) of May, 3, 2019 supplementing the Directive of the European Parliament and of the Council 2008/98/EC as regards a common methods and minimum quality requirements for the uniform measurement of levels of food waste. Official Journal of Laws of the EU L 248/77.
- CORRADO S., SALLA S. 2018. Food waste accounting along global and European food supply chains: State of the art and outlook, Waste management, V. 79.
- CORRADO S., CALDEIRA C., ERIKSON M. et al. 2019. Food waste accounting methodologies: Challenges, opportunities and further advancements, Global Food Security, V. 20.
- Decision of the European Commission 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1 (a) of the Council Directive 75/442/EEC on waste and Council Directive 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EC on hazardous waste.
- Directive 2008/98/EC Art. 3 point 1.
- FAO 2014. SAVE FOOD. Definitional Framework of Food Loss, Global Initiative on Food Loss and Waste Reduction GIFLWR.
- FUSIONS 2016. Food waste quantification manual to monitor food waste amounts and progression, Paris.
- Justification to the Act on counteracting the food wastage 2018: [www.senat.gov.pl](http://www.senat.gov.pl)
- Official Journal of Laws EC L 300 of 14.11. 2009, p. 1. It refers to the products covered with the Regulation (EC) No. 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Animal by-products Regulation).
- The Regulation (EC) 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of the food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety (Official Journal of Laws EC L 31 of 1.02. 2002, p. 1, with later amendments).
- Regulation (EC) 2150/2002 of the European Parliament and of the Council of 25 November 2002 on waste statistics.
- The Resolution of the European Parliament of May, 16, 2017 on the matter of the initiative concerning the effective management of the resources: limitation of the wastage and increase of the food safety (2018/C 307/03).
- WORLD RESOURCES INSTITUTE 2016. Food Loss and Waste Accounting and Reporting Standard, Version 1.1.