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MANAGING AND MINIMIZING FOOD WASTE IN THE HOSPITALITY INDUSTRY

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Abstract

Food waste is a dominant issue for modern society, and the first step in addressing it is to recognize and comprehend the causes of it in each link in the food chain as well as in certain industries, in this case, the hospitality industry. Categorization and quantification are crucial steps in developing strategies and suggestions with the primary goal of preventing food waste. Given the unequal supply of food and and varied economic practices seen in the hospitality industry, this is not an easy task. Food waste management might be a crucial component of management in the hospitality industry, partly as most practices that result in both secured finished product and a cutback in food waste can be implemented after a food safety management system has been in place. The aim of this paper is to show the general current state of food waste in the hospitality industry and how it can be managed.

Key words: food waste, food service, management, prevention, sustainability, hospitality industry.

INTRODUCTION

In time of constant population expansion, climate challenges, and pressure from land use are the three main concerns facing the world today (Bassi Christensen & Damgaard, 2017). The amount of food thrown away worldwide, which amounts close to 1.4 billion tonnes of food annually, is one-third of the total bulk produced for human needs (Gustafsson et al., 2013). This amounts to US$ 750 billion in terms of money. Given that there were more than 820 million

hungry individuals across the globe in 2018, this information becomes even more significant (Morone et al., 2019). It has been established that food waste increases the emissions of dangerous gases, as well as the waste of water and soil, which then harms biodiversity. Without a chance for field repair, intensive agriculture, for example, depletes the soil's fertility, causing farmers to use artificial fertilizers more frequently, increasing environmental pollution and reducing the amount of arable land available for farming. In 2007, food was grown on 1.4 billion hectares of land worldwide, an area almost equal to the size of Canada and India put together. Since one third of all food produced is lost, one third of all arable land is unnecessarily subjected to intensive cultivation, which undoubtedly results in soil degradation.

Without the ability to restore the field, intensive agriculture, for example, depletes the soil's fertility, causing farmers to use artificial fertilizers more frequently, increasing pollution and reducing the amount of plowable land available for farming. One third of all arable land is unnecessarily exposed to intensive cultivation since one third of all food produced is lost, and this unavoidably degrades the soil.

Food waste is one of the factors that significantly affects biodiversity, which in turn increases the need for new farmland. Despite food waste, agriculture is being established on untamed territory, which causes species extinction, and deforestation is on the rise (74% of the total annual global deforestation). Additionally, unrestricted fishing to supply the demand for food generated via agriculture is depleting water supplies.

Given the numerous detrimental effects of food waste on global development, it is obvious that the only way to lessen these effects is by putting mechanisms in place to cut down the amount of food waste produced. First and foremost, this necessitates raising awareness among people, putting best practices into practice, modeling responsible behavior, and involving the scientific community and relevant authorities. Additionally, food industry entities need to become conscious of how much food waste they generate and how it affects the world at large.

All parties concerned might work together to create a community that serves human needs while making the best use of the resources at their disposal without further endangering the environment or natural systems.

Food wastage occurs at every stage of the food supply chain, from horticular production through harvest handling and storage to food manufacturing, distribution channels and daily consumption (FAO, 2013b), i.e., from farm to table, including the hospitality industry. To fully understand this problem, however, food loss and food waste must be distinguished. Food waste is the disposal of food deemed suitable for human use, irrespective of whether food is stored after its use-by date or is allowed to deteriorate. Food loss is the reduction in mass (dry matter quantity) or nutritional value (quality) of food that was initially intended for human consumption. As a result, regardless of how frequently it occurs or where it falls in the food chain, the term "food waste" is

used to describe all types of food loss. Any form of food that is wasted is referred to as "food wastage". Consequently, the term "wastage" refers to both food loss and food waste (Chaboud & Daviron, 2017). Food loss happens in the first stages of the food chain, primarily in underdeveloped nations. Due to the inadequate post-harvest infrastructure and immature technologies, this has occurred. Contrarily, food waste primarily happens in modern nations, making consumers largely responsible for their behavior toward food.

For instance, over 90% of food waste in Sub-Saharan Africa occurs in the pre-consumption stage, while nearly 53% of food waste in Europe originates from homes during the consumption stage (Omolayo et al., 2021). The household sector contributes the most, and the food processing industry comes in second (47 million tonnes). A staggering 72% of the food waste in the EU is reportedly accounted for by these two industries.

The trash from wholesale and retail, primary production, and food service account for 28% of the total amount of food waste, which totals 5 million tonnes (Lemaire & Limbourg, 2019). A big contributor to the problem that can and must be remedied is the hotel sector, which includes the food service business. The third-largest producer of food waste is the hospitality industry.

THE HOSPITALITY INDUSTRY'S FOOD WASTE

Globalization has raised living standards and per capital income throughout the world, which has fueled the expansion of the hotel industry. Hotels, restaurants, cafes, bars, sandwich shops and similar businesses that serve takeout food or dishes on the premises are the examples of enterprises in the hospitality sector that prepare food (Pirani & Arafat, 2014). The hotel industry has expanded at the same time that there are more businesses involved in food preparation, which has directly led to a rise in the amount of food waste created.

Contrarily, the 21st century has brought about changes in customers' lifestyles and behaviors. People increasingly resolve to get takeout or eat at restaurants instead of cooking meals at home due to lack of time. The only approach to address major issue of food waste, which has appeared as a challenge for contemporary society, is to comprehend and pinpoint the causes of its occurrence at every single stage of the food supply chain. Numerous studies have been carried out to quantify food waste as a result of this.

The hospitality industry can divide food waste into two categories based on whether it is created before or after guests' consumption. Pre-consumer food waste happens at the time of buying, storing ingredieences, and preparation of materials (storing or purchasing waste), as well as during food exposure (due to overproduction). The food that is remaining on the dish is referred to as the post-consumer waste. According to Pearson et al. (2013), this waste produced is also known as "food waste on plate" and refers to food that consumers have purchased but have not yet consumed.

Since it pertains to food that is made with the intention of being sold to consumers but is not sold to consumers, overproduction waste may also be viewed as end-guest waste. Additionally, based on whether it is edible or not and whether it can be prevented, food waste can be divided into different categories. It's vital to keep in mind that when talking about edible food waste, it encompasses waste from overly produced, spoiled, expired food, subpar food processing, and food leftovers. This preventable food waste happens when more food is produced or served than is necessary; it can also happen as a result of overcooking or thoughtless mistakes made during the food preparation process (such as errors in recipes), which may impair the quality that is sought or expected (Shaw et al., 2018). Buffet leftovers account for most of the edible and thus avoidable food waste (Shaw et al., 2018). At least 56% of all food waste in the hotel business is avoidable (Papargyropoulou et al., 2019). Non-edible food waste, which consists of byproducts from the mechanical processing and preparation of food, includes eggshells, inedible portions of fruits and vegetables, animal bones, and seafood shells. This kind of waste cannot be avoided (Papargyropoulou et al., 2019). Most frequently, plate food waste consists of a mixture of edible excess and inedible food fragments (Ravandi & Jovanović, 2019).

The type of restaurant service determines how much food is wasted by restaurants in the hospitality industry. Buffet-style restaurants offer the most superfluous food as opposed to à la carte restaurants. Salads and starchy meals like potatoes, rice, pasta, and bread make up the majority of the post-consumer (plate) food waste. Leftovers from a main dinner are unusual. Fruits and vegetables are the components that are frequently wasted when preparing food (Pirani and Arafat, 2016).

Food waste is produced by a variety of sources. The most common reason for waste to accumulate while buying and keeping essential ingredients for food preparation is non-compliance with good manufacturing practices and hygiene standards (Zrnić et al., 2021b). These established protocols guarantee the convenience, safety, and safe handling of food, but failure to adhere to temperature regulations or the first-in-first-out rule may result in food waste. Food that has been accumulated can be poorly planned or purchased in excess, which means that if it is not consumed, it expires and needs to be thrown out. Unavoidable inedible food waste is typically created during the food preparation phase by automated processing. The amount of this food waste may exceed what is acceptable, especially if processing is done with unapropriate tools or by untrained workers. Employee’s underestimation of the anticipated number of clients frequently results in overproduction during the meal preparation stage. Therefore, cooperation and information sharing regarding the volume and diversity of patrons are required between all hospitality sectors. Ineffective coordination and a lack of communication between the purchasing, cooking sectors also contribute to excessive waste production (Papargyropoulou et al., 2016). Most food waste during serving happens after it has been used for buffet-

style service (Pirani & Arafat, 2016). This is because the regulations governing the maximum amount of time and temperature that food may be exposed to at buffet tables are not being followed properly (Papargyropoulou et al., 2016). Furthermore, there is a plenty of food available, and the prices are set, which encourages customers to overfill their plates with food. However, management would prefer to lose clients than to throw away meals, therefore they showcase excessive amounts of food to satisfy and exceed consumers' needs (Papargyropoulou et al., 2016). This all results in post-consumer food waste, which is typically brought on by oversized portions (Pirani & Arafat, 2014). Large portions necessitate more ingredients and are typically caused by deviation from the recommended serving sizes. Additionally, this plate waste happens when a customer decides that a dish they bought is not of the expected or necessary quality (Zrnić et al., 2021a). Additionally, elements like the season, the volume of visitors, the days of the week, the area where the garbage is produced, etc. impact the amount of garbage created by the hotel sector (Okumus et al., 2020).

MANAGEMENT OF FOOD WASTE IN THE HOSPITALITY SECTOR

In the context of contemporary business, the idea of sustainable development has evolved into a cornerstone for strategic healthcare decision-making. Economic, environmental and social sustainability are its three foundations. The economic pillar derives from the goal of every company, which is to turn a financial profit. The environmental pillar focuses on protecting the area's resources and ecology in close proximity to the hotel sector. Everything that has an impact on people's overall health and quality of life is referred to as the social pillar. Because the improvement of the quality of life for those who are directly and indirectly related to this sector should be the basis for economic success, all pillars of the hospitality sector's sustainable development are interdependent. The modern consumer's demands for the services provided by the hospitality sector are also changing and getting more complex, which makes life today unique.

Elfimova et al. (2014) found a direct correlation between the goals of tourists and the concepts of sustainable development. According to these demands, the hospitality industry has begun to embrace the idea of sustainable development. In order for this idea to have any real-world application, the hotel industry's strategic attitude toward environmental preservation must be reduced to operational management practices. The state ought to encourage enterprises in the hotel sector to use their operations to enhance a green environment through a legislative framework. The three key facets of hospitality management that come to mind when thinking about sustainable development are waste management, renewable energy use, and energy efficiency. Energy efficiency and the usage of renewable energy sources are high priorities in the hotel industry since they lower operational costs and local pollution.

Increased global food production has been shown to result in consumer and food consumption losses, especially in industrialized countries. Therefore, the hospitality industry can make a substantial contribution to increasing the public's understanding of the value of food in order to reduce global food waste. The majority of hospitality-related businesses, including those in Serbia, still haven't figured out how to manage their trash, though. For instance, because of their extensive business operations, hotels produce a significant amount of waste. Waste removal and storage are issues encountered on a daily basis, particularly in tourist destinations with a pronounced seasonal nature. The two types of trash that the hospital industry generates most frequently are food waste and packaging waste (waste from cardboard, plastic, and glass containers that contained food, beverages, cleaning supplies, and cosmetics). The demands on management in the hotel sector are high because customers desire quality food and service. The government's requirements for food safety must also be met concurrently. The management then projects increasing profitability. Better understanding of environmental protection adds another barrier to the management of food waste in the hotel industry.

FOOD WASTE REDUCTION AND DISPOSAL AVOIDANCE

In order to develop and implement strategies and practices that would avoid or decrease food waste, managers in the hospitality sector must be able to recognize and characterize the sources of food waste. Sustainable food management is its main objective, and the best way to achieve this is through prevention. When carried out in the sequence outlined in the advice, the other recommended activities for accomplishing the sustainable objectives are less desirable. Reusing, redirecting leftover food for human or animal use, composting, creating renewable energy, and other strategies are some of the proposed measures. However, disposing of food waste in landfills is the final and least preferred choice.

Since preventing or reducing food waste is a priority activity in the process of waste reduction, specific recommendations should be put into practice in the hospitality business. In minimizing food waste, they also incorporate the principles of sustainable development. The steps listed below ought to be included with the intention of responsible behavior:

- **Inventory management system** - should include maintaining the ideal conditions for keeping goods, tracking grocery consumption patterns (Zrnić, 2020).
- **Portion size options** - utilize groceries in accordance with food standards and effectively utilize food leftovers from previous meals; properly teach kitchen workers to minimize food waste. Reduce serving sizes, especially for meals that are considered to contribute the most to plate food waste (Papargyropoulou et al., 2016).
- **Manage leftover food** - create procedures to minimize food waste

- **Disposal measures** - food waste is properly stored in order to develop waste disposal (Awasthi et al., 2018).

A solid food safety management system is required before beginning any of the several phases that are mentioned. An international standard for food safety management systems called ISO 22000 outlines the specifications for such a system. This standard is based on the ISO 9001 standard as well as the HACCP (hazard analysis and critical control point) methodology. This standard covers all of the widely accepted principles of food safety, including preparation programs, system management, process control, and HACCP concepts (Zrnić et al., 2021b).

In the USA, restaurants were responsible for 55–60% of all foodborne disease outbreaks (Harris et al., 2018). According to EFSA data, the hospitality industry is second in the EU Member States for foodborne illness (2018). Implementing the ISO 22000 standard, which has as its main goal the production of safe food, has the additional and very significant benefit of significantly reducing food waste when its requirements are met. Additionally, this standard deals with forecasting and analyzing a wide range of external events and dangers that not only pose a threat to food safety but also negatively impact business operations and employees' salaries. We stress the ISO 14000 (EMS- environment management system) standards for environmental protection considering the necessity to integrate sustainable development in the hospitality industry. The risk management standard ISO 14000 is focused on reducing the dangers associated with environmental pollution. By establishing systems, the EMS increases the business's dependability in adhering to its legal obligations and other environmental requirements while also lowering these risks and the frequency of accidents. This is one of the prerequisites for any company operating in compliance with the SDGs.

Over 100 voluntary eco-labels are being used in the hospitality industry globally. These eco-labels refer to a few environmental management practices, including the handling of food waste. The Green Key is the eco-label given to hotels throughout the world that is the most well-known and often utilized. The United Nations Environment Program and the World Tourism Organization both support Green Key (UNEP). The lack of mandatory nature and high cost of individual entities' eco-labels is a drawback. There are just four hotels in Serbia that have received the Green Key certificate at the moment. There are some signs that this kind of certification will ultimately be available in other nations, but for now, the Certified Green Restaurant is a restaurant-specific eco-label given out solely in the USA and Canada (Pirani & Arafart, 2014).

By implementing more efficient practices in the food distribution, storage, and preparation industries as well as the hospitality business, it will be feasible to reduce expenses associated with controlling food waste while also reaching the UN's sustainable development goals (Papargyropoulou et al., 2014). According to WRAP (2013), a 5% reduction in current waste output would result in savings for the hotel industry of more than £250 million. How a hotel's management model is formed depends greatly on whether it is independently owned or a part of a chain. If a hotel is a part of a chain, the business criteria of the network are included into the creation of the food waste management system. The framework for implementing standards, such as employee training in the food and beverage business, is provided by the design and furnishings of the hotel. Independent hotels are allowed to create and enforce their own standards, thus it is hard to develop a single system that would oblige hotels to have advanced food management systems. Independent hotels experience the most difficulty in creating and putting into practice food waste management guidelines because of their frequent lack of resources (both material and human).

However, owners of small hotels or restaurants frequently decide not to embrace and adopt eco-friendly measures in the hospitality industry because they think the quantity of food waste they make is little. The main issue with this garbage's negative environmental consequences is that it is frequently given to landfills, which is the least preferable course of action, along with all of the food waste from these small businesses. This mindset could be brought on by the government's lack of education on the need of reducing the quantity of food waste it generates, which prevents them from being aware of the issue. Additionally, they lack the backing of capable institutions and governmental entities, thus they are unwilling to invest their time or money since they believe that doing so will only result in financial losses rather than the conservation of material resources (Pirani & Arafart, 2014).

Food waste continues to be a major environmental and economical problem, according to research by Okumus et al. (2020) on the topic of dealing with it at all-inclusive resort hotels. The findings indicate that guests' decisions, deeds, and attitudes are believed to be the primary causes of food waste. The findings also suggest that tourists' eating habits are influenced by their cultural origins, which increases the quantity of waste created. In a hotel survey conducted by Pirani and Arafart (2014), a sizable portion of hotel kitchens (44%) had signs urging workers to cut down on food waste. However, it is perplexing that hotel restaurants do not have signage with a similar message pushing visitors to act morally and educate themselves on food waste. An effort to convince visitors to act more responsibly toward the issue of food waste has only been effectively implemented in 7% of

the hotels evaluated. In addition, 47% of hotels give both unused and extra food, and 67% either compost or intend to compost their food waste.

The most frequent excuse given by people who don't compost is that they think they don't produce enough garbage, while those who don't donate say they weren't aware of the programs' existence or that food contribution is prohibited by food safety laws. Food business entities, in this case food operators in the hotel industry, are responsible for assuring the safety of their goods in accordance with General Food Law Regulation (EC) 178/2002. However, they do not want to be held accountable for the food's safety after donation as it is out of their control. Because of this, food providers feel compelled to throw away food in order to avoid being held liable for it in the case of contributions (Martin-Rios et al., 2018). The amount of food that is permanently rejected in these circumstances would be decreased by a more accommodating approach to food safety liability. To help send excess food to those who need it most, management of food operators in the hotel industry could shift some or all its obligations.

MANAGEMENT OF FOOD WASTE AND MODERN TECHNOLOGY

Modern technology has enabled the development of several smartphone applications that make it simpler to measure and categorize food waste in kitchens in the hospitality sector. To help chefs measure, manage, and limit food waste in their kitchens, Unilever Food Solutions developed the "Wise Up on Waste" application (Başar, 2018). Research indicates that utilizing such technical developments might significantly minimize food waste (Gould, 2016). To enable consumers to purchase prepared meals from restaurants at drastically discounted rates towards the end of the day, decreasing waste and disposal expenses while also increasing sales, the "Too Good To Go" smartphone app was created from the standpoint of the consumer. They discovered that Too Good To Go is being used in 14 European countries. More than 11.000 automobiles have been kept off the road for a whole year thanks to the sale of more than 26 million meals and 66.000.000 kg of CO2 emissions reductions (Filimonau & De Coteau, 2019).

However, the implementation of these apps hasn't exactly been a success in Serbia. The justification is that a substantial percentage of the population would typically only buy meals from restaurants at the end of the workday. This would have a severe impact on restaurant revenues due to the large decline in daytime visitors.

CONCLUSION

The statistics unequivocally demonstrate that if food waste were to reduce globally, the adverse effects on the environment would be mitigated. It is clear that food waste has an effect on the sustainability of global development. Simply put, there is too much operational effort in the hotel industry to entirely eradicate food waste. However, due to new/updated rules and laws in the hospitality

industry, the quantity of food waste will decline (and other industries that produce food waste). Food waste management must be an essential part of hospitality management since the majority of the practices that have reduced food waste in the hotel business have been put in place. This achieves the manufacture of a safe product and the protection of customer health, which is an even more crucial goal in food safety. Positive food waste management techniques used by hotels might inspire other lodging establishments, hotel chains, and associations. By increasing possibilities for stakeholders to participate in the production of food waste, sharing experiences can help organizations and individuals develop more environmentally conscious organizational cultures. But it is also vital to pique management's attention in order to manage food waste properly. To do this, the hotel sector's contribution to food waste must first be categorized and quantified. The requirement to integrate food waste management into other company sectors, such as enterprise software and technology, presents several difficulties for managers.

REFERENCES

Awasthi, M. K., Wang, Q., Wang, M., Chen, H., Ren, X. & Zhang, Z. (2018). In-vessel co-composting of food waste employing enriched bacterial consortium. Food Technology & Biotechnology, 56(1), 83–89.

Başar, P. (2018). Social entrepreneurship: Case study in Unilever food solutions' trusted hands food safety online training program. *Entrepreneurship–Trends and Challenges*, 145-158.

Bassi, S. A., Christensen, T. H., & Damgaard, A. (2017). Environmental performance of household waste management in Europe-An example of 7 countries. Waste Management, *69*, 545-557.

Chaboud, G., & Daviron, B. (2017). Food losses and waste: Navigating the inconsistencies. *Global Food Security*, 12, 1-7.

EFSA (2018). The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. *EFSA Journal,* 16(12), 5500. doi: 10.2903/j.efsa.2018.5500

Elfimova, Y., Ivolga, A., & Radishauskas, T. (2014). Innovative processes in tourism on the basis of the principles of the sustainable development. *Young Science*, 1(5), 35-37.

FAO, Rome FAO. (2013b). Toolkit: reducing the food wastage footprint. FAO, Rome.

FAO. (2013a). Food wastage footprint: impacts on natural re-sources: summary report.

Filimonau, V. & De Coteau, D. A. (2019). Food waste man-agement in hospitality operations: A critical review. *Tourism Management*, 71, 234–245. doi: 10.1016/j.tour-man.2018.10.009.

Gould, L. H. Rosenblum. I., Nicholas, D., Phan, Q. & Jones, T. F. (2013). Contributing factors in restaurant-associat-ed foodborne disease outbreaks, FoodNet sites, 2006 and 2007. *Journal of Food Protection*, 76, 1824–1828. doi: 10.4315/0362–028X.JFP−13–037

Gustafsson, J., Cederberg, C., Sonesson, U., & Emanuelsson, A. (2013). The methodology of the FAO study: Global Food Losses and Food Waste-extent, causes and prevention"- FAO, 2011.
HOTREC (2017). European hospitality industry guidelines to reduce food waste and recommendations to manage food do-nations.
Harris, K. J., Ali, F., & Ryu, K. (2018). Foodborne illness outbreaks in restaurants and patrons' propensity to return. *International Journal of Contemporary Hospitality Management*.
Lemaire, A., & Limbourg, S. (2019). How can food loss and waste management achieve sustainable development goals?. *Journal of Cleaner Production*, 234, 1221-1234.
Martin-Rios, C., Demen-Meier, C., Gössling, S., & Cornuz, C. (2018). Food waste management innovations in the foodservice industry. *Waste Management*, 79, 196-206.
Morone, P., Koutinas, A., Gathergood, N., Arshadi, M., & Matharu, A. (2019). Food waste: Challenges and opportunities for enhancing the emerging bio-economy. *Journal of cleaner production*, 221, 10-16.
Okumus, B., Taheri, B., Giritlioglu, I., & Gannon, M. J. (2020). Tackling food waste in all-inclusive resort hotels. *International Journal of Hospitality Management*, 88, 102543.
Okumus, B., & Giritlioglu, I. (2017, October). Food Waste in All-inclusive Resort Hotels in Turkey. In Global Conference on Services Management (GLOSERV 2017) (Vol. 10, p. 339).
Omolayo, Y., Feingold, B. J., Neff, R. A., & Romeiko, X. X. (2021). Life cycle assessment of food loss and waste in the food supply chain. Resources, Conservation and Recycling, 164, 105119.
Papargyropoulou, E., Lozano, R. K., Steinberger, J., Wright, N. & Ujang, Z. (2014). The food waste hierarchy as a framework for the management of food surplus and food waste. Journal of Cleaner Production, 76, 106–115. doi: 10.1016/j.jclepro.2014.04.020
Papargyropoulou, E., Steinberger, J. K., Wright, N., Lozano, R., Padfield, R., & Ujang, Z. (2019). Patterns and causes of food waste in the hospitality and food service sector: Food waste prevention insights from Malaysia. *Sustainability*, 11(21), 6016.
Papargyropoulou, E., Wright, N., Lozano, R., Steinberger, J., Padfield, R. & Ujang, Z. (2016). Conceptual frame-work for the study of food waste generation and prevention in the hospitality sector. *Waste Management*, 49, 326–336. doi: 10.1016/j.wasman.2016.01.017
Pearson, D., Minehan, M., & Wakefield-Rann, R. (2013). Food waste in Australian households: Why does it occur. *Aust. Pac. J. Reg. Food Stud*, 3, 118-132.
Pirani, S. I. & Arafat, H. A. (2014). Solid waste management in the hospitality industry: *A review. Journal of Environmental Management*, 146, 320–336. doi: 10.1016/j.jenvman.2014.07.038
Pirani, S. I. & Arafat, H. A. (2016). Reduction of food waste gen-eration in the hospitality industry. *Journal of Cleaner Production*, 132, 129–145. doi: 10.1016/j.jclepro.2015.07.146
Ravandi, B., & Jovanović, N. (2019). Impact of plate size on food waste: Agent based simulation of food consumption. *Resources, Conservation and Recycling*, 149, 550-565.

Seberini, A. (2020). Economic, social and environmental world impacts of food waste on society and zero waste as a global approach to their elimination. In SHS Web of Conferences (Vol. 74, p. 03010). EDP Sci

Shaw, P. J., Smith, M. M., & Williams, I. D. (2018). On the prevention of avoidable food waste from domestic households. *Recycling*, 3(2), 24.

WRAP (2013). Overview of Waste in the UK Hospitality and Food Service Sector. Written by: Oakdene Hollins, Re-sponsible Hospitality Partnership and WRAP.

Zrnić, M. (2020). Study on the importance of food traceability in the tourism industry. *Turističko poslovanje*, (25-26), 17-25.

Zrnić, M., Brdar, I., & Kilibarda, N. (2021a). The importance of traditional food quality—the viewpoint of the tourism. *Meat Technology*, 62(1), 69-76.

Zrnić, M., Kilibarda, N., Brdar, I., Vujić, M., & Stojanović, D. (2021b). Food safety and eating habits during pandemic COVID-19 in the Republic of Serbia. *Economics of Agriculture*, 68(4), 895-910.