

An Empirical Research regarding the Food Waste Phenomenon in Romania Compared to Other Countries from European Union

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The negative effects generated by the food waste, show that this phenomenon has become a stringent problem of the century we are living in, a social, economic and natural problem with a significant impact at global level.

This food waste phenomenon, both at the European Union level and at the Romania level appears mostly within the households and services sector, and under these circumstances, this research represents a comparative analysis of the actual situation regarding the food waste in those two sectors, in European Union and in Romania, illustrating the evolution of this problem over time, based on relevant information from sources as: Eurostat, articles, reports from some European institutions and bodies.

Keywords: *European Union, food waste, household, Romania, services.*

JEL classification: Q53, Q56

Introduction

In the actual context, the food waste has become a major problem at global level through the negative effects in connection with the environment and humanity (Melikoglu et al., 2013). Although there hasn't been adopted any official definition of food waste yet, different definitions being used nowadays. According to FAO (Food and Agriculture Organization of the United Nations), the food waste represents the edible material, specific for human consumption, anywhere within the food supply chain which is wasted, lost, altered or consumed by pests (FAO, 1981).

Another definition presents the food waste as the edible material intentionally served as nourishment to animals or as a product derived from processed food, not intended for human food. (Stuart, 2009)

In order to present the conceptual frame of the food waste problem, it is necessary to define the concepts that cast this issue. FAO promote different definitions for the conceptual approach of food waste and of this type of rubbish (FAO, 2011).

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The biological wastes are biodegradable wastes produced in gardens and parks, food and kitchen wastes coming from households, restaurants, from commercial entities and from food production units.

Food loss can be defined based on food products that during the life cycle of supply chain are wasted, altered or lost while processed or during the management process, and all these happen before the product is exposed on the shelf for sale.

Food waste is represented by the food products being the main consumption basis for the people, which are consciously thrown away, for negligence or due to lack of economic need.

Compared to food loss that usually appears during the pre-sale stage, the food waste appears during all the stages within the food supply chain, starting from the producer source, e.g. the producer's holding, until the final consumer, in the kitchen.

1. Literature Review

Based on the above definitions, it can be noticed that this subject has been researched since 1980, but, what's even more important, some studies are dating back to 1939. For example, the study regarding the calories lost percentage as a waste in a diets mixt, investigating the wasteful way in which the food products are consumed (Carthcart & Murray, 1939).

This food waste appears during all the stages, starting from the production phase and until the consumption stage, within the producer's holdings, grocery stores, restaurants and households (Jones, 2006).

The European Commission presents the fact that only at the European Union's level, almost one hundred million tonnes of food is thrown away as waste every year. Among this food thrown away as rubbish, there is a significant quantity of products that are proper for human consumption (Commission to the European Parliament, 2011).

An analysis carried out in 2008 quantifies a food waste up to 50% of cultivated food, being wasted before and after its arrival at the consumer (Lundqvist, 2008).

The food is one of the most important factors that puts pressure on the environment through the water consumption, resources use and through the greenhouse gas emission, generating pollution and climatic changes (O'Connor et al., 2014).

According to FAO, the food waste is one of the major problems considering the efforts made while fighting the climatic changes, combating hunger, increase and improvement of food safety, almost a quarter from the food produced for human consumption is lost or thrown away (FAO, 2011).

According to the "Roadmap of European Commission", the value chain for food and beverages in EU generates a rate of 17% from the greenhouse gas direct

emissions and 28% from the material resources use (Commission to the European Parliament, 2011).

Furthermore, the food waste has also a social impact; in global food industry the food request from one side of the world indirectly affects the resources from other sides of Earth. In this context, a food waste behaviour from developed countries affects the food availability in the developing countries. There is currently almost a billion people undernourished, and they could have the food needs assured only if the developed countries would waste less (Stefan, 2011).

Global food security will be one of mankind's major challenges this century (Vanham et., al, 2015).

2. Objective and Methodology of Research

The main objective of this research is to identify for comparison the current situation of the food waste phenomenon at the European Union level and at Romania level, within households and within services sector, through statistical data.

In order to carry out this study, an empirical research was used, collecting relevant information regarding the above mentioned subjects from sources as: Eurostat, articles, reports from some European institutions and bodies and afterwards this information was interpreted based on the below charts.

3. Results and Discussions

The approach of the above mentioned subject in this research aims to a comparative analysis carried out for European Union and for Romania.

3.1. Food waste analysis in European Union

3.1.1 Food waste triggers

Food waste exists at different levels in the food supply chain, although it is most defined at retail and household level (Parfitt et al., 2010).

During the entire food supply chain, there are some causes that determine the food waste, this chain being composed of the following segments: production segment, processing segment, marketing and consumption segments (European Court of Auditors, 2016).

The production segment is mostly characterized of causes like: inobservance of ripening cycle, inobservance of harvesting techniques, improper transportation and deposit of food products and rigorous sorting of products based on esthetic criteria.

In the processing segment, the causes usually alleged are: loss during the processing, damages of some products during the deposit and returning not-marketed products to the providers.

At the level of marketing segment, the causes that generate a significant food waste are the following: expiry of the validity of the products exposed for sale, but also of the products in stock, oversized stocks of products, damages of the products during the deposit and the refusal of the products for sale due to some esthetic conditions.

Among the most obvious causes that determine the appearance of food waste phenomenon in the consumption segment, we can find causes like: incorrect planning of food needs, their processing in excessive quantities, and degradation of the cooked food in a short time and the lack of time necessary for the consumption of cooked food.

3.1.2 Instruments for food waste assessment at the European Union level

In order to correctly approximate the food waste quantity, it is necessary an analysis of the support indicators, based on which the situation can be assessed.

The waste categories in Eurostat are based on the European waste classification for CED-Stat Statistics. Previous studies suggested the category “EWC_09_NOT_093: Animal and vegetal waste excluding slurry and manure” as a pertinent indicator for the food waste approximation.

Table 1. Base of indicators

Category	Cod
Animal and mixed food waste	W091
Vegetal wastes	W092

Source: Eurostat, code [env_wasgen]

The categories included in the code “EWC_09_NOT_093” are available for all the states member of the EU depending on the NACE classification by activity branches. A NACE branch relevant for the subject follow up is “EP_HH - Households” - however, there are no specific data for retail and catering sectors. Those two sectors are included in the “Services” branch covering the NACE sections from G (Services - except wholesale of waste and scrap - G-U_X_G4677) up to U (except from G46.77).

3.4.1.3 Statistical dimensions at the European Union level

In figure 1 and figure 2 the food waste situation is presented by two indicators: “Animal and mixed food waste” and “Vegetal wastes”, at the household level, based on the last valid data for the countries in European Union, provided by Eurostat.

Figure 1 present the countries generating a food waste volume bigger than a million tonnes, and figure 2 presents the countries where the food waste volume does not exceed a million tonnes.

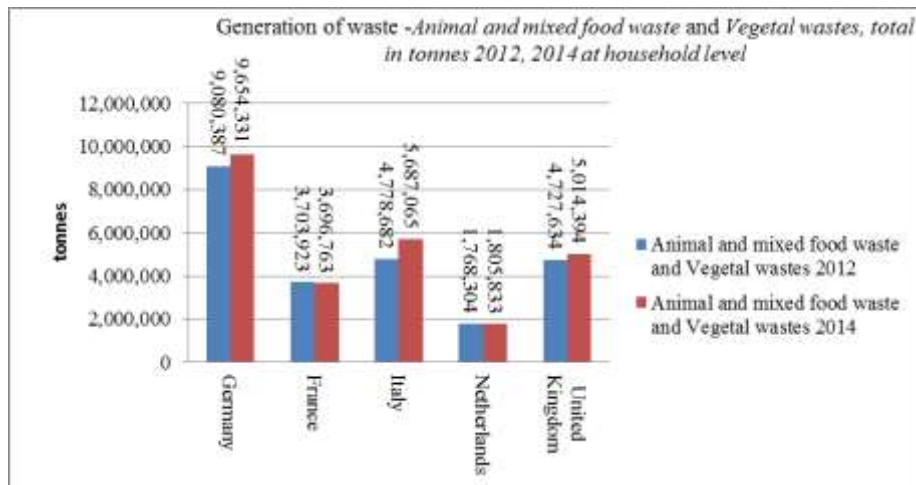


Figure 1. Quantities of waste generated in European Union - for the categories “Animal and mixed food waste (W091) and Vegetal wastes (W092)” at household level, total in tonnes, 2012 and 2014, for those countries generating more than a million tonnes of food waste (Source: Eurostat, code env_wasgen)

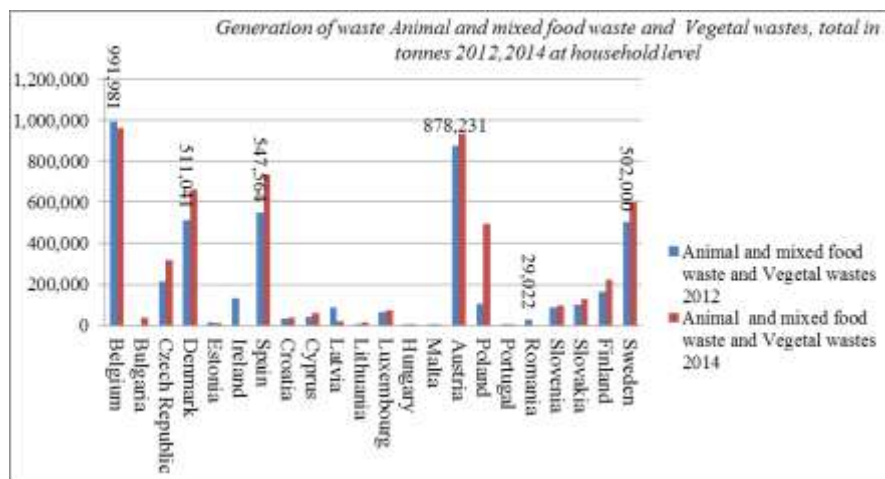


Figure 2. Quantities of waste generated in European Union - for the categories “Animal and mixed food waste (W091) and Vegetal wastes (W092)” at household level, total in tonnes, 2012 and 2014, for those countries generating less than a million tonnes of food waste (Source: Eurostat, code env_wasgen)

As it can be noticed from figure 1 and figure 2, we can say that the food waste phenomenon divides the EU countries into two categories; the first category is represented by the countries generating a food waste volume bigger than a

million tonnes, and the second category is represented by countries generating less than a million tonnes of waste.

Obviously, in this context, the countries ranking the first five places are represented in figure 1: Germany (9,080,387 tonnes/year), Italy (4,778,682 tonnes/year), United Kingdom (4,727,634 tonnes/year), France (3,703,923 tonnes/year) and Netherlands (1,768,304 tonnes/year), illustrative values of 2012.

Among the countries generating a food waste volume smaller than one million tonnes, the ones ranking the first places are: Belgium (991,981 tonnes/year), Austria (878,231 tonnes/year), Spain (547,564 tonnes/year), Denmark (511,041 tonnes/year) and Sweden (502,000 tonnes/year).

A significant concern is the fact that the food waste quantity at European level is increasing, as it can be concluded from figure 3. In 2010, the European Union registered a value of 26 million tonnes, and later on, in 2014, the waste level exceeded the value of 31 million tonnes.

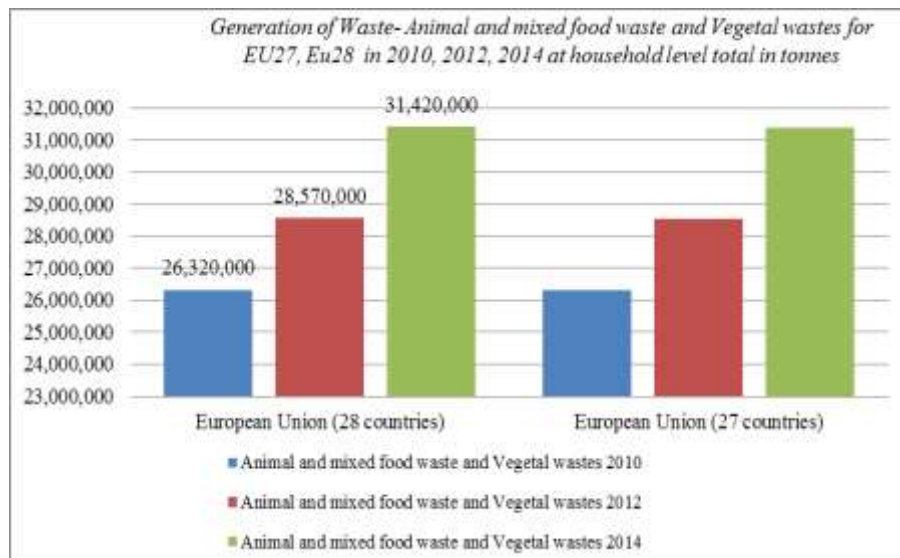


Figure 3. Quantities of food waste generated in EU27 and Eu28 – for the categories “Animal and mixed food waste (W091) and Vegetal wastes (W092)” for household sector, total in tonnes, 2010, 2012 and 2014 (Source: Eurostat, code env_wasgen)

Based on the same indicators, but analysing the services sector, the values reached at the food waste level in this field are presented in figure 4.

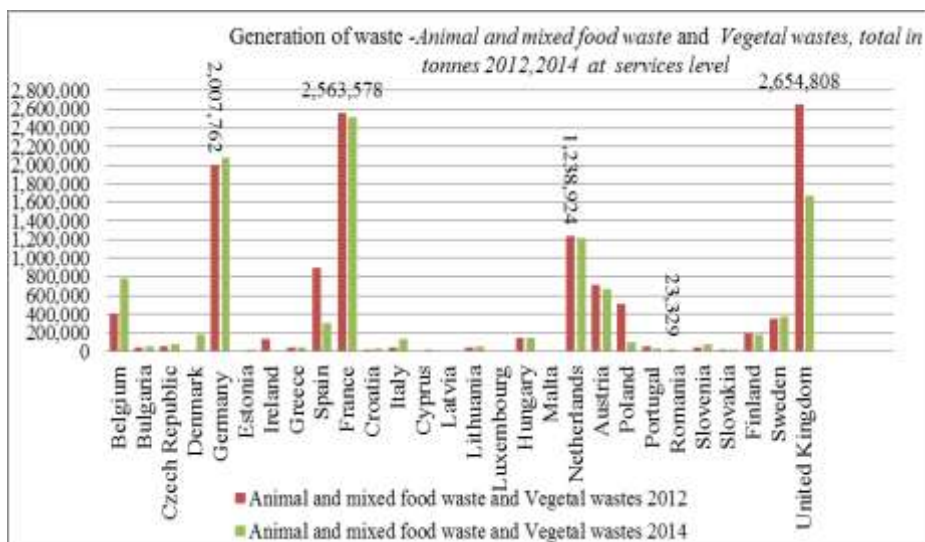


Figure 4. Quantities of waste generated in EU – for categories „Animal and mixed food waste (W09) and Vegetal wastes(W092)”for services sector, total in tonnes, 2012 and 2014
(Source: Eurostat, code env_wasgen)

Furthermore, from the chart, we can see the fact that the countries ranked on the top are the same as at the household level, except from the fact that Italy generates in this sector a significant lower food waste volume. On the other hand, the food waste volume generated by most of the countries in EU is smaller than the food waste registered at household level reaching values as: United Kingdom (2,654,808 tonnes/year) France (2,563,578 tonnes/year), Germany (2,007,762 tonnes/year), Netherlands (1,238,924 tonnes/year).

Romania ranks a positive position both at household level and at services sector level, registering a food waste volume which is below the European average, generating also a less significant quantity of food waste at the household level compared to services sector.

3.2 Food waste analysis in Romania

The National Association for Consumers Protection and Programs and Strategies Promotion in Romania (A.N.P.C.P.P.S.) – InfoCons carried out a national study approaching the food waste subject.

The analysis was based on the fact that the consumers should have filled in a survey with 21 questions, and its results were the following (Infocons, 2014):

32% from the surveyed people with ages between 30-39 years, most of them women (59%) coming from urban environment (85%), with academic and postgraduate education (46%), having a family composed of 1-3 members (78%), spend for food between 500-900 RON (110-200 Euro) each month (39%);

According to people's answers, the main causes why the food is thrown away are the following: their degradation in a very short time (26%), an incorrect estimation of food quantity consumed during a repast (21%) and shopping done in exaggerated quantities (14%);

They also think that the main methods to avoid food waste are as follows: a correct estimation of food needs (19%), doing the shopping by drawing up a list before leaving home (14%). It was noticed that among the food products usually becoming rubbish, there are: cooked food (25%), bakery products (21%), vegetables (19%) and fruits (16%).

Among the surveyed consumers, 53% throw away less than 10% from the total of bought products each month, and 22% throw away the food in a percentage between 11-20%.

45% from the buyers acquire their products from the neighbourhood shops, less than 15% from the buyers don't collect separately their waste due to the fact that they don't have a proper system for home collection, but 92% from the consumer would be available for separate collection.

The main modalities resulted from the study regarding the reduction of food waste quantity at each household level are: proper assessment of own consumption based on appropriate food quantity acquisition (47%), use of some sorted waste collection system that should include separate containers for food/organic waste (30%) and buying food products with extended validity (11%).

Food waste generated at home is encountered in consumers' food-linked activities. Romanian consumers' food waste at home is mostly driven by their routines in terms of planning and shopping of food (Tudoran et al., 2013).

In Romania, as in other countries members of European Union as well, the generated food waste is higher at the household level in relation to the services level, 29,022 tonnes/year compared to 23,329 tonnes per year.

According to the last data registered by Eurostat for Romania regarding the food waste (figure 5), as a total volume at national level, both for the household sector and for the services sector, based on the two indicators "Animal and mixed food waste- W091 and Vegetal wastes - W092", Romania occupies a position in the second part of the ranking, with a quantity exceeding 50,000 tonnes of food waste (52,351 tonnes/year); therefore, it occupies a positive position considering the European average.

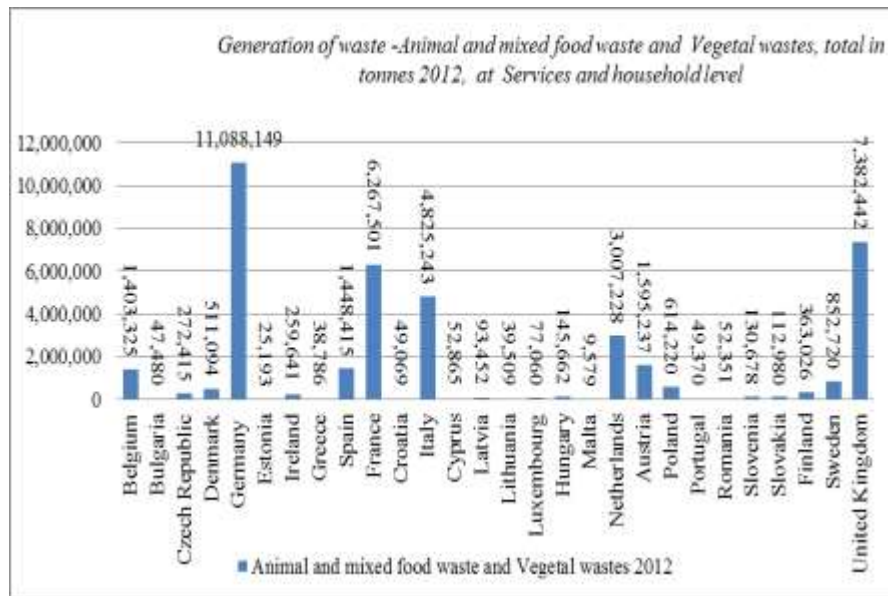


Figure 5. Quantities of food waste generated in EU –for the categories „Animal and mixed food waste (W091) and Vegetal wastes(W092)” at services sector and household level in 2012
(Source: Eurostat, code env_wasgen)

Conclusions

After the analysis regarding the food waste in European Union and in Romania, the following main conclusions were taken: the European Union, as a whole (EU28) generates each year an increasing quantity of food waste in relation to the previous year. At European Union level mainly, but also as far as it concerns Romania situation, significant quantities of food waste come from households. In this problematic phenomenon, Romania does not occupy an alarming rank within the European table regarding the generation of food waste, as it is ranked on the second part of this table and for both sectors, Romania has a rate under the European average.

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