Research Paper

Future of Food: Journal on Food, Agriculture and Society
8 (1) April 2020

Household food wastage in Albania: causes, extent and implications

Rovena Preka [1], Sinisa Berjan [2], Roberto Capone [3], Hamid El Bilali [3,4], Mohammad Sadegh Allahyari [5,6,*], Philipp Debs [3], Francesco Bottalico [3,7], Vesna Mrdalj [8]

[1] Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Department for Sustainability, Resources Valorisation Lab., Bologna, Italy
[2] Faculty of Agriculture, University of East Sarajevo, East Sarajevo, Bosnia and Herzegovina
[3] Sustainable Agriculture, Food and Rural Development department; International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM-Bari), Valenzano (Bari), Italy
[4] Centre for Development Research, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria
[5] Department of Agricultural Management, Rasht Branch, Islamic Azad University, Rasht, Iran
[6] Extraordinary Associate Professor, North-West University, Faculty of Economic and Management Sciences, South Africa
[7] Department of Science and Technology, Parthenope University of Naples, Naples, Italy
[8] Department for Agricultural Economics and Rural Development, Faculty of Agriculture, University of Banja Luka, Banja Luka, Bosnia and Herzegovina

* Corresponding author: allahyari@iaurasht.ac.ir

Data of the article

First received : 11 March 2019 | Last revision received : 22 August 2019
Accepted : 04 March 2020 | Published online : 02 April 2020
doi:10.17170/kobra-202002281029

Keywords

food waste; consumer behaviour; economic loss; food labeling.

Food waste (FW) is a very serious issue not only in ethical and social terms, but also given its economic and environmental impacts (cf. resource wastage and depletion). Recent data show that more than half of food wastage in the European Union is generated in households. FW is unfortunately not well addressed in Albania. For this reason, an exploratory online survey of 185 Albanians was carried out during August–November 2016 to analyse the causes, extent and implications of household food wastage in Albania. Most of the respondents' profile included a high education level, which may have affected the survey's outcomes. Nevertheless, results showed that awareness about negative impacts of FW is still low. Although FW seems high, few public initiatives and campaigns are put in place to tackle the issue. Therefore, it is time to move towards a comprehensive strategy that raises awareness on FW negative impacts in the Albanian society and increase knowledge on food purchase management, consumption habits and related food storage.

Citation (APA):
Preka, R., Berjan, S., Capone, R., El Bilali, H., Allahyari, M.S., Debs, P., Bottalico, F., Mrdalj, V. (2020). Household Food Wastage in Albania: Causes, Extent and Implications. Future of Food: Journal on Food, Agriculture and Society. 8(1)

1. Introduction

Food is lost or wasted throughout the food supply chain, from agricultural production down to final consumption (FAO, 2011; FAO, 2017; HLPE 2014). Different studies and reports show that between one third and half of the world food production is lost or wasted (FAO, 2011; Monier et al., 2011; Bio Intelligence Service, 2013; Institution of Mechanical Engineers-UK, 2013; Lipinski et al., 2013; Canali et al., 2014; HLPE, 2014; Berjan et al., 2018). According to recent data, 88 million tons of food are wasted throughout the whole food chain in one year in the European Union (EU), which is associated to an estimated cost of around 143 billion euros. Out of this, more than half of the waste (53%) is generated in households (Stenmarck et al., 2016). This leads to negative impacts throughout the food supply chain (Smil, 2004; Parfitt et al., 2010; BCFN, 2012; Kummu et al., 2012; Venkat, 2012; Chapagain and James, 2013; FAO, 2013; Grizetti et al., 2013; Hodges et al., 2010; Jereme et al., 2013; HLPE, 2014; FAO, 2015; OECD and FAO, 2015; FAO, 2017). Food waste is directly linked with environmental (energy, climate change, water, availability of resources), economic (resource efficiency, price volatility, consumption, waste management) and social (health, equality) impacts (Berjan el al., 2018).

Box 1. Definitions of key concepts.

- Food loss and waste (FLW) refers to a decrease, at all stages of the food chain from harvest to consumption in mass, of food that was originally intended for human consumption, regardless of the cause.
- Food losses (FL) refers to a decrease, at all stages of the food chain prior to the consumer level, in mass, of food that was originally intended for human consumption, regardless of the cause.
- Food waste (FW) refers to food appropriate for human consumption being discarded or left to spoil at consumer level – regardless of the cause.

Source: HLPE (2014:22)

In the last years, the European Union adopted a series of policies and strategies to address the food waste problem. The 'Roadmap to a Resource Efficient Europe' (EC, 2011) sets the aspirational goal of halving the disposal of edible food waste by 2020. The Circular Economy Package (EC, 2015), adopted by the European Commission in December 2015, is considered by many scholars as a concrete step to the transition towards a more circular economy in the EU (Brears, 2015) considering environmental, economic and social concerns. The package acknowledges the efforts and aligns with the Sustainable Development Goal (SDG) 12 "Ensure sustainable consumption and production patterns" in the framework of the 2030 Agenda for Sustainable Development (UN, 2015) – adopted by the United Nations' General Assembly on September 25th, 2015 - especially target 12.3 of the agenda that aims to halve per-capita food waste at the retail and consumer level, as well as to reduce food losses along production and supply chains. In the Mediterranean region, household food consumption accounts for 28% of the region's ecological footprint and a considerable part of the food footprint comes from waste or discarded food in the supply chain or in households (Galli et al., 2016), although the percentage varies among countries.

There is a considerable amount of food loss and waste along the whole food chain, including in households in the European countries (FAO, 2011; HLPE, 2014; Stenmarck et al., 2016). The seminal report of FAO on global food losses and waste (2011) shows that per capita food loss in Europe, including Albania, is 280-300 kg/year. Meanwhile, per capita food waste by European consumers is 95-115 kg/year. Nevertheless, percentages of food losses and waste change, not only along the food supply chain but also from one commodity group to another (Table 1). This leads to assume that food waste is also an issue in Albania. Nevertheless, few data are available on food loss and waste and few initiatives have been put in place to raise awareness about food wastage and its negative impact on social equity, resource efficiency and the environment. The only exception seems to be from Food Bank Albania, which was founded in 2015 and is the first national initiative to address the issue of food waste (FW) by organizing redistribution of surplus food (Food Bank Albania, 2016).

ISSN-Internet 2197-411x OLCL 862804632

Table 1. Estimated food losses and waste percentages for each commodity group in each step of the food supply chain for Europe

Step of the food supply chain Commodity group	Agricultural production (%)	Postharvest handling and storage (%)	Processing and packaging (%)	Distribution: Supermarket retail (%)	Consumption (%)
Cereals	2	4	0.5, 10	2	25
Roots and tubers	20	9	15	7	17
Oilseeds and pulses	10	1	5	1	4
Fruits and vegetables	20	5	2	10	19
Meat	3.1	0.7	5	4	11
Fish and seafood	9.4	0.5	6	9	11
Milk	3.5	0.5	1.2	0.5	7

Source: FAO (2011).

In medium- and high-income countries, such as Albania, food is to a significant extent wasted at the consumption stage (FAO, 2011; HLPE, 2014). There is a growing body of literature dealing with household food waste in different countries and regions (Evans, 2011; WRAP, 2011; Lebersorger and Schneider, 2011; Williams et al., 2012; Jereme et al., 2013; Quested et al., 2013; Graham-Rowe et al., 2014; Neff et al., 2015; Principato et al., 2015; Secondi et al. 2015; Mondéjar-Jiménez et al., 2016; Stenmarck et al., 2016; Bygrave et al., 2017; Canali et al., 2017; Principato, 2018; Schanes et al., 2018; Schmidt and Matthies, 2018). However South-East Europe (SSE) and in particular, Albania remain largely underserved (Kambo et al., 2017a; Kambo et al., 2017b; Osmani and Kambo, 2018). Therefore, in order to fill this literature gap, this paper analyses determinants, extent and implications of household food waste in Albania.

2. Materials and methods

2.1. Data collection and analysis

2.1.1. Survey

The paper investigates the results of a voluntary online survey carried out in Albania. Questionnaires previously used for similar research purposes - e.g. New South Wales (NSW) Environment Protection Authority (EPA), Australia (NSW-EPA, 2012); the University of Bologna, Italy (Last Minute Market, 2014) – were adapted to the Albanian context.

The survey was conducted through a self-administered questionnaire in Albanian, which was available online through the online survey website Survio (www.survio.com) between August – November 2016 (65 days in total). Participation was entirely voluntary and responses were analysed only in aggregate.

The multiple-choice questionnaire consisted of 25 one-option questions structured in six sections: (i) food purchase behaviour and household food expenditure estimation; (ii) knowledge of food labelling information; (iii) attitudes towards food waste and extent of household food waste; (iv) economic value of household food waste (HHFW); and (vi) willingness and information needs to reduce food waste. In the introductory part of the questionnaire the concept of FW was briefly introduced to inform the respondents about the topic and the purpose of the research (the following statement was included in the questionnaire: "For the purpose of the present survey, food waste is considered food that was purchased by the household for human consumption but was thrown away i.e. was not consumed") as well as the approximate time needed to complete survey (10-15 minutes).

Various communication channels were used to disseminate the survey, in particular social media (i.e. Facebook), emails and other communication channels (e.g. professional forums).

2.1.2. Data analysis

Quantitative data were analysed using descriptive statistics (e.g. means, max, min, percentages), and inputted into Microsoft Excel spreadsheets, to get a general picture of frequencies of variables. Besides descriptive statistics, the Chi-square test of contingency was performed to assess the associations between different respondents' characteristics and their answers. The Chi-square statistic is a non-parametric test designed to analyse group differences when the dependent variable is measured at a nominal level. It permits evaluation of both dichotomous independent variables, and of multiple group studies. The Chi-square is a significance statistic, and should be followed with a strength statistic (McHugh, 20113). The Pearson's contingency coefficient is the most common strength test used to test the data when a significant Chi-square result has been obtained. The Pearson's contingency coefficient was also calculated in SPSS Statistics 16 for Windows (IBM Corporation, Armonk, NY).The null hypothesis was that there is no relation between tested variables (e.g. gender, age, level of education) and respondents' answers regarding food behaviors and food wastage (e.g. frequency of food purchasing, use of shopping list, knowledge about food labelling, estimated amount of household food waste).

2.2. Socio-demographics of respondents

Convenience sampling method was applied becacuse of easy accessibility, availability at a given time and willingness to participate by members of the target population (Etikan et al. 2016).
Survio registered 295 visits out of which 203 questionnaires were completed for an overall 69% completion rate. Out of all completed questionnaires, 18 questionnaires were not considered for further data processing because there was missing data (unfinished questionnaires) and/or contradictory or bad quality data. Therefore, the size of the sample was 185 adult Albanians.

The sample is not gender-balanced, as a preponderant part of the respondents is composed by females (66.5% female) and predominantly young respondents (75.7% are less than 44 years old) with a high education level (around 80%). The territorial distribution is highly concentrated in Tirana, the capital city, which contains almost one third of the whole population of the Republic of Albania, but the remaining part is fairly distributed in the rest of the country (north and south, coastal and mountain areas). Half of the respondents are married with children while almost all the rest live with parents, with other people (not related) or are in a civil partnership. A very small part (2.2%) live alone, confirming that Albania still counts as not – one – person household. In fact, most of the respondents declare that their household is composed of at least 3 – 4 members (Table 2).

3. Results and discussion

3.1. Food purchase behaviour and household food expenditure estimation

The results of the survey showed that respondents buy food mostly in supermarkets (51.9%) and minimarkets (39.5%). Supermarkets are a rather new trend in the Albanian lifestyle, but it has significantly invested medium – high income households and highly educated Albanians. Generally, the reason is a certain variety in the products (not only agricultural but also processed ones), the proximity to other shopping centres (any non –food shop), parking space availability and lack of time during the working days. Minimarkets are very frequent and consist of small shops located in every inhabited area or quarter. This category also includes specialized shops such as bakeries, butcher' shops, dairy' shops, etc. Traditionally, minimarkets are the most common way for an average Albanian family to purchase basic goods because of the consolidated role these shops have gained throughout the years in the urban areas. A small number of respondents (4.3%) declared to buying their food in local markets. These results can be explained considering the high level of education of the sample and the high number of students and/or the youngsters. Morever, going to a local market or to a farm is more common for families with aging parents or for low-income households. Although there is a growing awareness among the new generation about the good food quality bought at a local market, it is still premature and thus not able to

ISSN-Internet 2197-411x OLCL 862804632
UniKassel & VDW, Germany- April 2020

Table 2. Respondents' profile

Items		Frequency	Percentage (%)
Gender	Male	62	33.5
	Female	123	66.5
	Total	185	100
Age (years)	18-24	48	25.9
	25-34	58	31.4
	35-44	34	18.4
	45-54	30	16.2
	55 and over	15	8.1
	Total	185	100
Family status	Single person household	4	2.2
	Living with parents	23	12.4
	Partnered	25	13.5
	Married with children	93	50.3
	Shared household, non-related	38	20.5
	Other	2	1.1
	Total	185	100
Level of education	Primary school	0	0
	Secondary school	2	1.1
	Technical qualification	36	19.4
	University degree	118	63.8
	Higher degree (MSc, PhD)	29	15.7
	No formal schooling	0	0
	Total	185	100
Household composition (number of members)	1 to 3	70	38
	4 to 6	114	62
	7 to 10	0	0
	> 10	0	0
	Total	185	100
Occupation	In paid work (full time or part time)	101	54.6
	Student	43	23.3
	Unemployed and looking for work	23	12.4
	Home duties	12	6.5
	Retired/ Age pensioner	6	3.2
	Total	185	100

influence their lifestyle. Alternatively, going directly to the farm is more common for households that are directly linked with rural areas (having part of the family living there or relatives owning a farm) and this can explain the low percentage of respondents (4.3 %) buying food at a farm.

The frequency of food buying is rather high. Collected data revealed that 16.8% of the respondents declare they purchase food every day and 35.7% do it every two days. A considerable part of the sample (23.8%) do it every three days while a low percentage (15.1%) do it only once a week. This can be explained by a low attitude to budget planning, but also because of a need for fresh products. A small part of the sample (8.1%) purchases food once a month but it can be supposed

that these respondents are not regularly in charge of food planning for the household.

The survey shows that the monthly food budget of 36.8% for the respondents is concentrated in the range 7000 ALL (Albanian Lekë) – 14000 ALL (52–78 Euro; 1 Euro ≈ 136 ALL), while for 27.6% of respondents' food expenditures are in the range of 14000 ALL – 21000 ALL (78–104 Euro). A low number of the respondents declared they purchase food for less than 26 euro per month (9.2%), as they may not be the main person in charge of food planning.

The use of a shopping list is frequent, but not a consolidated practice. While 20% declare they use one at all the times, 18.4% claim that they do not make use of one. The remaining majority (61.6%) use one only sometimes. This is in line with the above observation that showed that most of the respondents have a high frequency of buying food. In this case, a shopping list may be marginal.
The attractiveness of special offers is quite high, with approximately one third (30.8%) claiming they always consider them and a significant 56.2% claiming frequent (sometimes) attention to offers. Only 13% say they are not at all attracted to offers. This can lead to food waste; thus, attention must be paid to expiry dates.

3.2. Knowledge of food labelling information

The questionnaire analysed whether there is any behavioural difference regarding "use by" and "best before" date labels. Interestingly, 72.4% show awareness that food should be consumed before "use by" date or otherwise discarded; while a lower percentage (25.9%) believe that the food may be eaten even after the "use by" date, as long as it is not damaged (Table 3). Notably, the "best before" label is not widespread in Albania and few information is given on it. Respondents have shown confusion between the two labels. About nine-tenths of respondents (88.6%), higher than that recorded in the case of "use by" date, believe that foods must be eaten or thrown away by "best before" date. This creates an opportunity to implement awareness campaigns that explain the meanings and the differences between the two date labels.

3.3. Attitudes towards food waste

The results of the survey show that food waste awareness is significantly low: 54.6% of the respondents do not consider food waste as an important problem, only 22.7% worry about it and try to reduce waste within their everyday routines. 9.2% understand the issue, but are not ready to change their behavior, 13.5% have worried in the past, but do not consider it a problem anymore. This trend may be explained by a low awareness about food waste impacts and by the consolidated habit to not waste food often seen in traditional societies . In fact, when asked how much food waste their household produces, 63.2% say a generic "reasonable quantity". Very few (5.4%) declare they produce much more than needed, while 13.5% are aware they produce more than needed. Moreover, 14.6% say they produce very little food waste and 3.2% say they produce almost none. The survey confirms that respondents' perception is that they generally do not generate much waste, driven by a low awareness about food waste.

The lack of awareness about the impact of food waste

Table 3. Knowledge of food date labels (n=185)

Statements	Which of the following do you think best describes what is meant by the "use by" date? (one answer was possible%)	Which of the following do you think best describes what is meant by the "best before" date? (one answer was possible%)
Foods must be eaten or thrown away by this date	134 (72.4)	164 (88.6)
Foods are still safe to eat after this date as long as they are not damaged, deteriorated or perished	48 (25.9)	5 (2.7)
Foods must be sold at a discount after this date	3 (1.6)	16 (8.6)

ISSN-Internet 2197-411x OLCL 862804632

is further confirmed by food waste behaviour. Household food waste is managed in different, not mutually exclusive, ways. An overwhelming majority (86.5%) of respondents say that sometimes they throw their food waste in the trash. Meanwhile, 60% of respondents also say they feed their pets with it. A very low percentage of respondents (10.3%) declare they give it to families in need, while 9.7% say they compost it in the garden.

Overall, the survey shows that only a 10.3% of the respondents throw out food more than twice a week, demonstrating a low/moderate propensity to waste food. It is wasted at least once a week for 53% of the respondents while 28.1% discard food less than once a week and 8.6% declare they never throw out food.

3.4. Extent of household food waste

Exploring the behaviour towards meals, a large percentage (48.1%) prepare their principal meal with fresh ingredients three to six times a week and 33.5% do it at least twice a week. A very small percentage (3.8%) prepares meals ex–novo more than 10 times a week, meaning many respondents do not cook every day and thus contribute towards waste production with a consequent important food waste production. However, these results might be affected by the survey's biasedness capturing mainly well-educated respondents from medium/high-income households.

Although with varying frequency, most households prepare meals from leftover foods. One third of the respondents claim to do it between seven to ten times a week and another third (29.7%) does it between three to six times a week. The remaining 4.9% declare they never do it. One aspect that reduces the extent of food waste is the Albanian habit to eat outside the home during the day (mostly fast food): 53% do it three to six times a week and 24.3% do it seven to ten times a week. Of the respondents, 20% eat outside the home at least twice a week and only 1.6% never do it. Nevertheless, these findings might be due to the biasedness of location, as a high share of the respondents are from urban areas, especially the capital city, Tirana. During the last years, semi-prepared or frozen foods (convenience foods) have become another alternative to cooking for urban medium/high-income Albanian households. The survey shows that 41.1% declare the use of convenience food in their meals three to six times a week and 27.6% do so seven to ten times a week. Another 9.2% prepare their meals with convenience foods more than ten times a week unlike 10.3% that never do. The use of semi-prepared or frozen food is prevalent and confirms the increasing popularity of convenience foods in Albania, a custom that 15 years ago was rare.

There are plenty of reasons why food is wasted in the Albanian household. The survey highlights bad food management by final consumers. For 76.2% of the respondents, food waste is generated because it has been left for a long time in the refrigerator and for 62.2% , food is thrown because it is stored improperly. For 61.6%, food is thrown because it does not have a good aspect, for 64.3%, it is done because it contains mould and for 50.8% because it no longer has a good flavour (Table 3). While many respondents selected the option "food is left in the fridge for too long time" or "food has expired", it is important to consider the root causes that led to this result and the subsequent food wastage. These reasons are mainly related to inappropriate meal planning and inadequate food storage. In light of these results, it is important to raise awareness among the population on ways to correctly save food and prepare adequate amounts of food for one meal in order to reduce food leftovers. It is essential to correctly manage meal planning and food buying behaviour since 36.8 % say that food waste is also due to incorrect planning and 47.6% say that the package sizes do not reflect their needs. In contrast, 53% say that food is thrown because it has remained from previous meals and a 42.2% say they can afford to throw out leftovers because the food in the household is abundant. The data further confirms the need to correctly manage meal and food preparation in the household. Complex labelling or label confusion by consumers, also accounts as a reason for food waste, although it is a relatively low reason(28.6%) compared to others. Nevertheless, with the growing trend of consuming semi – prepared and frozen food, the labelling issue must be clearly explained and an awareness-raising campaign should be implemented.

The quantity per week of thrown out food depends on the number of the members of each household. The survey's results show a worrying amount of food waste exemplified by the 36.8% of respondents who

throw out between 0.5 kg to 1 kg of food per week and 22.7% of respondents that reach between 1kg to 2 kg of food thrown out within a week (Table 5).

The amount of food waste differs according to food group (Table 6). Perishable and more frequently used products seem to be more sensible towards food waste. The survey shows that 50.8% say that more than 20% of purchased cereals and bakery products and 39.5% of purchased milk and its derivatives have been wasted. The large percentage of the wasted cereals and bakery products, as well as milk and dairy products is a serious environmental and economic problem considering the food groups' high consumption in Albania. The least wasted food group is roots and tubers, legumes and oilseeds, meat and meat products, and fish and seafood. Recent sources (e.g. Agroweb, 2016) also demonstrate that wastage of horticultural products is at alarming level in Albania. About 30-40 % of vegetables and fruits are wasted from production site to the market destination. That figure accounts for up to 50% of fruits and veggies lost from production to

Table 4. Main reasons contributing to household food wastage

Answer choices (multiple answers were possible)	**Frequency (%)**
Food expired	86 (46.5)
Food does not look good	114 (61.6)
Food has mold	119 (64.3)
Food does not have a good smell or taste	94 (50.8)
Labelling generates confusion	53 (28.6)
Food is left in the fridge for too long time	141 (76.2)
There was an error in meal planning / purchasing	68 (36.8)
Packaging was not the proper size	88 (47.6)
Poor cooking skills	88 (47.6)
Wrong preservation	115 (62.2)
Leftovers	98 (53.0)
Portions at home are too abundant	78 (42.2)
I did not like the food or ingredients	87 (47.0)

Table 5. Quantity of thrown food per week

Answer choices	**Ratio of respondents (%)**
I do not throw food	3.8
Less than 250 gr	19.5
Between 250 and 500 gr	14.6
Between 500 gr and 1 kg	36.8
Between 1 and 2 kg	22.7
More than 2 kg	2.7

ISSN-Internet 2197-411x OLCL 862804632

export and about 2% losses from supermarkets. Nevertheless, the survey results show that fruits and vegetables wastage at household level is rather low.

It is interesting to note that meat is moderately wasted considering the higher costs associated with it and that less than 20 years ago it was a coveted food and consumed with certain parsimony. This survey shows that the Albanian society has gone through important transformations concerning food consumption habits. The transition from a poor economy to an expanding one, has produced a quick and deep change that affected the food consumption habits of the country.

3.5. Economic value of household food waste

The outcomes of economic value of food waste show that 38.4% declare that they account for less than ≈ 5 Euro per month. More than a quarter (25.9%) of the respondents say that their food waste economic value is between 5 to 25 Euro per month,; this is huge considering that Albania has one of the lowest per capita incomes in Europe (5,253.6$ in 2018) (World Bank, 2019). A mere, but significant 6.5% of respondents say it is more than 50 Euro per month, a rather high economic burden for a considerable number of respondents, given the low average wages of Albanian households and their food budget. Albania has had a severe increase in income gap within its population in the last 25 years. Almost half a million of Albanians live under the national poverty line, which constitutes around 15% of the entire population living on no more than 1 Euro per day for personal expenses. In Albania, the average expenses on food are 58.5 % of the household budget. The lower the household budget is, the higher the income share necessary for daily food becomes, and this is increased up to 80% for more marginalized families (Food Bank Albania, 2016). The survey shows that there is economic loss in the household's budget in relation to food waste, so more careful food purchasing and meal planning will positively impact their lives.

3.6. Willingness and information needs to reduce food waste

According to 74.1% of respondents one way they would reduce food wastage is if taxes were to be implemented on food waste. Other respondents (36.8%) believe that food waste can be reduced if correct information is delivered about the negative impact on the environment and 29.2% believe that awareness to their own negative economic impact would reduce food waste. Overall, 35.7% of the respondents believe it could be done if packaging became more appropriate and a 33.5% if labelling would be clearer.

Table 6. Ratio of thrown food per group

Food waste ratio / Food groups	Less than 2%	3 to 5%	6 to 10%	11 to 20%	More than 20%
Cereals and bakery products (e.g. bread, rice, pasta)	9.2*	11.9	7.6	20.5	50.8
Roots and tubers (potatoes, etc.)	15.7	42.7	5.4	32.4	3.8
Legumes and oilseeds (e.g., peas, chickpeas, olives, sunflower)	12.4	11.4	55.7	19.5	1.1
Fruits	17.8	20	18.4	33.5	10.3
Vegetables	8.6	10.3	11.9	47.6	21.6
Meat and meat products	14.6	6.5	29.2	24.3	25.4
Fish and seafood	36.8	33	21.6	7.6	1.1
Milk and dairy products	8.6	25.4	15.1	11.4	39.5

*Figures in table refer to percentages of respondents and they sum up to 100% per food group.

Awareness on initiatives and campaigns by organizations that deal with food waste and its reduction is very important for 78.4% of respondents. Another 70.8% retain that food waste can be reduced if correct information is given on freshness of food and more than half believe that information on how to save food will also have a positive impact.

3.7. Discussion and suggestions for future actions

The relation between respondents' characteristics (e.g. gender, age) and their answers was assessed using Chi-Square Test of Contingency (Tables 7, 8).

The location of buying food, frequency of food shopping, attraction to special offers as well as the quantity of uneaten food thrown out by households were independent from the gender of respondents ($p \geq 0.05$). However, the frequency of throwing away leftovers or food, and the quantity of still consumable food thrown away in a week were dependent of respondents' gender ($p<0.05$). The economic value of food waste generated each month by households was highly dependent of gender ($p <0.01$) (Table 7). Both male and female respondents said that they feel attracted to special offers when they buy food. Regardless of respondents' gender, the quantity of uneaten food thrown away in a household is considered reasonable. Gender influenced the frequency of throwing away leftovers or foods that are no longer considered good i.e. female respondents answered they throw away this kind of food more often. However, this may be because women are responsible for cooking and meal preparation in Albanian households and not because of higher food wastage among women. Regarding the economic value of food waste generated each month by a household, in comparison to male respondents, most of the female respondents answered that this value is less than 5 EUR (700 Albanian Lek, ALL) or 5-25 EUR (700 -3500 ALL), so they tend to underestimate the value of wasted food.

Table 7. Chi-Square test of the influence of respondents' gender on food buying and throwing away food

Tested variables	Chi–square test statistics	p–value	Contingency coefficient
Where do you generally buy food?	0.979 ^{ns}	0.806	--
How often do you do food shopping?	8.054 ^{ns}	0.153	--
Do you feel attracted to the special offers when you buy food?	4.2463^{ns}	0.119	--
In general, how much of uneaten food your household usually throws away?	7.999 ^{ns}	0.091	--
How often you throw away leftovers or food that you consider not good?	8.677 *	0.033	0.212
Approximately, how much of still consumable food your household throws away in a week?	14.137 *	0.014	0.266
Please indicate the economic value of food waste generated each month by your household	13.539 **	0.003	0.261

ns = statistically not significant; * = statistically significant at $p <0.05$; ** = statistically significant at $p<0.01$. Gender: Male / Female.

ISSN-Internet 2197-411x OLCL 862804632

Results in Table 8 show that the age of respondents influence tested variables significantly. Young respondents answered that they buy food at supermarkets and minimarkets more often, whereby the same population buy food every day or once every two days, i.e. more frequently in comparison to older respondents, as expected. Most of the older respondents answered that they were not attracted to special food offers. Likewise, with age increase, there is a decrease in the quantity and frequency of throwing away food.

The results obtained are in line with the findings of Schanes et al. (2018) who states that food waste is "… a complex and multi-faceted issue that cannot be attributed to single variables" (p. 978). Kambo et al. (2017a) and Osmani and Kambo (2018) found that income, number of employed people in the household, age, and education level are all factors that determine the amount of food wastage in urban areas of Albania.

The results of the survey show that most of the respondents have low concerns regarding food waste and a large share of them are not ready to change food purchasing and consumption behaviour to reduce food wastage. This result is surprising taking into consideration the young age and high education of the sample. Different studies (e.g. von Kameke and Fischer, 2018) show that young people are more open to changing their behaviour in order to reduce food wastage. In Albanian urban areas, Kambo et al. (2017a) and Osmani and Kambo (2018) also found that there is a positive relation between age and the percentage of food wasted. The dominant profiles of wasters (Gaiani et al., 2018) that emerge from the study are the 'conscious-fussy type', who overemphasize food-related cosmetic and aesthetic features, and the 'conscious-forgetful type', that have bad food management and tend to forget food in the fridge or on shelves.

Table 8. Chi-Square test of the influence of age on the practices of food purchasing and food wastage at Albanian households

Tested variables	Chi–square Test Statistics	p–value	Contingency coefficient
Where do you generally buy food?	21.1772*	0.047	0.321
How often do you do food shopping?	127.895***	0.000	0.639
Do you feel attracted to the special offers when you buy food?	33.808***	0.000	0.393
In general, how much of uneaten food does your household usually throw away?	43.986***	0.000	0.438
How often do you throw away leftovers or food that you consider not good?	42.588***	0.000	0.433
Approximately, how much edible food does your household throw away in a week?	95.533***	0.000	0.584
Please indicate the economic value of food waste generated each month by your household	65.391***	0.000	0.511

* = statistically significant at p<0.05; ** = statistically significant at p<0.01; *** = statistically significant at p<0.001.
Age: 18-24 years old (first group), 25-34 years old (second group), 35-44 years old (third group), 45-54 years old (forth group), ≥ 55 years old (fifth group).

According to the survey, food waste is prevalent in Albania and the most wasted foods are bakery and dairy products. This result differs from the findings of Kambo et al. (2017a) that "The largest contributors to food waste are easily perishable items like fresh fruit and vegetables, followed by bakery products, dairy products and eggs" (p. 496). They add that each Albanian urban household wastes on average 22.4 percent of the purchased food. However, Silvennoinen et al. (2014) found that vegetables and milk products are the most discarded foodstuffs in Finnish households. This shows that the amount, as well as the composition of household food waste is dependent on context.

Food wastage has negative impacts on the food expenditures of Albanians. For more than a quarter of the respondents, the economic value of food waste generated each month is more than 25 EUR. Likewise, Kambo et al. (2017a) estimated the average value of food waste per month and per urban household at 19.4 EUR. However, the present survey shows that the estimate of the value of food waste depends on gender and age of respondents.

Moreover, more than half of the interviewees declared that they throw at least 500 g of food per week. Anyway, the amount of food waste might be affected by the fact that most of the respondents live in cities (especially the capital city, Tirana); indeed, some scholars (e.g. Samangooei et al., 2016) argue that people living in cities have become disconnected with food production, leading to increased food waste. In a survey conducted by Kambo et al. (2017a) in urban areas of Albania, the average weight of wasted food per week by each urban household amounted to 1.042 kg.

Food waste is a serious issue that undermines food security and food system sustainability in the Mediterranean region (Berjan et al., 2018; Capone et al., 2016; El Bilali, 2018), Albania included. The results of the present survey are in line with those obtained in similar studies on HHFW in other Mediterranean countries such as Algeria (Ali Arous et al., 2017), Egypt (Elmenofi et al., 2015; Abdelradi et al., 2018), Lebanon (Charbel et al., 2016), Morocco (Abouabdillah et al., 2015), Tunisia (Sassi et al., 2016), Montenegro (Berjan et al., 2019) and Turkey (Yildirim et al., 2016; Salihoglu et al., 2018). All the above-cited studies urgently call for action addressing household food wastage given its negative environmental (Hall et al., 2009; WRAP 2011; FAO, 2013; Chapagain and James, 2013; Quested et al., 2013; FAO 2014; FAO 2015; Shafiee-Jood and Cai, 2016), economic (HLPE, 2014; Principato, 2018; Rutten, 2013; TEEB, 2018) as well as ethical (Stuart, 2009) implications.

Despite that, food waste is not specifically addressed in waste management strategic documents and policies in Albania. A recent report on waste management in South East Europe (Eunomia Research & Consulting LTD, 2017) shows that Albania still has many gaps in its waste management system and lags behind with respect to other countries in the region. This has implications in food waste management. Furthermore, there are only a few initiatives on food waste reduction in Albania e.g. Food Bank Albania (Box 2), which are mainly active in Tirana and other main cities in Albania. For instance, Tirana is among the cities that through local initiatives and policies (e.g. in agriculture/food, energy, water, health, transport, waste sectors) is rising up to the challenge of reducing food waste in the framework of the activities of the Milan Urban Food Policy Pact (United Nations – Albania, 2017).

Evidence shows that focusing attention on the reduction of food waste generated by households is likely to yield faster results. Kummu et al. (2012) argue that the largest global potential for food losses and waste reduction is in agricultural losses and consumption waste, including household food waste. Therefore, communication campaigns should target consumers with the objective to raise awareness on the issue of food waste. Monier et al. (2011) recommend conducting consumer education campaigns and facilitating increased surplus food donation (cf. food banks) to prevent and/or reduce food waste. However, education campaigns should be included in broader intervention programs that address various food waste related behaviours such as planning, shopping, storage, preparation and consumption practices (Schmidt and Matthies, 2018).

Some potential causes of food waste result from business practices and private standards set at higher levels than those set by the government e.g. the "best before" date displayed on food products (NRDC, 2013). Likewise, marketing and sale strategies influence waste behaviour of individuals (e.g. Aschemann-Witzel, 2018), especially youths (Mondéjar-Jiménez et al.,

ISSN-Internet 2197-411x OLCL 862804632

Box 2. Food Bank Albania.

Food Bank Albania is a non-profit organization dedicated to the fight against food waste in Albania. It does so by raising awareness throughout Albanian society about food waste. It combines the goal of reducing food waste with that of eradicating poverty as it believes that these two issues are strongly linked i.e. distribution of food surpluses, instead of wasting them, contribute to improving the living conditions and food security of the poor in Albania (Food Bank Albania, 2019a). To address food surpluses, the Food Bank works with businesses (e.g. supermarkets, farmers), Albanian Red Cross, institutions and individuals to collect food donations and raise awareness about food waste. The collected food is provided to NGOs (over 40 NGOs work with the Food Bank), social soup kitchens (10 soup kitchens throughout Albania) or the state social services involved in the fight against poverty (Food Bank Albania, 2019a, 2019b). In 2018, it managed to distribute 100,000 kg of food surpluses (Food Bank Albania, 2019b). Food Bank Albania also highlights that giving food surpluses to the needy Albanian households can reduce the environmental costs of food waste (Food Bank Albania, 2019a); for instance, it argues that food distributed in 2018 prevented up to 96 tons of CO_2 from being released into the atmosphere from potential food waste (Food Bank Albania, 2019b). Food Bank Albania also provides tips to help Albanian households reduce food waste, save money and protect the environment (Food Bank Albania, 2019a). However, one of the obstacles to the activities of the Food Bank is that the law on food donations in Albania does not include an interesting tax system, which implies that the Food Bank should put continuous efforts in fundraising (European Food Banks Federation, 2018).

2016), so that retailers can play an important role in preventing food wastage. Therefore, the private sector should be more engaged in the reduction of food waste throughout the food supply chain through various initiatives such as innovation (e.g. technologies, packages, production processes) and corporate initiatives such as consumer education (BIAC, 2013; Bygrave et al., 2017; Di Terlizzi et al., 2016).

Cooperation among all actors of the food supply chain is crucial to reducing food wastage (e.g. Göbel et al., 2015). Besides state institutions responsible for environmental protection and waste management, NGOs should have a more active role in food waste reduction initiatives. NGOs – in cooperation with public institutions and the private sector – can play an important role in initiatives such as educational campaigns directed to consumers and industry and food recovery as well as knowledge dissemination activities. National campaigns, such as consumer education campaigns on reading "use by" or "best before" date labels, can help change consumer behaviour (NRDC, 2013) contributing to the prevention and/or reduction of HHFW. Such campaigns should focus on youths, who prove to be the population segment most inclined to waste food (Mondéjar-Jiménez et al., 2016; Principato et al., 2015) and on concrete practices such as waste sorting, which was found to be positively associated with food waste reduction (Secondi et al., 2015). Kambo et al. (2017a) suggest focusing on awareness raising campaigns improving Albanian consumers skills to cook as much as needed, as well as their shopping planning skills. Principato et al. (2015) proposes that actions against food wastage, especially educational campaigns, should also target marketers, retailers and policy makers.

3.8. Study limitations

In general, the major constraint faced during research, was the shortage and/or difficult access to adequate, reliable and updated, (both published and non-published), secondary data on FWL in Albania, as well as, in neighbouring countries (e.g. Montenegro, Macedonia). This made it difficult to discuss and compare obtained results with findings from previous similar studies. In fact, to the authors´ best knowledge, there is no previous journal paper that specifically dealt with household food wastage in Albania. This statement is corroborated by a search carried out in Scopus database using queries "Albania AND food waste" on August 13, 2019; the search yielded only three documents that deal with municipal solid waste in Tirana (Alcani et al., 2010), recycling in Albania (Vozga et al., 2013), and lead contamination of soil due to industrial waste (Alushllari et al., 2019), but none regardingfood

waste or household food waste.

One of the major limitations of the present study is the non-probabilistic sampling design used for data collection as respondents were recruited on a voluntary basis. This also implies a non-representative recruited sample for the adult population in Albania. Online surveys have several biases like unbalanced coverage and location, no control on respondents and self-selection that affect the quality of the results. Furthermore, the cross-sectional study design does not allow interpretation of causal relationships between the variables.

It should be mentioned that the survey results of Albania is by no means representative for the entire population of the country concerned. There were more females and more consumers from urban areas in the population under study. One of the reasons for these discrepancies may be the sampling technique used. However, having a higher number of women in the sample is rather normal in food-related studies, since women generally have more of the responsibility for cooking and shopping than males, and are more willing to answer questionnaires related to food issues (Stancu et al., 2016). Another limitation is that the questionnaire was sent via Internet to different respondents and it can be assumed that mainly people with a distinct interest in environmental issues and sustainability with higher level of education were willing to spend their time answering (Jörissen et al., 2015).

The study used self-reported data and did not control for respondents' emotions, affects or perceptions. Thus, mono-source bias and social desirability bias (De Jong et al., 2010) might have distorted or inflated the parameters of interest. Moreover, all data were collected using the same method (cf. online survey) so that common method bias may be an issue. While household food waste surveys are methodologically simple, they are mainly useful to provide qualitative information, because quantification of food wastage (cf. weight of food purchased and discarded, so not consumed) is prone to error as consumers often tend to underestimate their waste (and food waste) when self-reporting (e.g. Beretta et al., 2013; Neff et al., 2015; Simunek et al., 2015; Ventour, 2008).
Last but not least, the questionnaire was prepared in English, then translated into Albanian and this may have affected the Albanian respondents' understanding of issues regarding food wastage and, consequently, their answers.

4. Conclusions

The survey has tackled an important, although unexplored issue on Albanian food habits and practices as well as their implications in terms of household food wastage. Mapping the determinants of waste generation at the household level helps to deepen the understanding of food-related household practices. It emerges that food waste is a concern since several issues regarding food shopping and meal planning at the household level are underestimated. Firstly, there is the issue of poor management in food purchasing and meal preparation. In fact, a considerable amount of food waste is generated because food has not been properly stored or it has been purchased in inappropriatly sized packages. Furthermore, it has been shown that there is very low awareness on the negative impact of food waste due to a lack of campaigns, proper information and public initiatives on this issue. It seems that food habits of Albanians have radically changed and the alleged ancient parsimony on food consumption is rapidly losing ground. The paper highlights that focusing attention on waste generated at the consumer level is likely to yield positive results in food waste prevention and reduction strategies. Therefore, a comprehensive raising of awareness on the value of food saving both in environmental and socio – economic terms is needed, especially among young Albanians. From this point of view, useful evidence has emerged from the survey, confirming that the respondents can be ready to modify their food-related attitude and beahvior leading to food wastage if correct information is given on the negative environmental and economic impacts of food waste as well as on organizations dealing with food waste such as food banks.

To the best of our knowledge, this is the first paper that addresses household food wastage in Albania. However, the present study was not without limitations. Therefore, future research should consider collecting data from multiple sources (cf. face-to-face survey, diaries, waste sorting) and/or at multiple times. The use of a longitudinal study design would allow better analysing causal relationship between determinants (cf. food purchasing, preparation and consumption

ISSN-Internet 2197-411x OLCL 862804632

practices) and food wastage. Likewise, the use of data collected from different sources and using different methods could avert the potential method bias. It is also necessary to increase sample size and improve territorial coverage in future studies.

Conflict of Interest

The authors declare that there is no conflict of interest.

References

Abdelradi F. (2018) Food waste behaviour at the household level: A conceptual framework. Waste Managemet 71, 485–493. https://doi.org/10.1016/j.wasman.2017.10.001

Abouabdillah A., Capone R., El Youssfi L., Debs P., Harraq A., El Bilali H., et al. (2015). Household food waste in Morocco: An exploratory survey. Book of Proceedings of the VI International Scientific Agriculture Symposium "Agrosym 2015", Jahorina, Bosnia and Herzegovina; pp. 1353-1360.

Agroweb (2016). Food is the New Gold - Don't waste it. Retrieved on April 14, 2017 from: http://agroweb.org/?id=10&l=930&ln=en.

Alcani M., Dorri A., Hoxha A. (2010). Management of municipal solid waste in Tirana: Problems and challenges. Tehnicki Vjesnik 17(4), 545-551.

Ali Arous S., Capone R., Debs P., Haddadi Y., El Bilali H., Bottalico F. and Hamidouche M. (2017). Exploring household food waste issue in Algeria. AgroFor International Journal 2, 55-67. https://doi.org/10.7251/AGRENG1701055A

Alushllari M., Dhoqina P., Mico S., Civici N., Deda A., Kacani L. (2019). Hazardous quotient factor of lead in soil around industrial waste. AIP Conference Proceedings, art. no. 130023. DOI: 10.1063/1.5091308

Aschemann-Witzel J. (2018). Helping you to waste less? Consumer acceptance of food marketing offers targeted to food-related lifestyle segments of consumers. Journal of Food Products Marketing 24 (5), 522-538. DOI: 10.1080/10454446.2018.1472693

BCFN (2012). Food waste: causes, impacts and proposals. Barilla Centre for Food & Nutrition (BCFN), Parma (Italy).

Brears R. (2015). The circular economy and the water-food nexus. Future of Food: Journal on Food, Agriculture and Society 3(2), 53-59.

Beretta C., Stoessel F., Baier U., Hellweg S. (2013). Quantifying food losses and the potential for reduction in Switzerland. Waste Management 33, 764–773.

Berjan, S., Capone, R., Debs, P., El Bilali, H. (2018). Food losses and waste: A Global overview with a focus on Near East and North Africa Region. International Journal of Agricultural Management and Development 8(1), 1-16.

Berjan, S., Mrdalj, V., El Bilali, H., Velimirovic, A., Blagojevic, Z., Bottalico, F., Debs, P., Capone, R. (2019). Household food waste in Montenegro. Italian Journal of Food Science, 31, 274-287.

BIO Intelligence Service (2013). Modelling of Milestones for achieving Resource Efficiency - Turning Milestones into Quantified Objectives: Food waste. Prepared for the European Commission, DG Environment, Brussels.

BIAC [Business and Industry Advisory Committee] (2013). BIAC perspectives on private sector solutions to food waste and loss. https://www.oecd.org/site/agrfcn/BIAC Perspectives on Private Sector Solutions to Food Waste and Loss.pdf

Bygrave K., Rogers D., Eisenhauer P., Bruggemann N., Timmermans T., Cseh B., Lopez-i-Gelats F. and Díaz-Ruiz R. (2017). Frameworks for action - selection process. REFRESH (Resource Efficient Food and Drink for the Entire Supply Chain) project. https://eu-refresh.org/sites/default/files/D2_3_FA%20Selection%20Process%20FINAL.pdf

Canali M., Östergren K., Amani P., Aramyan L., Sijtsema S., Korhonen O., Silvennoinen K., Moates G., Waldron K., O'Connor C. (2014). Drivers of current food waste generation, threats of future increase and opportunities for reduction, Report of FUSIONS project. Retrieved on April 15, 2017 from: www.eu-fusions.org/index.php/download?download=111:drivers-of-current-food-waste-generation-threats-of-future-in-

crease-and-opportunities-for-reduction.

Capone R., Bennett A., Debs P., Bucatariu C.A., El Bilali H., Smolak J., Lee W.T.K., Bottalico F., Diei-Ouadi Y. and Toppe J. (2016). Food losses and waste: global overview from a Mediterranean perspective. In "Zero waste in the Mediterranean: Natural resources, food and knowledge". CIHEAM and FAO (Ed.), pp. 193-242. Presses des Sciences Po, Paris.

Chapagain A. and James K. (2013). Accounting for the impact of food waste on water resources and climate change. In "Food industry wastes: assessment and recuperation of commodities". M. Kosseva and C. Webb (Ed.), pp. 217-236. Elsevier. Available at http://doi.org/10.1016/B978-0-12-391921-2.00012-3 (accessed March 6, 2016).

Charbel L., Capone R., Grizi L., Debs P., Khalife D., El Bilali H. and Bottalico F. (2016). Preliminary insights on household food wastage in Lebanon. Journal of Food Security 4, 131-137. http://pubs.sciepub.com/jfs/4/6/2

Czarniawska B. and Löfgren O. (2013). Coping with excess: how organizations, communities and individuals manage overflows. Edward Elgar. Cheltenham, UK.

De Jong M.G., Pieters R., Fox J.P. (2010). Reducing social desirability bias through item randomized response: An application to measure underreported desires. Journal of Marketing Research 47(1), 14-27.

Di Terlizzi B., Van Otterdijk R., Dragotta A., Pink P. and El Bilali H. (2016). Innovation for the reduction of food losses and waste. In "Zero waste in the Mediterranean: Natural resources, food and knowledge". CIHEAM and FAO (Ed.), pp. 281-301. Presses des Sciences Po, Paris.

EC [European Commission] (2015). Closing the loop - An EU action plan for the circular economy. European Commission, Brussels, 2.12.2015 COM(2015) 614 final. Retrieved on March 10, 2017 from: http://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF.

EC [European Commission] (2018). Commission staff working document: Montenegro 2018 Report. Strasbourg, France. https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20180417-montenegro-report.pdf

EC [European Commission] (2011). Roadmap to a Resource Efficient Europe. Brussels. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571&from=EN

El Bilali H. (2018). Research on food losses and waste in North Africa. The North African Journal of Food and Nutrition Research 2(3), 51-57.

Elmenofi A.G.G., Capone R., Waked S., Debs P., Bottalico F. and El Bilali H. (2015). An exploratory survey on household food waste in Egypt. Book of Proceedings of the VI International Scientific Agriculture Symposium "Agrosym 2015", Jahorina, Bosnia and Herzegovina; pp. 1298-1304.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. American Journal of Theoretical and Applied Statistics, 5(1), 1-4.

Eunomia Research & Consulting Ltd (2017). A comprehensive assessment of the current waste management situation in South East Europe and future perspectives for the sector including options for regional co-operation in recycling of electric and electronic waste. Task 1: National waste assessment and roadmap for improving waste management in Montenegro. Report for DG Environment of the European Commission.http://ec.europa.eu/environment/enlarg/pdf/pilot%20waste/Montenegro_en.pdf

European Food Banks Federation (2018). Food Bank Albania raises money in a playful way. Retrieved on August 13, 2019 from: https://www.eurofoodbank.org/en/newsletters/2018-12-12-food-bank-albania-raises-money-in-a-playful-way

Evans D. (2011). Beyond the throwaway society: ordinary domestic practice and a sociological approach to household food waste. Sociology 46(1), 41-56.

FAO (2011). Global food losses and food waste – Extent, causes and prevention. Rome, Italy. www.fao.org/docrep/014/mb060e/mb060e00.pdf

ISSN-Internet 2197-411x OLCL 862804632

FAO (2013). Food wastage footprint: impacts on natural resources. Rome. Retrieved on January 8, 2017 from: http://www.fao.org/docrep/018/i3347e/i3347e.pdf

FAO (2014). Food Wastage Footprint: Full-Cost Accounting - Final Report. Rome.

FAO (2015). Food wastage footprint & climate change. FAO, Rome. Retrieved on February 11, 2017 from: http://www.fao.org/3/a-bb144e.pdf.

FAO (2017). The future of food and agriculture – Trends and challenges. Rome, Italy. http://www.fao.org/3/a-i6583e.pdf

Food Bank Albania (2016). Solidariteti per ushqim. Retrieved on March 20, 2017 from: http://foodbank.al.

Food Bank Albania (2019a). Who We Are. Retrieved on August 12, 2019 from: https://foodbank.al/en/who-we-are

Food Bank Albania (2019b). Celebrating 100,000 kg food distributed in 2018. Retrieved on August 12, 2019 from: https://foodbank.al

Galli A., Iha K., Halle M., El Bilali H., Grunewald N., Eaton D., Capone R., Debs Ph., Bottalico F., (2016). Mediterranean countries food consumption and sourcing patterns: An ecological footprint viewpoint. Science of the Total Environment 578, 383–391.

Gaiani S., Caldeira S., Adorno V., Segrè A., Vittuari M. (2018). Food wasters: Profiling consumers' attitude to waste food in Italy. Waste Management 72, 17-24. DOI: 10.1016/j.wasman.2017.11.012

Göbel C., Langen N., Blumenthal A., Teitscheid P., Ritter, G. (2015). Cutting food waste through cooperation along the food supply chain. Sustainability 7, 1429–1445.

Graham-Rowe E., Jessop D.C. and Sparks P. (2014). Identifying motivations and barriers to minimising household food waste. Resources Conservation and Recycling 84, 15-23

Grizetti B., Pretato U., Lassaletta L., Billen G., Garnier J. (2013). The contribution of food waste to global and European nitrogen pollution. Environmental Science & Policy 33, 186-195. https://doi.org/10.1016/j.envsci.2013.05.013

Hall K.D., Guo J., Dore M., Chow C.C. (2009). The Progressive Increase of Food Waste in America and Its Environmental Impact. PLoS ONE 4(11), e7940. DOI:10.1371/journal.pone.0007940

HLPE (2014). Food Losses and Waste in the Context of Sustainable Food Systems. Report of the High Level Panel of Experts on Food Security and Nutrition (HLPE), Rome. Retrieved on April 10, 2016 from: www.fao.org/3/a-i3901e.pdf.

Hodges R.J., Buzby J.C. and Bennett B. (2010). Postharvest losses and waste in developed and less developed countries: opportunities to improve resource use. Journal of Agricultural Science 149, 37-45. https://doi.org/10.1017/S0021859610000936

Institution of Mechanical Engineers-UK (2013). Global food, waste not, want not. London. Retrieved on January 16, 2015 from: http://www.imeche.org/Libraries/Reports/IMechE_Global_Food_Report.sflb.ashx.

Jereme I.A., Abdul Talib B., Siwar C. and Ara Begum R. (2013). Household food consumption and disposal behaviour in Malaysia. Social Sciences 8, 533-539.

Jörissen, J., Priefer, C., & Bräutigam, K. R. (2015). Food waste generation at household level: results of a survey among employees of two European research centers in Italy and Germany. Sustainability, 7(3), 2695-2715.

Kambo A., Keco R., Tomori I. (2017a). An empirical investigation of the determinants of food waste generation in urban area at household level in Albania. International Journal of Economics, Commerce and Management 5(5), 487-497.

Kambo A., Keco R., Tomorri I. (2017b). Pre-shopping activities and their influence on amount of food waste generated at household level in urban area of Albania: an econometric approach. International Journal of Economics, Commerce and Management 5(6), 440 – 453.

Kummu M., De Moel H., Porkka M., Siebert S., Varis O., Ward P.J. (2012). Lost food, wasted resources: global food supply chain losses and their impacts on freshwater, cropland and fertilizer use. Science of the Total Environment, 438, 477-489. https://doi.org/10.1016/j.scitotenv.2012.08.092

Last Minute Market (2014): Last Minute Market - Trasformare lo spreco in risorse. Last Minute Market S.r.l., Bologna, Italy. Retrieved on February 10, 2015 from: http://www.lastminutemarket.it.

Lebersorger S. and Schneider F. (2011). Discussion on the methodology for determining food waste in household waste composition studies. Waste Management 31, 1924-1933.

Lipinski B., Hanson C., Lomax J., Kitinoja L., Waite R., Searchinger T. (2013). Reducing Food Loss and Waste. Working Paper, Instalment 2 of Creating a Sustainable Food Future. World Resources Institute, Washington, DC. Retrieved on April 14, 2017 from: http://www.worldresourcesreport.org.

McHugh, M. L. (2013). The chi-square test of independence. Biochemia Medica, 23(2), 143-149.

Mondéjar-Jiménez J.A., Ferrari G., Secondi L. and Principato L. (2016). From the table to waste: An exploratory study on behaviour towards food waste of Spanish and Italian youths. Journal of Cleaner Production 138, 8-18.

Monier V., Mudgal Sh., Escalon V. et al. (2011). Preparatory study on food waste across EU 27. Technical Report, 2010 – 054, October 2010, Brussels, European Commission (DG ENV). Retrieved on March 12, 2015 from: http://ec.europa.eu/environment/eussd/pdf/bio_foodwaste_report.pdf.

Neff R.A., Spiker M.L. and Truant P.L. (2015). Wasted Food: US Consumers' Reported Awareness, Attitudes, and Behaviors. PLoS One 10(6), e0127881.

NRDC (2013). The dating game: how confusing food date labels lead to food waste in America. Harvard Food Law and Policy Clinic and the Natural Resources Defense Council (NRDC), NY, USA. http://www.nrdc.org/food/files/dating-game-report.pdf

NSW-EPA (2012). Food Waste Avoidance Benchmark Study. State of New South Wales (NSW) - Environment Protection Authority
(EPA), Australia.
Retrieved on February 15, 2016 from: http://www.frankston.vic.gov.au/files/34d7963e-24ab-455b-a1f5-a22300d89be2/Love_food_hate_waste.pdf.

OECD and FAO (2015). OECD-FAO Agricultural Outlook 2015. OECD Publishing, Paris, France. http://dx.doi.org/10.1787/agr_outlook-2015-en
Osmani M. and Kambo A. (2018). Food waste factors of urban Albanian consumers – A Multinomial Econometric approach. European Scientific Journal 14(3), 11-30.

Parfitt J., Barthel M. and Macnaughton S. (2010). Food waste within the supply chains: quantification and potential for change to 2050. Philosophical Transactions of the Royal Society of London B: Biological Sciences 365, 3065–3081. https://doi.org/10.1098/rstb.2010.0126

Principato L. (2018). Food Waste at Consumer Level: A Comprehensive Literature Review. SpringerBriefs in Environmental Science, Springer. ISBN 978-3-319-78887-6.

Principato L., Secondi L. and Pratesi C.A. (2015). Reducing food waste: an investigation on the behaviour of Italian youths. British Food Journal 117(2), 731-748. https://doi.org/10.1108/BFJ-10-2013-0314

Quested T.E., Marsh E., Stunell D. and Parry A.D. (2013). Spaghetti soup: The complex world of food waste behaviours. Resources, Conservation and Recycling 79, 43-51. https://doi.org/10.1016/j.resconrec.2013.04.011

Rutten M.M. (2013). What economic theory tells us about the impacts of reducing food losses and/or waste: Implications for research, policy and practice. Agriculture & Food Security 2, 1-13. https://doi.org/10.1186/2048-7010-2-13

Salihoglu G., Salihoglu N.K., Ucaroglu S., Banar M. (2018). Food loss and waste management in Turkey. Bioresource Technology 248, 88-99. DOI: 10.1016/j.biortech.2017.06.083

ISSN-Internet 2197-411x OLCL 862804632

Sassi K., Capone R., Abid G., Debs P., El Bilali H., Daaloul Bouacha O., et al. (2016). Food wastage by Tunisian households. AgroFor International Journal 1, 172-181. https://doi.org/10.7251/agreng1601172s
Schanes K., Dobernig K., Gözet B. (2018). Food waste matters - A systematic review of household food waste practices and their policy implications. Journal of Cleaner Production 182, 978-991. DOI: 10.1016/j.jclepro.2018.02.030

Schmidt K. and Matthies E. (2018). Where to start fighting the food waste problem? Identifying most promising entry points for intervention programs to reduce household food waste and overconsumption of food. Resources, Conservation and Recycling 139, 1-14. https://doi.org/10.1016/j.resconrec.2018.07.023

Secondi L., Principato L. and Laureti T. (2015). Household food waste behaviour in EU-27 countries: A multilevel analysis. Food Policy 56, 25-40. https://doi.org/10.1016/j.foodpol.2015.07.007

Shafiee-Jood M. and Cai X. (2016). Reducing food loss and waste to enhance food security and environmental sustainability. Environmental Science and Technology 50(16), 8432-8443. DOI: 10.1021/acs.est.6b01993.

Silvennoinen K., Juha-Matti K., Hanna H., Lotta H., Reinikainen A. (2014). Food waste volume and composition in Finnish households. British Food Journal 116(6), 1058 – 1068. http://dx.doi.org/10.1108/BFJ-12-2012-0311

Simunek J., Derflerova-Brazdova Z. and Vitu K. (2015). Food wasting: A study among Central European four-member families. International Food Research Journal 22(6): 2679-2683.

Samangooei M., Sassi P, Lack A. (2016). Soil-less systems vs. soil-based systems for cultivating edible plants on buildings in relation to the contribution towards sustainable cities. Future of Food: Journal on Food, Agriculture and Society, 4(2), 24-39

Smil V. (2004). Improving efficiency and reducing waste in our food system. Environmental Sciences 1:17-26. http://dx.doi.org/10.1076/evms.1.1.17.23766

Stancu, V., Haugaard, P., & Lähteenmäki, L. (2016). Determinants of consumer food waste behaviour: Two routes to food waste. Appetite, 96, 7-17.

Stenmarck A., Jensen C., Quested T., Moates G. (2016). Estimates of European food waste levels. FUSIONS project (Reducing food waste through social innovation). Retrieved on March 11, 2017 from: http://www.eu-fusions.org/phocadownload/Publications/Estimates%20of%20European%20food%20waste%20levels.pdf.

Stuart T. (2009). Waste: uncovering the global food scandal. Penguin W.W. Norton Co. London, UK.

TEEB (The Economics of Ecosystems and Biodiversity) (2018). Measuring what matters in agriculture and food systems: a synthesis of the results and recommendations of TEEB for Agriculture and Food's Scientific and Economic Foundations report. UN Environment, Geneva.

UN (2015). Transforming our world: the 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly on 25 September 2015. Retrieved on April 12, 2017 from: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

United Nations – Albania (2017). Tirana among cities that through local policies, are rising up to eradicate hunger and eliminate food waste. Retrieved on August 12, 2019 from: http://www.un.org.al/news/tirana-among-cities-through-local-policies-are-rising-eradicate-hunger-and-eliminate-food-waste

von Kameke C. and Fischer D. (2018). Preventing household food waste via nudging: An exploration of consumer perceptions. Journal of Cleaner Production 184, 32-40. DOI: 10.1016/j.jclepro.2018.02.131

Venkat K. (2012). The climate change and economic impacts of food waste in the United States. International Journal on Food System Dynamics 2, 431-446.
66. Ventour L. (2008). Food Waste Report - The Food We Waste. Waste & Resources Action Programme (WRAP), Banbury (UK).

Vozga I., Kaçani J., Kasemi V. (2013). State of the art of recycling in Albania. Metalurgia International 18(SPEC.1), 140-143.

Williams H., Wikström F., Otterbring T., Löfgren M. and Gustafsson A. (2012). Reasons for household food waste with special attention to packaging. Journal of Cleaner Production 24, 141-148.
World Bank (2019). World Bank Open Data – GDP per capita. Retrieved on August 16, 2019 from: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD

WRAP (2011). The Water and Carbon Footprint of Household Food and Drink Waste in the UK. Banbury, UK.

Yildirim H., Capone R., Karanlik A., Bottalico F., Debs P. and El Bilali H. (2016). Food Wastage in Turkey: An Exploratory Survey on Household Food Waste. Journal of Food and Nutrition Research 4, 483-489. DOI: 10.12691/jfnr-4-8-1.

ISSN-Internet 2197-411x OLCL 862804632