Towards SDG 12.3: Household food waste quantities in Italy and limited awareness in consumers

Claudia Giordano, Fabrizio Alboni, Luca Fasconi, Department of Agricultural and Food Sciences, University of Bologna

Introduction

- In recent years, both policy and research devoted an increasing attention to the issue of food waste reduction. Advancements have been made towards an harmonized definition and measurement methodology by the EU 27 and first baseline datatasets need to be delivered by Member States, in order to monitor food waste reduction towards 2030 (as from SDG 12.3).
- The high incidence of households' on the whole has probably influenced the academic debate on food waste, with 1201 out of 1437 documents on the Scopus database having been published since 2008. [Date of the research: 13/05/2020]
- Most of household food waste studies keep being run through the use of questionnaires (Cicatiello and Giordano, 2018), despite studies (Giordano et al., 2018; Elimelech et al., 2019; van Der Werf 2020) have shown their low reliability in terms of predictive capacity.
- The present study shows the results of the first study quantifying household food waste in Italy, obtained through the application of Commission Delegated Decision (EU) 2019/1597 of 3 May 2019, resulting from the FUSIONS project. Moreover, the difference between food waste assessed through questionnaires and diaries, on the same sample, is shown.
- A pilot study had been run on a small sample size (30 families) in 2015, applying the three methods suggested by FUSIONS methodological framework: questionnaires, diaries and Waste Compositional Analysis The diary was selected as the most cost-effective solution and its "underestimation" factor was assessed.

Materials and Methods

The main study was run in May-June 2017, composed of a paper diary (1 week) and a CAWI questionnaire delivered after 2 weeks from the diary completion. Respondents were rewarded consistently for their effort, through shopping vouchers.

Sample of the paper diary delivered to families

The FUSIONS food waste definition was applied, namely both edible and not edible parts of food were included, but computed separately. Drinks were included, except water. Packaging is NOT included.

A sample of 388 families was selected all over Italy. Stratified random sampling was employed in the selection of participants, based on distribution for macro-regions (North, Center, and South), population of the city (under or above 100.000 inhabitants), and the presence of children.

Non-parametric tests (Kruskal–Wallis H test and Mann–Whitney U test) have been used in order to verify whether the different levels of the qualitative variables identify significantly different behaviors in waste, since the hypotheses of normality and homoscedasticity were not verified. Analysis were performed in R.

Summary

According to the EC definition, food waste quantities amounts to 907.8 grams per person per week. It would roughly correspond to 2.8 million tons for Italian households in 2017.

Despite the efforts spent by the families to fill out the diary for one week, respondents were not able to assess a correct average of their own food waste when asked through questionnaires, after 2 weeks.

Household food waste in Italy, 2017

Weekly average, expressed in percentage. Including not edible fraction as from EC definition.
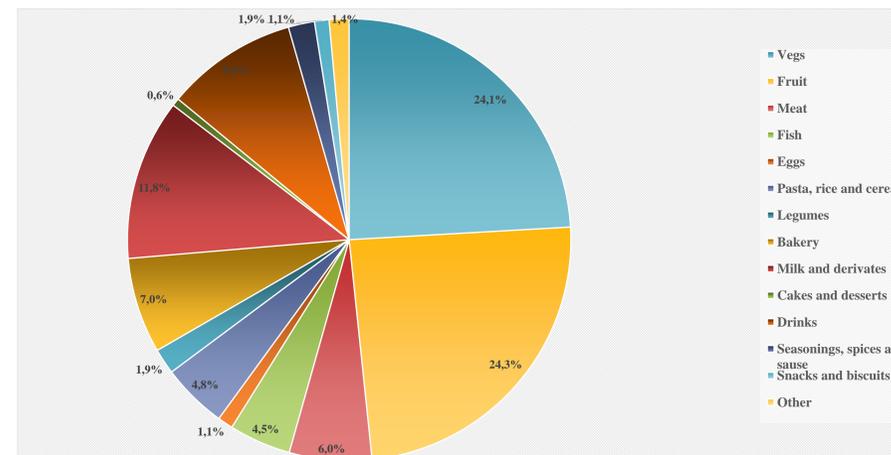
Vegetables, milk and derivates and fruits are the most frequently wasted products. Despite it, there is an important difference in terms of edible fraction: about 60% of the total vegs waste is edible, whereas less than 40% is edible for fruit.
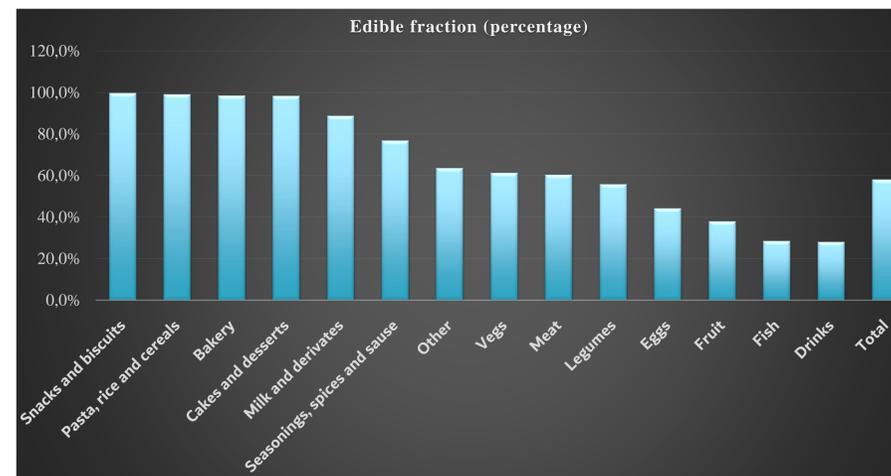
Acknowledgments

Awareness of food waste

Questions: Based on the week of the diary, how much food do you think your family wastes weekly?*

Answer (Provided Options)	Number of Families that selected the Option	Average FW of Group of Respondents
0-200 g	141	1010.9
201- 500g	167	1301.7
501-800 g	59	1484.9
801-1000 g	16	1235.4
More than 1000 g	5	1551.8
Total	388	1224.4

*This question makes reference to the only edible fraction, due to the Italian translation that is referred to the only edible fraction («spreco alimentare»).

Giordano, Alboni, Falasconi (2019) Quantities, Determinants and Awareness of Households' Food Waste in Italy: A Comparison between Diary and Questionnaires Quantities, Sustainability, 11(12), 3381, Table 4

Conclusions

❑ Household food waste in Italy is higher than in previous studies and report, all based on questionnaires.
❑ Results confirmed about 900 g of food waste per person per week, of which 60% edible fraction.
❑ Fresh vegetables, milk and derivates and fruits are the most frequently wasted products, accounting about 60% of the total food waste. However, there are differences between type of products in terms of edible fraction actually wasted.
❑ Results from the present research have been confirmed by a waste compositional analysis run in three regions of Italy some months earlier (2016-2017), within the same project (Grosso et al., 2019).
❑ After one-week of systematic reporting through paper diaries, families have not been able to assess their average food waste: 308 out of 388 respondents assessed their family food waste being less than 500 g per week, where the average edible fraction is 1224 per week.
❑ Questionnaires should be definitely set aside as a methods for assessing food waste quantities, due to perception-related biases. Indeed, the Commission Delegated Decision (Eu) 2019/1597 Of 3 May 2019 excluded questionnaires from the list of methods suitable to assess household food waste.

Future Directions

❑ Diary method suffer of underestimation if compared to waste compositional analysis. However, it allows reaching a wider sample and it is logistically easiest than WCA. A unique, standard table to convert units in weight should be designed at EU level in order to compare results from different countries. This is missing from the current methodological framework.
❑ If respondents do not realize how much they waste not even after a weekly diary study, it is to question the efficacy of awareness raising campaigns. Do respondent consider him/herself target of such campaigns?
❑ Despite looking an impressive number when aggregated for the whole population, 70g of edible food waste per day (average) is not astonishing: it equates to a quarter of an apple, or a few maccheroni (cooked), or less than a tomato.
❑ How cost effective are awareness raising campaigns to consumers instead of other measures? We need scientific evidences answering to this question, in order to set up effective strategies for food waste reduction by 2030.

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