

**THE STUDY OF FOOD WASTE IMPACT ON THE HOUSEHOLDS' SOCIO -
ECONOMIC STATUS IN THE MUNICIPALITY OF VRŠAC**

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Abstract

Food waste made by consumers' uneconomical behaviour has negative ecological effects and it also affects households' financial costs. Wasted food, as a consequence of the incomplete use of its edible part, is an important issue and is not sufficiently explored in Serbian science. At a global level it can be claimed that there is a lack of an adequate estimate of the total amount of uneconomically wasted food, a lack of data about food loss' critical stages in the food supply chain, and also about various consequences, that is, possible effects of such waste on ecological, economic and social environment and position of households.

Republic of Serbia is facing increasing problems of such uneconomical food loss (and, thus, resources), although its standard of living does not allow such daily behaviour. In theoretical and methodological terms, there is a problem of quantitative estimates of food waste, made within a household, as well as finding ways for its reduction. The aim of this paper is to analyze the awareness, attitudes, behaviour and ways of treating food and food waste within a household, based on a survey research of a random sample of a one hundred respondents. The results indicate the situation in this field and the patterns of daily behaviour of households in Vrsac municipality, and also estimation of monetary value of the food which is lost hereby. Based on these results, the authors conclude on the relevance of food waste problematic in Serbia and in regards to cultural habits and neglect of economic values of wasted food by surveyed households.

Key words: food waste, consumers, household, behavior, economic value

Introduction

Food waste arising as a result of poor food handling at different stages of the entire process of food supply is a global issue because of the impact on quality, food safety, economic development and the environment. Historical and cultural heritage, the level of economic development, social structure and the degree of social consciousness lead to a significant difference in the amount of wasted food, and consequently to different approaches to resolving this issue, in comparison to other countries. In middle and high-income countries the largest amount of food is wasted at home, which is usually associated with the consumers' behavior and habits (the losses exceed 40%) (Gustavsson et al., 2011). In low-income countries, a significant loss of food occurs during the early and middle stages of the food supply chain (40% of food loss occurs during harvesting and post-harvest, while much less food is thrown away at the consumer level) (Ibid.). The reason is that consumers in undeveloped countries, which are often subject to unstable political and economic climate, with high rates of poverty, limited income and high unemployment rate, have a strong awareness of food supply uncertainty. Therefore consumers are forced to better plan buying, storing and preparing of food.

Today, the amount of food produced in the world is more than enough to feed the entire population. However, according to FAO, about one third of the food produced globally is thrown away or wasted, which is a significant amount of 1.3 billion tons (Ibid.). Food waste

occurs during the entire food supply process, from the beginning of agricultural production to final consumption in households (Ibid.).

Food waste, as such, represents the loss of economic value for the stakeholders in the supply chain (FAO, 2012). Different studies indicate that a large amount of food is thrown away while still at the stage in which it could be completely used. According to Waste & Resources Action Programme record, in the UK most of the thrown food (4.1 million tones or 61%) is avoidable and could have been eaten if it had been managed better (Ventour, 2008).

Regardless of the achieved level of political and economic development and modernization of a society, the waste of food should be kept to a minimum. Many initiatives have been launched around the world to resolve this issue. In 1974, at the World Food Conference, the reduction of food loss is for the first time offered as a solution to reduce hunger in the world, while in January 2012. EU Parliament adopted a resolution to reduce waste by 50 per cent by 2020 and to improve access to food for EU citizens in need (Segrè 2013: 23).

Serbia is also facing a growing problem of food waste, although the standard of living does not allow that kind of loss. Generally, institutions in Serbia have insufficiently addressed the problem of quantification of food waste, but also of food losses and causes of losses at various stages of the supply chain, as well as the issue of the necessary financial resources for prevention of food loss. Certain phases of food loss have been however researched in domestic science, such as loss at the production, postharvest and processing stages, but very rarely food waste has been investigated. Further research in food waste (that occurs during retain and consumption - thrown food) is essential bearing in mind that food safety is a major issue in the economic, social and environmental terms. In this paper we analyze data from empirical research that aimed to survey consumers' attitudes and behaviour during different stages of daily food management, in households from buying, storing, preparing to food disposal. An important part of this paper is establishing the level of respondents' knowledge and awareness of causes and consequences of wasted food, as well as the level of their will to change behaviour when managing food in households.

Materials and methods

The aim of this paper is to analyze data gathered in empirical research on ways to handle food and food waste at household level through the analysis of awareness, attitudes and behavior of consumers, taking into account the different types of households. The basic assumption is that there is an increasing problem of handling food waste, as well that there are significant effects of such waste on ecological, economic and social environment and the position of households. Based on the available data and the results of other analysis, we have defined the methodology and the sample on which the field survey was conducted in the municipality of Vrsac in the first half of 2013. As a model for the development of the questionnaire we used methodology of *Food waste avoidance benchmark study*⁴⁰ that was adjusted to the needs of our research. The field research was conducted by survey of 100 respondents, who are mostly equally responsible for the buying, preparation, storage and disposal of food within their households. The questionnaire covered urban and rural, agricultural and non-agricultural multi-member households in the municipality of Vrsac. In addition to data on demographic, economic and social characteristics of households, questionnaire also contained information about the daily food handling at the monitored households in the Municipality of Vrsac, and the respondents' evaluations of the cash value of food that has been lost by their non rational treatment. The first part of the questionnaire related to socio - economic structure of a household, in order to determine the level of education, sex, place of residence, household type and its economic status. The second part of the questionnaire contained a set of questions that examined consumers' attitudes toward food waste as well as the consumers' conceptual distinction among the categories of food waste. The third part examined the knowledge and

⁴⁰ <http://www.lovefoodhatewaste.nsw.gov.au/portals/0/docs/11339FWABenchmarkstudy.pdf>

attitudes of respondents in relation to food and its possible economic impacts, behaviour of participants during the planning, buying, preparation and storage of food, and an assessment of the economic impact of wasted food on the household budget.

Results and Discussion

The study conducted in the municipality of Vrsac mostly included non-agricultural urban households (86%) with satisfactory financial situation (84%). Most respondents mainly in charge of the food management at households were female (80%). More detailed analysis of socio-economic features and their intersection with the level of knowledge, awareness, attitudes and behaviour of respondents is very important and it is still pending. However, in this paper we present only the results of the other segments of the questionnaire, which analyzes the attitudes of consumers about food waste, as well as their conceptual knowledge and differentiation between food waste that can and (or) cannot be avoided.

Knowledge regarding the food waste. The aim of this section was to analyze the respondents' attitudes about the type of food that they consider to be the waste which can and which cannot be avoided. The results indicate that the respondents think waste that could be avoided by better managing include food such as old frozen food (77%), damaged fresh products (52%), food leftovers on plates, occurring after meals (56%), unfinished drinks (63%), uneaten portions which remain after meals (58%), and packaged food with the expiration date (58%). Under the waste that cannot be avoided, regardless of food management, respondents include fruit and vegetables peels (53%), bones (59%), tea bags or coffee grounds (80%). Given that just over half of respondents correctly classified food waste into a particular category, it can be concluded that a significant amount of waste just comes from lack of knowledge and improper food handling by consumers. Given that the visual appearance has a rather strong influence on average consumers' perception of food, damaged products and unappealing food leftovers are often the reason to avoid consuming, and therefore creating food waste. Consumers are often unaware that the date that is marked as *best before* indicates the time when the food is guaranteed of top quality but can afterwards be used without consequence for some time. Recognizing this food by consumers as an edible might reduce the amount of wasted food on a household level. Most respondents (85%) *agree or completely agree* with the statement that food that people could have eaten is not wasted if it was eaten by pets or composted. Although most respondents think neither of waste nor of its effects on the acceleration of climate changes (43% of respondents are neutral, and only 38% *agree or completely agree* with the contribution of food to accelerated climate change) respondents think that the population of Serbia throws a lot of food (64%), and that disorganization and laziness (79%) and consumers' fast lifestyle (67%) contributes to food waste. The majority (82%) of respondents believe that the energy, water and nutrients used in the food production and transportation are "wasted" if the bought food is not eaten. The reason for this attitude is a public misunderstanding and lack of knowledge about the problems food waste may cause such as a loss of resources used in production in the form of land, biodiversity, water, energy and inputs as well as unnecessary CO₂ emissions. According to a research by WRAP (Waste & Resources Action Programme), food waste emits about 18 million tons of CO₂ each year. WRAP estimates that if food were not discarded in this way in the UK, the level of greenhouse gas abatement would be equivalent to removing 1 in 5 cars from the road.

When asked about the safety of short-term and long-term stored food 73% of respondents said that they believe that cooked food cannot be kept in the freezer for over a year, but 53% of respondents *disagrees* and *strongly disagrees* with the statement that food kept in refrigerator for more than one day is not safe for consumption. These responses indicate that the participants are well informed that the food safety depends on longevity and type of storage of food. However, in practice this is often neglected and the food is stored longer than necessary, and ultimately thrown away, further increasing food waste. The main reason for this is

overloading the fridge with food, where food remains out of sight in storage for longer than necessary.

Respondents' opinions in regards to wasted food. Behaviour and attitudes of consumers before and during shopping for food have a direct impact on the way they buy food, as well as on the amount that is later wasted. Respondents were asked to choose between two completely opposite statements offered about food that describe their views best. In our sample, 61% of respondents said that before going food shopping they plan their meals and buy food on a pre-made list and during shopping they carefully think about how much food they use (89%). At the same time, in line with the current economic situation, 87% buy only food that they know it will be used, and 68% of the respondents noticed that purchased food was not used. However, the majority of respondents (90%) said they feel bad when they don't use purchased food. More than half of respondents (56%) believe that the cause of insufficient use of food was the fact that they buy larger quantities, which should last until next purchase. The reason for that behaviour was often a miscalculation of daily or weekly needs for a certain amount of food purchases, buying on sale and behaviour patterns of consumers to buy food in bulk because of price volatility, as well as the problem of continuous market supply with certain products. Among the respondents, there is increased concern for the health and safety of food so 66% throw away fruits and vegetables because they appear damaged, 63% throw food that is moldy, 55% throw fresh food passed its use date, 63% throw packaged foods that are not open, if passed use date. Although there is a view that food should not be wasted, most respondents – *answering that they still throw edible food away* - realized that throwing a small amount of food daily, expressed in monetary value, has a strong impact on their economic situation annually. A large amount of still edible food ends up in the landfill due to reasons like: health concerns, food visual appearance, various justifications in the form of being too busy, too lazy and also lack of familiarity with the "best before" issue. However, the majority of respondents (72%) show a certain kind of saving, in the context of poverty in society and the specific relationship to idea of throwing bread, which is expressed in the practice to use dry bread for toast, bread crumbs or some other culinary purposes. Respondents were asked to estimate how much uneaten food is thrown away in the household: 53% responded that they throw away very little food, 26% is throwing food away a reasonable quantity, while 18% responded that they throw more food away than is necessary, and only 3% answer they do not throw away any food. However, answering the following questions many consumers who believed they don't not throw away food came to the conclusion that they still throw a certain amount of food away, so during the survey the number of respondents who do not throw food away was reduced. The reason is the lack of recognition of food waste as an important factor in the economic sense. Respondents were asked to provide a free assessment of the average weekly amount of food bought and then thrown away unused. During the assessment of money wasted on food on a monthly basis, 50% responded that they throw food away equivalent to the amount of 1,000 dinars, 38% to 5,000 dinars, while 12% thought that they throw away food worth up to 10,000 dinars. Given that the average household income for the first half of the 2013 was 42521.00 RSD (SZS 2013), and the average basket of consumer goods was 34171.68 Dinars (Ministry of Foreign and Domestic Trade and Telecommunication 2013), this leads us to the conclusion that typical household spends relatively large amount of money on food that is uneaten and thrown away. A possible reason is that consumers, although aware of the problem, do not recognize themselves as the actors of food waste process.

Reasons for food waste. During our research we tried to find the reasons for consumers' behaviour in shopping, cooking, storage and food wasting. An important goal of this study was to identify areas in which consumers would show the will and desire to change behaviour when managing food in the household. Respondents were asked to identify the reasons for throwing away food at the household and to show their willingness to change behaviour for the sake of reducing food waste in the household. As two main reasons for throwing food

away in households, 21% of respondents stated that the food is thrown away because it's expired, while 14% said that the reason is they like to eat fresh food. Second group of reasons for food waste are: the food that stays long in the refrigerator and freezer as well as some members of the household do not always finish their meals 11%, 10% stated that they do not plan meals in advance, 9.5% stated that family members often change their plans during meals, while 9% don't use the remaining ingredients in other meals. From these results it can be concluded that for the majority of respondents there is no habit of planning and managing food in the household, as well as negligent practice regarding the remains of still edible food. Although many people think it is wrong to waste food, large quantities are thrown away, and are justified by being too busy and not getting the time to use leftover food from the fridge.

Changing the planning and buying of food. Although 97% of respondents said they are aware that they waste food and that waste as such has a negative impact on the environment and on the economic factor, only a small percentage is willing to change their behaviour when managing food in the household. In the questionnaire, respondents were offered 11 suggestions with the help of which they could intervene to reduce the amount of food waste. Of the 11 suggestions proposed 51% is *ready* or *very willing* to buy a smaller amount of food, 32% *not at all* or *not very ready* for a change, while only 14% have already implemented these changes, 51% of respondents are *very ready* and *ready* to cook the right amount of food for meals, while 33% is *not at all* or *not very ready* for such behaviour change. 49% of respondents are *very ready* and *ready* to change the way they dispose food, while 41% is *not at all* or *not very ready* to change. About 49% is *very ready* and *ready* to be more informed through information technology, and through tips from the experts. About 39% is *very ready* and *ready* to use leftovers for other meals, 45% is *not at all* or *not very ready* to change, while 31% is already using leftovers. Given that a significant part of the leftovers comes from unplanned purchase it is significant to analyze the behaviour before the purchase. Most respondents (72%) reported that they *often* or *always* check the food in the house just before buying. Based on this, 60% of respondents make a list and adhere to it as much as possible when shopping, while 37% are ready to begin using the shopping list. In the survey respondents expressed awareness that food waste monetarily valued has great economic impact on the household budget. They are also aware that better organization of purchases by planning food shopping in advance, by creating a shopping list based on their needs and weekly menu, could contribute to significant savings. However, a significant proportion of respondents are still not ready to change their old habits.

Shopping behaviour. Since the respondents claim that the economic situation affects the purchase, 90% of them claim to buy food *always* in accordance with the household budget. About 46% *often* and *always* buy food that is on sale, and 31% *often* and *always* buy groceries in bulk, and if the price is lower. Respondents in previous statements claimed that they have an awareness of food safety, yet only 65% said they check the expiry date before buying groceries. Only 10% of respondents recognize shopping for food in larger quantities than they need as the main reason for food waste, while 7% of respondents identify this as a secondary reason. In analyzing the reasons for the increased purchases of food, our research shows that it is mainly about the fact that our respondents believe that they really need increased amounts of food (24%), others believe that the main cause is failure to use shopping lists (11%), not checking the refrigerator before going shopping (11%) and the need to use fresh ingredients in meal preparation (8%). It is interesting that only 11% of respondents *recognize* that the reason for the increased purchases of food is unplanned buying at a discount. At the consumer level an effort to reduce food waste goes back to the purchase itself. However, consumers often fall under the influence of strong impulses such as special offers, food on sale, marketing or similar psychological traps, which are a major cause of unnecessary buying of large quantities food.

When asked what family members often do in preparing the main meal, 42% answered that they *never or rarely* determine the amount of servings and cook as needed. In line with that,

57% *always* or *usually* cook more than needed until the next meal. Relatively small number of respondents recognized that *cooking too much food is basic cause for throwing large amounts of food away*. In Serbia there is a lot of uneaten food left due to the cultural, traditional and hedonistic pattern of behaviour and cooking habits. That cultural pattern implies preparation of big meals in the fear that family members can't *be left hungry*, and also due to the need for variety and richness of cuisine (imperative of „good host“), as well as poor estimate of required amounts. This behaviour is typical for poor societies where *good* nutritional status is considered desirable (especially in the older generation, not burdened by trendy skinny appearance), regardless of the food quality. However, it could be claimed that due to impoverishment of society, many families in Serbia are increasingly concerned about their family budget, and thus about the amount purchased, consumed and thrown away food.

Conclusion

Regardless of the achieved level of political and economic development and modernization of a society, lost/wasted food is important problem in economic and social terms, especially in Serbia, where the poverty rate is very high and many social categories that are barely surviving. This situation further increases the need for a scientific analysis of this issue, which at first glance may not seem so relevant, but data on the volume of wasted/lost food in some countries is alarming to address this question in the social as well as economic terms. Although there are many studies conducted worldwide, in Serbia we have no adequate analytic or synthetic estimation of total amount of wasted and lost food in various stages of the food supply chain.

This study represents one of the few analyzes of awareness, attitudes, behaviours and ways of managing food and food waste in the household and is limited to geographical area of Vrsac. However, for the purposes of this paper, only a minor share of the collected and processed data is presented, so this paper is the first in a series of papers from this empirical research that could serve to shed light on this topic and bring it to the public. In further research the authors plan a more detailed analysis of certain attitudes and behaviour patterns of respondents in the context of the types of households, financial status, level of education, the attitudes and practices, and the like.

The results of this study point to the problem of insufficient food utilization, and food waste (about 65% of respondents see it as a problem, and 68% admitted that part of the household purchased food is not used). This is mostly frozen food, food which has expired, and food leftovers due to excessive shopping, meal planning and inadequate cultural habits to prepare more food than needed, neglecting the economic value created by food waste. In short, despite the fact that there is awareness of the issue, part of the food is still thrown away. Studies of food waste is a relatively new field of domestic science with a lot of unexplored topics. This is relevant if we have in mind that empirically based knowledge about this issue could improve the awareness, attitudes and practices of waste management by consumers and institutions, but it could also be useful in the sake of creation of strategies for addressing this problem in a regional or national level.

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