

Food Loss in Romania Comparative with the Neighbouring Countries

Anamaria Roxana Martin^{1,2}, Ioana Mihaela Balan^{1*}, Ioan Brad¹, Remus Gherman¹, Tiberiu Iancu^{1,2}

¹ Banat's University of Life Sciences "King Mihai I" from Timisoara – Romania, Faculty of Management and Rural Tourism

² Institution Organizing Doctoral Studies - University of Life Sciences "King Mihai I" from Timisoara, Doctoral school Plant and Animal Resources Engineering

Abstract

The article presents aspects of food loss concept in Romania and its neighboring countries, respectively Hungary, Serbia, Bulgaria, and Ukraine. Food waste and food loss are worldwide phenomenon. Minimizing food losses and waste plays an important role in a world where the number of people suffering from lack of food has been steadily increasing since 2014 and where daily enormous quantities of food that is consumable are lost and wasted day-to-day. Food waste and loss are detrimental to the sustainability of our food systems. When food happens to be lost and wasted, all the resources used for creating it, including water, land, energy, work, and capital, are also lost. The main important thing to underline is that in the analyzed countries, there are different categories of food that produce most of the food loss.

Keywords: food loss, food waste, consume, production

1. Introduction

Food waste and loss are detrimental to the sustainability of our food systems. When food happens to be lost and wasted, all the resources used for creating it, including water, land, energy, work, and capital, are also lost. [1] Additionally, discarding of food loss and waste in landfills contributes to climate change through the emission of greenhouse gases. [2] Food loss and waste can also have unfavourable consequences on food security and food availability, as well as increase food prices. [3]

Food and Agriculture Organization of the United Nations (FAO) estimates that around the world, 14 percent of food costing approximately 400 billion \$ is lost between harvest and distribution, but not retail. UN Environment Programme affirms that

17 percent more is wasted in retail and in the plate. [4]

According to the FAO, food loss (FL) is a reduction in the weight (dry matter) or nutritional content of food that was formerly prepared for human consumption. [5] The majority of the losses are the consequence of FSC inefficiencies, including bad logistics and infrastructure, a lack of technology, and a lack of knowledge, skills, and managerial ability among supply chain actors. [6]



Figure 1. Food loss and food waste on food chain

Author own adaptation by [7]

* Corresponding author: ioanabalan@usab-tm.ro

Food loss happens when it's challenging to have access to the right harvesting tools, insecticides, fertilizers, farmer training programs, extended services, and institutions for research, finance, and meteorology. [8] FL at this stage is primarily due to time and harvesting technique (human or mechanized). It happens when harvesting is delayed throughout the harvest season owing to poor automation rates and a lack of workers. [9] Sometimes harvesting is put off for financial reasons. If there appears to be little market for the product and returns from harvesting are insufficient to pay harvesting and shipping costs, producers opt to leave the crop unharvested. [10] Additionally, using inferior harvesting techniques and using inadequate tools might result in FL. In order to guard against pest infestations, bad weather, fluctuations in the market, and to ensure their contractual responsibility to the purchasers, farmers frequently overproduce. [11] A surplus lowers market prices and results in more crops going unharvested. Some products are not harvested or are discarded right away after harvest because they didn't match the quality requirements set by processors or target markets, such as form, size, color, and weight. [12] Speaking about FL in handling and storage stage, it depends on the category of the food product. Vegetables, for example, suffer losses as a result of deterioration and spillage during loading and unloading, transit (from the field to the distribution center), and storage. [13] Losses in the context of fish products include the deterioration and leakage that occur during icing, storage, packaging, and transportation after landing. Similar to fish, milk likewise suffers losses during transportation from the farm to the consumer, including deterioration and spilling. [14] The majority of all food loss and waste is attributable to FL during the handling and storage phases. Fresh goods including fish, meat, vegetables, and fruits can readily spoil in hot temperatures due to a lack of transportation infrastructure and inappropriate vehicles. [15] With appropriate road infrastructure, field facilities, and adequate loading and unloading facilities, the FL level in transportation can be extremely low. Therefore, improved loading docks and transportation infrastructure might reduce FL. [16] Additionally crucial to minimizing food waste is timely distribution from the warehouse to the retail setting through precise demand forecasts.

Some products, including meat, milk, and fish, incur unavoidable losses during the refining stage. [17] For instance, meat is lost during additional industrial processing (such as the production of sausages) and trimming spills during slaughtering. For milk, overflow occurs during pasteurization (industrial milk treatment), and milk is lost during yogurt and cheese production. Losses can occur during industrial processing and packaging of fish (canning and smoking). [18] However, the majority of occurrences of FL during the processing and packaging stages are due to technical inefficiencies and failures. Processing errors result in defects in the final product, such as improper shape, size, or weight, or damaged packaging. [19] Occasionally, these types of flaws do not have a significant impact on the safety and quality of the final product, despite being discarded in accordance with established safety and quality standards. [20]

2. Materials and methods

The study presents a research based on external data, pertaining to food loss in Romania, Hungary, Serbia, Bulgaria and Ukraine, provided by FAO. The analyzed products derive from different categories of food encountered in the whole food supply chain between 2014 to 2017.

3. Results and discussion

Analyzing the situation of food loss in Romania between 2014 to 2017 based on different categories of food it is important to underline some facts. Firstly, in three consecutive years precisely 2014, 2015 and 2016 rice has the highest value of food loss generated in the whole food supply chain. In 2016 the percentage is significantly increased than in the other years, more exactly 12,09 percent. In 2017 potatoes are the first ones in the ranking of food loss, with 9,03 percent. The food categories that produced the least food loss during these four years are beans, dry and sunflower seed.

Another important aspect that results is that potatoes hold the second position in the ranking after rice in 2014, 2015 and 2016.

Therefore, in Romania, rice and potatoes cause the largest quantities of food loss, with considerable

higher values than the other categories of food. (Figure 2)

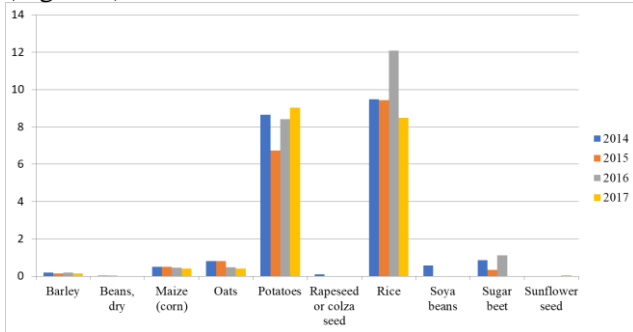


Figure 2. The percentage of food losses in Romania from 2014 to 2017

In Hungary, the case of food loss from 2014 to 2017 shows to be different, with another types of food categories that generate the largest values of food loss. Wheat is the category of food that in 2014 and 2015 leads in the ranking of food loss, with 4,07 percent and 5,55 percent. In 2016, canary seed generated most of the food loss in the whole food chain, precisely 4,05 percent. In 2017, millet occupies the first place regarding food loss, with 4,33 percent. This category of food also has the second highest value in 2016 after canary seed, with 3,75 percent.

That being the case, in Hungary wheat, canary seed and millet have the highest percentage of food loss. (Figure 3)

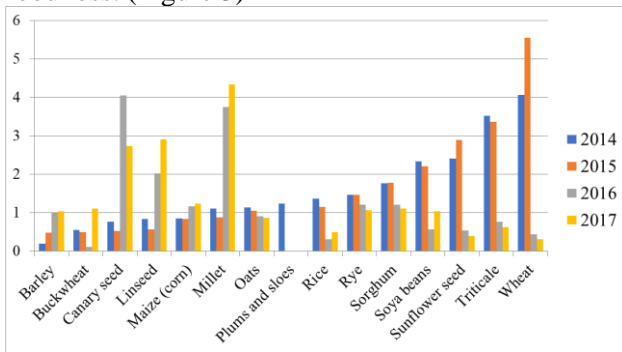


Figure 3. Food loss in Hungary from 2014 to 2017

In Serbia, there are some other food categories that generate most of the food loss. Natural honey is leading in the classament with 3,17 percent in 2014, followed by maize (corn) with 2,5 percent. Maize it is also the first one in the classification in 2015 with 2,49 percent and 2016 with 2,62 percent. In 2017, raw milk of goats generated most of the food loss, with 0,54 percent. Raw milk

of cattle produces the least of the analysed foods in all the four analyzed years. (Figure 4)

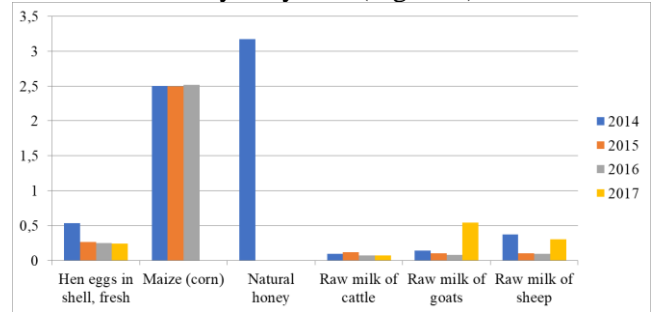


Figure 4. Food loss in Serbia from 2014 to 2017

Bulgaria did not declare data about the situation of food loss on the same food categories between 2014 and 2017 as the other countries mentioned, but it declared some other data in 2020. (Figure 5)

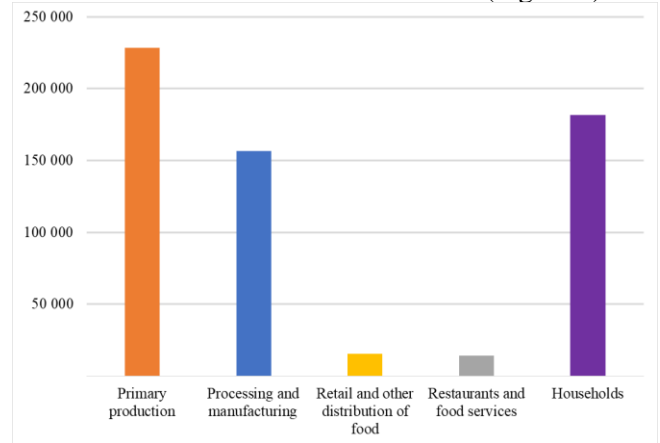


Figure 5. Food loss in Bulgaria in 2020

In Ukraine, potatoes are the first ones in the ranking in three different years: in 2014 with 14,59 percent, in 2015 with 16,14 percent and 2016 with 18,23 percent. The food category that generates the least of food loss is buckwheat. (Figure 6)

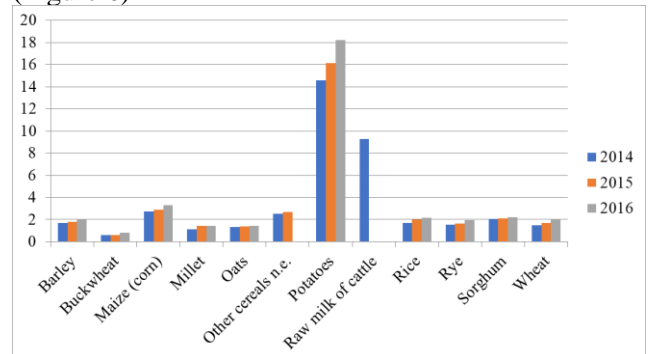


Figure 6. Food loss in Ukraine from 2014 to 2017

4. Conclusions

The main important thing to underline is that in the analyzed countries, there are different categories of food that produce most of the food loss. Rice, potatoes, wheat, canary seed, millet, natural honey, maize and raw milk are the food categories that are generating the most of the food loss in the previously presented countries.

Regardless the food type, in order to prevent food loss and waste, action must be taken quickly. All the citizens need to know this situation and be aware of the gravity of the situation around the globe. In addition to improving the general sustainability of our food systems, reducing food loss and waste offers the chance for immediate climate benefits. This transition is important to secure better planetary and nutritional results for both the present and future generations.

References

1. HLPE . Food Losses and Waste in the Context of Sustainable Food Systems. A Report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Committee on World Food Security; Rome, Italy: 2014. <https://www.fao.org/3/i3901e/i3901e.pdf>
2. Beretta C., Stoessel F., Baier U., Hellweg S. Quantifying food losses and the potential for reduction in Switzerland. *Waste Manag.* 2013;33:764–773. doi: 10.1016/j.wasman.2012.11.007
3. Garrone P., Melacini M., Perego A. Opening the black box of food waste reduction. *Food Policy.* 2014;46:129–139. doi: 10.1016/j.foodpol.2014.03.014.
4. Gheorghescu, I. C., Velcota, I. I., Martin, A. R., & Balan, I. M. (2019). Food waste a major problem in the European Union. *Journal Agricultural Management*, 21(3), 65-80.
5. Ishangulyyev R, Kim S, Lee SH. Understanding Food Loss and Waste-Why Are We Losing and Wasting Food? *Foods.* 2019 Jul 29;8(8):297. doi: 10.3390/foods8080297. PMID: 31362396; PMCID: PMC6723314.
6. Gustavsson J., Cederberg C., Sonesson U., van Otterdijk R., Meybeck A. *Global Food Losses and Food Waste.* FAO; Rome, Italy: 2011
7. Population Education, 2020, What is the Difference Between Food Loss and Food Waste?, <https://populationeducation.org/what-is-the-difference-between-food-loss-and-food-waste/>
8. Miller D.D., Welch R.M. Food system strategies for preventing micronutrient malnutrition. *Food Policy.* 2013;42:115–128. doi: 10.1016/j.foodpol.2013.06.008.
9. Östergren K., Gustavsson J., Bos-Brouwers H., Timmermans T., Hansen O.J., Møller H., Anderson G., O'Connor C., Soethoudt H., Quedsted T. FUSIONS definitional framework for food waste. *EU Fusions.* 2014
10. Kumar D., Kalita P. Reducing postharvest losses during storage of grain crops to strengthen food security in developing countries. *Foods.* 2017;6:8. doi: 10.3390/foods6010008.
11. Kaipia R., Dukovska-Popovska I., Loikkanen L. Creating sustainable fresh food supply chains through waste reduction. *Int. J. Phys. Distrib. Logist. Manag.* 2013;43:262–276. doi: 10.1108/IJPDLM-11-2011-0200.
12. Martin A. R., Balan I. M.; Trasca T. I., 2022, Romania facing the problem of food waste, *Scientific Papers: Animal Science & Biotechnologies / Lucrari Stiintifice: Zootehnie si Biotehnologii .* 2022, Vol. 55 Issue 1, p251-255. 5p.
13. Taylor D.H. Demand management in agri-food supply chains: An analysis of the characteristics and problems and a framework for improvement. *Int. J. Logist. Manag.* 2006;17:163–186. doi: 10.1108/09574090610689943.
14. Yu M., Nagurney A. Competitive food supply chain networks with application to fresh produce. *Eur. J. Oper. Res.* 2013;224:273–282. doi: 10.1016/j.ejor.2012.07.033.
15. FAO . *Food Wastage Footprint: Full-Cost Accounting, Final Report.* FAO; Rome, Italy: 2014, <https://www.fao.org/3/i3991e/i3991e.pdf>
16. Balan I.M., Popescu A.C., Iancu T., Popescu G., Tulcan C., 2020, Food safety versus food security in a world of famine *Journal of Advanced Research in Social Sciences and Humanities (JARSSH)* 5, 1, 20-31
17. Stuart T. *Waste: Uncovering the Global Waste Scandal.* Penguin; London, UK: 2009.
18. FAO, *Technical Platform on the Measurement and Reduction of Food Loss and Waste,* <https://www.fao.org/platform-food-loss-waste/en/>
19. Forbes, *What Environmental Problems Does Wasting Food Cause,* <https://www.forbes.com/sites/quora/2018/07/18/what-environmental-problems-does-wasting-food-cause/?sh=13c591792f7a>
20. FoodPrint, *The Problem of Food Waste,* <https://foodprint.org/issues/the-problem-of-food-waste/>