STUDY ON THE PERCEPTION OF ROMANIAN CONSUMERS REGARDING FOOD WASTE

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Abstract

In accordance with the objectives of the European Union, Romania, along with the other member states, must take measures to reduce food waste in the coming period. This phenomenon represents a major problem for our country, which involves consumer education, prevention campaigns and legislative measures. In this context, within the project "Research on agro-food waste, its causes and ways to prevent it in Romanian households", ReWaFA, a study was carried out that investigates the perception of Romanian consumers on food waste, their behavior and prevention measures. The data was collected through an online questionnaire, through Google Forms, distributed between January 29 and March 5, 2024 to 260 respondents. The analysis was performed using SPSS, applying the relative frequency method for data interpretation. The results showed that young people, between 18 and 24 years old, from urban areas, with higher education, have information about food waste and its implications, but do not always have the necessary levers to manage the food surplus. Because many continue to throw away food, especially cooked food and bakery products, respondents proposed as solutions to combat food waste: the distribution of informative materials, partnerships with schools for early education and the holding of events on this theme.

Key words: *consumer perception, food waste, food purchasing habits, waste reduction measures*

INTRODUCTION

Food waste is a widespread issue worldwide, posing a significant challenge for everyone involved in the agri-food sector [10]. Nearly 40% of all food produced goes uneaten [5, 12] due to factors such as storage and transportation conditions [5]. Additionally, approximately one-third of global food production is either lost or discarded throughout the supply chain. This phenomenon generates major environmental, social and economic effects [10], contributing to increased greenhouse gas emissions and considerable financial losses [12].

Simultaneously, it should not be forgotten that food waste, together with the high consumption of meat and dairy products, currently exerts a significant influence on food systems [17].

In recent years, reducing food waste losses and quantities has been perceived as an effective strategy for lowering production costs and increasing food quality [11]. At the same time, bibliometric studies on this topic have highlighted the importance of continuing to maintain interdisciplinary and international collaboration in order to effectively manage the complexity of food waste challenges [16].

In Romania, food waste results from a combination of factors, including consumer habits, business strategies, supply chain inefficiencies, and strict quality standards. Issues such as incorrect labeling, misunderstandings regarding expiration dates, poor storage conditions, oversized portions, and frequently changing menus further exacerbate the problem [13].

To address this challenge, several initiatives have already been introduced, beginning with

Law no. 217/2016, subsequently amended by Law no. 49/2024. Thus, the donation of surplus food was legislated by simplifying donation contracts and clarifying the types of economic operators that can redistribute food. According to the same law, donated food is exempt from VAT if it is redistributed at least 10 days before the expiration of the validity period [6]. A key development in 2024 was the requirement for all businesses within the agri-food sector to adopt strategies aimed at reducing food waste [14].

Additionally, the Ministry of Agriculture and Rural Development (MADR), in partnership with the Ministry of Education, launched awareness and education campaigns to inform students about the environmental, social, and economic consequences of food waste [6, 9].

At the same time, international projects carried out by the Food and Agriculture Organisation of the United Nations (FAO) will be translated and implemented in schools to educate young people [8].

Based on online data from Barilla Center for Food & Nutrition platform, Romania achieved a Food Sustainability Index score of 64.40 [2, 3]. This score represents the average performance across three key categories: sustainable agriculture (68.00), food loss and waste (67.70), and nutritional challenges (57.40). It reflects an average level of sustainability. The best result was obtained by France, 76.10.

The article is based on the study undertaken to examine the perception of Romanian consumers on food waste, analyzing both attitudes and level of awareness, as well as specific behaviors related to the purchase, consumption and management of food. The research also investigated the prevention measures that consumers are willing to implement to reduce food waste, highlighting the factors that influence these decisions, such as education, access to information and daily habits.

MATERIALS AND METHODS

The authors conducted an analysis of the literature to understand the context and factors influencing food waste. The bibliographic study included scientific articles, government reports and statistical data, providing a broad perspective on trends at national and international level. This step allowed the correlation of the results obtained by the questionnaire with the conclusions of other researches, contributing to the validation of the data.

Study Design
Within the Project "Research on agro-food waste, its causes and ways to prevent it in Romanian households", ReWaFA, the project team was also interested in finding out what is the consumers' perception of food waste. For this purpose, an online questionnaire was compiled, through Google forms, with voluntary self-administration, which included 24 items, predominantly closed items, with the following exceptions: Question(Q) 4, Q9, Q10, Q11, Q20, Q22 and Q24.

The questions and answers were grouped into the following categories:

Q1-Q6 - general information about respondents (gender, age category, area, county, studies and monthly income),
Q7, Q8 - knowledge of the topic of the questionnaire,
Q9-Q13 - shopping cart,
Q14, Q15 - food preparation,
Q16-Q19 - information on wasted food,
Q20-Q24 - measures to reduce food waste.

The questionnaire was distributed electronically to potential respondents, between 29.01.2024 and 05.03.2024, by e-mail (without collecting e-mail addresses) and on WhatsApp, to subjects from the academic and entrepreneurial environment, both in urban and rural areas. The participants were informed about the objective of the study and the data protection measures according to the GDPR regulations.

A total of 260 responses were received and the collected data were analysed using the SPSS (Statistical Package for Social Sciences), using the relative frequency of the examined indicators, as a processing method.

Study Participants
Figures 1-3 graphically represent data related to the questionnaire respondents, which were extracted from the "General information about respondents" category, Q1-Q6:
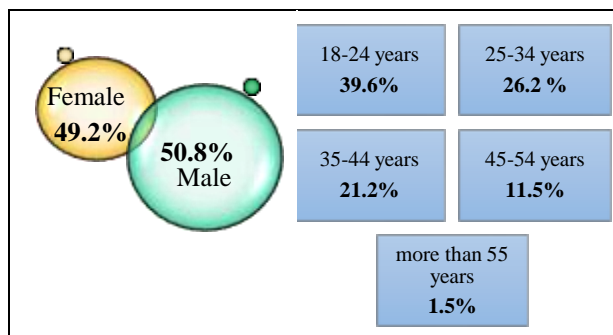
Fig. 1. Gender of respondents and age category (%)
Source: own processing of questionnaire information.

As can be seen from Figure 1, men and women answered the questionnaire in approximately equal proportions (Q1), and the age category in which most of the respondents were included was "18-24 years old", 39.6%. At the opposite pole was the "over 55 years" category, with only 1.5% (Q2).

60.4% of the respondents came from urban areas and the rest from rural areas (Q3), and the counties of residence (Q4) are shown in Figure 2. Most of the people interviewed were from Calarasi County and Bucharest – 57 responses each. It should be noted that out of the 260 answers received, to the question regarding the county of residence, 259 answers were correct, i.e. they clearly specified the county, and 1 answer was incomplete.

Fig. 2. Area (%) and counties to which the respondents belong
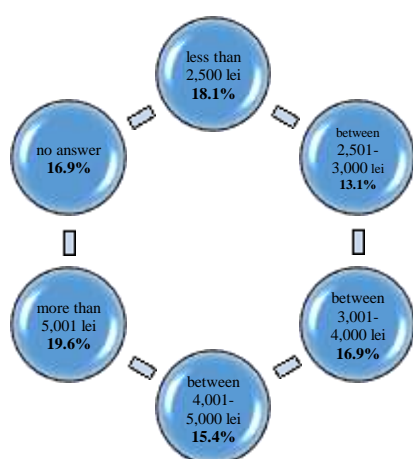Source: own processing of questionnaire information.

Fig. 3. Categories of respondents' monthly income (%)
Source: own processing of questionnaire information.

The answers received in terms of income (Q5) were relatively balanced for all six options, but two stood out: "more than 5,001 lei/month" – 19.6% and the opposite, "less than 2,500 lei/month" – 18.1%, Figure 3.

The respondents' studies (Q6) framed into the "bachelor's level" category - for 90.8% of them, the remaining 9.2% ticking the "higher education - master's level" category.

It is known that gender, age, residence, level of education and income significantly influence various aspects of the social and economic life of individuals, affecting access to education, employment opportunities, determining income and social status, access to resources and opportunities and, finally, quality of life. Therefore, using the answers received from the questionnaire, the authors set out to track how these factors leave their mark on food waste.

RESULTS AND DISCUSSIONS

In the European Union, it is estimated that 59 million tons of food waste are produced, i.e. around 131 kg/person. Households are responsible for the majority of this waste, accounting for 53% of the total [7]. Estimates suggest that Romania ranks ninth among the countries with the highest levels of food waste [1]. Although awareness campaigns have taken place, in Romania these initiatives remain limited compared to those in other European countries [4].

Therefore, the questions in the *category "knowledge of the topic of the questionnaire"* highlighted the fact that even among our respondents the term food waste (Q7) is known in proportion of 96.5%, and 43.1% of them are "very interested" in avoiding this phenomenon, respectively "quite interested" – 49.2%, the rest being not at all interested (3.1%) or indifferent (4.6%) – Q8.

"Shopping cart" category

Answers to the question "Do you usually get your food through..." (Q9), a multiple-choice question, shows a predominant trend towards the option "Do you or another member of the family cook?". This choice reflects a common eating behavior in many societies, especially in environments where the culture of cooking at home is well rooted, either for economic reasons or out of a desire to control the quality and health of food. Cooking at home is associated with achieving healthier meals, prepared according to the taste and needs of each family, and is often viewed as a social or traditional activity within the family. The "Order food" and "Go to a restaurant" options mentioned quite often, seem to be occasional or complementary choices and suggest that some respondents adopt a more flexible lifestyle, alternating between different ways of obtaining food depending on context, schedule or preferences. There are also some responses that refer to "Other" options, such as self-producing food by raising animals or obtaining products from trusted local sources, aspects that show an orientation towards sustainability and self-sufficiency, especially in rural communities.

Answers to the question "Where do you usually shop for groceries?" (Q10) showed a predominant preference for supermarkets and hypermarkets, stores that offer a balance between price, accessibility and diversity. However, a significant part of the respondents also indicated a preference for "market" and "specialized stores". This suggests an appreciation for fresh, local or artisanal products, which offer confidence in quality and freshness. There is also a trend towards purchases "from local producers or farmers' associations", which denotes an increased interest in local, organic, or less processed products. This behavior can be influenced by concerns about sustainability, supporting the local economy, or the desire to consume food with a low environmental impact. The multiple options, frequently mentioned by some respondents, indicate the diversity of sources of supply, which suggests that people are not limited to a single purchasing channel. This can be caused by factors such as seasonal product availability, convenience, or specificity of certain products. The "online" option, although less frequently mentioned, reflects a growing trend, especially in the context of the evolution of e-commerce and the COVID-19 pandemic, which has forced a rapid adaptation to remote shopping.

Answers to the question "Approximately, how much do you spend monthly on purchased food products?" (Q11) varies significantly, with values ranging from 50-100 lei to 4,000 lei. This fact indicates a monthly budget between 1,000 and 2,000 lei for food products, which is a typical average for a medium-sized family in urban areas. Higher or lower expenses depend on factors such as income, lifestyle, number of household members, and geographic area.

Although the majority of respondents (38.5%) largely check supplies before sourcing and 19.2% check every time, there is still a significant percentage (16.2%) who do not attach any importance to this aspect, and 26.2% attach less importance–Q12. This trend could indicate either a lack of time for organization or more spontaneous shopping habits.

Regarding the expiration date of products (Q13), the majority of respondents (40.4%) check it frequently or almost always (32.3%), which reflects a careful and cautious consumer behavior. However, there is a percentage of 11.2% that does not pay any or not enough attention (16.2%) to this aspect, which can lead to food safety problems or the purchase of products that need to be consumed urgently. Educating consumers on the importance of checking the expiration date could improve this behavior.

"Food preparation" category

Within the sample on which the questionnaire was applied, most responses (48.5%) showed that respondents prepare food 2-3 times a week at home, and 35.4% daily. Other answer options were "once a week" – 6.2%, "rare" – 5%, "at special events" – 0.4%, while 4.6% "don't cook" – Q14.

Answers to the question "What do you do when you cook too much food?" (Q15), indicated that the majority of respondents adopt sustainable methods for managing surplus food, either by cooking as much as necessary (31.9%), or by sharing food with close people – colleagues, friends, family (7.3%) or third parties (7.3%), or by preserving surplus food (25%) or even giving it to pets (21.2%). However, there is a percentage that throws away food (7.3%), which highlights the need for awareness of food waste.

"Information about wasted food" category

Although the majority of respondents try to reduce food waste (44.2% rarely throw away food and 13.5% never), 42.3% throw away food either occasionally or often (Q16).

This highlights the need for more effective strategies, such as shopping planning, proper food storage and reuse of food scraps - Figure 4.

The majority of respondents (77.31%) stated that they are mindful of the amount of food discarded each week. However, 22.4% reported disposing of more than 1 kg of food per week (Q17), likely due to factors such as over-purchasing, poor meal planning, or inadequate food storage (Figure 5).
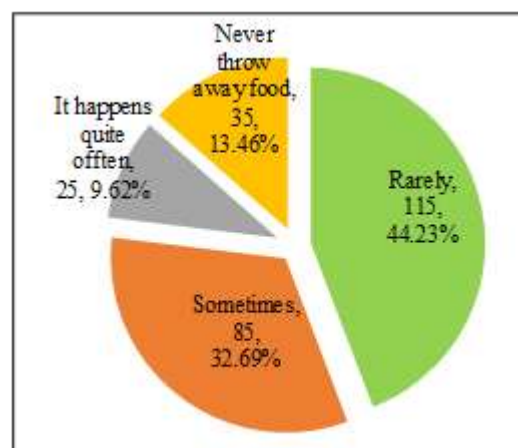

Fig. 4. Frequency of throwing food in the trash (number of respondents, %)
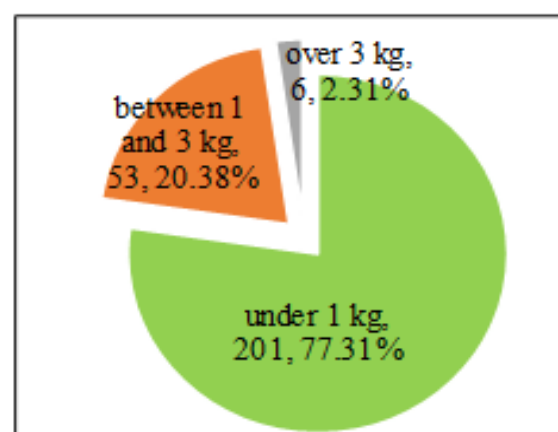Source: own processing of questionnaire information.

Fig. 5. The weekly volume of discarded food (number of respondents, %)
Source: own processing of questionnaire information.

Figure 6 shows that cooked foods (41.2%) and bakery products (25%) are the most wasted, highlighting the need for better meal and portion planning. Among the products least discarded by respondents were fruits (6.5%), although it is known that these are perishable and Expired groceries and canned goods (flour, rice etc.) – 4.2% (Q18).
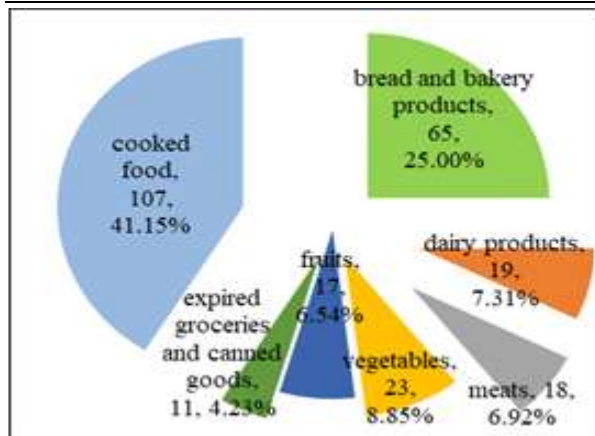
Fig. 6. The most often discarded food category (number of respondents, %)
Source: own processing of questionnaire information.

In the opinion of the respondents in the analyzed sample, the main cause of food waste is the variation of household consumption (36.2%), followed by excess purchases (16.5%) and lack of shopping planning (15.8%). A significant percentage of people (22.3%) are not aware of exactly why they throw away food (Q19), suggesting the need for information campaigns on meal planning, appropriate food storage and limiting spontaneous purchases (Figure 7).
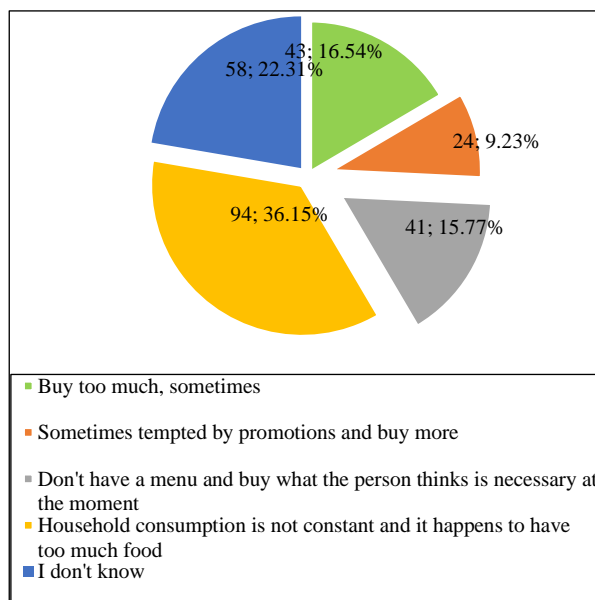

Fig. 7. The causes behind food waste (number of respondents, %)
Source: own processing of questionnaire information.

"Measures to reduce food waste" category
To the open question "What do you think would make you throw away less food?" (Q20), the majority of respondents (around

70%) believe that more information about organising food and reducing waste would help them throw away less food. A percentage of 10% believe that a higher sanitation tax would be an influencing factor. The rest of the respondents offered other solutions, such as responsible buying, economic crises or the existence of systems to redistribute the surplus.

The most effective solution to reduce food waste (Q21) is "Shopping planning", as appreciated by 44.2% of respondents. Other important percentages, 23.5% - highlighted the importance of efficient use of food, either by cooking all purchased ingredients or by reusing food scraps in other preparations, and 18.1% the importance of "Food storage and organization". The other 2 answer options had a low impact. (Figure 8).
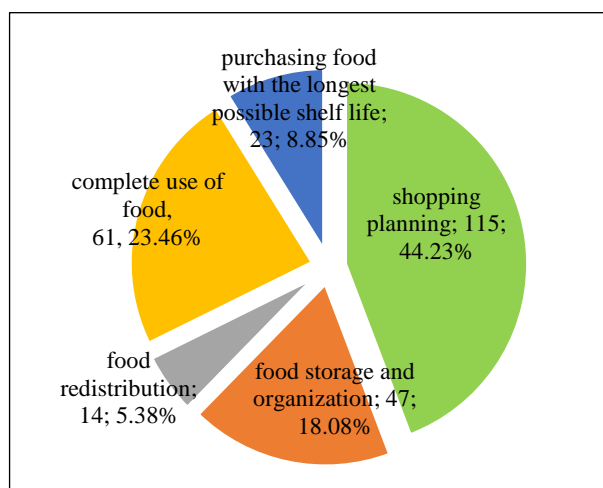

Fig. 8. Measures to reduce food waste (number of respondents, %)
Source: own processing of questionnaire information.

To the open question "At national and/or local public authority level, I believe that the most important concrete measure to reduce food waste and loss is..." (Q22), respondents rated "Distribution of information (guides, leaflets)" as the most effective measure, receiving 67 responses, followed closely by "Collaboration with schools" (64 responses). Local events are considered a fairly effective method, but less popular the first 2 and this variant received 52 responses. Other respondents proposed other solutions, such as the creation of "Food Collection Centers", "Food Banks", "Local collections and social canteens for food

redistribution", "System for taking over surplus food for those in need".

The authors of the article also wanted to know how online posts affect consumer behavior (Q23): 45.8% of respondents considered that influencers have an important role in reducing food waste, which may be motivated by the dominant age categories of the sample on which the questionnaire was applied, between 18-24 and 25-34 years old. This finding can be explained by the growing influence of social networks on the behavior of young consumers, who are more receptive to the messages sent by influencers. Previous studies show that people in the 18-24 and 25-34 age groups are active users of digital platforms and are more likely to adapt their consumption habits according to trends promoted online. Also, educational content and awareness campaigns carried out by influencers on reducing food waste can have a significant impact on their purchasing decisions and sustainable behavior. However, 27.3% do not consider the intervention of influencers useful, and 26.9% "do not know".

At the same time, the majority of respondents (over 50%) considered that influencers do not affect their decisions at all, while about 25% appreciated that influencers can have a positive impact, especially by promoting responsible behaviors. However, 15% considered that influencers have a negative impact, promoting consumption and products of questionable quality, 5% said they are influenced according to the credibility and transparency of the influencer and 5% admitted that although they are not personally influenced, influencers have a strong impact on young people (Q24).

The analysis of the results of the questionnaire, correlated with data from similar studies [15], confirmed certain consumption trends: the preference for purchasing food from hypermarkets, the habit of cooking frequently at home, shopping planning and checking stocks before supply. Meanwhile, most respondents believe that adopting a national policy and implementing educational projects are essential for preventing and reducing food waste.

Despite being a major issue in Romania, food waste remains insufficiently documented, emphasizing the need for extensive national-level research [15].

As a member of the European Union, Romania is also required to align with EU targets, which aim to cut food loss and waste by 30% per capita by 2025 and by 50% per capita by 2030 [14, 15].

Promoting responsible food consumption, raising awareness through prevention campaigns, and enforcing legislative measures can play a crucial role in reducing food waste across the country.

CONCLUSIONS

The results of the study showed that young people from urban areas (age category 18 - 24 years), with higher education, are aware of the problem of food waste and interested in reducing it. However, consumption habits and management of food surplus are not always effective. A significant portion of respondents continue to throw away food, mainly from the "cooked foods" and "bakery products" categories, which indicates the need for meal and portion planning.

The answers also revealed that most respondents prepare their food at home and prefer to stock up on supermarkets and hypermarkets. However, there is also considerable interest in the market and local producers. This suggests a diversity of consumer preferences and habits, influenced by factors such as accessibility, product quality and sustainability.

To minimize food waste, respondents identified the most effective strategies as careful meal planning, maximizing the use of purchased food, and better organizing household supplies. On a national scale, the proposed solutions include the creation of information guides, collaboration with schools for education in this field and the organization of local events. Although the influence of social media is a controversial issue, an opportunity has been identified to develop awareness campaigns through opinion leaders relevant to young audiences.

In addition, in order to combat food waste, an integrated approach involving consumers, public authorities and the private sector is essential in Romania. It must aim at: educating and informing consumers on meal planning, proper food storage, avoiding excessive purchases; supporting short supply chains; promoting local products to reduce food waste.

By adopting such measures, Romania can make significant progress towards a more responsible and sustainable food consumption.

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