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DECEMBER, 2021
ROMANIA



Study of Food Waste in Romania

Advisory Group 2 - Policy
and governance tools

Study of Food Waste in Romania

Prepared by:



In collaboration with:



Grant:

Study on food waste and its carbon footprint in Romania, code GI2021-02,

No. 084 / 25.02.2021

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Terms and abbreviations

CE - Circular Economy

BA - Bank for food collection and distribution

MADR - Ministry of Agriculture and Rural Development

EC - European Commission

EU - European Union

FAO - Food and Agriculture Organisation of the United Nations

HORECA - Hotels/Restaurants/Cafés

R&D - Research and Development



Chapter I. Food Waste in Romania



1.1 History

The history of food waste is closely linked to globalization. In an increasingly connected world, supply chains are getting longer and everything is available everywhere - Indian mangoes in Germany and American apples in Indonesia - all year round. In that often-long journey from the farm to the table, food is lost or wasted at every stage, and fresh foods such as fruits, vegetables, dairy and meat are particularly vulnerable.

Food waste is a current global concern. The need to feed a growing population can be satisfied by rationally managing food systems. Ensuring the food security of the population is the obligation of each state. The problem of food security, where the population has access to basic agri-food products of adequate quality, is a major concern faced, to a greater or lesser extent, by all the states of the world, but most intensely felt by the underdeveloped or developing nations (Oancea et al., 2012; Andreea et al., 2019).

Food waste is any food and/or inedible parts lost or wasted in the food chains that need to be recovered or disposed of (by composting, anaerobic digestion, bio-energy production, incineration or storage of organic waste). The term "food waste" doesn't always mean the same thing, however here, food waste refers to any product or part of a product grown, captured or processed for human consumption, which could have been consumed if it had been handled or stored under different conditions. Food waste refers to any food and inedible parts of food that are removed from the food chain for recovery or disposal (including composting, arable/non-harvested crops, anaerobic degradation, bioenergy production, cogeneration, incineration, disposal in sewage system, landfills or back to sea) (Herzberg et al., 2020).

Research has shown that food waste poses major problems at national and European level. There is a desire from the authorities to solve this problem, and steps towards solving it are constantly being taken, but it is irrelevant to estimate the time when food waste will be reduced to grasp the change in good (Antoneac et al., 2019).

With regard to total food waste, both at national and European level, the general trend is constant. The actions to reduce food waste in Romania started to be observed at the time of Romania's accession to the European Union. Prior to its accession, Romania did not comply with the existing European measures in this regard, but subsequently a drastic improvement was observed.

The issue of food waste (in terms of social responsibility) was analysed at the level of a well-known retailer in Romania, highlighting the main aspects that should be considered for the success of a social entrepreneurship initiative (for example, a clear articulation of the problem and solutions, mobilization of civil society actors, perseverance and implementation of a strategy in accordance with the resources held by the retailer). The study concludes that food waste management based on the principles of social entrepreneurship can lead to a sustainable competitive advantage for traders (Cantaragiu, 2019).

Following the research carried out on a sample of 900 respondents, from 153 cities in Romania, an individual profile representative for food waste was identified: male consumer, under 35 years old, alone, with a high level of education. The explanations found for the identified profile are the lack of interest in food resource management, the deficit in time management and the influence of modern consumer-oriented marketing tools. Thus, changing consumer attitudes, as well as awareness and education campaigns are factors that can have a significant impact on reducing food waste (Iorga et al., 2017).

Another study assessed the existence of consumer groups in Romania based on their perception of food waste and the actual behaviour related to this topic. The results revealed the existence of three clusters at the level of the surveyed population: "Inattentive", "Cautious" and "Ignorant".





Similar results were obtained in Italy by Talia et al. which identified three consumer groups. Of these, the “Unconscious Consumers” cluster in Italy has in common certain elements with the “Inattentive” in Romania: both clusters are made up of rural consumers who do not feel responsible for food waste and have no information on this subject. Another similarity resulting from the comparison of the clusters identified in the two countries is between “Conscious Consumers” in Italy and “Precautions” in Romania: people belonging to these groups know the problem of food waste and try to avoid it as much as they can. Checking the expiration date of food as a method of waste prevention is a feature of consumer behaviour in the “Precautions” group. Some Romanian consumers belonging to the “Ignorant” group have a high level of education and come mainly from urban areas (Di Talia et al., 2019; Giordano et al., 2019; Pocol et al., 2020).

Unlike the results of the research conducted by Djekic et al. and Richter who identified the presence of guilt among consumers as a significant variable in cluster modelling, the present study could not confirm the importance of this variable. The level of education does not always seem to be an important predictive factor regarding the topic of food waste. This result is confirmed by Delley and Brunner, 2017 who identified a similar group of consumers in Switzerland, entitled “Indifferent”, composed of people with a high level of education, but disinterested in food waste (Elimelech et al., 2019; Delley et al., 2017).

The influence of socio-demographic factors on the attitude of urban consumers towards the phenomenon of food waste in Romania was also studied by Cantaragiu who demonstrated the existence of major differences between women and men, belonging to different age segments, in terms of attitude towards food waste. In this regard, women between the ages of 20 and 30 are more likely than men to feel guilty about throwing away food and associating food waste with social inequality. As they age, women become more representative for food waste and irresponsibility (Cantaragiu, 2019).

A recent study conducted in Romania analysed the behavior of consumers regarding food waste when they are on vacation, in the tourist reception structures in rural areas. The authors of this study showed that there is no significant impact of socio-demographic factors (sex and age) and length of stay on the behaviour of Romanian tourists in terms of food waste (Stefan et al., 2013).

1.2 Types of food waste

Five boundaries of the system have been distinguished in the food supply chains of plant and animal goods. Food loss / waste was estimated for each of these segments:

- Commodities and plant products agricultural production: losses caused by mechanical damage and / or spills during the harvesting operation (for example, cutting or harvesting fruit), crops sorted after harvesting;
- Handling and storage after harvest: including losses due to leakage and degradation during handling, storage and transport between farm and distribution.
- Processing: including losses caused by spillage and degradation during industrial or domestic processing, for example, juice production, preservation and baking of bread. Losses can occur when crops are sorted if they are not suitable for processing or during washing, peeling, slicing and boiling or during process interruptions.

1.3 Quantification of food losses

Regarding the general recycling rate of municipal waste, Romania registered the highest increase in the period 2008-2014, which was over 14.5 times. Of this amount, 24% is cooked food, 22% - fruits, 21% - vegetables, 20% - bakery products, 11% - dairy products and 1% - meat. We waste almost as much as the European average, although we have much lower incomes and spend about 40% of them on food (Gheorghescu et al, 2019).

Despite all this spectacular growth, in 2014, Romania, with a recycling rate of 13.1%, occupies almost the last place in the European Union, surpassing only Malta and Slovakia. Regarding the recycling rate of packaging, it increased 1.64 times in Romania in the same period of time, from 33.5% to 54.8%.

The registered growth places Romania on the second place at the level of the European Union (which registered a general increase of only 5% from 60.5% to 65.5%), being surpassed only by Cyprus. The 54.8% rate places Romania in the second part of the European ranking, surpassing only Liechtenstein, Malta, Croatia and Greece.



It is important to note that Romania, in 2014, was approximately 29.84% of the average EU recycling rate for municipal waste and 83.66% of the average EU packaging recycling rate (Strat et al., 2018).

Paradoxically, some Romanians know that the main problem is the amount of food bought. 39% of the respondents in a study believe that they could reduce waste by correctly estimating the food they need, 34% would like to be able to selectively collect food waste in order to recycle it, and 15% believe that they could recover it. The data belong to an experimental study conducted by the environmental consultant EPC at the request of the association "MaiMultVerde" and the Resource Centre for public participation (Ce-Re). The specialists applied around 100 questionnaires to consumers and talked with representatives of producers and retailers. They pointed out that the data are not representative and that a much more in-depth analysis of the food waste phenomenon is needed (Gheorghescu et al., 2019; Gadde et al., 2016).

With regard to their own assessments of necessary measures at company level, the options of entrepreneurs in productive links, including public catering, come as the main measure to reduce the waste of investments in new technologies, with increased efficiency. The distribution sector believes that better business management is the solution for its representatives. However, the appetite of entrepreneurs in this direction is low. A significant problem is that entrepreneurs do not correlate the chosen lines of action with the various causes, identified by themselves, remaining to conventional, often formal solutions. Agricultural producers reuse waste mainly for composting / fertilizer, processors are mainly looking for internal solutions for the recovery of by-products, distributors are inclined to resort mainly to donations, but also in very small proportions, and the food sector is tempted to optimize its supply and launch new products to encourage consumption. The situation also seems to be perpetuated in the short-term action plans at the level of the whole food chain.

Food processing has higher losses in the bakery and meat industry. Losses in confectionery as well as technological losses in meat processing are also significant. The main sources of losses in retail are related to damaged and expired products. In public catering, the types of products subject to loss are represented by various food scraps (from the preparation process, uneaten scraps from served portions or expired food) as well as expired raw materials. At the level of consumers' households, the data indicate bakery products and home-cooked food as the products with the highest risk of waste.



The researchers focused on finding good practices in logistics for combating food waste from companies (retailers and producers) to beneficiaries (NGOs and people who have nothing to eat). Good practices for the reduction of food waste logistics activities must be coordinated within a functioning industrial system in which producers, distributors and sellers are present. All participants in the supply chain must be coordinated with each other through a unified system within an industry, so that they operate in a coordinated manner, leading to low losses (Principato et al., 2015; Liljestrang, 2017).

The logistics system and the increasing efficiency of its management can also be complemented by increasing the shelf life of the product. These two actions combined would lead to a reduction of waste (Gadde and Amani, 2016).

1.4 Legislative framework in the field of food loss

The law on reducing food waste was adopted in Romania in 2016, the normative act regulating in particular how economic operators should proceed so that food does not reach garbage (<http://legislatie.just.ro>).

Food safety is regulated in our country by law no. 150/2004 on food safety as the basis for ensuring a high level of protection of human health and consumer interests, taking into account the diversity of food supply, including traditional products and the operation efficient functioning of the internal market. Of all the NGOs surveyed about food waste, food banks are the best structured in terms of infrastructure, as they have a special warehouse and transport vehicles. The rest of the NGOs are in partnership with local authorities or a food retailer, but these partnerships are not extensively developed.

In Romania, the statistics indicate 5 million tons of food waste per year, representing between one third and a half of the total amount of food for human consumption produced in a year, i.e. about 250 kg / inhabitant, compared to 179 kg / inhabitant, the European average, while about 25% of the country's population (4.74 million people) live on the edge of poverty and have difficulty procuring daily food.



The greatest waste of food is recorded in urban areas: while rural communities use traditional methods of recovery of food waste in the household, in urban areas over 95% of waste in municipalities reach the landfill, thus making it impossible to recover waste of any kind, both food and non-food (Antoneac et al., 2019; Dumitru et al., 2019).



At the moment, Romania is on the 9th place in the top of food waste in Europe. Specifically, in Romania the highest waste is related to the level of households (about 49%), this being followed by the food industry sector (37%), retail (7%), public catering sector (5%), respectively the agricultural sector (2%), results from the data provided by the representatives of the Ministry of Agriculture and Rural Development (MADR).

Romanians claim that the main reasons for throwing food in the trash are rapid degradation (26%), incorrect estimation of the amount of food consumed at a meal (21%), but also excessive shopping (14%), according to a study conducted by InfoCons and the Association of Large Commercial Networks in Romania (AMRCR). The food that most often ends up in the garbage is cooked food (25%), bread or bakery products (21%), vegetables (19%) and fruits (16%).

In Romania, there is the National Sanitary Veterinary and Food Safety Authority (ANSVSA) which deals with issues of legislation and food safety regulations, risk assessment and food quality standards. Food safety standards, STAS are developed by the Romanian Institute of Standardization, which is periodically updated according to European Union regulations. These STAS include quality standards and analysis methods. The latter refer to the parameters in the quality STAS (<http://www.fao.org/>).

General food law requires operators to have a traceability system capable of tracking a product in the stage immediately preceding and following the operator's intervention (the so-called "one step forward, one step back" approach). Traceability is essential when recalling or withdrawing products for food safety reasons. The more developed a traceability system, the lower the risk of food waste, because the products that need to be recalled / withdrawn can be identified with greater precision (<https://insp.gov.ro/sites/cnepss>).

Thus, according to law no. 217/2016 on reducing food waste, all economic operators in the agri-food sector should voluntarily get involved in the campaigns carried out by the authorities and should initiate such actions on their own.

In 2014, an inter-institutional and inter-organizational working group was set up within MADR, which aims to reduce food waste at the national level, as well as to support initiatives of NGOs operating in this sector. In order to quantify food waste in Romania, MADR through the Sectoral Plan for Research - Development in the field of agriculture and rural development of the Ministry of Agriculture and Rural Development, for the years 2015-2018, "Agriculture and Rural Development - ADER 2020", a research project on food waste - "The socio-economic impact of food waste at the national level in the current context of food security crises and climate change", (Dinu, 2016).

The legislative proposal was adopted by the Presidency. 851/2015, regarding the reduction of food waste, it aims to reduce food waste at national level. For the purposes of this law, food waste means the situation as a result of which food leaves the circuit of human consumption due to degradation and is destroyed, according to the legislation in force. According to the Law on Reducing Food Waste, economic operators in the agri-food sector are obliged to take measures to prevent food waste. These measures are carried out according to the hierarchy of prevention of food waste generation, as follows:

- a) accountability measures for reducing food waste on the agri-food chain, starting with production, processing, storage, distribution, marketing, reaching the final consumer, including the hotel industry and food services;
- b) measures regarding the sale at a reduced price of the products close to the expiration of the consumption deadline, according to the legislation in force;
- c) measures regarding the transfer of food by donation or sponsorship, for human consumption, but close to the expiration of the consumption deadline, to entities that have become operators in the agri-food sector, following the registration with the National Sanitary Veterinary and Food Safety Authority, with the obligation to comply with the legal provisions regarding the hygiene conditions, including the requirements regarding the temperature during storage and transport as well as the corresponding labelling;





- d) measures for the targeting of by-products not intended for human consumption in accordance with Regulation (EC) No 1774/2002 of the European Parliament and of the Council of 3 October 2012 laying down health rules concerning animal by-products not intended for human consumption, category 3 a for the consumption of certain categories of animals, under the conditions provided by the sanitary-veterinary legislation in force regarding the elimination of animal by-products;
- e) measures for the targeting of agri-food products that have become unfit for human or animal consumption by composting, according to the sanitary-veterinary legislation in force regarding the elimination of animal by-products not intended for human consumption and the legislation on environmental protection;
- f) measures for the targeting of agri-food products that have become unfit for human or animal consumption in order to capitalize on them by transformation into biogas according to the environmental legislation and the veterinary sanitary legislation in force;
- g) measures regarding the directing to an authorized unit for neutralization of the products remaining after completing the stages provided in let. a) -f). (Dinu, 2016).

In Romania, annually, about a third of the products end up in the trash. At the moment, Romania is on the 9th place in the top of food waste in Europe. Specifically, in Romania the highest waste is related to the level of households (about 49%), these being followed by the food industry sector (37%), retail (7%), public catering sector (5%), respectively the agricultural sector (2%), according to data provided by representatives of the Ministry of Agriculture and Rural Development (MADR).



Chapter II. Food Losses in Romania

2.1 Causes and prevention of food loss

Romanians claim that the main reasons for throwing food in the trash are rapid degradation (26%), incorrect estimation of the amount of food consumed at a meal (21%), but also excessive shopping (14%), according to a study conducted by InfoCons and the Association of Large Commercial Networks in Romania (AMRCR). The foods that most often end up in the garbage are cooked food (25%), bread or bakery products (21%), vegetables (19%) and fruits (16%).

The Food Waste Combat project of the Junior Chamber International (JCI) Cluj association launched in 2017 a complex campaign against food waste on all fronts. Thus, in one year the number of partner schools doubled and practical workshops were held bringing together over 300 students.

The Timișoara Regional Public Health Centre carried out the campaign "From farm to plate" which aimed to improve the health of the population by promoting a healthy lifestyle and combating the main risk factors.

2.2 Primary production

Food is lost or wasted throughout the supply chain, from initial agricultural production to final household consumption. When food is thrown away, we must turn our attention to all the resources needed in the traceability process: water for irrigation, land for planting, fuel for feeding harvesting and transport vehicles. All these resources are essentially wasted with food. In a world with limited natural resources (land, water, energy, fertilizers) and in which cost-effective solutions must be found to produce enough safe and nutritious food for all, reducing food losses should not be a forgotten priority (Gustavsson et al., 2011).

The seasonality of losses from primary agricultural production is determined by the seasonality of vegetable production, especially vegetables, which makes autumn the main season of food losses. There is a significant share of producers who do not register seasonal differences.

The food industry is facing problems with food losses during the summer, probably related to the risks of preserving / storing products in the hot season.

Food processing has higher losses in the bakery and meat industry. Losses in confectionery, as well as technological losses in meat processing are also significant. Primary agricultural production feels as the main weaknesses, generating losses, outdated technologies, as well as the generation through primary processing of by-products for which they do not have capitalization solutions such as inefficient marketing. The food industry is facing problems related to the capitalization of by-products resulting from technological processes, but also problems of excessive supply of raw materials, or the emergence of substandard products. The distribution is the critical cause generating losses as a sum of the mistakes in handling the products as well as the over-supply with certain assortments, which are not sold fast enough.

Food waste is the result of decisions made by retailers and food service providers that affect consumer behaviour (FAO, 2019).

According to a systematic review of the literature, there is great variability in estimating data due to the different methodologies used in collecting them, directly or indirectly (Van der Werf et al., 2017).

Loss and waste exacerbate food insecurity, malnutrition and water consumption at a time when global hunger is on the rise. Inefficiencies that occur along the food supply chain and in consumption also have major consequences for the environment. Limiting food loss and waste helps fight hunger and climate change.

All links in the agri-food chain (from agricultural production, management, storage, processing and distribution to the final consumer) face the problem of food waste, for various reasons (e.g. improper food management during the harvesting and storage process, incorrect labelling and inadequate buying and consuming habits of final consumers).





Also, education on how to avoid food waste (for instance, freezing food that is not eaten immediately, arranging food in the refrigerator according to category and temperature, following hygiene rules, checking the expiry date of food, storing it correctly and correct estimation of food portions) should be done in the family and at school. For this, it would be necessary to include in the curriculum some theoretical and practical subjects that would lead to the acquire of knowledge and the formation of a sustainable behaviour (Pocol et al., 2020).

2.3 The impact of climate change on food security

In addition, food waste generates around 8% of greenhouse gas emissions, while 55 million EU citizens cannot afford a quality meal every day. Therefore, both for the environment and for people suffering from malnutrition, all opportunities to reduce food waste and create food production and consumption that maximize its benefits must be identified quickly.

”Food waste produces greenhouse gases in the pit, which unfortunately has a negative effect on the environment. Undesired greenhouse gases go to the landfill on the outskirts of the city because unfortunately they infiltrate, spontaneous fires happen and everything goes into the atmosphere. Food losses occur in the production, post-harvest and processing stages of the food supply chain.

Losses that occur at the end of the food chain (retail and final consumption) are rather called ”food waste” and refer to the behaviour of retailers and consumers (Petrescu- Mag et al., 2017; Parfitt et al., 2010).

Climate change is an added factor on food security, often affecting more vulnerable countries that do not have the necessary means to adapt. Drought, fires and floods impede the productive capacity of some regions in Romania. The impact of climate change on vulnerable systems (mountain, polar ecosystems) has shown greater vulnerability due to rising temperatures.

It is estimated that 8-10 percent of global greenhouse gas emissions are associated with uneaten food (Mbow et al., 2019) - and yet none of the nationally determined contributions to the Paris Agreement mention food waste (and only 11 mention food loss) (Schulte et al., 2020).

As the impact on the environment accumulates over the life cycle of food, the waste of food at the consumer level has the greatest burden. Without good management of agricultural biodiversity, some key functions of the agro-ecosystem could be lost (nutrients, water cycles, disease and pest regulation, pollination and soil erosion control).

These issues bring to the fore the fact that it is increasingly difficult to ensure food safety, which inevitably affects the health of the population. A correct approach of the issue of food safety involves, in fact, the co-responsibility of all the component linked to the agri-food chain (Cantaragiu et al., 2019).





Chapter III. Good practices from Romania

3.1 Civil society initiatives

Community refrigerator



In Bucharest, in 2015, a community refrigerator was placed for the surplus of non-perishable food, in Foişorului Square, where people were asked not to lay eggs, cooked food or raw meat. A guard belonging to

the General Directorate of Social Assistance checks every hour if food that was to be donated was eventually put in the refrigerator.

No Waste Aiud

The activities of the Society for Responsible Consumption include education and consulting projects, and are aimed at developing the understanding and implementation of the concept of responsible consumption especially among young people. The "No Waste" project is carried out by the SCR Association and aims to reduce food

waste in the agri-food market in Aiud, a city of 20,000 inhabitants in Alba County, promoting a sustainable lifestyle and increasing access to food for needy families. In the agri-food market in Aiud, SCR volunteers collect unsold vegetables and fruits from producers for unsightly or fresh reasons every Thursday, and in the evening, they are delivered to the beneficiary families, identified during the respective week.



”No waste” also has a special stand set up from July to November, where producers can leave the goods they no longer need. More than 700 kg of food were collected in the fall of 2016. More than 50 people in need benefited from food. A team of 10 volunteers ran this process from July to November 2016.

Bio & Eco



In 2015, the Bio & Eco program led to the development of a 4-hectare vegetable farm respecting the principles of organic farming in Ciocănari, Dâmbovița and a 1000 m² platform for natural composting of vegetable and fruit waste to produce natural fertilizer for organic farming, a social

enterprise of insertion that employs people from the local Roma community and disadvantaged people from vulnerable groups who benefit from socio-professional training and support to integrate the conventional labour market. Through Bio & co in 2016 alone, the Association collected over 290 tons of food waste, of which it later distributed over 2000 kilograms to people in need through DGASMB (Bucharest Social Assistance Department) and partner associations and foundations.

Somaro - Social Store Association

The Somaro - Social Store Association successfully combines 3 major social directions that today's society faces: supporting people on the brink of

poverty, reducing food waste by capitalizing on products and helping people at risk of social exclusion and isolation from society. The concept of social store is not new in Europe and is not the only type of stores which are a real help to people in difficulty. Somaro collects, with its own cars equipped with refrigeration system, products such as food, household products, clothing, footwear from various companies and sells them at symbolic prices to low-income beneficiaries. All products are 100% suitable for consumption or use, but are no longer marketable on the standard market for various reasons (short warranty period, damaged or dirty packaging, etc.).

somaro



So As they are donated, the beneficiaries pay only the salaries of the staff and minimum additional expenses. There are currently two offices in Bucharest and Sibiu and work is currently underway to open the third in Pitești.

Vasiliada Association



Since 2009, the Vasiliada Association has been running the "Meal of Joy" project for the needy in Dolj and Gorj counties. The program started in 2009, through the partnership with Selgros Cash & Carry, and in 2016 Carrefour Romania SA joined this social initiative. The Meal of Joy project aims to help people in need with food and non-food products. Foods are distributed

in perfect condition for consumption, but which for various reasons can no longer be used in the economic process (goods with improper packaging, overproduction, short shelf life). In Dolj and Gorj counties, the Vasiliada Association distributes the food collected from the two commercial partners to the people in need, beneficiaries of its social projects. Thus, the food reaches both families who for various reasons face financial and material problems, but also in residential centres where the elderly, children, people with disabilities or homeless people have found shelter. In 2016, in the two counties, a number of approximately 1400 people benefited from aid within this national partnership which is a natural expression of a social responsibility program.

Info Cons - Protection Association

The Cons Consumer Protection Association Info Cons has been active in the field since 2012. It is currently implementing a European project "The

Global Approach to Food Waste through Non-Formal Education" and is running a Campaign to inform and educate consumers about food waste, in partnership with MADR.

InfoCons[®]
PROTECTIA-CONSUMATORILOR.RO

Terra Mileniul III



Terra Mileniul III has implemented and is implementing both educational and direct-action projects to support the reduction and combating of waste such as the project "Too good to be wasted" - an educational project on food waste for students implemented in 2016 and 2017 and the project "The Roman appreciates food", a project developed with the support of the Roman City Hall, starting in 2018.

Zero Waste - for responsible production and consumption in ECO

The University of Agricultural Sciences and Veterinary Medicine (USAMV) in Cluj-Napoca, as a project coordinator, together with the University of Craiova, the Technical University of Moldova



and the University of Sainte Cyrille et Method in Skopje, together with the Food Waste Combat Project team, between June and September 2020 a study on food waste in households, and the results were presented on October 16, in a webinar. The study was part of the project "Zero Waste - for responsible production and consumption in ECO" (Zero waste, for responsible production and consumption in Central and Eastern Europe), funded by the Agence Universitaire de la Francophonie in Central and Eastern Europe. The results obtained show that, regardless of the country of origin, the respondents state, to an overwhelming extent, that they throw away food. Thus, in Romania, 83% of the study participants state that they have this habit, in the Republic of Moldova 78.7%, and in Macedonia 67.2%. "The subject of food waste arouses increased interest for many respondents, most of whom say they are interested in it being consumers in Romania (approximately 60%). There is thus a contradiction between "interest" and "effective behaviour", which denotes an insufficient education on the sustainable consumption behaviour of the population in the three countries.





Fruits, vegetables and bread are the most wasted food, and the main reasons why study participants throw away food are the expiration date and their alteration state”, said the coordinator of the research team at USAMV Cluj-Napoca, Prof. dr. Cristina Pocol. The participants in the study considered that, of all the actors involved in the agri-food chain, the main people responsible for the phenomenon of food waste are consumers and restaurants, and the least responsible are farmers and small traders.

#EUCircularTalks



The Institute for Research in Circular Economy and Environment “Ernest Lupan” (IRCEM), the Collaborating Centre on Sustainable Consumption and Production (CSCP), the Bio-Based Industries

Joint Undertaking (BBI JU), Innowo and the ECESP organised the #EUCircularTalks – ”Resource Efficiency to Help Combat Food Waste” event on 26 October 2021. The event was part of a series organised by the Leadership Group on Food waste, food systems, bioeconomy to frame the food waste impact. Speakers discussed the different implications of food waste and resource efficiency from a macro perspective to study cases and stakeholder engagement.

European Week for Waste Reduction - Circular Communities

During November 22-30, 2021, the ”European Week for Waste Reduction - Circular Communities” took place, period in which IRCEM and the Maramures Food Bank ran a project involving 70 families who joined the cause and decided to compost the food waste from their homes. For a week, the participants collected food waste in a compost bucket provided by the Maramureş Food Bank, in order to determine the current situation of food waste and to calculate the equivalent carbon footprint. The research is ongoing, the report being released at the beginning of 2022



România Durabilă



Romania's 2030 Sustainable Development Strategy develops the guides for the implementation of the UN's 2030 Agenda in all sectoral policies that can promote sustainable development at the national level. As so, the General Secretariat of the Government with its partners, touched upon the subject of food waste as part of the in-depth assessment of SDG 12 - Sustainable Production and Consumption. The responses show that cooked food is the most wasted food category (36%), followed at a great distance by bread and bakery products (17%). This can be taken as a characteristic of Romanian households, where they cook frequently and a lot of food. 66% of respondents state that food waste is used for animal feed. If we add the percentage of 4% of those who declare that they compost them, it results that 70% of Romanians practically recycle food waste, while the main reason for food being thrown away is "overcooking" (44%).

The COVID-19 coronavirus crisis also affected households in the three countries studied. However, about two-thirds of study participants said they could enjoy the same amount of food with the same money, and the amount of food thrown away increased to more than 10% of households, contrary to initial assumptions made by researchers who had conducted the study.

3.2 The role of the Romanian Food Banks Federation in combating food waste



A Food Bank is a dedicated service that recovers food surplus, saving it from becoming waste and donates it to disadvantaged people, in order to prevent hunger and poverty.





The goods, mostly food and personal hygiene products, are collected, transported to one of the network's regional authorized warehouses, they are sorted and prepared to be delivered immediately to NGOs with social programs for people in need, where the donations are given to the end beneficiaries.

The donors are usually companies that produce, store, deliver or sell foods and hygiene products and want to reduce waste, by donating the goods several days before the expiry date, so that they can safely be consumed by the persons in need: agri-food producers, distributors in the supply chain, hypermarkets, supermarkets, grocery stores, canteens, restaurants, hotels etc.

The products can be given away through sponsorship, donation or donation based on the law against food waste, law 217/2016, that was unapplied until 2021, due to lack of alignment to the fiscal legislation. Fortunately, thanks to the active advocacy of the Food Banks, in partnership with The Department of Sustainable Development, The Sustainability Embassy, IRCEM and other stakeholders, in December 2020 the legal framework was modified and in 2021 many big companies started to donate based on this law, at the national level to the food bank network.

The food banks run exclusively based on sponsorships and financial donations, so the partners are vital for this activity. In addition to the food donors, the Food Banks' partners can provide help such as:

- financial, with sponsorships;
- material, by donating goods and services necessary for the proper functioning of the Banks (transport vehicles, handling equipment, refrigerated chambers, refrigerated display cases, packaging supplies, office equipment, office furniture, fuel etc.);
- social involvement of their employees in voluntary activities within the Bank.

The network of food banks in Romania started in Bucharest in July 2016, using the US and European model, in order to create a means through which products safe to be used that come from over-stocks, marketing campaigns, mislabeling etc. are reintroduced in the circular economy, being given a second life, where they can feed the people who can hardly afford the daily meals.

In 5 years the program expanded, with the financial help from a few big retail companies (Lidl Romania, Metro Romania, REWE Romania) and some local partners, covering the entire national territory, through 9 regional foodbanks, united in the Romanian Food Banks Federation, as a nationally representative structure, under the tutelage of European Food Bank Federation (FEBA).

The results grew organically from the 57 tons collected by the Bank of Bucharest alone in 2017 to 1352 tons in 2020 and 1500 tons in 2021. The Covid Pandemic added a lot of pressure to the food bank network that had more requests both from the donors and from the affected categories of people in need. In 2020, the entire network of Food Banks in Romania collected almost 3,000 tons nationwide which were distributed over 115,000 final beneficiaries. In 2021 the Federation saved 3723 tons and redistributed it to reach over 150.000 disadvantaged people on a monthly basis, through over 500 NGOs nationwide.

The need to support food banks by local authorities, private companies and universities in Romania was identified. Infrastructure development and digitalization in the fight against food waste is emphasized by researchers who believe that the role of IT applications is to connect potential sources of food waste with consumers in need of food. Studies on the behavior of Romanian consumers in terms of food waste are, as in the case of other actors in the food chain, quite limited. However, there are some milestones in the scientific literature on the role of households and the final consumer in food waste management (Dumitru I et al.,2019).

The total quantity of the goods collected since the beginning of the network is 8040 tons , at a commercial value of over 7.4 millions Euro and the quantities collected in every region in 2021 are shown in (Figure 1 and Table 1).



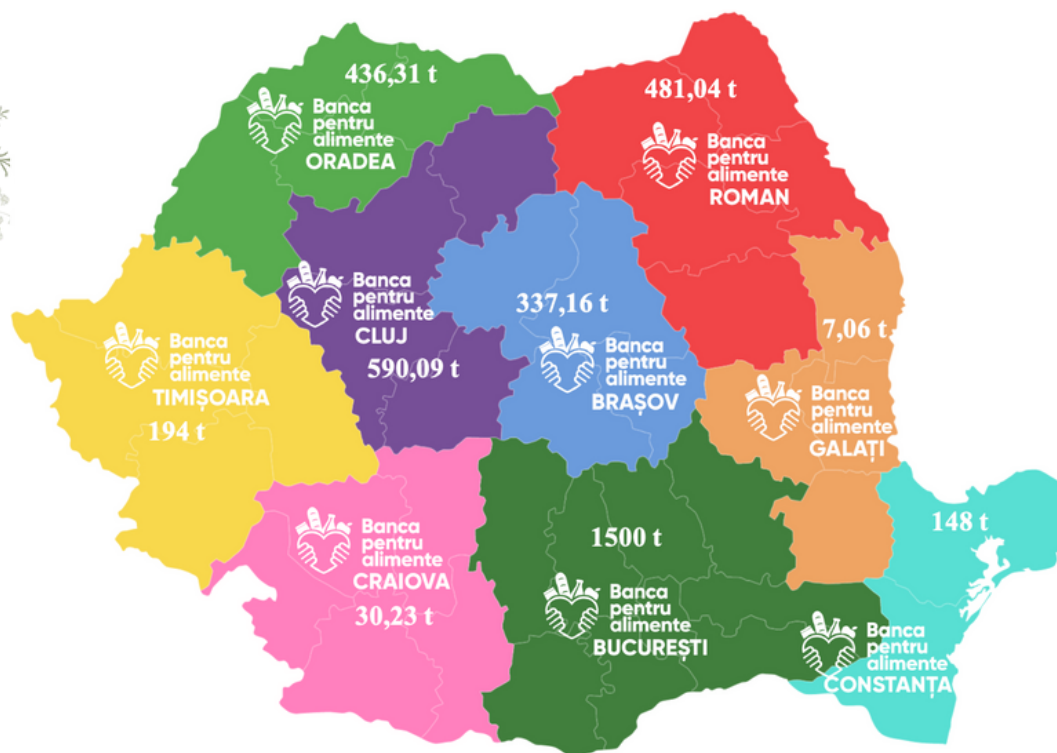


Figure 1. Network of Food Banks in Romania and the quantities of food collected in 2021.

Table 1. Total quantities of goods collected by FBAR.

FBAR	Regional Food Bank	Total values from the beginning of the activity until 1 January 2022 (t)	Total values 2021 (t)
	TOTAL	8040	3723,89
1	Bucuresti	3944	1500
2	Cluj	968	590,09
3	Roman	1192	481,04
4	Brasov	555	337,16
5	Oradea	953	436,31
6	Timisoara	232	194
7	Constanta	159	148
8	Craiova	30	30,23
9	Galati	7	7,06

Chapter IV.

Conclusions

In conclusion, we have known for many years that waste and food loss are a huge problem that cannot be ignored and in turn could reduce the impact of food systems on nature and climate. The presentation of data on the extent of food waste has a key role, being responsible for 10% of global greenhouse gas emissions.

According to the data obtained from Food Banks in Romania, the total amount of products collected is 715,850 tons. Thus, greenhouse gas emissions related to food surplus have increased, estimating that this amount of wasted food would be the equivalent of 2025.8 t CO₂.

Action is needed to combat food loss on the farm globally and not just in certain regions. Past interventions have tended to focus on technical solutions, addressing issues related to agricultural or storage technology, largely ignoring socio-economic and market factors that shape the agricultural system. However, food waste is not a phenomenon that can be attributed to a certain socio-demographic category, but it seems a widespread phenomenon, the diminution of which still requires many investments materialized in information and education campaigns of the actors involved. This conclusion reaffirms the importance of the actions taken so far by civic, academic and governmental actors to stop food waste.

- Today's food supply chain is increasingly globalized;
- Food is lost or wasted throughout the supply chain, from the initial agricultural production to the final consumption of the household;
- Further research is needed in our country, given that food security is a major concern for developing countries;
- The impact of international trade related to food losses must be assessed much better;
- Following the data collected in this study, a need for awareness of the population was identified, through information campaigns at national level on the importance of combating food waste and mechanisms that help reduce it. The responsibility for initiating these campaigns lies with the political decision-makers, but also with all the actors involved in the agri-food chain;

- The results highlight the current situation in households on the issue of food waste and the need to continue awareness through education campaigns among consumers;
- Consumer awareness as well as global awareness can have a positive impact on reducing food waste and adopting sustainable production and consumption systems;
- Considering the collection method, we emphasize that a necessity of comprehensive research is precisely the promotion of the completion missing link in profile groups, by a specialized NGO;
- The food bank is a priority in Romania. These food collection and distribution banks should be supported by local authorities and private companies. Every food bank needs an adequate infrastructure (warehouse, transport cars) and employees to manage all the food received and offered, then to the NGOs.

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