

## Aspects of Food Waste in the COVID-19 Pandemic

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### Abstract

**Research purpose:** The World Health Organisation identifies diet as one of the key determinants of health. Dietary guidelines for good health are constantly being updated and the latest research on these issues becomes public. Food culture in Lithuania follows global trends and conscious consumption is one of the biggest trends globally. The importance of a balanced, healthier diet is increasing, people are more careful about what they eat, analyse labels and are more likely to choose healthier products. Vegetables and plant-based foods are increasingly important.

Food consumption is closely related to our habits, in addition to food waste. Today, food wastage is a significant problem, so it's no surprise that it's constantly tackled every year. The zero-waste movement aims to stop people from using disposable cups, straws, plastic bags, encourages the use of leftovers, and promotes responsible food consumption. Annually, approximately one-third of the world's edible food is lost and wasted, in addition to the resources used for production and the personal income of the population. Unfortunately, there have been no reliable data regarding food waste in Lithuania. Therefore it is believed that under conditions of the crisis caused by the coronavirus pandemic, in cities, the problem of food waste has become even more relevant than before. As a result, at the beginning of January 2021, an online study was launched to identify the changes in shopping habits and food waste during the pandemic. In November 2020, the research company Norstat carried out an online survey on food waste commissioned by the Maisto Bankas and Swedbank. The methodological part of the research presents comparisons of the results of these two studies and measures for rational food consumption.

**Methodology:** To achieve the goal of the research, an online survey was conducted. At the beginning of January 2021, a questionnaire was developed to identify changes in shopping habits and food waste during the crisis caused by the COVID-19 pandemic. One hundred three respondents took part in the survey.

**Practical implications:** The results of the study can be used to inform society about food waste and measures to be taken to mitigate food waste.

**Keywords:** Healthy Food; Food Waste; Pandemic; COVID-19; Perishable Foodstuffs

## Introduction

Food culture and society are inseparable as we need food every day. Changes occurring in society affect our eating habits: old eating habits are abandoned in favor of new ones. Consumers face challenges in the grocery store what to buy as a wide range of 'healthy food' is labeled as organic, preservative-free, or gluten-free food, or suitable for vegetarians or vegans. To tackle health inequalities, it is necessary to improve the nutrition of all social groups in society. For the development of health programs, it is crucial to identify the dietary habits of various social and demographic groups of the Lithuanian population and their changes [4].

Food waste is associated not only with unavoidable social, economic, ecological but also with ethical consequences, as well as the changes in dietary habits brought about by the Corona-19 pandemic. According to the Food and Agriculture Organisation of the United Nations (FAO), 1.6 billion tonnes of food waste are generated globally each year, compared to 88 million tonnes in the European Union (EU). Approximately estimated that one EU citizen throws away around 173 kg of food each year, while one Lithuanian throws away around 60 kg of food that could have been consumed.

Households are the largest source of food waste in the EU (53%), but there is also a significant amount of food waste from processing plants (around 19%), catering (around 12%), agriculture (around 10%) and wholesale and retail trade (around 5%). Worldwide, the largest annual discards are fruits, vegetables and root crops that still are suitable for consumption [10].

It should be mentioned that at present, the Food Bank distributes to the poor about 5 thousand tons of food intended to be discarded.

Food waste is a largely unintended outcome of entangled daily routines revolving around food, such as meal planning, grocery shopping, and food storage. The characteristics of food retail infrastructures — in terms of accessibility, density, and type — shape these routines and thus potentially influence excess food purchases.

Food storing practices as well depend on the characteristics of domestic infrastructures and co-evolve with technologies used for storing food. Unraveling the interconnectivity between material contexts and household food practices can inform policy, product design, and food retail

development and thus has implications for reducing consumer food waste [2].

According to the Food and Agriculture Organisation of the United Nations, almost one-third of the world's food production is lost or wasted. Food discarded in Europe alone could feed 200 million people every year. Food that has been produced for human consumption but has been removed from the food supply chain for various reasons is lost or wasted [11].

Food loss and waste represent the decrease in quantity or quality of food along the food supply chain, where food losses occur from harvest/slaughter/catch up to, but not including, the retail level, while food waste occurs at the retail and consumption levels [3].

Food suitable for human consumption but not consumed, e.g. left spoiled or discarded by consumers or retailers themselves, is considered food loss or food waste. Thus, food is wasted throughout the food production, marketing, marketing, and consumption chain. Data on food waste is not available in individual countries, and it is extremely difficult to collect, as food waste is not required to be reported. The Food and Agriculture Organisation estimates that every year approximately 1.3 billion tons of food is lost or wasted in the supply chain from farm to fork worldwide, including about 45 percent of fruits and vegetables, 35 percent of fish and other seafood, 30 percent of cereals and their products, 20 percent of dairy products and 20 percent of meat products [11].

Food that is 'out of date' is often mentioned as an important reason for food disposal. Therefore, understanding shelf-life dates and proper handling of food is crucial in preventing the wastage of edible food [2]. A few authors argue that the current food expiration labeling system is a barrier to the management of both food waste and food safety issues. Simplifying and clarifying expiry date labeling could be one of the most cost-effective ways to reduce food waste. Consumers tend not to trust their ability to assess the edibility of food and may instead rely on date labeling [9]. The term 'Use by' is used to indicate the expiry date. The term 'Best before' is used for the labeling of products with a shelf life of more than 30 days [10].

Original ways to prevent food waste are presented in the EU Platform on Food Losses and Food Waste. According to Vitunskiene, it is recommended to develop skills that help to reduce food waste in everyday life.

During COVID-19 quarantine, food production and consumption at home increased several times. Food waste has increased in those households that have started buying food stocks, e.g., perishable food (dairy, meat and fish products, fresh vegetables, or other short-term products) for weekly consumption and long-term products (flour, groats, pasta, canned food, oil, etc.). Although these products are suitable for long-term use, practice shows that some of them have eventually been discarded due to overstock (Vitunskiene, 2020). Subsequently, food waste was reduced in those households that reevaluated and changed their shopping, cooking, storage, and consumption habits under quarantine conditions.

Consumers face a common problem when buying a food product as they are misled by the product's name. Furthermore, they are disappointed by taste as the product's properties, such as taste or others, do not meet their expectations. More attention should be paid to educate consumers by making it clear how natural food products differ from those which ingredients are replaced with other parts of food, given a wide range of such products in the market. Attention should also be drawn to the fact that the price of such products is usually lower. Research conducted by Stankeviciene et al. (2010) show that 77,2 percent of the respondents indicated that they always or often pay attention to the price of the product, and 64 percent stated that when choosing food, first they always or often pay attention to discounts or promotions offered.

Despite the principles of healthy eating, many people are still eating not nutritious food preparation of which does not require efforts and time.

As food waste is an environmental and ethical issue, to avoid food waste, consumers must change their eating habits and take appropriate preventive actions.

## Research methodology

Research problem: Recently, intemperance and food waste has become a pressing problem. Particularly important are the dietary changes that occurred during the COVID-19 pandemic.

**The aim:** To identify the dietary changes that occurred during the COVID-19 pandemic.

## Research Tasks:

- Describe the characteristics of food waste.
- To identify food consumption and waste during the COVID-19 pandemic.
- Outline measures to prevent food waste.

Despite the principles of a healthy diet, many people still eat randomly purchased nutritionally incomplete food, turning their bodies into a trash bin or throwing away food as unfit for consumption.

Using a quantitative research approach, an online survey was launched at the beginning of January 2021 with 103 respondents - 74,5 percent of women and 23,5 percent of men participated. Most of the respondents, approximately 44 percent, were individuals aged 18-25, followed by 18 percent of the respondents aged 26-34, and 18 percent of the respondents aged 35-51, and 18 percent aged 51 and more, respectively. A multiple-choice questionnaire was designed aiming to identify changes that occurred during the COVID-19 crisis and food waste.

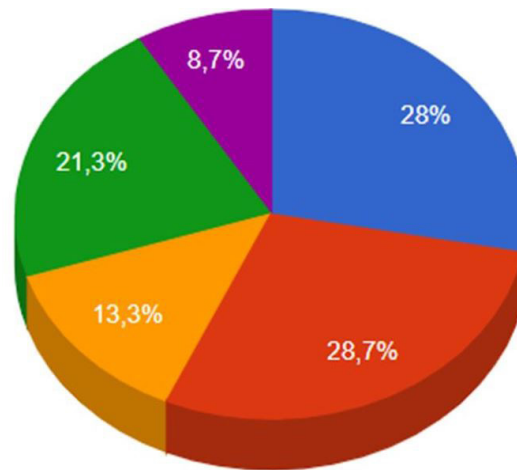
In November 2020, a survey to identify the population's food waste commissioned by the Maisto Bankas and Swedbank was carried out by the research company Norstat.

Comparative results are presented below.

## Research results

The problem of food waste is thought to have become even more relevant in the context of the crisis caused by the COVID-19 pandemic. The online survey revealed the occurring changes.

The diagram (Figure 1) shows the changes in the crisis caused by the COVID-19 pandemic.



Eating habits have changed 28 %  
 Eating habits remained the same 28,7 %  
 Started to eat healthier food 13,3 %  
 Started to buy more food 21,3 %  
 Discarded more food 8,7 %

**Figure 1:** Changes in the crisis caused by the COVID-19 pandemic

The chart below shows that in the context of the COVID-19 pandemic crisis, consumers' responses of changed and unchanged eating habits were split between 28 percent. Due to the quarantine, consumers spent more time at home. As a result, 21,3 percent of the respondents tend to buy more food, but at the same time, 8,7 percent throw more food away. However, respondents (13,3 percent) report that their diet has improved and they

are eating healthier than in the non-pandemic period. This may be linked to cooking when the whole family is at home and more time is available.

Table 1 shows the changes in the amounts of food consumed during the pandemic period.

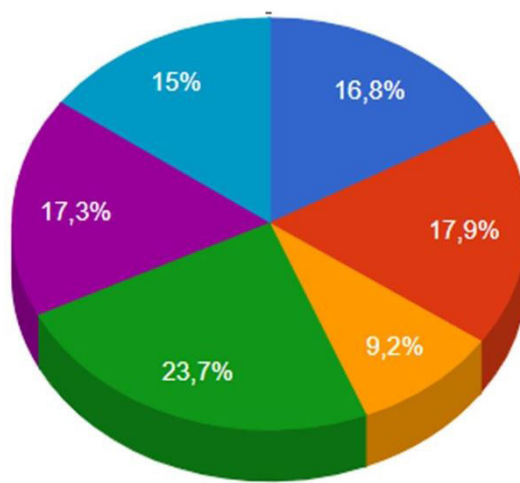
**Table 1:** Changes in the amounts of food during the pandemic period

Food consumed as indicated in the questionnaire	Average, %
Fast food	29
Sweet food	43
Sugary drinks	25
Meat products	57
Fish products	47
Potatoes, carrots	58
Tomatoes, cucumbers, aubergines, sweet peppers, zucchini, pumpkins, artichokes, etc.	68
Leguminous vegetables (beans, broad beans, peas, chickpeas, lentils, soybeans, etc.)	50
Spinach, lettuce, broccoli, celery, kale, cauliflower, red cabbage, etc.	58
Fruits, berries	63
Seeds, nuts	50
Groats	60
Whole-grain products (pasta, bread, etc.)	53
Superior grade wheat flour products (pasta, bread products, etc.)	49

When asked about the changes in food consumption, the following answers were received that 68-57 percent of the respondents consume more meat, tubers, roots, fruits, and leafy vegetables, 53-47 percent fish products, groats, flour products, whole grain products, legumes, seeds, nuts, 43 percent like sweet products and 25-29 percent fast food and drink sugary drinks. These responses suggest that the majority of consumers

during the pandemic period were eating regular and sugary foods, with a smaller proportion opting for healthier products. Although not a significant proportion of respondents, they chose "Fast food" and sugary drinks, which can be linked to ordering food at home.

The diagram (Figure 2) shows the causes of discarded food.



Leftovers 16,8 %  
 Fear of food poisoning 17,9 %  
 Getting bored of eating the same food some days in a row 9,2 %  
 Forgetting what is in the refrigerator or the freezer 23,7 %  
 Buying too much 17,3 %  
 Buying oversized food packages 15 %

**Figure 2:** Causes of food waste

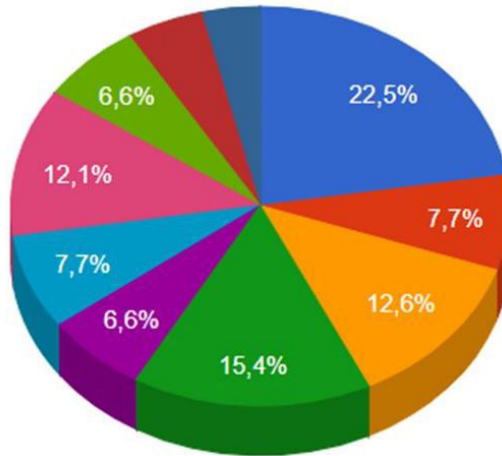
During the COVID-19 pandemic, when the respondents were asked about the causes of food waste, 29 percent of the respondents indicated that they forget what is in the refrigerator, 18 percent buy too much food, 16 percent were afraid of food poisoning, and 14 percent discard leftovers and buy too much, 9 percent get bored of eating the same food for a few days in a row.

A survey of the Lithuanian population in the non-pandemic period in 2020 showed that one of the main reasons, such as forgetting what is in the refrigerator or freezer, was indicated by one-third of the respondents. Another 20 percent state that

they buy too much, 15 percent purchase food in oversized packages. Half of the consumers discard food due to fear of food poisoning, and one-third of the respondents are unwilling to eat unattractive-looking leftovers, and one in five just gets bored of eating the same thing for some days in a row [5].

Taken together, the results show that during the sub-pandemic and post-pandemic periods, respondents forget what is in the fridge, buy too much food and are afraid of poisoning. This may be related to people's ability to assess the shelf-life of food.

The diagram (Figure 3) shows the most common discarded foodstuffs.



Bread products 22,5 %  
 Sweet pastry products 7,7 %  
 Curd 12,6 %  
 Sour cream 15,4 %  
 Apples 6,6 %  
 Tomatoes 7,7 %  
 Lettuce 12,1 %  
 Bananas 6,6 %  
 Potatoes 4,9 %  
 Carrots 3,8 %

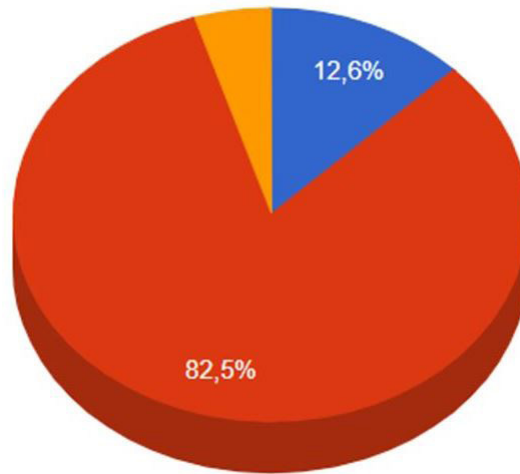
**Figure 3:** The most common discarded foodstuffs

Based on the survey carried out during the pandemic period, 22 percent of bread products, 12-15 percent of dairy products, lettuce, and approximately 4-8 percent of vegetables and confectionery products are the most discarded products.

According to the data of 2020, in the non-pandemic period, even 29 percent of consumers throw away bread products, often dispose of milk, apples, tomatoes, lettuce, potatoes, bananas, and that started to perish. In terms of dairy products, sour

cream and milk are most left uneaten. It can be assumed that during both the sub-pandemic and non-pandemic periods, respondents are not aware of preventive measures to preserve food products.

The diagrams (Figure 4) show how consumers feel about discarded foodstuffs.

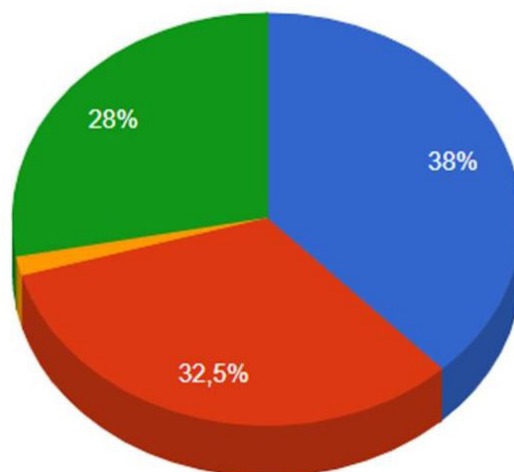


Don't feel bad 12,6 %  
 It's not pleasant 82,5 %  
 Didn't answer 4,9 %

**Figure 4:** Consumers' attitude towards food waste

For 82,5 percent of the respondents, throwing away food during a pandemic period is not a pleasant thing to do, yet 12,5 percent do not feel bad when discarding foodstuffs, and 4,9 percent did not answer this question. Similar data was obtained in the study carried out by Norstat, where discarding food is not a pleasant thing for many respondents, and 16 percent are igno-

rant about that. To summarise the results of these surveys, it is considered that during the sub- and post-sub-pandemic period, the majority of respondents value the products and the resources used to produce it.



The diagram (Figure 5) shows shopping habits.  
 Review available foodstuffs at home 38 %  
 Always make a shopping list 32,5 %  
 Don't buy products without discount 0 %  
 Buy discounted foodstuffs 28 %

**Figure 5:** Shopping habits

Thirty-eight percent of respondents state that they review available foodstuffs in the refrigerator, 32,5 percent always make a shopping list, 28 percent tend to buy products in the case of a special offer or discount. In contrast, no respondents have indicated purchasing products without a discount.

In the 2020 survey, in the non-pandemic period, 90 percent of the respondents always or often review what food is at home before shopping. Half of the respondents almost always make a list of products. Respondents of higher education make a shopping list. On the other hand, residents of large cities do so less often than those living in rural areas. Twenty percent of the respondents claim that they never buy discounted food, whereas the same percentage of the respondents constantly or often buy discounted products. These responses support the view that food waste increased during the pandemic. This is linked to the fact that food is purchased without assessing the amount of food available at home.

## Conclusions

The description of food waste treats, food waste as an economically and morally negative phenomenon along the entire food production, marketing and consumption chain. It is noted that consumers fail to understand or misinterpret date labeling 'Best before' and 'Use by,' which may be another reason why lot of food is wasted. It is also necessary to develop skills to help reduce food waste in everyday life.

Summarising the results of the survey on food consumption and wastage during the COVID-19 pandemic, it can be concluded that:

- during the pandemic, the whole family was at home with more free time, so meals were cooked at home using healthier products: fish, wholemeal, whole grains, legumes, seeds, nuts;
- the majority of consumers during the pandemic period ate regular and sugary foods, with only a small proportion of respondents opting for fast food and sugary drinks, which can be linked to ordering food at home;
- during the pandemic and non-pandemic periods, respondents forget what's in the fridge, buy too much food and fear poisoning. This may be related to people's ability to assess the shelf-life of food;
- in pandemic and non-pandemic periods, respondents are unaware of preventive measures to preserve food products;

- during the pandemic and non-pandemic period, the majority of respondents value the products and the resources used to produce them;
- food waste increased during the pandemic. This is linked to the fact that food is purchased without assessing the amount of food available at home.

Developing skills to reduce food waste in everyday life is very important, so food waste prevention measures include: not to buy too much, produce as much food as will be eaten, constantly review available foodstuffs at home, first consume perishable products, freeze perishable products, e.g., butter, bread, meat, and fish products, meals, vegetables if possible, and take food out from the freezer just before use. If food discard is inevitable, the best solution is to compost it.



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