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The value of food waste: An exploratory study on retailing

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ABSTRACT

Retailers are increasingly concerned with the sustainability of their business. Food waste is a major sustainability issue: 90 million tons of food are wasted in the EU every year. The production of much of this waste is directly linked to the food chain operations, included those performed at the retail stage. The literature on food waste has mainly focused so far on the quantification of the total food lost along the supply chain. However, the stage of retail has long been neglected. This paper attempts to partly fill this research gap, with the aim of measuring the extent of food waste in retailing as well as its environmental, social and economic value. To do so, we analyse the results of a food waste recovery project held in an Italian supermarket and, by drawing on the data collected in this case study, we perform an evaluation of the value of the food wasted. The results show that the extent of food waste in retailing is certainly considerable, both in terms of quantity and economic value. Moreover, we found evidence that it may be greatly reduced, with a significant limitation of its environmental impact and, through the mechanism of recovery, it may even generate social benefits. Despite the many limitations of such preliminary research, the results provide useful information for retailers aiming to develop strategies against food waste in the context of improving the sustainability of their business.

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1. Introduction

In the food sector, waste is a major social, nutritional and environmental issue, affecting the sustainability of the food chain as a whole. In the EU alone, we waste 90 million tons of food every year, i.e. 180 kg per person (European Commission (EC), 2011a). This is due, firstly, to climate and biological factors beyond the control of man and, secondly, to the behaviour of food chain participants, including all the operations concerning the food management at the stage of retailers.

Some of the wasted products simply cannot be consumed, as they are not fit for human consumption and thus they must be considered “losses” in all respects. Instead, a part of the wasted products is still suitable for human consumption (Segrè and Falasconi, 2011). Halving this edible waste is one of the goals in the Roadmap to a Resource-Efficient Europe, not least because the food value chain in the EU is responsible for 17% of Europe's direct greenhouse gas emissions and 28% of its material resource use

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E-mail addresses: cicatiello@unitus.it (C. Cicatiello), franco@unitus.it (S. Franco), bpancino@unitus.it (B. Pancino), e.blasi@unitus.it (E. Blasi).¹ Last Minute Market is a spin-off of the University of Bologna, Italy, whose aim is to reduce waste at all stages of the food chain. To do so, it promotes projects and campaigns to help firms and public administration to reduce waste. www.lastminutemarket.it

(European Commission (EC), 2011a). In order to prevent and reduce food wastage, the European Parliament declared 2014 the European Year against Food Waste, inspired by Last Minute Market¹ and its campaign “One year against waste”.

The literature on food waste has so far focused on the quantification of the total food losses along the supply chain (Buzby and Hyman, 2012; Parfitt et al., 2010; Griffin et al., 2009) to highlight the negative implications of this phenomenon as well as its impact on the whole food system as a whole (Sonnino and McWilliam, 2011). However, the retail stage has long been neglected by such studies, although its contribution in limiting the implication of food waste might be consistent and, at the same time, sustainability is becoming an important business issue for retailers, as their practices may influence the whole supply chain process and its economic, environmental and social consequences (Claro et al., 2013).

This paper attempts to fill part of this research gap, by focusing on the extent of food waste at the retail stage of the supply chain. The aim of the research is to assess the impact of the food wasted in the retail stage, moving from the evidences of a case study in Central Italy. Namely, drawing from data collected during a project aiming to recover food waste for human consumption, we analysed the food waste at a supermarket by assessing its environmental, social and economic value.

To this purpose, the paper will first discuss the definition of food waste in order to clearly recognise, from a conceptual point of

view, the proportion of food losses suitable for recovery. Then, we will focus on retailing, by analysing the state-of-the-art of the knowledge about food waste at this stage of the supply chain. In the empirical section of the paper, we will describe the design and implementation of a food recovery project in an Italian supermarket and, drawing on the data collected in this case study, we will perform an evaluation of the value of the food wasted at the supermarket. Such evaluation will encompass economic outcomes as well as the social and environmental impacts arising from the recovery process. These results, highlighting the scale and the causes of the food waste phenomenon at retailing stage, allow to draw some preliminary conclusions on the possible actions to be undertaken to reduce its dimension and potential impacts.

2. Background

2.1. Food waste: definition, causes and strategies for prevention

The growing concerns about hunger, preservation of the environment and the economic crisis have raised public awareness of food waste (Buzby and Hyman, 2012; Kantor et al., 1997). As several authors now assert, there is a need to investigate the social and environmental implications of waste at different stages of the supply chain. Indeed, food waste has an impact on food security, on food quality and safety, on economic development and on the environment (Gustavsson et al., 2011).

Moreover, from an ethical perspective, food waste represents a great paradox. Fig. 1a displays the average daily calorie supply per capita in European countries, showing that it greatly exceeds the actual people needs. Indeed, quite a large quota of this food supply is not used for feeding people, but it is wasted in different stages of the food chain. At the same time, the ranks of the poor are increasing, along with the quota of the people who are not able to provide for their basic needs (Fig. 1b). This means that, even in developed countries, while tons of food are wasted every day,

there are many people who cannot afford to provide meals for themselves and their family. Italy, Poland, Portugal and Lithuania are the European countries where this paradox is most evident, i.e. the food supply greatly exceeds people needs but, at the same time, there is a remarkable quota of the population living in extreme poverty conditions. Indeed, it is important to note that food insecurity is often determined by a lack of access (purchasing power and food prices) rather than a supply problem (Gustavsson et al., 2011).

The causes of food waste are numerous and diverse, as they are highly influenced by both the local socio-economic context of a given country and the organisation of its food system. In broad terms, the amount of food waste depends on crop production choices and patterns, the structure of the distribution channels, consumer purchasing behaviours and food use practices (Gustavsson et al., 2011). Buzby and Hyman (2012) provide a comprehensive list of the causes of food waste at the three main stages of the food chain, namely the production, retail and consumer levels. With the exception of a few (products damaged by insects, rodents, birds or microbes, losses due to unfavourable climate), all these causes may be traced to human intervention in the food chain, to how food is handled or marketed and to the consumption habits of people both at and outside the household (Sonnino and McWilliam, 2011; Engström and Carlsson-Kanyama, 2004).

However, beyond the stage of the food chain where the food is lost, it must be understood that food waste is not all the same: in some cases the food is no longer suitable for consumption, thus it has to be thrown away or turned in different products (e.g. compost); in other cases it may no longer be consumed by humans but can still be used as animal feed; quite often, it is still suitable for human consumption (Kantor et al., 1997).

To this end, a clear definition of what has to be meant by food waste is crucial. Some authors have addressed this issue by differentiating between the two concepts of “food loss” and “food waste”. Food loss can be defined as a qualitative or quantitative drop in the food supply due to a reduced nutrient value of the food

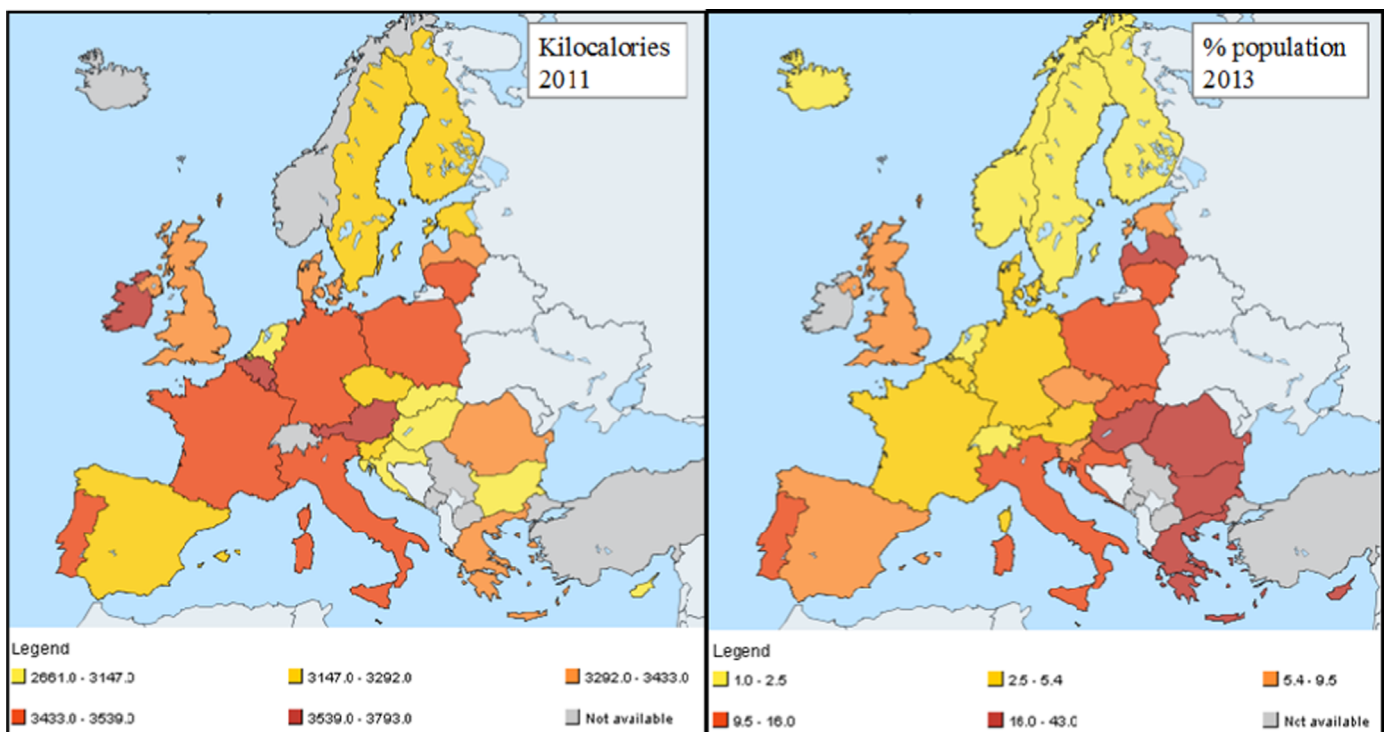


Fig. 1. Daily calorie supply per capita (a) vs. severely materially deprived people in Europe (b).
Source: Eurostat <http://ec.europa.eu/eurostat/eurostat.eu>.

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