

## FOOD WASTE IN LATVIAN HOUSEHOLDS: AMOUNTS, ECONOMIC ASPECTS

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**Abstract.** Even though thousands of people suffer from hunger every day, there are people that simply throw away their food. Nowadays, even if the food wasting problem is getting more and more urgent, and all kinds of political and non-governmental organizations accentuate the importance of research on this problem, still not much research has been conducted regarding food wasting. A broader research study of food wastage would help to understand how fundamental the influence of a food choice pattern is on the lives of people. The aim of the paper was to find out how much food gets wasted and to identify factors that influence such behaviour in Latvia from the perspective of eating habits. To achieve the aim, the authors conducted a survey in 2013. The 2013 survey questionnaire consisted of 48 open and closed questions. The 2013 study revealed that 13.3 % of all the food bought household members lost and 9.39 % - wasted. In monetary terms, the average household wastes EUR 475.56 per year. By stressing the food waste issue in Latvia early on, it could be possible not to reach average EU wastage rates, which were around 22-25 % in 2016.

**Key words:** eating habits, food wasting, income, behaviour.

**JEL code:** D12

### Introduction

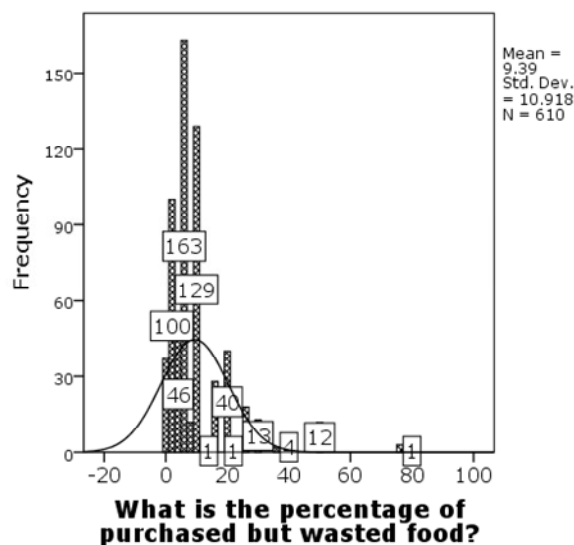
The aim of the paper was to examine the situation regarding food wastage in Latvia and to identify aspects that influence such behaviour. The authors have conducted two research studies that were grounded on a previously developed theoretical basis. This paper identified which of the previously determined economic and social aspects affected food wastage in Latvia and also calculated wastage amounts and wastage cost, as well as studied what kind of food gets wasted the most.

The authors conducted the research in 2013. The research survey questionnaire consisted of 48 open and closed questions. Respondents were asked to identify how much of food bought they wasted, and to indicate it as a percentage of the total amount of food bought. The assessment was done by feel.

The authors didn't research the waste of donated or home-grown food. In the framework of the paper, donation of food bought for people or animals isn't considered food wasting. In the context of the paper, food discarding, whose expiration date has expired, or food discarding, whose taste, look, smell has changed and is no longer suitable for consumption are considered food wasting.

### Research results and discussion

The question about how much of the food household members are able not to discard is closely linked to food waste.



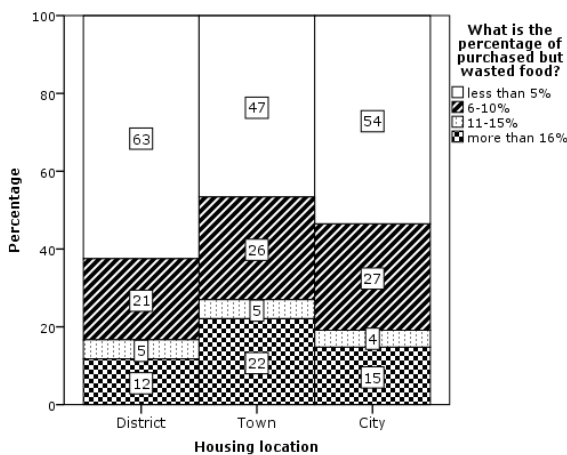
Source: authors' construction based on the 2013 survey

Fig. 1. The normal distribution curve for food wasted by the surveyed household, year 2013, quantity (n=610)

The data of wasted food don't form a normal distribution curve, as the answers with a lower value dominate. Household members on average waste 9.39 % of all purchased food, this part of food is still suitable for consumption or was suitable at the time of purchase. The authors' research data indicate that on average households spent EUR 422.47 on food; if 9.39 % of the lost food is converted into money, then in

total an average household loses EUR 39.63 per month/ EUR 475.56 per year.

All the questions that were closely connected with the study of economic aspects by the authors of the paper were divided into two groups. The first group - aspects that affect food security, and the second group – aspects that are closely connected with customers' behaviour, which are divided into two subgroups: a demographic profile and personal aspects.

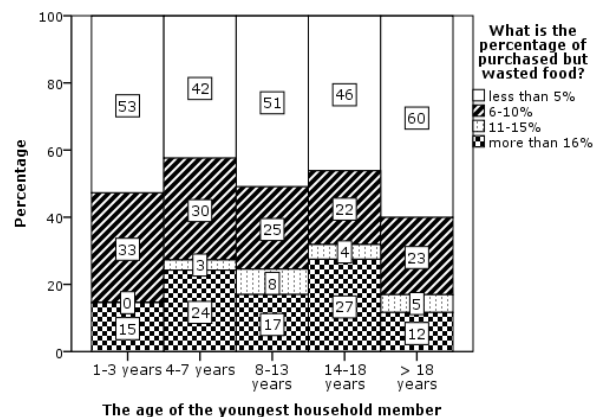


Source: authors' construction based on the 2013 survey

Fig. 2. The impact of the sub-aspect "housing location" on wasted food amounts, year 2013, % (n=610)

The housing location correlates with wasted food amounts, and this correlation is negative, meaning that the greater the city where the household is located, the more food is wasted in this household. People from rural areas, who live closer to the food production sites and often see how food products they buy are grown, as well as those people who have their own allotments, which are used for food production, are also those people who waste food way less. By contrast, people in cities waste food the most among all Latvia's citizens. This could be explained by the ease of food access in urban areas, and by the fact that when people don't grow their food themselves, they don't realize what kind of effort it requires, and what kind of resources are used when food is grown, thus not realizing the negative impact of food waste on the environment.

The packaging is important from the food safety perspective because it helps to prolong the freshness of the food and it also makes food longer safe for human consumption, thus it is possible to buy food and be able to fully consume it before it spoils. The 2013 research data analysis indicates that consumers pay more attention to price and a food product's expiration date, rather than to packaging, even if the packaging of the product directly correlates to duration of food validity. It is difficult to assess the extent to which household members understand the **labelling** on food products. For example, if they understand what kind of food products is still safe for consumption for some time after the labelled expiration date or not. Food labels can mislead people into thinking that the product is unsuitable for the consumption, assuming that the expiration date indicates the exact day when product must be discarded obligatory. If they understand all the label information about additives and preservatives, they buy food only suitable for the particular person's consumption, and food isn't wasted due its characteristics.



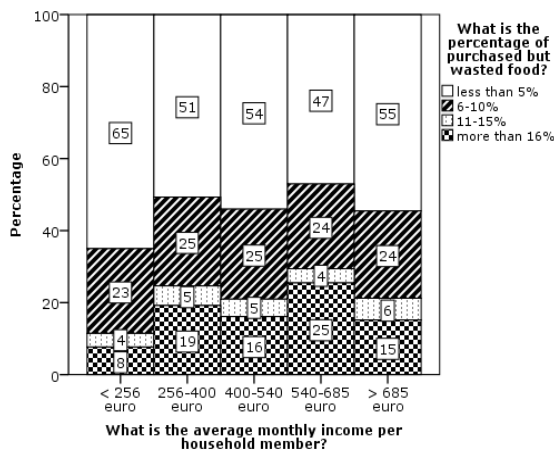
Source: authors' construction based on the 2013 survey

Fig. 3. The impact of the sub-aspect "age of the youngest household member" on wasted food amounts, year 2013, % (n=610)

The authors' study indicates that in Latvia food is wasted the most in households with children but the least food is wasted in households where live only adults (more than one member). This situation could be explained by the fact that it is easier to plan meals in

households with only adult resident; adults already have a particular taste for food and mostly know what they like and don't like to eat, while children, in their turn, especially children aged 4-7, are often too picky when it comes to food, and some of the food that was cooked particularly for them may get wasted.

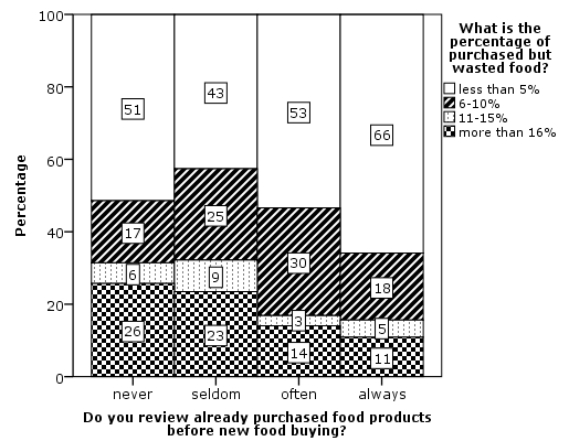
The study, which was conducted in the United Kingdom in 2012, indicated that the greatest amount of wasted food was generated in single person households (DEFRA, 2013). Similar trends were shown in a study conducted in Denmark (EPA, 2012). With a probability of 93 % it can be asserted that a similar situation is observed in Latvia.



Source: authors' construction based on the 2013 survey

Fig. 4. The impact of the sub-aspect "average monthly income per household member" on wasted food amounts, year 2013, % (n=610)

With a probability of 95 %, there is a correlation between the average income per member of a household and how much food is wasted in this household; besides, an increase in income also increases the amounts of wasted food.



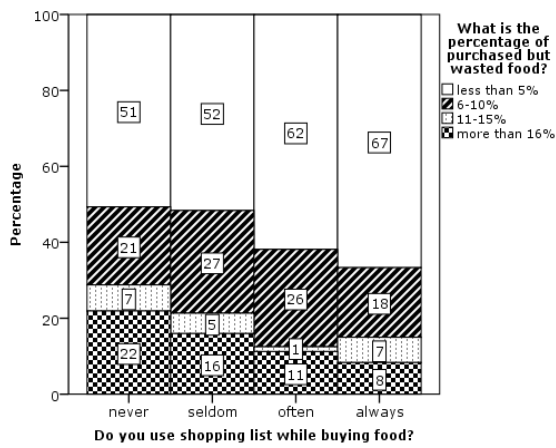
Source: authors' construction based on the 2013 survey

Fig. 5. The impact of the sub-aspect "review of already purchased food products" on wasted food amounts, year 2013, % (n=610)

The 2013 research indicated that the average amount of wasted food in the household was around 9 %, while the potential increase of incomes can have a positive effect on the growth of wasted food amounts.

The **creation of a shopping list** as an economic aspect affects the wasted food amounts in households. There is a negative correlation between the responses to the question whether before making the food purchase household members check what kind of food they already have at home and how much, as a percentage of purchased food, gets ultimately wasted. The more often household members **review already purchased food products**, the least food gets wasted in the household.

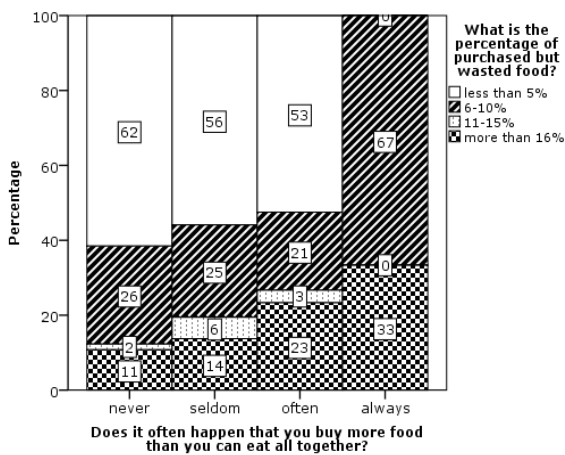
The prepared shopping list helps to reduce wasted food amounts. The correlation between the aspect and wasted food amounts is negative, the probability is 99 %. Thus, it can be confirmed that the creation of a shopping list and using it during purchasing food have a positive impact on the reduction of wasted food amounts.



Source: authors' construction based on the 2013 survey

Fig. 6. The impact of the sub-aspect „use of a shopping list” on wasted food amounts, year 2013, % (n=610).

Planning meals and listing products that need to be bought can help reduce food wasting because that can help with preventing from buying unneeded products spontaneously. But no matter how good a person previously thought about what to buy and what to do with bought food, during shopping, it still is hard not to buy the food that wasn't planned, and thus this action, in the end, can be a reason for some food wasting.

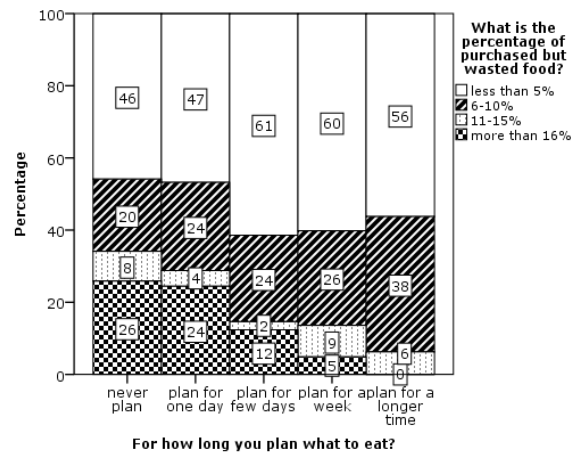


Source: authors' construction based on the 2013 survey

Fig. 7. The impact of the sub-aspect “amount of purchased food” on wasted food amounts, year 2013, % (n=610)

The correlation between the questions "Does it often happen that you buy more food than you can eat all together?" and "What is the percentage of purchased but wasted food?" is positive, which indicates that despite the fact that the shopping list gets created and also used during shopping routine, it is still hard for

household members not to buy a product that wasn't listed, thus also buying more than they can eat.



Source: authors' construction based on the 2013 survey

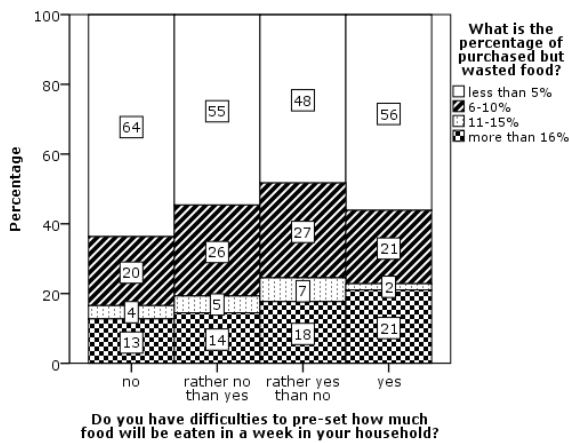
Fig. 8. The impact of the sub-aspect “length of the planning period” on wasted food amounts, year 2013, % (n=610)

And even if Latvian respondents plan their meals beforehand, it is still hard for them to refrain from impulsive buys influenced by short-term desires.

According to the research results, there isn't a significant correlation between wasted food amounts and household members' practice to divide food buying chores. But in households where only one person is responsible for food provision, the amounts of wasted food are much lower. The more people are shopping together, the greater the possibility is that purchased food will be wasted, because each member of the household tries to meet their immediate food related wishes.

The research data show a positive effect of shopping list creation on the reduction of food wastage. Thus, it was expected that the more difficult it is for household members to determine in advance the household food consumption amounts in a week, the more food they would waste. The correlation coefficient is positive; the probability is 99 %. These correlations suggest that it is important to pre-plan meals, to keep track of food that was bought and food that still needs to be bought, as well as to track expiration dates and spoiling of the products, and to try to

integrate food into meals while the food is still suitable for consumption. The more often food related planning and coordination will be carried out in the household, the easier it will be for household members to determine in advance the food consumption amounts.

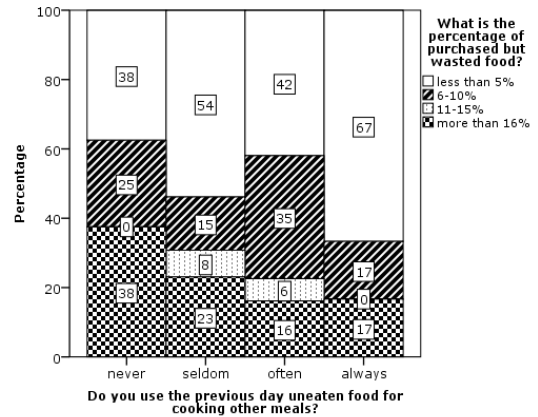


Source: authors' construction based on the 2013 survey

Fig. 9. The impact of the sub-aspect "difficulty of determining in advance the consumption amounts" on wasted food amounts, year 2013, % (n=610)

A food **storage** practice is tightly linked to how long food will stay fresh and valid for consumption, thereby directly affecting the food efficient use. It is therefore safe to say that the right type of storage helps to use the purchased food sustainably. It is possible to see the correlation between the existing of storage places and the amount of food that could possibly not be wasted. Household members waste the least or less than 5 % of all their purchased food, if they have an adequate food storage space. And, the more storage space they have, the less food gets wasted.

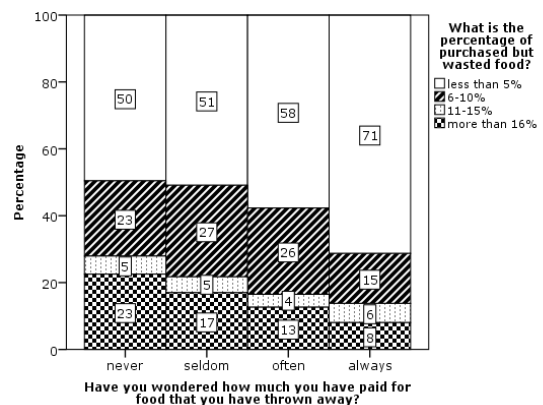
In order to assess the awareness of food wastage amounts, the question "Do you use the previous day's uneaten food for cooking other meals?" was asked to be able to figure out whether respondents often adopted a practice to use leftovers while cooking new meals, thus reducing wasted food amounts and also saving some money, because they wouldn't need to buy extra food.



Source: authors' construction based on the 2013 survey

Fig. 10. The impact of the sub-aspect "use of leftover food" on wasted food amounts, year 2013, % (n=610)

Household members often are unaware of wasted food amounts because discarded food doesn't stay for that long in the household. Therefore, respondents were asked whether the previous day's uneaten food was used in their households for the cooking of other dishes. The data indicate that with a probability of 99 %, there is a negative correlation between the use of the previous day's uneaten food and wasted food amounts, meaning that the less food leftovers are integrated while cooking new dishes, the more households waste their food. And the less household members are conscious about discarded food amounts, the more these households waste food. This issue is also closely correlated with the matters that concern the meal planning routine and potential improvement of financial stability.



Source: authors' construction based on the 2013 survey

Fig. 11. The impact of the sub-aspect "realizing how much wasted food costs" on wasted food amounts, year 2013, % (n=610)

After assessing the economic impact of the aspect's "potential improvement of financial stability" sub-aspect "realizing how much wasted food costs" on wasted food amounts, with a probability of 99 %, it is possible to confirm that this sub-aspect correlates with wasted food amounts, and the correlation is negative, which indicates that the less members of the household think about how much they have paid for the food they have wasted in the end, the more, in percentage terms, gets wasted from the bought food. This points to the fact that Latvian citizens are motivated to waste less when they know how much they paid for such an action. Information provided by "Viduskurzeme Waste Management Organization" Ltd shows that sorted bio-waste collection costs 30 % less than unsorted waste; if the organic waste collection rate is equal to 7.93 EUR/m<sup>3</sup>, then the unsorted waste collection rate is 11.33 EUR/m<sup>3</sup> (VAAO, s. a.). Often, when people say that they do not waste their food, they really believe in what they say, because the food that is intended to be thrown away does not stay stored in the house for too long (Jones, 2004). That is why people do not really see the actual amount of food they waste because when considering the amount of food that gets consumed, the wasted part of it seems insignificant.

To get a clearer picture, the issue of the food cost identification was studied from the perspectives of average household members' incomes and wasted food amounts. With a probability of 99 %, it can be confirmed that there is a negative correlation between the questions, the correlation coefficient is -0.13. The result analysis indicates that in households where an average income per person did not exceed EUR 256, their members most often thought about how much wasted food had cost them. By contrast, households where an average income per person exceeded EUR 685 were also the ones that had spent most money on food and also thought the least about how much wasted

food had cost them. It is therefore important to speak more about the food waste problem, so that even those who can buy as much food as they want and don't aim to save some money also could think about the consequences of their actions.

### **Conclusions, proposals, recommendations**

The research studies on wasted food amounts and motivating aspects are not done regularly, and they don't help to reveal global trends; that's why it is difficult to monitor the trends. Methods for calculating food waste amounts can differ, so sometimes wastage amounts can differ in a context of one country, even if real wastage amounts can be pretty similar. Therefore, the aim of this paper was to determine the wastage amounts in Latvian households and to research the economic aspects that affected such behaviour.

- 1) People in cities waste food the most, because people in urban areas have easy access to food; in addition, by not growing their food themselves, people don't realize what kind of effort it requires, and what kind of resources are used when food is grown.
- 2) International research studies indicate that food packaging is important from the food safety perspective because it helps to prolong the freshness of the food; it also makes food safe longer for human consumption, thus it is possible to buy food and be able to fully consume it before it spoils. The members of households surveyed by the authors indicated that consumers paid more attention to price and the food product's expiration date, rather than to packaging, even if the packaging of the products directly correlated with the duration of food validity.
- 3) In households with only adult residents, food gets wasted the least. This situation can be explained by the fact that children, especially children aged 4-7, are often too picky when it comes to food; therefore, it is harder to plan meals in such households. But, in contrast,

adults already have a particular taste for food, and mostly know what they like and don't like to eat, and they also can plan and cook their meals for themselves.

- 4) Single-person households generate the greatest amount of wasted food.
- 5) Households with higher incomes waste more food, international studies also indicate a similar tendency. Therefore, it can be expected that an increase in the average income per household member can influence the increase of wasted food. This is the reason why in Latvia the food waste problem must be addressed, although the wastage amounts are below the average EU figures.
- 6) Storage practice indicates that household members waste their purchased food the least, if they have an adequate food storage space. And, the more storage space they have, the less food gets wasted.
- 7) Planning meals and listing products that need to be bought positively influence food waste reduction, but no matter how good a person previously thought about what to buy and what to do with the bought food, during shopping, it still is hard for Latvian consumers not to buy food that wasn't planned, and thus this action in the end can be a reason for some food wasting. The more household members think about what they plan to eat in a longer term, the less food is wasted in the end. The data also correlates with the shopping list positive effect on the reduction of the wasted food amounts. Thus, naturally, the more difficult for household members it is to determine how much food is eaten in a week in their household, the more food gets wasted in these households.
- 8) The household members' active involvement in food shopping list planning motivates these people to also more often cook wholesome meals at home. However, an analysis of the responses indicates: the more people shop together, the greater the possibility is that the bought food gets wasted, because each member of the household tries to meet their immediate food-related wishes, therefore buying more food than needed, and it also can be difficult to integrate the bought food into meals.
- 9) The less household members are aware of wasted food amounts in their households, the more food gets wasted in such households, and the less food leftovers are integrated while cooking new dishes.
- 10) The less members of a household think about how much they have paid for the food they have wasted in the end, the more, in percentage terms, gets wasted from the bought food. This points to the fact that Latvia's citizens are motivated to waste less when they know how much they paid for such an action.

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