

Department of Political Science
Master's degree in Policies and Governance in Europe
Chair of EU Law and Regulation

Food waste and date labelling.
An analysis of the EU legislation and the
potential reform of Regulation (EU) 1169/2011

Prof. Marta Simoncini

SUPERVISOR

Prof. Mark Thatcher

CO-SUPERVISOR

Miriana Paciotti

648602

CANDIDATE

Table of contents

<i>List of abbreviations</i>	3
<i>Introduction</i>	4
<i>Chapter I</i> Food loss and waste as a multilevel emergency	9
1.1 Food waste and the obstacles to fighting it	11
1.2 Negative consequences of food loss and waste	15
1.2.1 Environmental dimension.....	16
1.2.2 Economic dimension	20
1.2.3 Social and ethical dimensions	21
1.3 The causes of food loss and waste.....	22
1.4 Measures to fight food waste.....	26
1.4.1. Global level	26
1.4.2 European level.....	27
<i>Chapter II</i> The relevance of date labelling legislation in the fight against food waste.....	31
2.1 The legal framework of date labelling.....	33
2.1.1 A comparative analysis of past and present date labelling legislation.....	35
2.2 The risks of date labelling	43
2.2.1 Food business operators' side.....	44
2.2.2 Consumers' side.....	46
2.3 Trade-off between food safety and food waste.....	50

<i>Chapter III</i> The EU strategies to reform date labelling legislation and the Italian best-practice..	54
3.1 European Union measures to improve date labelling legislation	56
3.1.1 The Circular Economy Action Plan (CEAP).....	57
3.1.2 The European Green Deal and the Farm to Fork Strategy	58
3.1.3 <i>FUSIONS'</i> guidelines	60
3.2 Member States' proposals to amend date labelling legislation.....	62
3.3 The European Commission's strategy	66
3.3.1 Action targeting consumers	66
3.3.2 Action targeting FBOs.....	68
3.4 The Italian best-practice	71
3.4.1 From the legislation on the donation of unsold food.....	74
3.4.2 ... to Legge Gadda and the interpretation of the “best before” date	75
<i>Conclusions</i>	79
<i>Bibliography</i>	82

List of abbreviations

CEAP	Circular Economy Action Plan
CJEU	Court of Justice of the European Union
EC	European Commission
EEA	European Economic Area
EEC	European Economic Community
EFSA	European Food Safety Authority
EU	European Union
FAO	Food and Agriculture Organization
FBOs	Food Business Operators
FUSIONS	Food Use for Social Innovation by Optimising Waste Prevention Strategies
GDP	Gross Domestic Product
GHG	Greenhouse Gases
REFRESH	Resource Efficient Food and dRink for the Entire Supply cHain
SDGs	Sustainable Development Goals
UN	United Nations
UNEP	United Nations Environment Programme

Introduction

Food loss and food waste are a global emergency as they negatively affect the environment, the economy, and the socio-ethical sphere.

“Tackling the scourge of food loss and waste represents a triple win opportunity.”¹

Firstly, the reduction of food loss and waste would imply a decrease in greenhouse gas (GHG) emissions as well as damage caused to land, water, and biodiversity. Secondly, also economic costs would decrease. Only at the European Union (EU) level, 132 billion euros would be saved.² Thirdly, considering that globally more than 800 million people starve from hunger and more than 3 billion people cannot afford healthy and balanced diets³, it is not ethically acceptable that about 1.3 billion tonnes of food are wasted yearly as reported by the Food and Agriculture Organization of the United Nations (FAO, 2011).⁴ The reduction of economic costs due to food loss and waste would also reduce food costs by making it affordable for food-insecure populations. The reality that one-third of the food produced is lost or wasted worldwide cannot be overlooked, especially in light of the climate crisis, poverty and hunger affecting millions of people globally.⁵ Therefore, international targets have been set to reduce global food loss and waste. In particular, among the 17 Sustainable Development Goals (SDGs) elaborated by the United Nations (UN) in 2015, there is the 12.3 objective directly aimed at halving food waste and reducing food loss by 2030. According to FAO (2019), in order to achieve this ambitious goal, it is crucial to know how much food is lost or wasted, which stages of the food supply chain contribute the most to the wastage, and the causes of the wastage. Considering that all these factors vary depending on the geographical region, FAO specifies the necessity of acting at the supranational and national levels to find more efficient solutions to reach the final international SDG. Additionally, a definition problem exists. Different institutions and organizations at both international and national levels use with different meanings the term “food waste” and the wordings related to it. This creates discrepancies by also affecting data on the amount of food loss and waste actually presenting many gaps.⁶ Hence, food loss and waste can be identified as a multilevel problem

¹ FAO, *Tackling food loss and waste: A triple win opportunity*, 2022. Available at: <https://www.fao.org/newsroom/detail/FAO-UNEP-agriculture-environment-food-loss-waste-day-2022/en>

² European Commission, 2023. Commission staff working document impact assessment report Accompanying the document Directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste. 5.7.2023, Brussels.

³ Hudson U. and Messa M., *Slow Food*, 2016. Documento di posizione sulle perdite e gli sprechi alimentari. SIMeVeP, 2016.

⁴ FAO, *Global Food Losses and Food Waste*, Study conducted for the International Congress *SAVE FOOD!*, 2011.

⁵ Ibidem.

⁶ FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome.

that needs to be addressed through local interventions. The latter can create agreements on the used terminology, facilitating the collection of results as fewer actors and a smaller territory are involved.

At the European Union level, the European Commission (EC 2018) reported that date labelling on foodstuff is one of the main factors causing food waste. 10% of food produced in the EU is wasted due to date marking.⁷ In particular, as explained by FUSIONS (2014) and the Commission (2018), the “*best before*” date is often confused with the “*use by*” date. The former refers to the expiration of the quality of products and implies that after that date food is still edible if correctly stored. Differently, the latter refers to the date after which it is no longer safe to eat foodstuffs. Hence, confusing them means managing food wrongly by generating unnecessary food waste. On the one hand, food business operators (FBOs), for precautionary reasons, tend to select “use by” dates for food products simply requiring a “best before”. Furthermore, usually, FBOs discard products after the expiration of food quality instead of keeping them on the market or donating them. On the other hand, consumers misinterpreting labels are used to throw away edible foodstuffs only because the “best before” date has passed.⁸ Nonetheless, to date, the EU legislation on date labelling has never addressed the negative relationship between date marking and food waste. They have always been regulated as two different and separated policy areas. Therefore, this work aims to understand the extent to which a reform of the current EU date labelling legislation can be implemented in order to tackle this issue and thus, reduce the generation of food waste.

Regulation 1169/2011 EU, better known as *FIC Regulation*,⁹ regulates food information for consumers in the EU, including the expiration of “best before” and “use by” dates. FIC Regulation aims to promote transparency to avoid fraudulent practices and to guarantee public health by ensuring fair competition within the internal market. However, among its objectives, there is not the reduction of food waste due to date marking. Directive (EU) 2018/851¹⁰ is the only legal act recognizing the role of Member States in the mission of spreading accurate information to consumers in order to improve their knowledge about date labels. Apart from that, the European law on date marking does not include the regulation of food waste due to dates on labels. Concrete guidelines and suggestions

⁷ European Commission, Directorate-General for Health and Food Safety, “*Market study on date marking and other information provided on food labels and food waste prevention. Final Report*”, 2018.

⁸ FUSION, Canali M., Östergren K., Amani P., Aramyan L., Sijtsema S., Korhonen O., Silvennoinen K., Moates G., Waldron K., O’Connor C., *Drivers of current food waste generation, threats of future increase and opportunities for reduction*, Bologna, 2014 and Eriksson M., Giovannini S., and Ghosh R. K., *Is there a need for greater integration and shift in policy to tackle food waste? Insights from a review of European Union legislations*. SN Applied Science, 2020.

⁹ *Regulation (EU) No 1169/2011* of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers.

¹⁰ *Directive (EU) 2018/851* of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste

to solve the problem have been identified in packages of policy measures such as the Circular Economy Action Plan (CEAP 2015) or the European Green Deal with its Farm to Fork Strategy (2020). However, they have not yet been translated into binding acts. In 2022, the European Commission was expected to formulate a legislative proposal to reform FIC Regulation in order to address the issue of food waste. Still, no proposals have been submitted yet.

The EC is committed to working on improvements to the FIC Regulation related to both the understanding and the management of dates by consumers and FBOs. On the one hand, the discussion about proposing possible alternatives to the terms expressing the dates on labels is still open between the EC and the members of the EU Platform on Food Losses and Waste and the Working Group on Food Information to Consumers Regulation. Among the listed options, there is also the abolition of the “best before” wording. On the other hand, the question related to the possibility of selling or donating foodstuff after the expiration of the “best before” date has been clarified by the European Food Safety Authority (EFSA). In both cases, the main obstacle is represented by the necessity of ensuring public health when food information is provided. Eliminating the “best before”, for example, could threaten consumers' protection as transparency about food information would decrease. Similarly, according to EFSA (2020), the donation of products beyond the “best before” date cannot be legally binding, because special storage conditions must be observed to keep the food edible. Thus, it is necessary to act on a case-by-case basis. This implies the arose of a trade-off between food safety and food waste that the EC needs to face to revise Regulation 1169/2011 EU. Moreover, the *Austria v Susanne Muller*¹¹ case law specifies that Member States are even allowed to implement stricter rules on date labelling to better protect public health. Additionally, the Court of Justice of the EU (CJEU) clarified that regulating food donation beyond the “best before” date is a national competence. Therefore, considering the primacy of food safety and the heterogeneity of Member States, it is not easy to find harmonized solutions, especially when a legal reform is at stake.

A significant case study comes from Italy. It is the only EU country to have elaborated a national law against food waste by incentivizing – and not forcing – donation practices past the “best before” date. The country demonstrates that it is possible to address the issue even with the legislation currently in force. Hence, by focusing on the role of FBOs, the Italian *Legge Gadda*¹² encourages and facilitates the donation of food even with an expired “best before” date. In this way, the nation became

¹¹ C-229/01, *Unabhängiger Verwaltungssenat im Land Niederösterreich (Austria) v Susanne Müller*, ECLI:EU:C:2003:153.

¹² *Legge 19 Agosto 2016, n. 166*, Disposizioni concernenti la donazione e la distribuzione di prodotti alimentari e farmaceutici a fini di solidarietà sociale e per la limitazione degli sprechi.

a best practice to be followed in the context of reducing food waste due to date marking as underlined by the Research Centre DIVULGA (2023).

To identify practical findings regarding the possibility of reforming FIC Regulation, the thesis will employ an original approach that analyses past and present EU legal acts on date labelling. In this process, it will be highlighted that the legislation has always focused primarily on consumer protection. On the contrary, the relationship between date marking and food waste has never been addressed by the law. Thus, this study will explore the phenomenon of food waste, the legislation regulating date marking and their negative correlation. As argued, the main obstruction to the resolution of this problem is identified in the importance of guaranteeing public health. This will clarify why a reform to Regulation 1169/2011 has not been implemented yet. Three chapters will help the exploration of this particular issue as follows.

Chapter I will be an instrument to set the general framework. It will stress that, considering the multilevel nature of the phenomenon, the EU is called to intervene at the supranational level in the fight against food waste. Then, the description of the negative impacts of food loss and waste and the numerous factors causing it will highlight that distribution and consumption are the sectors of the food supply chain where food waste occurs mostly, especially in developed countries. Hence, this will clarify why the EU decided to implement specific policy measures targeting retailers and consumers. Some of these measures are particularly aimed at improving date labelling legislation. The latter is actually recognized as one of the main causes of food waste.

Therefore, Chapter II will contribute to understanding how date marking has been regulated over time in the Union. The analysis of the past and present legislation will accentuate that the negative relationship with food waste has never been included in the legal framework of date marking. Additionally, it will help to recognize the two major shortcomings characterizing the current Regulation. Firstly, the distinction between “use by” and “best before” dates needs to be better clarified to avoid confusion among consumers and misuse of dates among FBOs. Secondly, the possibility of selling or donating food after the expiration of the “best before” date needs to be emphasized to prevent unnecessary discard of products. Nonetheless, the need to guarantee high levels of consumer protection obstructs the possibility of easily improving these aspects of FIC Regulation.

Chapter III wants to investigate the proposals elaborated so far by the EU institutions and the Member States also starting from the afore-mentioned packages of measures. The central role is occupied by the Commission which has started to work with EFSA and groups of experts to follow scientific and technical advice in the elaboration of its proposal. The Italian case and the exploration

of its general legal framework will be the protagonists of the last section of Chapter III. It will demonstrate that it is possible to incentivize donation practices to avoid the generation of food waste without making them compulsory. The nation can be considered a source of inspiration for other Member States and for the Commission's work on developing a legal reform.

Finally, the conclusions will summarize the key findings concerning the need to reform the current Regulation 1169/2011 EU in light of food waste reduction. These insights will be based on the examination of date labelling legislation in the EU and the analysis of the action undertaken so far by the EU institutions and Member States. Since no proposals have yet been submitted, it is interesting to reflect on the various food safety constraints that the Commission has to consider. In fact, considering the EFSA guidelines and the consultation of expert working groups, the alternatives available for the revision of FIC Regulation are diminishing.

Chapter I

Food loss and waste as a multilevel emergency

Today, globally speaking, humans do not eat one-third of all food produced for human consumption, contrarily it is lost or wasted.¹³ Food waste has become a global problem by negatively impacting the environmental, economic, social, and ethical spheres. Furthermore, over time, the emergency related to food losses started to emerge in developing countries as well. Thus, considering the climate emergency, world hunger and poverty, food waste needs to be considered a priority to be addressed by targeted measures. However, many times this is not the case. Närvänen, Mesiranta, Mattila, and Heikkinen (2020) recognize food waste as an “*unstructured problem*” due to a lack of a “unified agreement on the definition of food waste”.¹⁴ The absence of a shared definition of the phenomenon hinders the possibility of developing shared tools and strategies to tackle it. Therefore, international organizations such as the United Nations, the Food and Agriculture Organization of the United Nations, and the United Nations Environment Programme (UNEP) started to act to create a common path to deal with the problem of food waste at the international level by also standardising key definitions. Nevertheless, not always terms referring to the topic of food waste are properly used.¹⁵ In addition to the definition problem, different methods of measurement as well as different resources available to governments according to their income level, have created inconsistencies or difficulties in the calculation of the amount of wastage at both the national and international levels. Furthermore, FAO (2019) clarifies that the causes of wastage differ based on the sector in the food supply chain where it occurs but also vary according to the income and development levels of countries, affecting the three spheres mentioned (environmental, economic, and social) to different degrees. To find optimal solutions it is essential to identify the specific stage of the food chain causing food loss and/or waste and the main drivers.¹⁶ Considering all these variables and the fact that they change across geographical regions, it is possible to argue that food loss and waste is a multilevel emergency. Therefore, it is crucial to act at the supranational and national scale to select more targeted measures.

¹³ FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome.

¹⁴ Närvänen E., Mesiranta N., Mattila M., and Heikkinen A., *Introduction: A Framework for Managing Food Waste*, Food Waste Management, 2020.

¹⁵ Ibidem.

¹⁶ FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome.

This chapter aims to study the global emergency of food loss and waste to understand why the EU tackles it by especially concentrating on improving the management of foodstuffs in the distribution and consumption sectors. To do this, the several obstacles to the elaboration of harmonized international measures will be analysed. Moreover, the exploration of the negative impacts and the causes of the phenomenon will help to achieve the final goal of the chapter. The first section will be dedicated to the description of the definitions of terms related to the semantic sphere of food waste and established by the international organizations that should be followed in order to create a unified scenario. Then, the different types of measurement used to address the problem will be analysed as well. Additionally, specific attention will be given to the availability of data on food wastage levels according to the distinction between low, middle, and high-income countries. In this way, the gaps and discrepancies affecting the results will be shown. The second section will be based on the analytical description of the impacts of food waste on the environmental, economic, and social domains. This will be useful especially to demonstrate why the fight against food waste should be considered a priority. The third section will be dedicated to the exploration of the causes of food waste to better understand how they differ according to the stage of the food supply chain. After discussing the problem of food waste and the challenges hindering its resolution, the final section of this chapter will present the strategies adopted so far to fight the issue. Both international and European Union measures will be reported to stress the extent to which the Union is following the global scenario and to highlight its peculiarities. The detailed analysis of the difficulties in defining and quantifying the phenomenon, its impacts and causes as well as the legislative and non-legislative measures implemented to fight it will help to understand that a common strategy to deal with this heterogeneous phenomenon exists. Acting starting from the last phases of the food supply chain, especially from the consumption level, seems to be the most efficient approach. This is mainly due to the fact that the highest levels of food waste are in the consumption sector and the reduction of waste at this stage automatically affects the reduction in the other sectors.

1.1 Food waste and the obstacles to fighting it

Definitions of food loss and waste are the first obstacles in the fight against this huge issue. This is because there is no common nor consolidated definition of the phenomenon. “The various definitions often reflect the different problems that stakeholders or analysts focus on or associate with food loss and waste”.¹⁷ FAO (2019) as well as Fattibene and Bianchi (2017) highlight the difficulties in correctly measuring the amount of wastage if common definitions are not used. Even more specific is the work of Parfitt, Barthel, and Macnaughton (2010). It is dedicated to the importance of using words sharing the same definitions in order to reduce wastage at every level of the food supply chain. They point out that referring to the same terms but with different meanings associated with them creates obstacles to the possibility of comparing data between different countries. Consequently, this does not allow to identify efficient solutions.¹⁸ Hence, it is crucial to underline which are the main definitions adopted at the international level. To start with, the notion of “*food*” is the first to be analysed. It is necessary to make a distinction between edible parts and inedible parts and then decide whether to include both in the definition or not. As explained by UNEP, the former refers to the parts of food intended for human consumption, whereas inedible parts include, for example, bones and peels that is to say all those components not intended for human consumption.¹⁹ The awareness of this distinction is essential when it comes to defining food waste and eventually measuring it. Secondly, the other relevant differentiation is related to the definition of “food waste” itself. According to FAO and UNEP, when food waste is mentioned, it does not refer to the wastage deriving from every sector of the food supply chain. The latter includes food production, aggregation, processing, distribution, consumption, and disposal. Food waste makes only reference to two phases of the chain: distribution and retail, and consumption. Differently, food loss occurs when the wastage is verified at the production, aggregation, and processing stages.²⁰ Hence, even in this work, this distinction will be respected every time food loss or food waste is mentioned, whereas “food wastage” or “food loss and waste” will indicate both phenomena together. Another differentiation may originate from the final destination of food which is to say that sometimes food is classified as waste when it is used for animal feeding as is the case for Stuart (2009). Differently, FAO (1981) does not include

¹⁷ Ibidem.

¹⁸ Parfitt J., Barthel M., and Macnaughton S., (Review) *Food waste within food supply chains: quantification and potential for change to 2050*, Phil. Trans. R. Soc. B, 2010.

¹⁹ United Nations Environment Programme (2021), *Food Waste Index Report 2021*, Nairobi.

²⁰ Ibidem and FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome.

this particular destination for food in the definition of food waste.²¹ Therefore, what someone could categorize as wastage, could be considered differently by someone else. It is crucial to take into account these distinctions especially when governments want to measure the amounts of wastage at the national level and also to contribute to the global measurement which is necessary to define strategies to fight the problem. Differences are also evident from the methodologies that may be used to measure wastage. Indeed, a distinction exists between quantitative and qualitative food loss and waste. The former intuitively refers to the reduction in the mass of food from the food supply chain. Contrarily, the reduction in the quality of food indicates a decrease in the nutritional, economic, or safety value of foods intended for human consumption.²² Thus, on the one hand, there is a physical reduction of food. On the other hand, decreasing the quality of food may lead to a reduction of safety in eating it and, consequently, to food loss or waste. Hence, the measurement of food loss and waste may differ also according to this classification. One may decide to measure the decrease in weight or volume of the food, the reduction in nutritional or caloric elements in the food, or both. Of course, data arising from these different ways of measuring will lead to different results implying different reactions from governments and/or supranational institutions.

An additional obstacle to the creation of a unified scenario to combat food waste is also represented by another distinction: high-income, middle-income, and low-income countries. As explained above, different gross domestic products (GDPs) and resources influence governments' more or less advanced possibilities and capabilities to measure food wastage.

²¹ European Commission, 2014. *Commission staff working document impact assessment on measures addressing food waste to complete swd (2014) 207 regarding the review of EU waste management targets*, Brussels and Parfitt J., Barthel M., and Macnaughton S., (Review) *Food waste within food supply chains: quantification and potential for change to 2050*, Phil. Trans. R. Soc. B, 2010.

²² FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*. 23/9/2014, Rome.

Table 1**Number of countries with measured data points, by sector and World Bank income classification²³**

World Bank income group	Household	Food service	Retail
High-income countries	28	18	20
Upper middle-income countries	12	3	2
Lower middle-income countries	10	2	1
Low-income countries	2	0	0
Total	52	23	23

Source: *Food Waste Index Report*, UNEP, 2021

Table 1 summarizes the global available food waste (and not food loss) data by World Bank income classification showing the slight number of countries measuring wastage. In particular, it is possible to highlight that there are only two low-income countries reporting data and these data only refer to one sector: household (consumption phase of the food supply chain). But especially, only three upper middle-income countries measured wastage at the food service level (distribution phase) and, even worse, only two at the retail level (distribution phase). Even if this classification does not consider food loss, it is a significant way to clarify that it is not easy to collect data when it comes to food waste because measurements coming from countries are limited. It also happens that several data are the result of “extrapolations based on the estimates observed in other countries”²⁴ when States do not have available statistics. This implies that the margin of error may be high and probably the actual situation is even worse than it seems. Evidence of that is given by the fact that, as reported by UNEP in the *Food Waste Index Report* of 2021, 2011 FAO estimations of food waste at the consumer level have been doubled by the 2019 UNEP report based on new data. Meanwhile, this also demonstrates that over time more precise methods and more developed resources have been employed to improve the accuracy of results. Nevertheless, it cannot still be argued that current data exactly report what actually verifies in countries and they still cannot be considered complete results. Additionally, it must be stressed that worse results derive from the measurement of food loss. This is due to the lack of

²³ United Nations Environment Programme (2021), *Food Waste Index Report 2021*, Nairobi.

²⁴ Ibidem.

information coming from the production phase of foods when it comes to measuring wastage. For example, considering Europe, according to the European Commission's *Impact Assessment on Measures Addressing Food Waste* (2014), there is no detailed data in this region on agricultural waste. This implies that without accurate methods, systems, and resources, it is difficult to properly calculate the real amount of wastage in single states and, especially, in the world. Consequently, it is also difficult to enforce global harmonised measures to fight the problem.

1.2 Negative consequences of food loss and waste

Dedicating only one paragraph to the negative consequences caused by food waste could be reductive. However, the most relevant data and information extrapolated by FAO, UN and EU institutions' datasets and reports, will be provided to give a general idea of how drastic and alarming the situation is. By convention, FAO (2019) decided to divide the different impacts of food wastage into three parts, describing how it affects the environment, the economy, and the ethical sphere. Nonetheless, it must be explicitly clarified that the three dimensions are strictly interconnected between them. The environmental impact causes high economic costs since precious resources are wasted. At the same time, the environment and all the creatures that are part of it are not respected and preserved, such as farmed animals, including fishes, as well as all those alien species populating seas and oceans. The marine and terrestrial ecosystems in general are threatened by production and consumption systems that are everything but sustainable. Therefore, the ethical impact of wastage characterises the environmental damages as well. Moreover, high economic losses due to food loss and waste harm the individuals who suffer from it, but at the same time, they nourish a reflection if statistics relative to hunger and poverty are taken into account.

Firstly, some data and percentages are going to be listed to give a general view of how dangerous food loss and waste are to human life and the environment. To start with, the fact that if food waste was a country it would have been the third largest source of emissions in the world, after the United States and China, is a first warning bell. Indeed, according to FAO, globally speaking food wastage generates between 8 and 10% of greenhouse gas (GHG) emissions. At the European level, considering emissions caused by the food system, 16% of them are produced by food waste²⁵. But how can it be possible? How did this phenomenon become “a country”? The first answer can be found in the amount of food loss and waste: 17% of food is lost or wasted every year, corresponding to about 1.3 billion tonnes of food. More specifically, it must be underlined that this percentage is composed of 14% of food that is lost from harvest up to retail²⁶ and 17% is wasted at the retail and consumer levels.²⁷ Thus, having introduced these first worrying data, it is now possible to go deeper into the concrete problems affecting the environmental sphere. Secondly, the economic side will be addressed followed by the socio-ethical one.

²⁵ See the European Commission website, *Food Waste. About Food Waste*: https://food.ec.europa.eu/safety/food-waste_en

²⁶ FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome.

²⁷ United Nations Environment Programme (2021), *Food Waste Index Report 2021*, Nairobi.

1.2.1 Environmental dimension

Environmental costs related to food wastage are produced not only by GHG emissions due to the carbon footprint of the phenomenon, but also by damages caused by food loss and waste to land, water, and biodiversity. Unfortunately, one of the FAO's most accurate research dedicated to the impact of food wastage on the environment and natural resources dates back to 2013 and it is based on data from 2007. Even a more recent report from FAO (FAO, 2019) relies on those data reported six years before to analyse impacts and possible solutions. This does not allow for a proper view of the current situation, but it is possible to estimate that present data would be even more worrying if – as specified in the previews section – UNEP's estimations from 2019 are compared to FAO's estimations from 2011. Nevertheless, this is another demonstration of the significant gaps affecting this field concerning the lack of data that should be filled in order to act in a more concrete and targeted way. However, the only choice by now is to rely on available information at the time of writing to specifically consider every environmental sector affected by food loss and waste. Hence, going deeply into this field, the first aspect to stress is that land, water, and biodiversity are negatively affected to different degrees according to three different elements involved: the stage of the food supply chain responsible for food wastage; the type of food that is lost or wasted; and the region of the world where food loss and waste is generated. First of all, land is damaged because of the phenomenon of “land degradation” which refers to the occupation of surfaces of territory due to the production of food. More precisely, it is defined by FAO as “the reduction of land capacity to provide ecosystem goods (e.g., food, water, construction material) and services (e.g., maintaining hydrological cycles, regulating climate, cleaning water and air), over a period of time for its beneficiaries”²⁸. Thus, when the food produced is not eaten, the capacity of production of that specific field is reduced and, additionally, that surface is occupied by a product that has lost its meaning of existence. Specific data from FAO's report registered that in 2007 1.4 billion hectares of land were occupied by food wastage. This is inevitably translated into a huge waste of a precious, *limited* resource (land) and the degradation of ecosystems. The main products contributing to this kind of waste are milk and meat, whereas the regions more responsible for land footprint are countries of the low-income world. This is because despite low-income countries registering lower levels of food wastage compared to middle or high-income regions, their occupation of land, especially non-arable land, is higher. Plus, waste or loss of meat and milk occupies 95% of non-arable lands. On the opposite side, Europe is one of the regions with the lowest levels of land occupation, and this is given by the

²⁸ FAO, 2013. *Food Wastage Footprint. Impacts on Natural Resources. Summary Report*. Food Wastage Footprint, 2013.

production systems of the developed world that allow countries to rely less on grassland making the latter also more productive.²⁹ As it has been possible to understand, the land footprint is mainly due to wastage coming from the first phases of the food supply chain, especially from production. Hence, one of the conclusions of this first analysis is that it is not possible to state that low-income countries are less responsible for food loss and waste than other regions, but at least, they can be considered less guilty. This does not mean that they do not contribute to the wastage of food. On the contrary, their levels of food loss are definitely higher than those in other regions of the world. Nevertheless, the main cause must be attributed to their scarcity of resources and innovative mechanisms that do not allow them to refine their food production systems in order to lose less food during the farming and harvesting phases. Conversely, still according to FAO (2013), middle and high-income regions record much higher levels of food waste. Reasons related to this difference in food loss and waste between countries distinguished in terms of income and development will be better addressed in the following sections. By now, the analysis of the other damaged sectors of the environment will be finalised.

As regards water, it is the other precious and limited resource negatively affected by wastage. Even in this case, according to FAO, the phase of the food supply chain most involved in this process is the production phase. Specifically, it has been reported that in 2007 the consumption of water taken from ground or surface water (also known as *blue water*³⁰) of total food wastage for agricultural production – especially for cereals and fruits – was equal to three times the volume of Lake Geneva that is to say 250km³ of water consumed because of food that does not end where it should do. Although the social impacts of the food loss and waste will be discussed later, it is inevitable at this point that a reflection arises. Globally, “2 billion people do not have access to clean and safe drinking water”³¹ and the majority of these people come from those countries causing food loss due to the lack of abilities and resources mentioned before. Hence, of course, it would be crucial to act at the base of the problem by financially helping these regions in improving their systems. Nonetheless, FAO’s report – as well as the definition related to the distinction between the three types of water – does not include the fact that the consumption of precious water happens also when food is wasted, and not only when it is

²⁹ Ibidem.

³⁰ There is a differentiation between blue, green, and grey water stressed by the Water Footprint Network when water footprint is considered. According to it, the first one refers to the use of water taken from ground or surface water; the second one is rainwater; and the last one refers to fresh water that is necessary for the dilution of pollutants. See M. M. Mekonnen and A. Y. Hoekstra. *The green, blue, and grey water footprint of crops and derived crop products*. 2011, Twente Water Centre, University of Twente, Enschede, The Netherlands.

³¹ See UNESCO website, *Imminent risk of a global water crisis, warns the UN World Water Development Report 2023* at: [https://www.unesco.org/en/articles/imminent-risk-global-water-crisis-warns-un-world-water-development-report-2023#:~:text=Globally%2C%202%20billion%20people%20\(26.Water%20Conference%20in%20New%20York](https://www.unesco.org/en/articles/imminent-risk-global-water-crisis-warns-un-world-water-development-report-2023#:~:text=Globally%2C%202%20billion%20people%20(26.Water%20Conference%20in%20New%20York).

lost. Clearly, it is a more indirect way of damaging the environment, but it is still a cause of this phenomenon that cannot be ignored. Indeed, the same amount of water is used for the production of food that consumers or retailers decide to throw away instead of eating or selling it, and for the production of food that is lost during the agriculture or harvesting stages. Thus, how many more lakes of Geneva need to be filled before realizing that it is necessary and vital to produce and consume less food?

The other environmental factor threatened by food loss and waste is biodiversity. This is partly linked to the waste of the other two resources described so far. What is mainly considered here is the phenomenon of deforestation for agricultural purposes, and the process of aquaculture which represents a risk for biodiversity as well. Firstly, it is estimated that from 1990 to 2010 lands were deforested only for agriculture. Secondly, the use of pollutants, such as hormones or antibiotics, and the spread of diseases caused by industrial fishing, produce significant damage to marine species. Of course, intensive livestock farming represents the same threat, but on the surface.³² Thus, even in this case, this natural resource is considered to be negatively affected especially by the production phase and the difference is made by the product and the region. Indeed, three elements need to be considered again: the level of wastage of a product, the level of environmental impact generated by that product, and its origins of production. For the third time, it is possible to observe that low-income countries are more responsible for the impact on biodiversity due to food wastage than other regions. Specifically, deforestation is a practice that generally occurs in the developing world – especially in the tropics. Cereals, on the other hand, are those commodities that more than others need a large amount of land in order to be grown, especially in those parts of the world where agricultural processes result to be still underdeveloped. Consequently, low-income countries that need deforestation for crops and that then lose a large percentage of their cultivation, have the biggest responsibility when it comes to evaluating food wastage impacts on biodiversity. Nevertheless, regions of the developed world, including Europe, seem to be a risk for both biodiversity and land because of the occupation of territory for the production and relative wastage of meat.

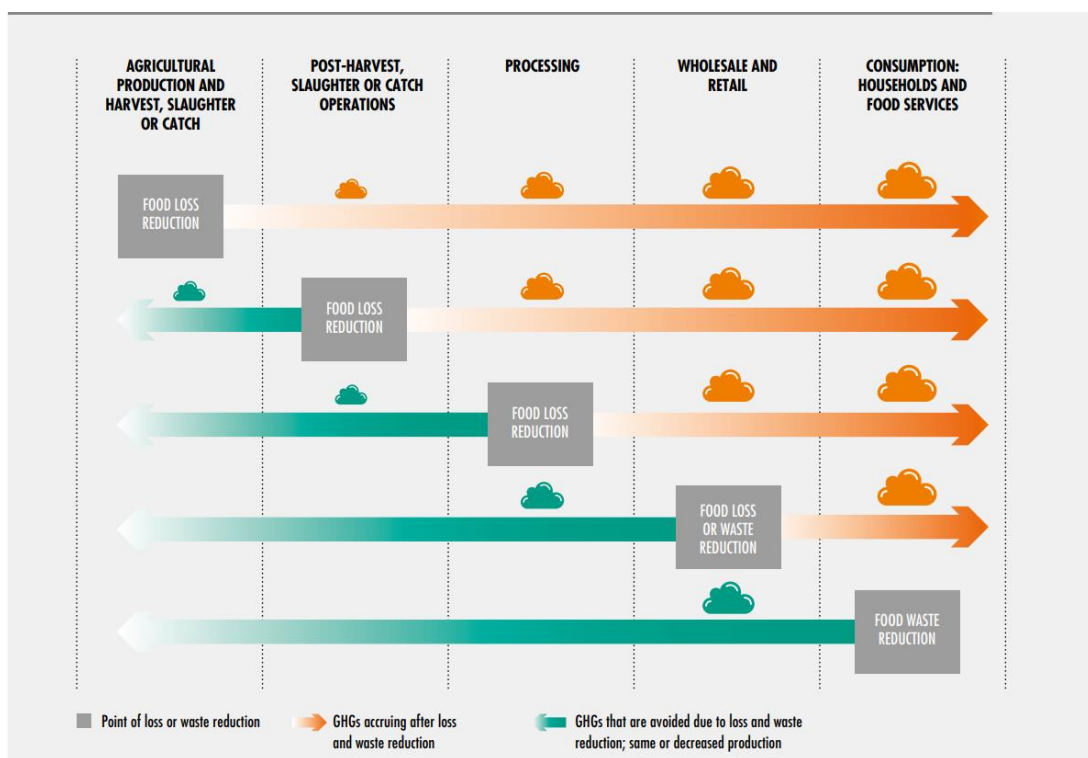
The last factor to examine – and probably the most critical – is carbon footprint. The understanding of the process of CO₂ emissions deriving from food wastage clarifies why it is essential to act as fast as possible to reduce food waste starting from the retail and consumption levels. It has already been discussed that although land, water, and biodiversity are mainly threatened by the first stages of the food supply chain, the other phases of the chain can be considered indirectly guilty as well. Whereas,

³² FAO, 2013. *Food Wastage Footprint. Impacts on Natural Resources. Summary Report*. Food Wastage Footprint, 2013.

when carbon footprint is at stake, the link with post-harvesting, distribution, retail, and consumption is evident and definitely direct. Indeed, the impact of consumers' waste on the environment due to GHG emissions reaches the highest levels compared to the other phases of the food supply chain. This is due to the fact that the carbon footprint at the consumer level is a sum of the emissions at each stage of the food supply chain, from production to disposal. This means that the energy used to produce and process food is added to the energy required to discard the foodstuff wasted by the consumer.³³ That is why it is more efficient to act at the very last stages of the food supply chain in order to reduce wastage.

Figure 1

Carbon Impact of Food Loss and Waste Reduction along the Food Supply Chain³⁴



Source: *The State of Food and Agriculture*, FAO, 2019

³³ Ibidem.

³⁴ FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome.

It is possible to identify two different and specific reasons that would lead to the reduction of environmental impacts if action were taken at the consumer level at first. First of all, as already highlighted it would reduce the CO₂ emissions that are currently deriving from food waste. The second aspect is an economic one. Figure 1 elaborated by FAO shows that the later in the food supply chain the reduction of wastage occurs, the better the result in terms of carbon footprint. The reason is that if the reduction of food loss is verified at the very first phases of the chain, operators in those sectors will be incentivized to increase their output as their costs of production decrease as well. This would inevitably increase the production and, hence, emissions. Conversely, the reduction of food waste would not influence operators in this sense. On the contrary, the opposite scenario could occur: less wastage from consumers translating into a more responsible and sustainable way of consumption that would decrease consumption and, eventually, production.

1.2.2 Economic dimension

The reduction of food waste inevitably leads also to advantages from an economic point of view. Economic costs due to food wastage are present at each stage of the food chain. Indeed, as with GHG emissions, the economic impact negatively affects every stage and every actor of the food supply chain. Globally speaking, according to FAO's 2019 report and the European Commission's 2014 Impact Assessment, 750 billion dollars is the yearly cost of food loss only at the production level of the food supply chain that is to say, the Swiss GDP of 2011. Considering only the European Union, it has been estimated that the economic loss produced by wastage every year is around 132 billion euros.³⁵ However, not only producers generate this high economic cost. According to the Waste and Resources Action Program (WRAP), at the household level, the amount of food waste that could be avoided has a cost of 595 euros per family.³⁶ Similarly, the European Commission has calculated that almost 400 euros could be saved per family every year if this huge amount of food was not wasted at the household level. Obviously, wholesale and retail sectors suffer an economic loss as well when companies cannot or do not sell food that they had ordered. Finally, even the refill stage of the chain is obliged to incur a financial loss when food needs to be discarded. The worst part of all these economic losses appears when data related to people starving every day worldwide emerges.

³⁵ European Commission, 2023. Commission staff working document impact assessment report Accompanying the document Directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste. 5.7.2023, Brussels.

³⁶ Hudson U. and Messa M., Slow Food, 2016. Documento di posizione sulle perdite e gli sprechi alimentari. SIMeVeP, 2016.

1.2.3 Social and ethical dimensions

Globally, more than 800 million people starve from hunger and more than 3 billion people cannot afford healthy and balanced nutrition.³⁷ These drastic numbers introduce the last consequence of food wastage that will be examined in this section. Considering what has been discussed so far, it could be imagined that the majority of people suffering from hunger do not come from those regions of the world causing food waste. They generally live in those areas where food does not even reach consumers as it is lost before in the food supply chain, especially during the production phase. Another relevant aspect is that many times the developing regions' lands are used to cultivate feed for animals farmed in the developed world or to produce food to be sold to markets of Northern countries. These are the same countries that mostly waste food when it arrives at the retail and consumer level. In accordance with statistics reported by Slow Food, the current food production would be enough to feed more than 12 billion people. However, it must be emphasised that people suffering from the lack of daily food are also on the increase in the developed part of the world: 42 million Europeans live in poverty and 17% of the European population is also at risk of becoming poor.³⁸ Hence, by reiterating that one-third of produced food is lost or wasted and that 800 million people do not survive because they do not have access to food, it is more than evident that human beings are making more than one mistake. It is also clear there is no time to discuss *whether* or *when* acting, but it is time to understand which the most efficient way is to act.

³⁷ FAO, IFAD, UNICEF, WFP and WHO. 2022. The State of Food Security and Nutrition in the World 2022.

³⁸ Hudson U. and Messa M., Slow Food, 2016. Documento di posizione sulle perdite e gli sprechi alimentari. SIMeVeP, 2016.

1.3 The causes of food loss and waste

The analysis of the impacts of food wastage on these three spheres of society brought to light one aspect deserving a deeper reflection. The point that has been discussed and highlighted in the chapter so far is that food loss and waste is generated at the different levels of the food supply chain. Now, it is also important to stress the main reasons at the basis of the wastage for each stage. As already mentioned, agricultural processes tend to generate mainly food loss. This can be due to products damaged by weather conditions, natural calamities, and all the consequences of climate change. Other reasons are linked to the typology of agronomic practices selected that, if not properly advanced and refined, they can generate food loss (e.g., type of fertilization, soil, or irrigation chosen). Of course, the harvest phase is crucial as well since it can cause losses. Even in this case, harvest practices can create physical damage to the foodstuff making it no more marketable. The other interesting aspect related to the production stage is that many times food is lost because hygienic standards for animal breeding are not respected leading to the loss of meat and milk. Food processing and packaging is the second step of the food supply chain to explore in this sense. Besides techniques that even in this case are crucial to avoiding food loss, there is another cause of food loss that this stage has in common with the previous one: throwing away food because the aesthetic conditions of the product make it unsaleable. Indeed, operators in this phase can decide to reject food sent by producers because they consider the quality of the commodity to be low. The logistics and warehousing are the following stages where the main reason causing the loss is characterized by the techniques used to transport and handle food that should arrive in the retail sector, but if badly managed it never reaches its destination. Moreover, transportation times also influence the “*use by*” date (the date on foods’ labels indicating that after that day it is no longer safe to consume that specific product). Indeed, the longer the transport, the shorter the “*use by*” date on sale. Differently from the phases analysed so far, the retail sector is more responsible for food waste rather than food loss. The main reasons are related to the overestimation of consumers’ demand that leads to overstocking of food unsold. The latter could eventually be donated, but many times it happens that there is a lack of donation systems within the companies or countries, and this inevitably produces food waste. The other interesting aspect that will be consistently explored later is that it is not rare that retailers associate too short “*use by*” or “*best before*” (wording indicating the minimum durability of food in terms of quality) dates to foodstuff. This implies that food that could still be eaten is wasted. Finally, the last phase of the food chain to be considered is consumption. Causes of food waste at the household level can be linked to a scarce consideration of the importance and the preciousness of food. This translates into overbuying processes due to a lack of organization when food is bought. What verifies, for example, is an

overestimation of actual needs, no check of stock at home before shopping, or simply a lack of shopping plans. The other relevant and very spread reason among households leading to waste is the wrong understanding of labels.³⁹ Firstly, consumers do not always have a clear distinction in their mind between “use by” and “best before” dates. Secondly, they often tend to trust more food labelling rather than their own senses, such as smell and taste. Therefore, they may decide to throw away food that is still completely safe to eat only because the “best before” date has passed. This specific topic will be deeply addressed in Chapter II.

Hence, having summarized the main causes of food loss and waste, it is possible to argue that every stage of the food supply chain has at least one reason for wastage relative to expiration dates on labels. Some sectors are more indirectly linked to it, but the fact that even at the production phase many times food is lost only for its aesthetic is a signal that consumers would not buy an apparently damaged product because they think it is not safe for them. This is also because aesthetic standards are inevitably linked to “best before” dates assigned to items. Nonetheless, the previous sector underlined the higher effectiveness of acting at the last phases of the food chain to better reduce food wastage. In addition to this, it must be emphasized that the retail and consumption levels’ causes of waste are considerably more directly related to date marking. Considering every aspect mentioned, there is another important element that explains why it is reasonable to start acting on changing date labelling legislation. The highest levels of food waste at both the global and European levels are recorded for household consumption.

³⁹ Reasons related to food wastage available by consulting: Ocicka B., and Raźniewska M. *Food Waste Reduction as a Challenge in Supply Chains Management*. Log Forum [online]. 2018 and FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome.

Table 2**Share of food losses and waste in the food supply chain (percent)⁴⁰**

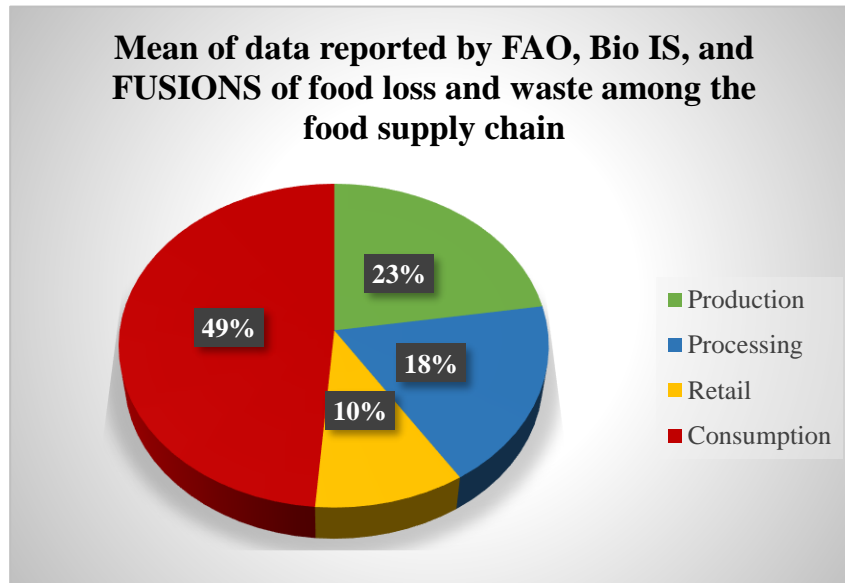
	FAO (Europe)	Bio Intelligence Service	FUSIONS
Production sector	23	34.2	11
Processing sector	17	19.5	19
Retail sector	9	5.1	17
Consumers	52	41.2	53

Source: Bianchi M., Fattibene D., Fighting against Food Losses and Waste: An EU Agenda, IAI, 2017

Table 2 – elaborated by the European Court of Auditors and reported by Bianchi and Fattibene – shows percentages of food loss and waste registered by different institutions: FAO, Bio Intelligence Service, and FUSIONS. The first characteristic that can be noticed confirms what has been argued many times in this chapter: data do not coincide by demonstrating one of the main shortcomings of this global issue. Secondly, despite this data inconsistency, consumption level always registers the highest percentage of wastage.

⁴⁰ European Court of Auditors, Combating Food Waste: An Opportunity for the EU to Improve the Resource-Efficiency of the Food Supply Chain, 2016 in Bianchi M., Fattibene D., Fighting against Food Losses and Waste: An EU Agenda, IAI, 2017.

Graph 1



Source: my elaboration of data extrapolated from the EU Court of Auditors (2016) in Bianchi M. and Fattibene D. (2017)

To have a more visible perception of the situation, Graph 1 has been created by calculating the mean of the percentage values reported by the three institutions in Table 2. This makes even more evident the weight of consumers when it comes to measuring food loss and waste. Indeed, half of the total wastage is produced only by the consumption level. Differently, the other three sectors together cover the other half. This implies that not only it is more efficient to act at the household level at first, but also that it is a necessity as their level of waste is the highest.

1.4 Measures to fight food waste

The analysis of the impacts and the causes of food loss and waste allowed to define a significant conclusion: it is reasonable to start acting from the last stages of the food supply chain to reduce food waste. Specifically, an even more targeted action would be to concentrate on the improvement of date labelling legislation in order to reduce food waste in the Western world. This is due to three key reasons. Firstly, the consumption sector registers the highest levels of food waste. Secondly, acting on the last stages of the food chain to reduce food waste is more efficient. Third, one of the main causes of food waste occurring during the last phases of the food supply chain (retail and consumption) is related to misuse and misunderstanding of date marking. Hence, date labelling occupies a crucial role in the fight against food waste that cannot be ignored by international, supranational, and national institutions and organizations. Nonetheless, before reaching the core of this work and analysing the legislation regulating date labelling in the world and in the EU and to what extent it should be reformed, it is worth making a brief reference to the more general legal framework of food loss and waste to understand how global and European actions are structured to reduce wastage and which are their key strategies.

1.4.1. Global level

The United Nations have been playing a pivotal role in the fight against food wastage. The UN has created important programmes that States can implement through their own legally binding measures.

As part of the Agenda 2030 for Sustainable Development launched by UN Member States in 2015, the 17 Sustainable Development Goals (SDGs) have been instituted at the core of the Agenda. In general, they are aimed at improving the sustainability of the world to ensure prosperity and peace for both human beings and the environment. Specifically, the 12.3 SDG is directly targeted at reducing food loss and waste by recognizing the negative impact they have on societies. According to it, global food waste should be halved by 2030 and global food losses should be reduced.⁴¹ The interesting part of this goal is that it identifies two different indicators useful to achieve the final aim: the *Food Loss Index* and the *Food Waste Index*. They differ by taking into account the definitions related to the terms. The former deals with specific foodstuff lost at the first stages of the food supply chain until

⁴¹ United Nations, Sustainable Development. The 17 Goals. Department of Economic and Social Affairs. Available at: <https://sdgs.un.org/goals>

the retail level without including it. Conversely, the latter considers every commodity wasted in the retail and consumption phases. Another difference regards the entity responsible for these indexes. On the one hand, the already-introduced Food and Agriculture Organization of the United Nations is the custodian of the Food Loss Index. Indeed, its action is mainly based on the achievement of food security with a specific mandate “to improve nutrition, increase agricultural productivity, raise the standard of living in rural populations and contribute to global economic growth”.⁴² Hence, considering what has been consistently underlined in the previous paragraphs, it is reasonable that this body is concerned with food loss as it mainly comes from the agricultural and production sectors. On the other hand, the Food Waste Index is in the hands of the United Nations Environment Programme, the leading global authority on the environment. The interesting data emerging from these two indicators is that if food loss seems to record different levels according to the region generating it (confirming that low-income countries tend to produce more food loss compared to middle and high-income countries), household food waste per capita data result to be high regardless of the region. This information is somehow disproving what was reported in the FAO 2013 document. Nonetheless, by analysing the 2019 report of the same organization, it is possible to notice that even FAO recognized that during the last years, the level of food waste increased in low-income countries as well. Specifically, it argues that “emerging economies are increasingly faced with this problem”.⁴³ This is another important element that may prompt to act on the consumption level at first not only in the Western world but also at the global scale.

1.4.2 European level

The European Union has also engaged in the reduction of food waste by implementing both legal acts and non-binding measures. Specifically, it adopted 29 regulations, 10 directives, 3 decisions, 10 communications, and 1 Parliament resolution. A review of these legal acts and EU policies against food waste has been published by FUSIONS (Food Use for Social Innovation by Optimising Waste Prevention Strategies), which is a research project on food waste operating from 2012 to 2016 and introduced by the European Commission. The intention behind this project was to clarify the distinction between food loss and food waste by defining a precise and common methodology to measure them.⁴⁴ Additionally, the REFRESH project (Resource Efficient Food and Drink for the Entire Supply Chain, 2015-2019) has been created to develop innovative approaches and technologies

⁴² See Food and Agricultural Organization of the United Nations website at: <https://www.fao.org/home/en/>

⁴³ FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome.

⁴⁴ Vittuari M., Politano A., Gaiani S., Canali M., Elander M., Review of EU Member States legislation and policies with implications on food waste. Final Report. FUSIONS, Bologna, 15 June 2015.

to fight food waste. These projects together have been part of a wider scenario: the EU's commitment to achieve the 12.3 SDG.

In order to realize this ambitious target, the Juncker Commission in 2015 adopted the so-called *Circular Economy Action Plan (CEAP)*. The latter wants to ensure a competitive economy in the EU where resources' efficiency is preserved. Indeed, the prevention of food waste with the purpose of halving it by 2030 is part of its action plan and, specifically, of one of the legislative proposals of the package, namely *Directive EU 851/2018* amending *Directive 2008/98/EC* on waste. One of the innovative concepts introduced by the new directive is the bio-waste separation to ensure a different view of food and food waste. In this way, the desired circularity model can be achieved by replacing the linearity that implies the production of food, the consumption, and/or the wastage of it. Furthermore, the directive also includes the introduction of a waste hierarchy: waste management options are valued by taking into consideration their environmental impacts. Through the European Union guidelines on food donation (EC 2017) it is possible to have access to an accurate classification of what are the best alternatives when food is not eaten. Prevention is the favourable choice followed by reuse for human consumption and reuse for animal feed. Less favourable options are recycling and recovery energy preceding the worst alternative: disposal. Even in this case, these are not part of binding legislation. On the contrary, they are simply guidelines. Nevertheless, the Circular Economy Action Plan includes a relevant Annex specifying a timetable to be followed by the Commission not only to better measure food waste but also to find alternatives that could help in improving the understanding of date marking.⁴⁵ Legislation related to date labelling will be the core of the next chapters. Therefore, by now, it will only be mentioned to have an idea of the most relevant legal measures related to the EU's effort on the reduction of food waste in general.

The before-described Circular Economy is actually part of a bigger plan adopted by the EU Commission in 2019: the *European Green Deal*. This is a package of measures and at the heart of its objectives there is the ambition of leading the EU towards climate neutrality by 2050. It covers all areas that may contribute to making the EU a more sustainable and climate-neutral place. Hence, the Circular Economy Package is not the only measure aimed at tackling the problem of food waste. A specific policy has been included in the Green Deal that is entirely based on the necessity of creating a more sustainable and fair food system, from the producer to the consumer: *the Farm to Fork Strategy*. Even in this case, food wastage is considered one of the obstacles to overcome in order to

⁴⁵ Eriksson M., Giovannini S., Kumar Ghosh R., Is there a need for greater integration and shift in policy to tackle food waste? Insights from a review of European Union legislations. SN Applied Sciences, 2020.

reach the desired result. Particularly, it presents two main actions to face this problem: on the one hand, the Commission is expected to propose legally binding targets for Member States to reduce food waste; on the other hand, it will present a proposal to revise EU rules for date marking, namely “use by” and “best before” dates.⁴⁶

As mentioned at the beginning of this sub-section, numerous legislative acts and policy measures characterise the EU legislation on food waste. It would be interesting and useful to analyse each of them to have a very detailed view of how the Union is acting in this sense. For the purposes of this work, it is not possible to undertake such a detailed investigation. Nevertheless, from the analysis of the obstacles to the fight against food waste, the impacts, and the causes of the phenomenon it has emerged that the best strategy to be followed – especially at the EU level – is to intervene at the consumption scale and the review of date labelling legislation will help in this mission. This aspect underlines another feature of this peculiar issue. Food wastage touches several aspects of society: food security, food safety, the environmental sphere (including land, water, CO₂ emissions, biodiversity, ecosystems, and more in general, climate change), natural resources, poverty, hunger, and economic aspects. This implies that many policy fields are covered when only one problem wants to be solved. At the same time, it also means that a large number of Directorate Generals are called to intervene as also recognized by Eriksson, Giovannini, and Kumar Ghosh (2020).⁴⁷ Thus, when so many bodies and policy areas are involved it is not rare that finding agreements and solutions results to be more difficult and that many times it can happen that overlapping of actions verify.

Nevertheless, the recognition of date labelling as one of the main drivers of food waste in the EU guided the identification of targeted policy measures to reduce wastage. Before investigating the identified solutions, it is necessary to analyse how date marking is regulated by EU law. On the one hand, this study will give a clearer idea of how different policy areas meet in the context of date labelling regulation. On the other hand, it will contribute to providing an accurate analysis of how the EU legislation regulated date labels over time. In particular, the historical excursus of the evolution of European legal acts on this issue will be the core of Chapter II. This will help to understand how the negative relation between date labelling legislation and food waste started to emerge and eventually became a priority to be addressed by EU institutions. However, it will be observed that no

⁴⁶ European Commission, 2020. Farm to Fork Strategy. *For a fair, healthy and environmentally-friendly food system*. 2020.

⁴⁷ According to Eriksson M., Giovannini S., and Kumar Ghosh R., the DGs involved are the rural development and agriculture DG, the maritime affairs and fisheries DG, the food safety and health DG, the industry, entrepreneurship, internal market and SMEs DG, the energy DG, the environment DG and the customs union and taxation DG.

legal act has been formulated yet regarding the connection between date marking and food waste. The current regulation on date labelling (Regulation (EU) 1169/2011⁴⁸), in fact, does not address the necessity of reducing food waste due to date labels.

⁴⁸ *Regulation (EU) No 1169/2011* of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers.

Chapter II

The relevance of date labelling legislation in the fight against food waste

This chapter investigates the relationship between date labelling legislation and food waste and focuses on the challenges the EU encountered in reducing food waste. Regulation (EU) no 1169/2011 (*FIC Regulation*)⁴⁹ is the legislative measure currently in force regulating date marking on foodstuff. Although it is the most recent legal act providing transparent food information to consumers, it does not make any reference to the existing connection between food waste and date labelling. This is a huge gap considering that the EU is following international guidelines on the provision of food information to consumers. On the one hand, these guidelines are based on the importance of creating homogeneity when food information – including dates on labels – is provided to consumers to ensure their protection. On the other hand, they are also aimed at overcoming the shortcomings that emerged over time and are characterized by the wrong use and understanding of date labels that generate food waste. Nevertheless, the European Union did not implement any legal act completely dedicated to the regulation of the negative relation between food waste and date labels. The main difficulty in elaborating such a legal measure is characterised by the fact that food safety and quality need to be protected as well. Therefore, the necessity of avoiding the risk of food waste due to date marking needs to be balanced with the protection of consumers' health.

This chapter aims to investigate the extent to which date labelling legislation affects the reduction of food waste and identifies the obstacles that the law finds to address this issue. To do this, it is necessary to retrace the history of date marking legislation by highlighting the key amendments leading to the current Regulation. The approaches that the EU adopted over time will be explored in the first section of the chapter. They will be placed in the wider context of the international measures regulating food labels. The latter will help to understand the benchmarks on which the EU law is based. Thereafter, a detailed analysis of the development of the European date labelling legislation will be provided in section 2.1.1. In particular, it will compare the past and present legislation to stress the main amendments that led to the elaboration of the current FIC Regulation. The analysis will guide towards two key issues. Firstly, the major shortcomings that today are considered a threat to the fight against food waste will be analysed. Hence, the problems generated by the misuse of date

⁴⁹ *Regulation (EU) No 1169/2011* of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers.

labels by food business operators and problems related to the misunderstanding of date labels by consumers will be considered in the second section of the chapter. Together, these problems derive from specific aspects that should be improved in the FIC Regulation. In particular, FUSIONS (2014) identifies the necessity of clarifying that food beyond the “best before” date remains edible and can still be marketed or donated, and the need to emphasize the distinction between the meaning of “use by” and “best before” dates. Secondly, section 2.3 will identify the obstacles to the formulation of new norms targeted to food waste and attention will be particularly paid to the primacy of food security. Food security is in fact a priority under Article 153 of the Treaty establishing the EEC⁵⁰ as well as under Regulation (EU) 1169/2011. The analysis of the case *Austria v Susanne Müller* (case C-229/01)⁵¹ will support this theory by underlining that the protection of public health always needs to be ensured even if this implies tightening EU rules. In this case, the Court of Justice held that it is legal to sell or donate food after the expiration of the “best before” date, but it is a competence that remains in the hands of the individual Member States. It is possible to apply stricter norms at the national level to better safeguard public health as also established by Article 39 of FIC Regulation. According to the principle of proportionality, Austria was thus allowed to adopt a stricter rule on the management of food after the expiration of the date of minimum durability that would possibly imply not selling the products and, hence, discarding them. This created a trade-off, over time, between food safety and food waste by increasing the difficulties at the EU level to implement targeted rules to avoid the generation of food waste due to date marking legislation.

⁵⁰ Consolidated version of the Treaty on the Functioning of the European Union - PART THREE: UNION POLICIES AND INTERNAL ACTIONS - TITLE X: SOCIAL POLICY - Article 153 (ex-Article 137 TEC), in force.

⁵¹ C-229/01, *Unabhängiger Verwaltungssenat im Land Niederösterreich (Austria) v Susanne Müller*, ECLI:EU:C:2003:153

2.1 The legal framework of date labelling

“A food label is any tag, brand, mark, pictorial or other descriptive matter that is written, printed, stencilled, marked, embossed or impressed on, or attached to, a container of food or food product”.⁵² Having considered the power of definitions in the previous chapter, even in this case this definition has relevance especially because it has been produced by the *Codex General Standard for the Labelling of Prepackaged Foods* (General Standard). Indeed, the possibility of understanding labels for consumers even abroad is given by the establishment of guidelines at the international level aimed at creating a harmonised scenario when it comes to labelling foods. This necessity started to be felt when trading food globally was perceived as a threat to consumers’ protection if not properly regulated. In May 1963 FAO together with the World Health Organization created the *Codex Alimentarius Commission* with the purpose of ensuring protection to consumers but also a fair food trade system. The latter could be threatened by a heterogeneous approach to labels: producers would face a wide variety of labelling requirements when selling and trading products in different countries by being forced to pay additional business costs.⁵³ Therefore, the institution of common standards was a solution to create equilibrium. Hence, the General Standard was adopted in 1969 and widely enlarged in 1985. Several revisions took place over time, particularly after the establishment of the World Trade Organization in 1995. The latter started following the Codex standards to ensure human health protection in trading food and it also recognized them as targets to be implemented by governments through the establishment of a specific agreement: the Sanitary and Phytosanitary Measures.⁵⁴ Thus, States and communities of States started to align their legal systems to these international benchmarks by harmonising the global framework of trading foodstuff in the context of consumers’ protection. Clearly, when labels are mentioned in this general perspective, several elements characterizing them are taken into account, such as ingredients list, allergenic ingredients, nutrient declarations, and many others. Among them, date marking is present as well and was already introduced in the first revision of the General Standard in 1985.⁵⁵

According to the FAO Handbook on Food Labelling (2016), the date information is one of the oldest and most common food data reported on labels to guarantee consumers the possibility to choose

⁵² Codex Alimentarius International Food Standards, *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985). Adopted 1985. Amended 1991, 1999, 2001, 2003, 2005, 2008 and 2010 in FAO, 2016. *Handbook on food labelling to protect consumers*, Rome, 2016.

⁵³ FAO, 2016. *Handbook on food labelling to protect consumers*, Rome, 2016.

⁵⁴ Ibidem.

⁵⁵ FAO, 2010. *Innovations in food labelling*. Published by The Food and Agriculture Organization of the United Nations and Woodhead Publishing Limited, 2010.

the foodstuff they prefer by making conscious choices. Moreover, retailers need this information as well to properly manage and sell their products. Before this information was included in the General Standard, each State had its own rules governing whether and how date indications should have appeared on labels. When date marking was included by the Codex in the Standard, the main purpose was related to the necessity of guaranteeing the freshness and thus, the quality, of food to consumers. In fact, the wording introduced by the Codex on labels was the “*best before*” date to indicate the date of minimum durability of foods, that is to say, the date until which a specific product could maintain its initial characteristics in terms of quality. Later on, as the Standard was revised over the years, the “*use by*” date was introduced to also guarantee the safety of consumers. After the date indicated by this new wording, the food is considered no longer safe to be eaten and no longer marketable. However, even after the introduction of this other wording, additional reviews were required. Specifically, at the beginning of the 21st century, the issue between date labelling and food waste arose. It was evident that the existence of different wording to indicate two different aspects of food – quality, and safety – was creating confusion among consumers by leading to the wastage of food completely safe to eat but thrown away when the “*best before*” date expired. Therefore, in 2016 the Codex amended the measures relating to date marking in order to give governments and policymakers more detailed guidelines to better distinguish between “*use by*” and “*best before*” dates to avoid confusion among populations, but also to spread the idea of donating food after the date of minimum durability.

The EEC legal framework followed the international benchmarks to establish its harmonized system of date labels on foodstuffs. Thus, even in this case, it is possible to identify three stages in conjunction with the global ones: the first one at the end of the 70s is related to the concern about the quality of food; the second one is related to the concern about the safety of food and developed at the end of the 80s; and the third one, relating to the concern about the generation of food waste as a consequence of date marking during the first decade of the 21st century to date. Nevertheless, on the one hand, the first two phases had legal consequences as they have been addressed through the implementation of legal acts. On the other hand, the third one is still part of the discussion at the institutional level of the European Union. Still, it is not possible to analyse specific legislation aimed at solving the issue between food waste and date labelling. Surely, the topic has been included in packages of measures that are still in progress, but there are no directives or regulations completely and solely based on tackling this problem. Instead of analysing the before-mentioned phases one by one, it could be more useful to make a comparative analysis between the most relevant legal acts that

marked the history of date labelling legislation. Subsequently, it will be explained how and when concerns about food waste arose in this particular context.

First of all, the legislative documents that have been selected for this analysis are Directive 79/112/EEC⁵⁶, Directive 89/395/EEC⁵⁷ and Regulation (EU) no 1169/2011. It is also necessary to first clarify that the following comparative analysis won't include Directive 2000/13/EEC⁵⁸ which is part of the legal history of date labelling, but it does not differ consistently from Directive 89/395 EEC when only date marking is considered. Contrarily, the mentioned directive will be useful for the analysis of the case law of *Austria v Susanne Müller* which will be discussed later.

2.1.1 A comparative analysis of past and present date labelling legislation

The first aspect that can be noticed is the fact that only the latter – being a regulation – is a binding legislative act. The other two are directives and, as directives, they simply set goals that the Member States are called to reach by shaping their national laws how they deem appropriate. The titles also give a first view of the differences that there can be between the three. The first two appear to be similar, but they are very different from the third one. A first reflection on these two aspects concerns the different approach that the Union has begun to adopt on this issue and the consequent increasing relevance of consumer protection for EU law. Additionally, it is also a demonstration that the EEC was following international development in setting guidelines to create a homogeneous scenario when it came to foodstuff labelling. Indeed, the introduction of the first directives seems to be an answer to the Codex Standard as their main goal was clearly the harmonisation of Member States' laws on “the labelling, presentation and advertising of foodstuff”, as it is explicitly expressed in the titles. Thereafter, high levels of consumer protection wanted to be guaranteed directly by the Community as also stated in Article 153 of the Treaty establishing the EEC.⁵⁹ The European Commission recognized that a differentiation in rules due to different national laws was creating barriers to the achievement of this goal. Particularly, within the context of the *Proposal for a Regulation on the*

⁵⁶ Council Directive 79/112/EEC of 18 December 1978 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs for sale to the ultimate consumer. No longer in force, Date of end of validity: 25/05/2000; Repealed by 300L0013.

⁵⁷ Council Directive 89/395/EEC of 14 June 1989 amending Directive 79/112/EEC on the approximation of the laws of the Member States relating to labelling, presentation and advertising of foodstuffs for sale to the ultimate consumer. No longer in force, Date of end of validity: 25/05/2000.

⁵⁸ Directive 2000/13/EC of the European Parliament and of the Council of 20 March 2000 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs. No longer in force, Date of end of validity: 12/12/2014; Implicitly repealed by [32011R1169](#).

⁵⁹ Consolidated version of the Treaty on the Functioning of the European Union - PART THREE: UNION POLICIES AND INTERNAL ACTIONS - TITLE X: SOCIAL POLICY - Article 153 (ex-Article 137 TEC), in force.

*provision of food information to consumers*⁶⁰, the Commission argued that amending and substituting existing legislative provisions on labels on foodstuff – including Directive 2000/13/EC – not only would have avoided the fragmentation of the EU legislation on this issue but also it would have generated a fairer level of consumer protection in every Member State.⁶¹ In fact, following a regulation means introducing and implementing national laws based on specific principles and norms dictated by the EU for every government of the Union. In this way, it would have been easier to realize a homogeneous scenario for food labels. However, before discussing these new principles introduced with Regulation 1169/2011, it is necessary to explore the old legislation and, in the meantime, compare it with the new one.⁶²

Starting with considering the purpose of each legislative act, it could be argued that it has already been addressed through the previous paragraph. Nevertheless, some other aspects still need to be emphasised. As introduced before, being in line with the international scenario, during the 70s' the European Union was committed to ensuring food quality to consumers. Nonetheless, this purpose was not as central as the necessity of guaranteeing the free circulation of goods among the Community and a fair competition of markets. Differences in food labels could have created barriers to this aim. Therefore, the application of similar principles among European countries aimed at reaching the same objectives could have helped in this sense. Hence, Article 3 of Directive 79/112/EEC introduced the list of compulsory specifics that needed to be shown on labels. Among them, there was also the date of minimum durability to express the expiration date of food quality. Despite the latter being the main concern during those years when it came to date marking, Article 9 also cited a primary introduction to the *possibility* of indicating the date after which food could be considered unsafe. It also specified that the Council was called to decide a common European wording to indicate this other type of expiration date in the six years following the publication of the Directive. In fact, this aspect was more deeply addressed by Directive 89/395 EEC. It presented the same purpose as its predecessor, but in its preamble, it clearly stressed the necessity of making the date marking system stricter in order to better ensure the safety of consumers when highly perishable foodstuffs were at stake. Indeed, Article 3 was amended through this directive by adding the “use by” date to the list of compulsory elements on labels when a product presented the risk of expiring in a very short period because of its

⁶⁰ European Commission, *Proposal for a Regulation of the European Parliament and of the Council on the provision of food information to consumers*, {SEC (2008) 92} {SEC (2008) 93} {SEC (2008) 94} {SEC (2008) 95}, Brussels, 2008.

⁶¹ *Ibidem*.

⁶² Every information on the content of those legal acts that are mentioned in the following comparative analysis is available on the EurLex webpages relating to *Directive 79/112 EEC*, *Directive 89/395 EEC* and *Regulation 1169/2011 EU*.

microbiological composition. As it could have been understood, Regulation 1169/2011 EU differs from the two directives if the purpose of the legislation is taken into account. Indeed, not only the title is different. The entire regulation is based on the necessity of guaranteeing consumer protection through the reduction of administrative questions that could create obstacles to consumers' understanding of the law and, especially, labels. Nonetheless, the simplification of legal acts mentioned before is not only aimed at citizens but also at protecting the internal market as well as the fair competition within it. Another difference is related to the list of the characteristics of food that are compulsory and required on labels because in the case of FIC Regulation they are mentioned in Article 4 (and not 3) and the date of minimum durability is generically called “durability” by including the “use by” and the “best before” dates in the meantime. The exact distinction between the two types of dates is better addressed in the following articles of the regulation. More specifically, each of these legal acts presents an article (Article 1 for Directive 79/112 EEC and Directive 89/395 EEC, and Article 2 for the Regulation) entirely dedicated to definitions. However, the directives' definitions are only two and they do not include the meaning of the “best before” and “use by” dates, whereas the list in the Regulation is longer but it only contains the minimum durability definition, not the “use by” date. This does not mean that the other two acts did not explain the wording for date marking or the FIC Regulation does not explain the “use by” date. They simply put these meanings only in the articles specifically dedicated to date labelling. This aspect emphasises the importance gained by date marking over time and, especially, the increasing necessity of making clear the existence of a “best before” date making it as understandable as possible. Nonetheless, as clearly stated in the Commission proposal of the Regulation, this necessity was still linked to the goal of the Union of raising the level of consumer protection and not decreasing the level of food waste. Thus, it is still too soon to see the food waste at the core of this discussion.

Going ahead with the comparative analysis, it is interesting for the purpose of this thesis, to dwell on the already mentioned Article 9 of the first two legal acts that can be compared to Article 24 of the Regulation. Article 9 of Directive 79/112 explicitly indicates the wording to be used by Member States when the initial quality of food expires – i.e., the “best before” wording – after having explained the meaning of the date of minimum durability. Then, it refers to the possibility that governments may have in choosing a “*use before*” date for highly perishable foodstuff. As anticipated, only through Article 3 of Directive 89/395/EEC did the EEC introduce the “use by” term as a compulsory instrument to be displayed on labels to indicate the date until which a foodstuff can be considered safe to be eaten. Even more detailed on the question is precisely Article 9 of Directive 2 which explicitly lists the exact wording to be used in every language of the Community to display the “use

by” date on labels. Another difference between these two articles is the list of foods not requiring either a “best before” or “use by” date as their quality or their components are not highly perishable.

In Directive 79/112/EEC the list includes:

- Fresh fruit and vegetables
- Wines
- Beverages containing 10% or more by volume of alcohol
- Bakery or pastry products
- Vinegar
- Cooking salt
- Solid sugar
- Confectionery products consisting of flavoured and/or coloured sugars

With Directive 89/395 this list has been expanded and the following products have been included:

- Chewing gums
- Soft drinks, fruit juices, fruit nectars and alcoholic beverages in individual containers of more than five litres, intended for supply to mass caterers
- Individual portion of ice-cream

The additional foods included in the list of Directive 89/395/EEC are another demonstration of the increasing attention of the Community to the topic of food and food properties. But, still, with the aim of protecting consumers and their safety. On the other side, the parallelism with Article 24 of the Regulation is because, as in Directive 89/395/EEC, even in this case it is explained when and why Member States are called to mark labels with a “use by” date. However, this article does not explicitly list the food not requiring a date of minimum durability. Differently, it invites reference to Annex X of the Regulation which is dedicated to this aspect. The Annex presents the same list as Article 9 of Directive 79/112/EEC, and the only additional components taken from Directive 89/395/EEC are “chewing gums and similar chewing products”. Hence, this implies that over time the list has been expanded but then reduced again. One explanation for this is surely related to the always increasing importance of ensuring consumers’ safety. Particularly, FIC Regulation is based on the principle that “Any Union measure in the field of food information law which is likely to have an effect on public health shall be adopted after consultation of the European Food Safety Authority”⁶³, as Article 5 of the regulation states.

⁶³ Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European

Actually, the establishment of the European Food Safety Authority in 2002 is one of the most relevant steps the EU made to protect its consumers. EFSA is the EU agency providing scientific-based advice and technical assistance to the formulation of legislation, guidelines and policies related to the safety of food and feed. It was established by Regulation (EC) 178/2002⁶⁴ whose Chapter III is completely dedicated to the detailed explanation of the role of the Authority within the EU. Specifically, the chapter is divided into six sections that accurately describe EFSA's mission and tasks; its internal organization; its concrete operation in the sphere of food and feed; the independence, transparency, confidentiality, and communication through which the Authority is called to operate and act; its financial provisions; general provisions related to EFSA's staff and its openness to third countries.⁶⁵ Hence, after the establishment of this body, the attention of EU institutions to the topic of food and food safety became even more rigorous. FIC Regulation is one of the most relevant examples in this context demonstrating to what extent the Authority and its mission shaped the development of the European legislation approach to the field of food safety, including date marking. Therefore, it is interesting to underline a specific aspect of the mission of the authority explained in the third paragraph of the first section of Chapter III of Regulation (EC) 178/2002: "The Authority shall contribute to a high level of protection of human life and health, and in this respect take account of animal health and welfare, plant health and the environment, in the context of the operation of the internal market."⁶⁶ It could be argued that this part of EFSA's mission is particularly relevant to the issue of date labelling and food waste. It embodies the purposes of European labelling legislation by considering the importance of protecting human health without neglecting the correct functioning of the internal market. At the same time, it includes the protection of all those spheres negatively affected by food wastage as largely discussed in Chapter I of this work. Nevertheless, it has been already stated that despite FIC Regulation dates back to 2011 (and thus 9 years after the creation of the authority), its indications on date marking seem to be not that far from those listed in the previous directives. Especially, the slight change in the list of food not requiring date labelling was still based only on the necessity of protecting consumers' health. Consultation with EFSA has surely been precious and meaningful if the entire regulation is considered and if only the consumers' safety and security are taken into account in the sector of date labelling. However, with time and the rising emergency

Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004.

⁶⁴ *Regulation (EC) No 178/2002* of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

⁶⁵ *Ibidem*.

⁶⁶ *Ibidem*.

relating to food waste, it became clear that the issue was not yet fully resolved. It will be addressed in the following sections of this thesis how the FIC Regulation is thought to be amended in this sense and which is the role played by EFSA in this specific context by considering that its mission includes environmental protection.

Finally, the significance of clarity and transparency is the last aspect to be explored in this historical excursus of date labelling legislation. In particular, Article 14 of Directive 79/112/EEC remains the same even with the amendment of Directive 89/395/EEC. It specifies the fundamental role played by the language used to indicate food information on labels. Additionally, it is also highlighted that Member States are allowed, if necessary, to select more than one language when it comes to marking compulsory particulars. These same principles have been included in the FIC Regulation as well. In the latter, there are even two articles (7 and 15) aimed at stressing how crucial the selection of an easily understandable language is to avoid ambiguity among consumers and ensure them the maximum ability to choose a product as safely and consciously as possible. Nonetheless, the current problematic interconnection between date labelling and food waste is partly caused by the difficulties consumers meet in correctly distinguishing the difference between “use by” and “best before” dates. The following sections of this chapter will deeply explain why, although transparency is ensured by the EU law, consumers tend to misunderstand date labels causing food waste. Speaking of clarity, to conclude the comparative analysis of the legislation on foodstuff with a clear view in this regard, a simple summary table will be constructed.

Table 3

Summary table on the comparative analysis of date marking legislation in the EU

	Title and purpose	Compulsory particulars (considering date marking)	Article on Definitions	Foods not requiring date marking	Clarity and transparency
<i>Directive 79/112 EEC</i>	Issuing rules to mark foodstuff labels to create a homogeneous scenario and protect the internal market with a concern for food quality	“Best before” date (a <i>use before</i> date is optional)	Not including the date of minimum durability	8 products are listed	Importance of using clear wording and language to avoid ambiguity
<i>Directive 89/395 EEC</i>	The same as Directive 79/112/EEC but with greater attention to food safety	“Best before” and “use by” date	The same as Directive 79/112/EEC	11 products are listed	The same as Directive 79/112/EEC
<i>Regulation 1169/2011 EU</i>	Focus on the internal market and consumers’ protection by simplifying the law concentrating on food safety	“Best before” and “use by” date	Date of minimum durability but not “use by” date	9 products are listed	The same as Directive 79/112/EEC and Directive 89/395/EEC but with an even greater focus on the topic

Table 3 represents the development over time of date labelling legislation. It is clear that the protection of the internal market has always been considered a crucial aspect within the Union which is why it has been decided to align Member States' rules on date labelling and eventually make them simpler and more homogenous. However, protecting consumers has also been part of this framework: at the beginning only by ensuring them the quality of food through the introduction of a "best before" date, but then it was clear that their health and safety needed greater safeguards and a "use by" date was set as well. The other element demonstrating the increasing relevance of food safety is the reduction of the list of products not requiring a date marking. Having a long list of foodstuffs in this category could represent a risk to consumers' health especially if new products, which have always been marked with at least a "best before" date, were to be included. Finally, the element that did not show any particular changes over time is the stress on the role of Member States in communicating food properties to consumers with clear and transparent language. Therefore, it is possible to conclude that throughout this time of changes and developments in European date labelling legislation, no reference has ever been made to the possible link between food waste and labelling considering also that FIC Regulation results to be the most recent legal act regulating date marking. This does not mean that a (negative) connection between these two topics does not exist. It has simply arisen later in the context of the EU law.

2.2 The risks of date labelling

Having explored the different steps that led to the current legislation regulating date marking in the EU, it is now the moment to understand why it generates food waste. According to the 2018 final report of the European Commission on date marking, 10% of yearly food waste in the EU is due to date labelling, corresponding to 88million tonnes of waste.⁶⁷ First of all, it is necessary to recognize which are the main shortcomings characterizing date marking legislation. They are the key to identifying the reasons why food business operators and consumers produce food waste related to date labelling since they act following the law. Hence, it can be argued that at the root of the problem, there are the weaknesses of the FIC Regulation that negatively influence FBOs' behaviours. This mechanism also affects the wrong consumers' approach to date labels which eventually produces food waste.

Figure 2

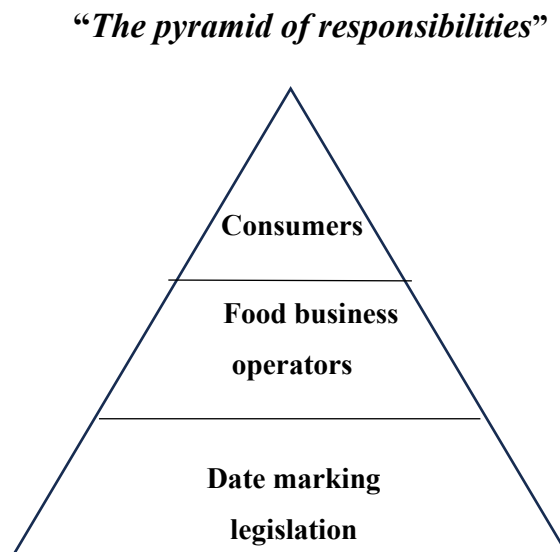


Figure 2 is a way to schematically show who are the three protagonists responsible for food waste in the context of date labelling. According to this pyramid, consumers' blame is a consequence of date

⁶⁷ European Commission, Directorate-General for Health and Food Safety, “*Market study on date marking and other information provided on food labels and food waste prevention. Final Report*”, 2018.

marking legislation, but it also depends on food business operators' actions. FAO defines FBOs as “The person/company who undertakes, whether for profit or not, any activities related to any stage of the food chain”⁶⁸ and they are producers, processors, wholesalers, distributors, importers, exporters, retailers, transporters, and food service operators. Both consumers and FBOs operate following the law that, of course, is at the base of the figure because everything starts from it.

“*The Pyramid of Responsibilities*” is also inspired by a specific and accurate study undertaken in 2014 by the FUSIONS group project introduced in Chapter I. It recognized 271 drivers somehow related to food waste and divided them into three categories: the current causes of food waste generation; the threats for the future generation of food waste; and the future opportunities for the reduction of the wastage. Each has been then divided into four other sub-categories indicated as technological, (institutional) business management and economic, (institutional) legislative, and social drivers.⁶⁹ In every category and the two institutional sub-categories, date labelling is recognized as a driver related to food waste. This is due to different elements identified by the study characterizing date labelling legislation. As repeatedly mentioned before, in the EU there is not a specific regulation or directive completely dedicated to the negative relation between date marking and food waste. The main aspect that a possible legal act on this issue may tackle is how food business operators should treat foodstuff once the “best before” date expires. Additionally, it should put more emphasis on the differentiation between “use by” and “best before” dates to avoid confusion among consumers. FUSION (2014) as well as Eriksson, Giovannini and Ghosh (2020) recognize that these are the two major shortcomings characterizing the current date labelling legislation from which food waste originates.⁷⁰ To understand more specifically how this phenomenon occurs, the behaviour of FBOs first and then consumers will be analysed in detail.

2.2.1 Food business operators' side

First of all, there are no binding rules to be followed by FBOs when products pass their date of minimum durability. As underlined by Eriksson et al. (2020), despite the EU law allowing the sale of products beyond the “best before” date, there is no common management of these foodstuffs. FBOs,

⁶⁸ See FAO website:

[https://www.fao.org/faoterm/viewentry/en/?entryId=173194#:~:text=Food%20business%20operators%20\(FBOs\)%20have,of%20food%20under%20their%20control](https://www.fao.org/faoterm/viewentry/en/?entryId=173194#:~:text=Food%20business%20operators%20(FBOs)%20have,of%20food%20under%20their%20control)

⁶⁹ FUSION, Canali M., Östergren K., Amani P., Aramyan L., Sijtsema S., Korhonen O., Silvennoinen K., Moates G., Waldron K., O'Connor C., *Drivers of current food waste generation, threats of future increase and opportunities for reduction*, Bologna, 2014.

⁷⁰ Ibidem and Eriksson M., Giovannini S., and Ghosh R. K., *Is there a need for greater integration and shift in policy to tackle food waste? Insights from a review of European Union legislations*. SN Applied Science, 2020.

non-profit organizations and food banks are often sceptical about donating such food to safeguard public health and, hence, their reputation. This creates different scenarios around the EU because it depends not only on the local authorities' guidelines but also on the single retailer or food bank that may decide to neither sell the product nor donate it, especially when there is no national legislation regulating food management after the expiration of the “best before” date. Indeed, the main problem – also underlined by FUSION (2014) – is the existing doubt related to the actual safety of products after the date of minimum durability. On the one hand, manufacturers and producers are those actors selecting the type of date labels to be displayed on a foodstuff. On the other hand, retailers need to trust the selected date to decide whether or not to keep selling or donate the product after the expiration of the “best before”. Generally, the most common attitude is to throw away products instead of keeping them on the market or donating them.⁷¹ Retailers want to avoid the risk of losing their reputation by ensuring as much as possible security and safety to consumers. The already-introduced EU guidelines on food donation (2017) address this issue by indicating how the EU law regulates it. It states that FIC Regulation allows the sale of foodstuff beyond its “best before” date, but not beyond its “use by” date as it is considered unsafe.⁷² Actually, the Regulation simply defines and differentiates the two types of date marking without explicitly expressing the possibility of selling products after their minimum durability date. Literally, it refers to the “best before” date as “the date until which the food retains its specific properties when properly stored”⁷³ and as mandatory information on food labels. This implies that Member States are not forced to follow binding procedures when the “best before” date has passed to avoid the generation of food waste. On the contrary, food operators have a huge responsibility – and also freedom – when it comes to dealing with the date of minimum durability. Indeed, not only their role is crucial after the expiration of the “best before” date, but also when the latter is selected to be displayed on labels. In particular, as introduced before, it is in their hands – especially of manufacturers and producers – to assess whether to choose a “best before” or “use by” date for food labels. As accurately explained by Milne (2013) and Eriksson et al. (2020), FBOs must have specific knowledge and expertise to assess food and food components in order to select the most appropriate date label for them. Products considered highly perishable by the scientific opinion of food authorities are surely marked with a “use by” date, following the norms dictated by the FIC Regulation. Nonetheless, sometimes even products whose microbiological components are not considered highly perishable may present a “use by” date on

⁷¹ Ibidem.

⁷² European Commission, Information from European Union Institutions, Bodies, Offices and Agencies, EU Guidelines on Food Donation, Official Journal of the European Union, 2017.

⁷³ *Regulation (EU) No 1169/2011* of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, Article 2.

their labels. The 2018 final report of the EC specifically highlights that “identical products manufactured by international brands displayed a ‘use by’ date in one Member State and a ‘best before’ date in another, and no significant difference was found between the average remaining life values for ‘use by’ and ‘best before’ labelled products of the same type”.⁷⁴ The reasons for these different choices are mainly due to the bad or good food management during the manufacture, production, transportation, and stock of groceries. Among the causes of food wastage described in Chapter I, it has been discussed that many times the bad management of food before reaching the retail level may cause food loss. Thus, it can also be the case that food badly transported and/or stored may not only lose its quality but also its microbiological components may deteriorate. Therefore, as also emphasized by the European Court of Auditors (2016), to avoid any risk to consumers’ safety by being as careful as possible, FBOs may decide to reduce the date of durability or even put a “use by” date on products that originally could have been simply marked with a “best before” date. This decision inevitably affects consumers' behaviours which will be better explored in the following subsection.

2.2.2 Consumers’ side

If on the one hand FBOs’ responsibility is crucial in the context of food waste and date marking, on the other hand, consumers play a fundamental role as well. In particular, two main factors affect consumers’ behaviour in the approach they have to date marking that leads to food waste: aesthetic standards and ambiguity of labels.

The first factor is strictly linked to the always higher expectations people have in finding freshness and perfect quality in products they buy in supermarkets. Nowadays, the aesthetic standards required by consumers when they buy foodstuff seem to be very high, sometimes even too much as also stressed by Aschemann-Witzel et al. (2015). This implies that when a “best before” date expires if the quality has lost its initial characteristics, the product is automatically discarded. On the other side, it may happen that even if the date of minimum durability has not expired the consumer may decide to not buy a product or to throw it away without smelling or testing it at first only because it presents some physical flaws. As explained in Chapter I, wastage may occur during the first stages of the food supply chain because producers or manufacturers know that, for example, a bruised or too-small apple is not attractive to consumers and retailers would not intend to sell it. This is due to the confusion

⁷⁴ European Commission, Directorate-General for Health and Food Safety, “*Market study on date marking and other information provided on food labels and food waste prevention. Final Report*”, 2018.

about food quality and food safety. Consumers' anxiety about the safety of food leads them to be too cautious. The increased perceived safety-risks level deviates from the real food safety risks by leading to the wastage of food and by creating another trade-off between food safety and food waste.⁷⁵ Therefore, to summarize, there are these two different directions chosen by too prudent consumers: wasting food whose date of minimum durability has expired because the product has lost its initial quality; wasting food whose "best before" date has not expired because the product does not present the expected aesthetic standards. In both cases, the result is wastage due to quality and not safety reasons. That is why in the previous paragraph it has been argued that the higher the prudence of retailers, the higher the wastage of food deriving from consumers. To better understand why this phenomenon verifies, it is necessary to explore the second factor influencing consumer food waste.

Many times, there is not widespread knowledge of the existing difference between "use by" and "best before" dates. It happens that consumers read the two different wordings as if they had the same meaning. If other languages apart from English are considered, this mistake may seem more reasonable. The European Parliamentary Research Service (2015) underlined that ambiguity increases, for example, for French consumers since the French term referring to "best before" ("*À consommer de préférence avant le*") is very similar to the one indicating the "use by" ("*À consommer jusqu'au*") date. After reviewing EU legal acts⁷⁶ specifying the wording for "use by" and "best before" in all languages of Member States, it appears that Italian and Portuguese are two additional languages that could potentially exacerbate consumer confusion.

⁷⁵ Aschemann-Witzel J., De Hooge I., Amani P., Bech-Larsen T., Oostindjer M., *Consumer-related Food Waste: Causes and Potential for Action*, Sustainability, 2015.

⁷⁶ Directive 2000/13/EC of the European Parliament and of the Council of 20 March 2000 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs. No longer in force, Date of end of validity: 12/12/2014; Implicitly repealed by 32011R1169 and Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers.

Table 4**Date labelling in Italian, French and Portuguese**⁷⁷

	Best before	Use by
Italian	Da consumare preferibilmente entro	Da consumare entro
French	À consommer de préférence avant le	À consommer jusqu'au
Portuguese	Consumir de preferênciã antes de	A consumir até

Actually, these three examples listed in Table 4 show the similarities characterizing the wording to indicate two completely different concepts in Italian, French, and Portuguese. This could explain why consumers may be confused by labels by interpreting the “best before” and the “use by” in the same way. Thus, it could be thought that this misunderstanding is due to the different ways of interpreting the terms in different languages among Member States. Nonetheless, this is not the only reason. The Flash Eurobarometer 425 survey undertaken in 2015 demonstrates that this lack of knowledge is not confined to Italy, France, and Portugal. On the contrary, according to the survey, the “best before” and the “use by” dates are properly understood respectively only by 47% and 40% of 26,601 European respondents from all Member States.⁷⁸ Of course, there are socio-demographic differences as well as country-level differences characterising these percentages. Younger people and more educated people tend to have more awareness about the distinction between the two date labels. Furthermore, it is interesting to know that Greece, Romania, and Sweden are the countries where the incorrect association of meaning to the two terms is most widespread.⁷⁹ Generally speaking, the main mistakes are related to the interpretation of “use by” as it was “best before” and vice versa, and to the conception of the date mark as information to be considered only when dealing with specific food categories. Therefore, it is evident that there is a large variety of elements influencing the correct or incorrect understanding of labels. The fact that the percentage of citizens with little knowledge about labelling is significantly high is alarming. Indeed, the consequence of these misunderstandings is food

⁷⁷ Information taken from *Directive 2000/13* and *Regulation 1169/2011*.

⁷⁸ European Commission, Directorate-General for Health and Food Safety, Directorate-General for Communication. Survey carried out by TNS political & social network, Flash Eurobarometer 425, *Food Waste and Date Marking*, 2015.

⁷⁹ Ibidem.

waste. People who consider a “best before” date as a “use by” date are inclined to throw away food when its date expires regardless of the typology of the date displayed on the product. This is also the answer to the question related to retailers’ prudence. Indeed, FBOs who decide to select shorter “best before” dates for foodstuff or “use by” instead of a date of minimum durability, fuel the mechanism. Firstly, if the “best before” date is read by consumers as “use by” and FBOs shorten this date, the possibility of waste inevitably increases. Secondly, if a “best before” date would have been enough but is replaced by a “use by”, the product would be wasted after the expiration date even by those consumers who generally read and correctly understand labels.

Furthermore, there is another characteristic of labelling that may create confusion and ambiguity among consumers. Specifically, the “use by” and the “best before” dates are not the only dates displayed on foodstuffs. Many times, other indications only addressed to FBOs are present as well. For example, the “sell by” and the “display until” are two of the extra information that do not concern consumers at all. Nevertheless, the presence of different wording or figures indicating different types of dates may contribute to the misunderstanding of date marking. This generates even more confusion among the community of consumers making them not only misinterpreting the information they should understand but also creating confusion about which information they should read. Actually, these additional date marking is not regulated under the EU legislation, and it is solely used to help retailers and FBOs in general to manage and stock their products.⁸⁰ However, considering the significant problem in the legislative sphere of date labelling, EU law should probably start thinking about how to regulate these extra date labels to prevent uncertainty among consumers from increasing.

⁸⁰ European Food Information Council, 2021. See <https://www.eufic.org/en/food-safety/article/best-before-use-by-and-sell-by-dates-explained>

2.3 Trade-off between food safety and food waste

Having understood to what extent FBOs and consumers generate food waste because of date labelling legislation, it is important to consider why there are no EU legal acts directly addressing this issue. The main answer is given by the existing trade-off between food safety and food waste. The European Consumers Organisation – BEUC – (2015) argues that after the expiration of the “best before” date not only does the quality of food decrease. BEUC acknowledges its concern about the possibility of migration of hazardous components in food that would also endanger food safety. Actually, it could be the case. Nevertheless, Regulation (EU) 1169/2011 clearly declares that if properly managed and stored, foodstuff beyond the “best before” date is still completely safe to eat.⁸¹ That is why the role of FBOs is crucial and that is why sometimes they tend to be too cautious by shortening dates or using a “best before” instead of a “use by” date. They may prefer to avoid this liability and protect their reputation. Hence, even in this case, a trade-off between food safety and food waste emerges by creating heterogeneity among the community of food business operators and food services. Furthermore, this lack of uniformity is enforced by Article 39 of the FIC Regulation. It includes the possibility that Member States have to “adopt measures requiring additional mandatory particulars for specific types or categories of foods.”⁸² To better understand why this article can fuel the already unstructured situation, the case of *Austria v Susanne Müller*⁸³ can be taken as an example. In fact, it has been a consequence of this freedom left to Member States. Even if the case law dates back to 2001, indications relating to the date of minimum durability and the sovereignty given to EU countries of the Regulation were already present respectively in Article 9 and Article 18 of the above-mentioned Directive 2000/13 EC. The article in question (39 for the Regulation and 18 for the Directive) refers to “mandatory particulars” and thus, it also refers to date marking being the latter compulsory information to be displayed on labels. Hence, it implies that governments and local authorities may decide to regulate the marketing (or non-marketing) of products after the “best before” date in a stricter way.

Ms Müller was the representative of Spar Österreichische Warenhandels AG, an international chain of supermarkets. The Austrian government forced her to pay a fine as she was accused of selling a

⁸¹ Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, Article 2.

⁸² Ivi Article 39.

⁸³ C-229/01, *Unabhängiger Verwaltungssenat im Land Niederösterreich (Austria) v Susanne Müller*, ECLI:EU:C:2003:153

product (the Zwettler Kuenringer Festbock beer) without explicitly signalling on the label that its “best before” date had passed. EU law expects the “use by” or the “best before” date to be always marked on labels of foodstuff requiring them, but it is not mandatory to indicate when the “best before” date expires with an additional wording or figure. Differently, Austrian law requires a specific and separate indication for the expiration of the minimum durability of a product; the indication of the “best before” date is not enough. If this obligation is not met, an administrative fine may apply. Ms Müller contended the absence of this obligation under the EU legislation in front of the national court. In June 2001 the case was referred to the Court of Justice of the European Union as the correct interpretation of Directive 79/112/EEC and Directive 2000/13/EC was needed.

The two directives aimed to harmonise national laws in the EU to avoid obstructing the circulation of products within the European territory. The national court found the additional specification imposed by the Austrian law a restriction on the free movement of goods as it requires an additional operation that increases distribution costs. In his Opinion, Advocate General Tizzano specified that the national provision does not necessarily require an additional label to indicate the expiration of the “best before” date.⁸⁴ Any other means could have been used. What the law wants to ensure is transparency to consumers and the protection of their safety. Indeed, the question to the CJEU was inherent to the possibility for the Member States to implement additional national rules to prevent fraud and protect public health according to paragraph 2 of Article 18 of Directive 2000/13. The Article specifies that non-harmonised national rules cannot create obstacles to the trade of foodstuff. Such rules would be accepted only if set to protect health, prevent fraud, or protect industrial and commercial property rights and prevent unfair competition. Hence, the Court of Justice was asked to verify whether the additional Austrian rules could be justified under the second paragraph of the above-mentioned Article. Specifically, it was necessary to ascertain whether the national law at stake was in line with the principle of proportionality of the EU law. The Austrian provision was considered by the Court as a means to guarantee the consumers every information on the characteristics of the quality of a foodstuff. Therefore, the Court held that the Austrian rule complies with the principle of proportionality insofar as it covers a “non-harmonised national provision justified on the ground of the prevention of fraud”.⁸⁵ Having recognized the alignment with one of the exceptions listed by Article 18 it was not necessary to analyse whether the rule could have been a way to protect public health as well.

⁸⁴ Opinion of Advocate General Tizzano, *Case C-229/01 Susanne Müller*, delivered on 10 October 2002

⁸⁵ C-229/01, *Unabhängiger Verwaltungssenat im Land Niederösterreich (Austria) v Susanne Müller*, ECLI:EU:C:2003:153.

A reflection that may emerge from this case law is related to the flexibility characterising the EU legislation. As already argued, the freedom left to the national law through Article 18 of Directive 2000/13 is still present in FIC Regulation. The question of *Austria v Susanne Müller* was related to the balance between the free movement of goods and the protection of consumers. As stressed, during those years the generation of food waste was not yet considered an emergency to be dealt with. Today, the possible additional non-harmonised national provisions could represent an additional obstacle to the fight against food waste. The trade-off becomes wider. The interesting peculiarity of the legislation on food labels is that it develops on the two levels – the supranational and the national one – in different ways. The EU level wants to reach a homogeneous scenario by imposing defined norms to create harmonisation among Member States. Nonetheless, the national law is allowed to act more strictly on the most crucial principles of the EU law on food labels (i.e. compulsory particulars on labels) under specific cases that are also at the base of the legislation (e.g., protection of consumers). Stricter laws on food labels could incentivise FBOs to throw away foodstuffs instead of keeping them on the market because of the implied extra costs and resources necessary to comply with tougher rules. Moreover, it may disincentivise consumers to buy the products because they could be even more confused and scared by warning labels highlighting, for example, not only the “use by” and “best before” date, but also the expiration of the “best before” date itself as in the specific case of the Austrian law.

This case law also highlighted another crucial aspect. On the one hand, the Court declared that a food product with an expired date of minimum durability can still legitimately be marketed. On the other hand, the CJEU clarified that Member States are competent to make such decisions.⁸⁶ This implies that there can be countries where products past the “best before” date are automatically discarded. This is the case for Romania as reported by the EU Court of Auditors (2016). According to the Government Ordinance OG No. 21/1992 on Consumer Protection (updated in 2008), “products may be sold only if they are within their ‘use by date’/ ‘date of minimum durability’.”⁸⁷ Hence, in this case, the two terms are even used as if they had the same meaning. The opposite scenario is represented by the Italian *Legge Gadda*⁸⁸ which encourages the spread of donation practices after the “best before” date. This case study will be analysed more in detail in the next chapter.

⁸⁶ Ibidem.

⁸⁷ European Court of Auditors, Special Report, *Combating Food Waste: an opportunity for the EU to improve the resource-efficiency of the food supply chain*, 2016.

⁸⁸ *Legge 19 Agosto 2016, n. 166*, Disposizioni concernenti la donazione e la distribuzione di prodotti alimentari e farmaceutici a fini di solidarietà sociale e per la limitazione degli sprechi.

In particular, Chapter III will aim to explore how the different institutions and Member States decided to act to solve the problem of food waste related to date marking at both the supranational and national levels. By taking into account the primacy of food safety, the EU institutions started to intervene in order to fight food waste due to date labelling legislation. The legal measures undertaken by the Italian government to manage foodstuff beyond the “best before” date will be part of the analysis. This will help to gain a deeper insight into possible legal changes, innovations, or reforms even at the EU scale.

Chapter III

The EU strategies to reform date labelling legislation and the Italian best-practice

The generation of food waste caused by the shortcomings characterizing date labelling legislation has proved to be one of the most recent challenges for the EU. Thus, the Union started to include in its plans the fight against food waste by focusing on the last phases of the food supply chain and, in particular, on the topic of date marking legislation. This chapter aims to address the possible solutions proposed and/or elaborated at the EU and national level with specific attention to the Italian law on food waste, namely the so-called *Legge Gadda*⁸⁹ (*Gadda Law*).

It has been discussed that one of the peculiarities of this phenomenon is the variety of policy areas it embodies. Specifically, the FIC Regulation aims to guarantee the free movement of goods, fair competition within markets, and consumer protection – including food safety and quality. Recognizing the necessity of reforming the current regulation on date marking to fight food waste implies the ability to ensure both the protection of the principles on which the regulation is built and the reduction of food waste. Moreover, food donation is another policy area deserving attention when it comes to dealing with the fight against food waste. Indeed, it has been described that according to the EU hierarchy of waste management food donation is the second most favourable option to avoid wastage. Additionally, according to the EU law, FBOs are allowed to donate food after the expiration of the minimum durability date. Nonetheless, they tend to prefer to discard this type of foodstuff rather than donate it to avoid safety risks for consumers and to protect their reputation. Italy decided to adopt the *Legge Gadda* to fight food waste based on the spread of donation practices. The country is the first EU Member State to have elaborated national legislation against food waste. In particular, its relevance is noteworthy in this context since it encompasses the donation of unsold food items, extending to products that have exceeded their "best before" date. The law wants to incentivize FBOs and non-profit organizations to donate instead of obliging them. In light of the high levels of food waste in both the EU and Italy, scholars such as Lucchini (2016), Trapè (2017), Buseti (2019), Franco and Cicatiello (2021), as well as the Research Centre DIVULGA (2023) recognize the Italian law as

⁸⁹ *Legge 19 Agosto 2016, n. 166*, Disposizioni concernenti la donazione e la distribuzione di prodotti alimentari e farmaceutici a fini di solidarietà sociale e per la limitazione degli sprechi.

a best practice to be followed by other Member States and by the Commission itself to develop its legislative proposal to reform the FIC Regulation. Indeed, the CEAP and the Farm to Fork Strategy set specific guidelines for the EC which is expected to formulate a legislative proposal amending the FIC Regulation to improve the use and understanding of date marking and, subsequently, reduce food waste.

This chapter will provide a detailed analysis of the action undertaken at the EU and Italian levels as follows. The first section will be dedicated to the description of the EU packages of policy measures recently implemented and aimed at reducing food waste by acting on the improvement and/or reform of the FIC Regulation. Particularly, the 2015 CEAP and its evolution in 2020 will be first described in sub-section 3.1.1. The following two sub-sections will be respectively aimed at analysing the EU Green Deal with the Farm to Fork Strategy and the 2016 FUSIONS' recommendations. The second section of the chapter will discuss the strategies proposed to improve legislation on date labelling by both the Parliamentary Research Service and the Member States. Then, the pivotal role of the European Commission will be highlighted in the third section of the chapter. Sub-section 3.3.1 and 3.3.2 will describe respectively the adopted measures targeting consumers and FBOs. In this way, it will be emphasized that the EC is proceeding differently in the two stages of the food supply chain to reach a legislative proposal to amend the FIC Regulation. In both cases, the main difficulties are identified in the necessity of balancing the protection of public health and the reduction of food waste. Hence, the consultation with expert working groups and EFSA will be part of the analysis as it is crucial for the Commission to receive technical and scientific advice. In addition to this, section 3.4 will highlight the role of the Italian case. It will demonstrate the possibility of acting on the FBOs' side even with the current legislation in force. Indeed, it is proof of how food waste can be reduced by encouraging donation practices without neglecting public health protection.

3.1 European Union measures to improve date labelling legislation

In the context of food waste caused by date labelling legislation, consumers play a fundamental role due to their misinterpretation of labels. In fact, scholarship underlines the importance of activating policies to improve the education and information of citizens in order to avoid ambiguity and misunderstanding of terms and wording on labels. WRAP (2008), Stuart (2009), and Berryman (2010), for example, propose several solutions to the existing confusion among consumers. All of them identify re-education and the spread of awareness as the key to solving the problem of ambiguity in reading dates on labels.⁹⁰ Aschemann-Witzel, Bech-Larsen, de Hooge, and Oostindjer (2015) also mention how experts identify as a precious solution the repeated delivery of precise information to consumers by appropriately educating them.⁹¹ Even Directive (EU) 2018/851 introduced in the 32nd paragraph of its preamble the fundamental role the Member States have in improving consumers' awareness of date labels to avoid food waste.⁹² Despite the relevant position occupied by education policies, it cannot be forgotten that consumers' misunderstanding may not only be due to a lack of information. On the one hand, the presence of additional date marking addressed to FBOs contributes to the confusion of consumers. On the other hand, FBOs' attitudes and behaviours are very relevant as well: they either directly cause wastage by not selling or donating edible food, or indirectly generate food waste by shortening dates on labels or choosing a "best before" instead of a "use by" date. It has been stressed that the latter fosters the attitude of consumers to discard food. Therefore, education policies are not enough. It is necessary to improve the legislation regulating labels to consequently improve both FBOs and consumers' behaviours. In this way, all three levels of the "Pyramid of Responsibility" – date marking legislation, FBOs' and consumers' use and understanding of date marking – can be reached to solve the entire situation eventually. The first 2015 Circular Economy Action Plan presents among its priority areas the action on date marking to tackle food waste. The 2020 Plan then introduced the Green Deal and the Farm to Fork Strategy that outlines the Commission's role in formulating a proposal to reform the FIC Regulation with specific mention of date labelling questions. Finally, the 2016 FUSIONS guidelines will be reported as they contain relevant recommendations on the improvement of the use and understanding of dates on labels.

⁹⁰ Milne R., *Arbiters of waste: Date Labels, the Consumer and Knowing Good, Safe Food*, Sociological Review, 2012.

⁹¹ Aschemann-Witzel J., Bech-Larsen T., de Hooge I., and Oostindjer M., *Consumer-Related Food Waste: Causes and Potential for Action*, Sustainability, 2015.

⁹² *Directive (EU) 2018/851* of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste

3.1.1 The Circular Economy Action Plan (CEAP)

The Circular Economy Action Plan adopted by the Juncker Commission in 2015 is the first step deserving attention in this context. Indeed, it not only included food waste in its “priority areas”, but also declared date marking as a specific sub-area requiring a targeted intervention. Specifically, the misinterpretation of dates on labels – especially of the “best before” date – started to be officially identified as a cause of food waste that had to be fought.⁹³ Hence, the European Commission was expected to act on two fronts: promoting and facilitating food donation activities through a revision of food waste legislation as well as improving the use and understanding of date marking by the food supply chain actors. According to the Annex of the CEAP, these two measures should have been taken in 2016 and 2017 respectively.⁹⁴ In 2018, the first update on the Action Plan was published. The possibility of reforming the EU legislation was still on the agenda but no concrete goals had yet been reached. Nevertheless, two supporting groups were formed. The first one represented by the *European Union Platform on Food Loss and Waste* was created immediately after the establishment of the CEAP, in 2016. The Platform was thought to tackle the general problem of food waste affecting the Union through the participation of experts from member countries, supranational institutions, international organisations, and stakeholders. They were called upon to perform three main tasks: exchanging exemplary practices; assisting all participants in formulating measures to curb food waste; and assessing advancements achieved over the years.⁹⁵ In this way, the specific question of date labelling was not receiving the focused attention required by the initial plan of the Circular Economy. Therefore, the second group was created in 2018 and its mandate was extended for another four years in 2022. In particular, the European Commission decided to set a specific sub-group on date marking as it was necessary to proceed following technical guidance. The sub-group was asked to examine and propose new legislative and non-legislative alternatives aimed at enhancing the understanding and the use of date labelling.⁹⁶ When these topics are dealt with, it is essential to always consider the relevance of consumer safety as well. In addition to the importance consumer protection

⁹³ Cristóbal J., Castellani V., Manfredi S., Sala S., *Prioritizing and optimizing sustainable measures for food waste prevention and management*, Elsevier, 2017.

⁹⁴ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Closing the loop - An EU action plan for the Circular Economy*, Brussels, 2015.

⁹⁵ See the European Commission website on *EU Platform on Food Losses and Food Waste*, available at: https://food.ec.europa.eu/safety/food-waste/eu-actions-against-food-waste/eu-platform-food-losses-and-food-waste_en and European Commission (2018), Nikolakopoulou A., *Update on Circular Economy Action Plan and Work of EU Platform on Food Losses and Food Waste*, Vilnius, 2018.

⁹⁶ European Commission, Directorate-General for Health and Food Safety, *Food and feed safety, innovation. Food information and composition, food waste*, 2018.

has for the EU law, a significant and concrete example is the case of *Austria v Susanne Müller*⁹⁷ described in the previous Chapter. The study of the case law has shown that when public health and ensuring consumer information are at stake, they generally prevail over other principles. Thus, the Commission needs to act as carefully as possible when deciding to propose a legislative reform for a regulation such as the FIC Regulation. Indeed, the key role the sub-group was called to hold in its second mandate of 2022-2026 included the sharing of evidence-based best practices coming from Member States' internal initiatives. In this way, it would have helped the EC in the implementation of relevant European legislation and the elaboration of legislative proposals.⁹⁸

Always in the context of the Circular Economy, a second step was made in 2020. In that year, another Action Plan – following the first one – was established. It was included in the further huge European project, the *Green Deal*. The latter will be better addressed in the following sub-section. In the meantime, exploring how the second CEAP was built is important. Its main goal is based on the optimization of the regulatory structure for long-term sustainability, ensuring it aligns with the demands of the future. It is geared at creating a “cleaner and more competitive Europe”, as stated in its title and introduction. Among the fields to be improved more sustainably are also the food and waste sectors (Chapters 3 and 4 of the Plan) with specific reference to the necessity of reviewing EU legislation on packaging.⁹⁹ Differently from the first CEAP, there is no section indicating the crucial role of date marking and the need to change how it is regulated by the law. Even its Annex does not present a timetable to be respected when it comes to finding alternatives to improve the use and understanding of date marking.

3.1.2 The European Green Deal and the Farm to Fork Strategy

While the second CEAP does not mention the question of date marking, it does refer to the package of measures – the European Green Deal – introduced in 2019 and to one of its policies, the *Farm to Fork Strategy*. The EU Green Deal is a kind of macro instrument aimed at accelerating the green

⁹⁷ C-229/01, *Unabhängiger Verwaltungssenat im Land Niederösterreich (Austria) v Susanne Müller*, ECLI:EU:C:2003:153.

⁹⁸ European Commission, Directorate-General for Health and Food Safety, *Food Sustainability, International Relations. Farm to Fork Strategy*, 2022.

⁹⁹ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. *A new Circular Economy Action Plan for a cleaner and more competitive Europe*, 2020.

transition of the European Union. In particular, it is based on three goals, as declared by the EU Commission on its website:¹⁰⁰

- *No net emissions of greenhouse gases by 2050*
- *Economic growth decoupled from resource use*
- *No person and no place left behind*

This big package is aimed at tackling those policy areas involved in the green transition through several sub-measures, each covering a different policy field. As mentioned, the Farm-to-Fork is the micro strategy, included in the Green Deal, addressing the question of food waste. Its general goal of ensuring a fairer and more sustainable food system through the whole food supply chain includes the halving of per-capita food waste by 2030, following the 12.3 SDG. In order to achieve the ambitious target on time, it integrates the reduction of wastage in other policy areas, including date marking.

It is at this point that the Circular Economy plan on date labelling emerges again. Indeed, according to the Strategy, the European Commission is still committed to reducing food waste by also revising the norms of the law regulating date marking. Hence, the initiative started in 2015 has not been abandoned by the second CEAP in 2020. On the contrary, it has been embedded in an even bigger project. It has been claimed that the first CEAP timetable envisaged a change in the date marking system to improve its use and understanding. Other than the formation of the date marking sub-group, no concrete action was taken then. Nevertheless, it could be argued that the implementation of a package of measures such as the Green Deal and, especially, the Farm to Fork Strategy, is an important step in response to the Circular Economy initiatives. Indeed, in this case, the EC has an even more concrete task: it is called upon to reform the EU rules on date marking. More specifically, the Farm to Fork Annex is characterized by another timetable. According to the latter, the Commission was supposed to present its legislative proposal in the fourth quarter of 2022. Unfortunately, no proposal was published by then. To better understand this apparent delay, it is necessary to explore how the EC has decided to act from 2015 – when the need for a change of the system regulating “best before” and “use by” was first made officially clear with the first CEAP – to the present day.

¹⁰⁰ See the European Commission website, *The European Green Deal Striving to be the first climate-neutral continent*. Available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

3.1.3 FUSIONS' guidelines

In 2016, the FUSIONS project group elaborated a specific work based on “*Recommendations and guidelines for a common European food waste policy framework*”. In particular, recommendations have been divided into six groups. For the purpose of this thesis, two of the six groups of guidelines are relevant and deserve specific attention.

Group 4 provided recommendations on how the Union and Member States should improve the donation system. In this context, it is not possible to address the wide sphere of regulating food donation as it is not the central topic. Nonetheless, it has been argued that one of the shortcomings characterizing the FIC Regulation also concerns the donation of food. Particularly, the issue at stake is the donation of products after the expiration of the “best before” date. The latter is completely allowed by the Union law. Conversely, not every Member State supports this practice. Donating is not a costless procedure. Firstly, FBOs need to have specific space to store food intended for donation. Secondly, they are also called upon to employ a staff dedicated to the management of this food. Moreover, food operators are required to establish a formal agreement with a selected non-profit organization and then coordinate and execute food collections.¹⁰¹ In addition to this process, some Member States create not only economic constraints to donations through, for example, the payment of VAT for donors but also legal constraints. National legislation tends to expose donors to greater or lesser liabilities. As a result, they are inclined not to donate and avoid reputational risks as well as safety risks for those who receive the donation. Therefore, recommendation 4.4 of FUSIONS suggests that the possibility of donating food past the minimum durability date should be clearly declared and eventually spread in every Member State. In doing so, it would be necessary to analyse every national donation system to decrease the liability exposure of donors and all the existing constraints. In particular, best practices in some countries should be taken as examples by other governments.¹⁰² The Italian Legge Gadda is the best example to be taken into consideration in this context. Section 3.4 will analyse it in detail by showing its main legal strategies.

Group 5 addressed the other cause of food waste generated by date labelling legislation: the misinterpretation of dates. Even in this case, it recognizes consumers' misunderstanding as a key problem to be solved in order to reduce food waste. By highlighting how both the food service and household levels affect wastage production, it suggests that reformulating the date labels system could

¹⁰¹ Busetti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019.

¹⁰² FUSIONS (2016), *Recommendations and guidelines for a common European food waste policy framework*, Recommendation 4 and 4.4.

improve their use and interpretation. Indeed, according to it, the choice of more direct and clearer terms could avoid the confusion and misuse related to dates. On the one hand, it proposes to spread information and awareness among citizens. On the other hand, it also recommends the possibility of introducing new terms or figures to be used by FBOs to make labelling clearer. Additionally, it mentions the option of expanding the list of foodstuffs present in Annex X of the FIC Regulation.¹⁰³ It has been widely discussed over time whether or not this option could be considered a solution. The next sections will also address the point of view of different European actors on the possibility of reforming Annex X. Hence, before exploring the EU Commission's strategy, the European Member States' and Parliament's proposals require attention. The latter will help the subsequent analysis of the EC activities as well.

¹⁰³ Ivi., Recommendation 5.5.

3.2 Member States' proposals to amend date labelling legislation

Over time, food waste and its relationship with date marking started to be understood not only by the European Union as a supranational organisation, but also by individual Member States. Thus, different types of initiatives arose. The majority of countries decided to address the general problem of food waste through financial instruments. Priefer, Jörissen, and Bräutigam (2016) recognize an existing paradox affecting some national legislative systems. In particular, in 2016, 18 Member States were trying to disincentivize wastage by imposing taxes and fees on companies. The problem is that, on the other side, many of them such as Austria, Belgium, Hungary, and Finland¹⁰⁴ also provide financial support to those enterprises producing energy from waste. This duality in facing the emergency of food waste, may not help to achieve the desired result. In particular, the authors recognize two aspects that should be taken into account by governments. First of all, separate collection of food waste should be made always compulsory. Second, taxes on wastage should be as high as possible in order to discourage both consumers and retailers from wasting by opting for the prevention of waste or the donation of unsold food. Nonetheless, they also argue that high taxes tend to facilitate illegal behaviours when it comes to discarding foodstuff. That is why, a rigid regulatory control system is crucial as well.¹⁰⁵ This implies the involvement of valuable human resources that could instead be used more efficiently in the fight against food waste.

Acting through economic and financial instruments has more than one shortcoming. Therefore, some EU countries decided to follow a different path, more focused on the issue of date marking. Particularly, they support the idea of proposing a legislative reform that would modify the FIC Regulation. In the 2015 briefing on “*Best Before Date Labels*”, the European Parliamentary Research Service reported the suggestion coming from two specific Member States, the Netherlands and Sweden. These countries asked for the expansion of the list of foodstuffs in Annex X which do not require the “best before” nor the “use by” dates. Among the products in question would be, for example, pasta, rice, and coffee. A large number of EU countries sustained their proposal by arguing that such a legal change would have contributed not only to the reduction of food waste, but also to lower the costs of stock monitoring and stock rotation for those products possibly added to the Annex. In this way, more resources could be left to the control of foods requiring a “use by” date as the latter

¹⁰⁴ European Commission (DG ENV), Watkins E., Hogg D., Mitsios A., Mudgal S., Neubauer A., Reisinger H., Troeltzsch J., Van Acoleyen M., *Use of Economic Instruments and Waste Management Performances*, Final Report, 2012.

¹⁰⁵ Priefer C., Jörissen J., and Bräutigam K., *Food waste prevention in Europe – A cause-driven approach to identify the most relevant leverage points for action*, Resources, Conservation and Recycling, 2016.

represents a more dangerous category for human health.¹⁰⁶ To support this idea more concretely, the Netherlands undertook in-country research on the correlation between discarding food in households and date labelling. Although the number of consumers involved in the survey seems to be low (only 86 respondents), it has been a useful instrument to be considered at the national level especially to support the proposal made by the State to the European Union. According to the results, 40% of foodstuff after the expiration of the “best before” date is discarded whereas only 27% of products without any date label are wasted. These data are also affected by the different categories of food. Still, it has been calculated that on average 12% more products are thrown away past the date of minimum durability than those without a “best before” date.¹⁰⁷

While these findings may encourage the reform of Annex X, several concerns emerge in this case as well. First of all, the risk of decreasing the quality and safety of food is the main issue arising. If the legislation has always attributed a “best before” date to specific food products, exempting them from this requirement could undermine the transparency ensured to consumers so far. Indeed, according to Regulation (EU) 1169/2011, even the expiration of the quality of foods should always be communicated to consumers. They must always be enabled to make completely informed and conscious choices. On the other side, the problem of food waste cannot be forgotten. The literature also recognizes the possibility of revising the European legislation on food safety. Too strict rules on the protection of consumers’ health could threaten the fight against food waste. Specifically, Priefer et al. (2016) argue that “the current practice of setting maximum levels according to the precautionary principle should be reconsidered. Also some rules under the current European food hygiene regime, such as short deadlines for storing open packages [...] should be reviewed.”¹⁰⁸ Nevertheless, as also demonstrated through the case of *Austria v Susanne Müller*¹⁰⁹, ensuring transparency is essential to avoid fraudulent practices as well. It has been declared by the Parliamentary Briefing (2015) that, generally, products without any date displayed on their labels are more subject to fraud. Therefore, it is expected that these practices will increase if the list in Annex X is expanded. Furthermore, the European Consumers Organisation (BEUC) as well as the sub-group on date marking did not agree

¹⁰⁶ Valant J., European Parliamentary Research Service, *'Best before' date labels. Protecting consumers and limiting food waste*. Briefing, 2015.

¹⁰⁷ Holthuysen N., Kremer S., Bos-Brouwers H., *The effect of date marking terminology of products with a long shelf life on food discarding behaviour of consumers*, Wageningen Food & Biobased Research, 2017.

¹⁰⁸ Priefer C., Jörissen J., and Bräutigam K., *Food waste prevention in Europe – A cause-driven approach to identify the most relevant leverage points for action*, Resources, Conservation and Recycling, 2016 based on the study of Waarts, Y., Eppink, M., Oosterkamp, E., Hiller, S., Van der Sluis, A., Timmermans, T., *Reducing food waste – obstacles experienced in legislation and regulations*, 2011.

¹⁰⁹ C-229/01, *Unabhängiger Verwaltungssenat im Land Niederösterreich (Austria) v Susanne Müller*, ECLI:EU:C:2003:153.

with the idea of reducing the use of “best before” dates. They believe that the absence of a label would create even more confusion among consumers. Especially, if they are used to reading a date on specific foodstuffs, the disappearance of it could increase their uncertainty and, subsequently, the likelihood of wasting food. A study conducted by the European Commission in 2015 actually supports this approach. It reported that the misinterpretation of date labels is widely spread among consumers. Only 47% of the respondents to this survey were able to correctly explain the meaning of “best before”. However, this research also allowed the EC to come to an important conclusion: the complete elimination of the minimum durability date would even increase waste generation. It is explicitly argued that “only a small group of consumers is likely to decrease disposal of food, whereas the majority of the consumers might be put at risk to dispose more” if dates disappear from labels.¹¹⁰

Considering the problems in the expansion of Annex X’s list, other alternatives have been proposed and listed in the Parliamentary Briefing of 2015. For example, BEUC organization considered the use of “more realistic food dates” as a good solution. Thus, it focused its attention more on the heterogeneity among FBOs in selecting a different date label for the same foodstuff. Other ideas are instead more related to the improvement of technologies, sustainable packaging, and apps or software to support consumers in their selection and storage of foodstuff by also helping them to better understand labels. However, the most relevant is the above-mentioned option also suggested by FUSIONS: the possibility of changing the terminology used to indicate date labels. Even in this case legal reform is required because, as explained in the previous Chapter, the legislation on food labelling has always specified the exact wording each Member State is called to use to indicate both “use by” and “best before” dates. The European Parliament particularly stressed the similarity between the two terms especially in some languages, as depicted in Table 4 of this work. The mentioned study undertaken by the Netherlands in 2017 also shows the option of changing the existing terminology as one of the best solutions to avoid ambiguity and eventually reduce food waste. A best practice to be considered in this context comes from an EEA country: Norway. In this case, the government decided to allow FBOs to freely choose whether to keep the traditional “best before” or add “*often good after*” to it¹¹¹ without imposing any legal obligations. The agreement on the integration of this voluntary wording was due to the fact that dates on labels are considered a technology leading consumers in their choices. Hence, it is essential to keep this technology always updated according to the new needs and behaviours. Despite the flexibility provided, Norway has been able to achieve important goals.

¹¹⁰ Elsen M., van Giesen R., Leenheer J., European Commission, Directorate-General for Justice and Consumers EU Consumer Programme, *Milan BExpo 2015: A behavioural study on food choices and eating habits*. Final report, 2015.

¹¹¹ Plasil T., “*Best Before, Often Good After*”. *Re-scripting the date label of food in Norway*, Nordic Journal of Science and Technology Studies, 2020.

Indeed, according to the 2020 report, food waste has decreased by 12% from 2015 to 2019.¹¹² Even in this case, the majority of EU countries support the idea of changing the wording or adding new terms to the existing one. In particular, in 2018 Sweden declared to be in favour of following Norway's example.¹¹³ However, it has to respect the EU law being in line with its norms. Therefore, also considering the support for this type of proposal coming from several Member States, the European Commission started to understand that it was crucial to act in this direction in order to address the problem.

¹¹² Matvett, “*Food waste reduction in Norway*”, 2020.

¹¹³ Plasil T., “*Best Before, Often Good After*”. *Re-scripting the date label of food in Norway*, Nordic Journal of Science and Technology Studies, 2020.

3.3 The European Commission's strategy

The common denominator between the strategies and the proposals investigated so far is the need for the European Commission to revise the EU legislation on date labelling to decrease food waste generation. It has been also discussed that when it comes to amending Regulation (EU) 1169/2011, the Commission is called to balance the need to reduce food waste with the principle of ensuring food safety and, thus, public health. Furthermore, it is expected to act in both the retail and consumption sectors. Therefore, it is appropriate to devote a specific analysis to the work of the EC, which is a key player in the process towards a possible change. In this way, it will be possible to understand the strategies and tools it decided to use and the main obstacles that did not allow the elaboration of a concrete proposal within the set timeframe.

As stressed, the EC has been involved in the process of reducing food waste by acting on date labelling since 2015. From that moment, several achievements have been reached including the adoption of the Farm to Fork strategy in 2020. To fulfil the tasks assigned by the Strategy, the Commission followed – and is following – different steps. First of all, it decided to operate on two distinct fronts. On the one hand, it was called upon to improve consumers' interpretation of date labels. On the other hand, it recognized the discrepancies concerning the selection of different date labels by different manufacturers and producers for the same food product. Considering the involvement of several types of actors with different roles and functions, it was clear that several kinds of instruments and strategies needed to be implemented as well. To start with, the action to help consumers will be explored. Later, the EC initiatives and achievements regarding FBOs' practices will be examined.

3.3.1 Action targeting consumers

Nolen and Stockebrandt (2021) deeply described the path taken by the Commission. Firstly, it began by conducting an *Inception Impact Assessment* to undertake an initial analysis of the issue in 2020. It is interesting to know that the latter involves not only the review of the rules regulating date information on labels but also nutrition and health claims, origin or provenance indication for specific products, and indications of ingredients or nutrition declaration regarding alcoholic beverages.¹¹⁴ Obviously, in this context, only the work concerning date marking will be analysed and studied. After having described the context and the problem to be tackled, the EC Inception Impact Assessment

¹¹⁴ European Commission, *Proposal for a revision of the Regulation on Food Information to Consumers (FIC)*, Food, farming, fisheries. Food Safety. Available at: https://food.ec.europa.eu/safety/labelling-and-nutrition/food-information-consumers-legislation/proposal-revision-regulation-fic_en.

presents the main policy objectives and solutions. Specifically, three policy options are listed and, if one of them is approved, a reform to the legislation on date marking would be needed. The first one is related to the largely discussed expansion of the list of foodstuffs present in Annex X; the second alternative is about the complete abolishment of the use of “best before” date; the third one concerns the improvement of the terminology used to indicate the date of minimum durability by modifying the existing terms and/or adding new ones. Moreover, a preliminary assessment of the potential impacts deriving from a possible reform of the FIC Regulation is provided. From an economic point of view, all the costs generated by the management of food waste would be avoided. At the household level money savings would increase thanks to a better organisation of food at home. The social aspect would be positively affected as well. Indeed, consumers could improve their ability to understand date labels. In this way, they would contribute to the prevention of food waste which is the best choice according to the EU hierarchy on waste management. Finally, the environmental sphere would be positively influenced by the entire initiative as the reduction of the wastage of food would reduce all those environmental costs deeply described in the first Chapter of this thesis.¹¹⁵ Hence, going ahead with the EC action, the second step has been marked by the involvement of stakeholders in the 2021 EU Commission Impact Assessment. The latter is generally followed by a legislative proposal that is also what the EC was expected to publish during the Q4 of 2022. However, no proposal has yet been submitted as also declared by the Parliament in the Legislative Train of November 2023. Also, it specifies that the announcement of a possible proposal is not present in the tentative agenda for forthcoming Commission meetings until the end of 2023, nor in the Commission work program for 2024.¹¹⁶ As already explained, to reform the FIC Regulation, other legislative acts and policy areas – especially public health – need attention, and a large number of actors are involved. Indeed, in 2021, the Commission started a consultation with members of the EU Platform on Food Losses and Waste and the Working Group on Food Information to Consumers Regulation. Having considered the three main options listed in the Inception Impact Assessment, the EC concluded that the third one is the most favourable. This is due to the negative results presented by the mentioned surveys conducted by both the Commission and Member States on the possibility of expanding Annex X or removing the “best before” date. On the contrary, the alternative of improving the terminology used to express the dates seems to be positively received. Therefore, the consultation of 2021 was aimed at discussing the possible changes that would eventually be included in the FIC Regulation. In particular, three sub-groups have been analysed: text-based options; graphical options; and a combination of graphical

¹¹⁵ European Commission, *Inception Impact Assessment*, 2020.

¹¹⁶ European Parliament, *Proposal for a Regulation Revising the Rules on Date Marking ('Use By' and 'Best Before' Dates) on Food Products - Q4 2022*, Legislative Train. A European Green Deal, 2023.

options with text. From this study, it emerged that the first option has been well-received by the participants. In particular, it has been argued that the following phase of the study would concentrate on changing the translation of “best before” in those languages that have caused more ambiguity so far. As regards additional wording, only “*best before... usually good after*” received negative votes being “usually” evaluated as a too generic term. Contrarily, the majority of votes for the second alternative have been negative. Only black and white graphs were better received and will be part of further research. Finally, for alternatives related to a combination of text and graphs, no majority of positive or negative votes have been achieved. Hence, an additional consultation will be needed in this case for the forthcoming insights on the issue.¹¹⁷ Again, this consultation demonstrates the complexity of the question and the subsequent long work needed to achieve a final conclusion with a concrete legislative proposal.

3.3.2 Action targeting FBOs

Improving how food business operators select the type of date for foodstuffs to harmonize the system of labels, required careful and sophisticated work for the Commission. Even in this case, supporting FBOs with more specific guidelines implies the involvement of actors able to always take into account the safety of food and, in order to do so, scientific knowledge is essential. In fact, to allow manufacturers and producers to create a more homogeneous European scenario when it comes to choosing date labels to avoid unnecessary food waste, it is important not to neglect human health. Therefore, the European Commission decided to consult with the European Food Safety Authority before taking any action targeted at FBOs’ behaviours. In this way, it also results in being in line with the norm specified in Article 5 of Regulation (EU) 1169/2011 already described in Chapter II.

In 2019 the EC called upon EFSA to elaborate a scientific opinion on the issue. In particular, in its mandate, the Commission asked the Authority to provide scientific advice in order to clarify the exact distinction between those products that might represent a danger to human health after the end of their shelf-life because of the emergence of pathogenic agents, and those that only lose their initial characteristics due to the growth of non-pathogenic microorganisms.¹¹⁸ Then, EFSA was asked to

¹¹⁷ CHAFEA Consumers Unit, *Consumer research study to identify new ways of expressing date marking that meet consumers’ information needs whilst minimising food waste*. Consultation on date marking policy options of the EU Platform on Food Losses and Food Waste and of the Working Group on Food Information to Consumers Regulation, 2021.

¹¹⁸ European Commission Request to the European Food Safety Authority for Scientific Opinions on *Date marking and related food information in view of the application by food business operators of Regulation (EU) No 1169/2011 on food information to consumers as an integrated part of their food safety management system (FSMS)*, 2019.

concentrate on the explanation of the factors influencing the growth of those pathogenic or non-pathogenic microorganisms by affecting the consequent decisions of FBOs of selecting a “use by” or a “best before” date. Furthermore, specific advice on “indicative time limits to be applied at EU level to facilitate marketing or donation of foods past ‘best before’ date”¹¹⁹ is required as well. In response to the Commission's mandate, the Authority decided to publish two separate parts of its guidelines. The first one, entitled “*Guidance on date marking and related food information: part 1 (date marking)*”, was published in 2020 whereas the second one (*part 2 – food information*) was submitted in 2021. The former requires more attention here than the latter, which focuses more on the avoidance of safety risks by giving indications on storage conditions, time limits for consumption, and defrosting frozen foodstuffs.¹²⁰ On the contrary, part 1 provides advice related to two of the main topics of this thesis: how FBOs are supposed to choose the correct date label, and the marketing or donation of products past the date of minimum durability. Starting from an important consideration, EFSA decided to develop a *decision-tree*¹²¹ to guide food operators in the selection of the type of date marking. The consideration in question refers to some definitions of the FIC Regulation. Particularly, it recognizes the lack of definitions of terms concerning the sphere of foods requiring a “use by” instead of a “best before” date. Indeed, wording such as “*short period*”, “*highly perishable*”, “*immediate danger to human health*”, and “*safe vs. unsafe*” are not explicitly explained in Regulation 1169/2011. This may lead to the formulation of a wide variety of interpretations by FBOs, which may subsequently act in different ways when identical situations occur. Therefore, EFSA found some difficulties in taking into account the FIC Regulation to elaborate its guidelines and the decision-tree was considered as the best solution to help FBOs.¹²² Finally, after a long series of technical and scientific considerations, the Authority concluded that in both the case of determining the most appropriate date label and donating or not foodstuffs after the expiration of the “best before” date, the decision must be made on a “product-by-product” basis. Given the heterogeneity of foodstuffs due to intrinsic and extrinsic factors, including different modes of transport, storage, and handling of foods, it is not possible to give a specific and sole indication of when a “best before” and when a “use by” date should be chosen. In the same way, EFSA decided to not provide an indicative time limit for

¹¹⁹ Ibidem.

¹²⁰ EFSA Panel on Biological Hazard (BIOHAZ), *Guidance on date marking and related food information: part 2 (food information)*, EFSA Journal, 2021.

¹²¹ It consists of a sequential list of ten questions supported with examples that FBOs can use to decide the most appropriate date label. See EFSA Panel on Biological Hazard (BIOHAZ), *Guidance on date marking and related food information: part 1 (date marking)*, EFSA Journal, 2020.

¹²² Introduction of EFSA Panel on Biological Hazard (BIOHAZ), *Guidance on date marking and related food information: part 1 (date marking)*, EFSA Journal, 2020.

food sold or donated past the minimum durability date as there are numerous variables to be considered on a case-by-case basis.¹²³

Having received the scientific opinion from the Authority, the Commission should include the consideration made by EFSA related to the absence of specific definitions in its elaboration of the legislative proposal to reform the FIC Regulation. Moreover, having understood that it is not possible to provide well-defined rules for FBOs when it comes to the use of date marking, best practices coming from other Member States gain even more value. Assuming the necessity of operating on a case-by-case basis, EU governments could elaborate national norms to give FBOs more precise guidelines to follow. In particular, the Commission itself highlights in its mandate to EFSA that national laws on the donation of food after the expiration of the “best before” date exist in some EU countries and can be taken as examples. In this case, the EC precisely referred to Italy¹²⁴ which is also the most relevant and discussed example in the literature. The following sections analyse this good practice.

¹²³ EFSA Panel on Biological Hazard (BIOHAZ), *Guidance on date marking and related food information: part 1 (date marking)*, EFSA Journal, 2020.

¹²⁴ European Commission Request to the European Food Safety Authority for Scientific Opinions on *Date marking and related food information in view of the application by food business operators of Regulation (EU) No 1169/2011 on food information to consumers as an integrated part of their food safety management system (FSMS)*, 2019.

3.4 The Italian best-practice

Italy has been the first EU country to implement a normative act to regulate food waste, namely Law 166/2016, also known as Legge Gadda. The Law primarily relies on encouraging retailers, food services and non-profit organizations to donate food that is no longer marketable even after the date of minimum durability.¹²⁵ This is a fundamental innovation in the context of date labelling and food waste. It explicitly clarifies the possibility of eating food after the expiration of the “best before” date if it has been correctly managed and stored by FBOs. Indeed, the proper management of foodstuff is the only liability left to FBOs. In this way, donors’ risks are minimized. Additionally, through the reduction of bureaucratic obligations and taxes, the Law aims to incentivize the donation of food. Although these facilities are ensured, Busetti (2019) underlines concerns about reputational risks among food operators which could potentially diminish their willingness to donate. Furthermore, the Law is addressed to manufacturers and distributors even if they are not the main responsible for food waste. This is due to the decision to act by choosing donation as an alternative to food waste rather than prevention as it is considered a more expensive and less efficient practice. The latter would target more consumers behaviours that primarily contribute to food waste. Nevertheless, Gadda Law recognizes the necessity of improving consumers’ awareness of food waste as well. It established a specific body – namely, OERSA – to select the best measures aimed at spreading information and improving education among the population. To concretely prove the efficiency of the Law, it would have been interesting to make a comparison between the level of waste recorded in 2016 (when the law had just been passed) and the most recent available data (2021). Unfortunately, there are no reliable data on the effects of the law yet. This is because the first EU-wide monitoring of food waste levels was conducted by Member States only in 2020.¹²⁶ Nonetheless, considering that no reform to FIC Regulation has been implemented yet, the Italian legislation demonstrates that acting at the national level is possible even with the current EU legislation in force.

Before exploring the Italian law on food waste and its implications for using date marking, it is necessary to have an idea of data characterizing food waste in Italy. This can help determine the context in which the law is applied. The 2021 European food waste ranking¹²⁷ – published in 2023 – showed the EU countries' levels of yearly food waste produced. First of all, considering absolute

¹²⁵ Ibidem.

¹²⁶ The EC has been delegated by Directive (EU) 2018/851 on Waste to establish a common methodology to measure food waste levels in the EU. The Delegated Decision was published in 2019. See: https://food.ec.europa.eu/safety/food-waste/eu-actions-against-food-waste/food-waste-measurement_en

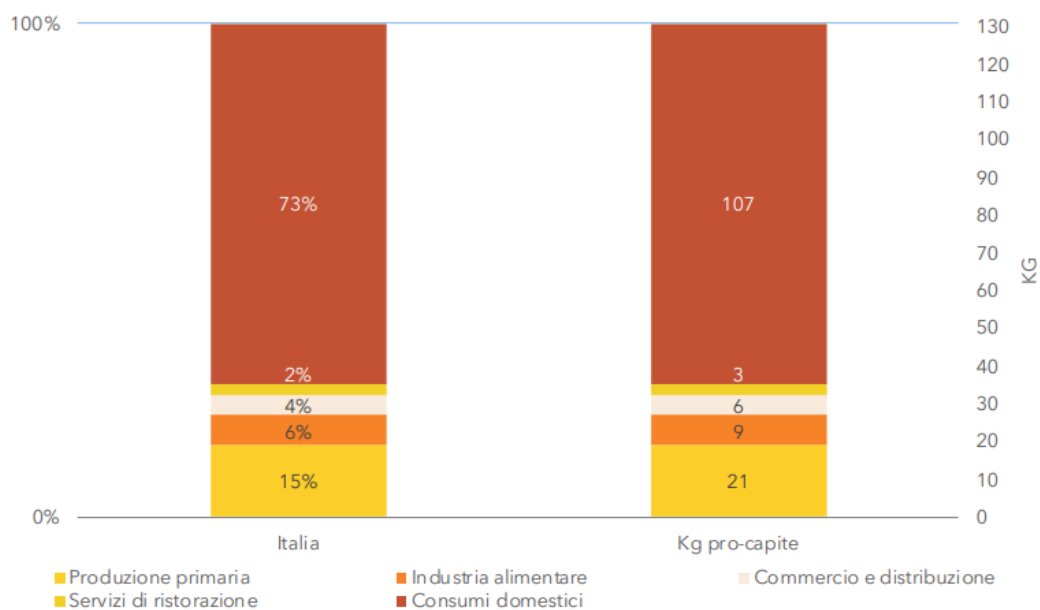
¹²⁷ It is the second EU-wide monitoring of food waste levels (2023). See: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Food_waste_and_food_waste_prevention_-_estimates&stable=0&redirect=no

values, Italy recorded 8.65 million tonnes of total food waste generated in 2021.¹²⁸ Secondly, when the annual waste per capita is calculated, the country occupies the seventh position with 146 kg of food waste per capita produced.¹²⁹ Thirdly, the economic costs of this wastage need to be shown as well. Yearly, the Italian economy loses 22.8 billion euros due to food waste and the per-person loss amounts to 385 euros.¹³⁰ After examining these data, it is crucial to understand how the waste is distributed in the food supply chain.

Figures 3 and 4

131

Food waste in Italy by stages (% and kg per capita)



Source: Centro Studi Divulga elaboration on Eurostat data

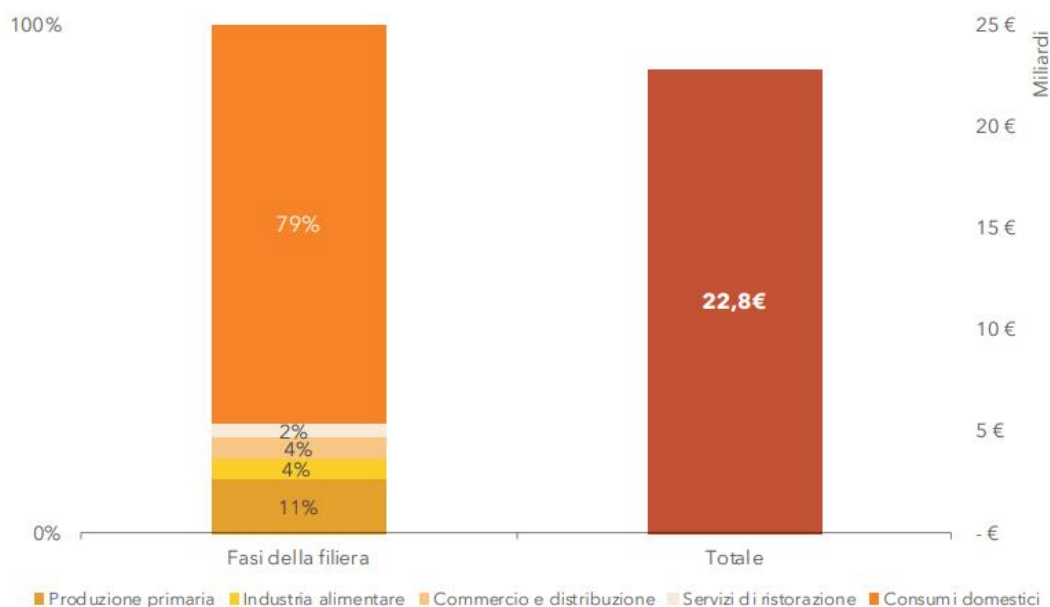
¹²⁸ The first two positions are occupied respectively by Germany and France. See Eurostat, *Food waste and food waste prevention – estimates*, Data extracted in September 2023. Planned article update: 29 September 2024. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Food_waste_and_food_waste_prevention_-_estimates

¹²⁹ Eurostat estimates (2023) in Adinolfi F., Fargione R., Vivani D., Sotgiu M., Coppola E., Riccio C., DIVULGA, *Spreco e fame. I costi economici, sociali ed ambientali dello spreco alimentare*, Aletheia, 2023.

¹³⁰ Ibidem.

¹³¹ Adinolfi F., Fargione R., Vivani D., Sotgiu M., Coppola E., Riccio C., DIVULGA, *Spreco e fame. I costi economici, sociali ed ambientali dello spreco alimentare*, Aletheia, 2023.

Economic value of food waste in Italy (% various stages, € total)



Source: Estimates by Centro Studi Divulga on Eurostat data

Basing its research on Eurostat statistics, DIVULGA¹³² created Figures 3 and 4. According to them, even in this case, household consumption generates the highest levels of food waste (73% of the total corresponding to 107 kg per capita) and, consequently, economic costs (17.92 billion euros). The retail and food services sectors are those targeted by the Gadda Law. Nonetheless, they do not occupy the first positions of the ranking. On the contrary, they collectively account for 6% of the total food waste (9 kg per capita) and for financial losses of 970 million and 550 million euros respectively.¹³³ Although the distribution stage of the food supply chain is not the main producer of food waste, it has been introduced that acting at this stage is considered to be cheaper, faster, and more effective. Moreover, as deeply discussed, food donation especially after the expiration of the “best before” date is a critical topic in the EU. If not well regulated it causes food waste as well. Hence, starting with a brief excursus of the Italian legislation on food donation and waste, Law

¹³² DIVULGA is a Research Centre focused on analysing production and consumption dynamics, economic and political trends, and socio-cultural orientations. Its purpose is to contribute to shaping action strategies for businesses, supply chains, institutions, associations, and policymakers. See <https://www.divulgastudi.it/>

¹³³ Adinolfi F., Fargione R., Vivani D., Sotgiu M., Coppola E., Riccio C., DIVULGA, Spreco e fame. *I costi economici, sociali ed ambientali dello spreco alimentare*, Aletheia, 2023.

166/2016 will be studied to comprehend why it is regarded as a best practice and the EU Commission could possibly take it as an example to formulate its legislative proposal.

3.4.1 From the legislation on the donation of unsold food...

The Italian legislation selected the donation option from the EU waste management hierarchy to tackle food waste. As recognized by Trapè (2017), Arcuri (2019), and Grant and Rossi (2022) the first important step to regulate how unsold food should be donated was made in 2003 through the so-called *Good Samaritan Law*.¹³⁴ The key goal of this law was the reduction of the legal constraints that may disincentivize donation. It wanted to reduce the liability of donors by equating non-profit social organizations to consumers. In this way, donor companies' responsibilities ended when they delivered food to organizations while the latter were exempted from their obligations related to food safety.¹³⁵ In 2004 the *hygiene package*¹³⁶ was adopted by the EU. It comprises European normative acts on food hygiene according to which the organisations are not expressly released from food safety responsibilities.¹³⁷ Hence, it became evident that, to comply with the new rules set by the EU, revisions to the Italian law on food donation were necessary, specifically in enhancing clarity about food safety liability.

A significant clarification regarding the issue occurred with the implementation of the *Legge di Stabilità* – or *Stability Law* – (law no. 147/2013)¹³⁸ in 2014. As highlighted by Trapè (2017), the law specifies that both FBOs and non-profit sectors are responsible for ensuring proper and safe preservation, transportation, storage, and use of donated food.¹³⁹ However, aligning the law to EU rules could not neglect the necessity of incentivising donations to avoid food waste. Therefore, a position paper on the simplification of the norms on unsold foodstuff was published in 2015 by the National Plan for the Prevention of Food Waste (PINPAS)¹⁴⁰. The document is aimed at improving the regulation on food donation in order to encourage an increase in the practice among food business operators and, consequently, organizations. Among the numerous critical aspects, the paper not only

¹³⁴ *Legge 25 giugno 2003, n. 155*. Disciplina della distribuzione dei prodotti alimentari a fini di solidarietà sociale.

¹³⁵ Arcuri S., *Food poverty, food waste and the consensus frame on charitable food redistribution in Italy*, Agriculture and Human Values, 2019.

¹³⁶ See the European Commission Website on Food Safety available at: https://food.ec.europa.eu/safety/biological-safety/food-higiene_en

¹³⁷ Trapè I., *Lo spreco alimentare e la legge italiana n. 166/2016*, 2017.

¹³⁸ *Legge 27 dicembre 2013, n. 147*. Disposizioni per la formazione del bilancio annuale e pluriennale dello Stato (Legge di stabilità 2014).

¹³⁹ Article 1, paragraphs 236-237, *l. n. 147/2013* in Trapè I., *Lo spreco alimentare e la legge italiana n. 166/2016*, 2017.

¹⁴⁰ Piano Nazionale di Prevenzione degli Sprechi Alimentari del Ministero dell'Ambiente, della Tutela del Territorio e del Mare adopted by Ministero dell'ambiente, 2014.

emphasises the need to simplify the regulation of civil liability of donors but also the need to explicitly allow for the donation of products whose “best before” date has passed.¹⁴¹ This was an influential step towards the recognition of the importance of the date of minimum durability when it comes to regulating food donation to fight food waste.

3.4.2 ... to Legge Gadda and the interpretation of the “best before” date

As underlined by Busetti (2019), the 2016 Gadda Law adopted almost all the initiatives proposed by the 2014 PINPAS position paper. For the purpose of this work and in the context of the possible reform of the FIC Regulation, two aspects of the Law are key. Firstly, it reduced the bureaucratic processes to facilitate donation practices. In particular, before 2016, donors were asked to communicate with the fiscal authorities at least five days before donating. With *Legge Gadda's* approval, they could start communicating only once per month and only for donations with an economic value higher than 15.000 euros. Additionally, at the municipal level, a decrease in taxes on waste can be applied for donors proportionally to the amount of donated food.¹⁴² As regards liability, Article 5 of Gadda Law confirmed what had been implemented with the Stability Law by merging it with what was applied with the Good Samaritan Law. It establishes that donors' liability ends at the moment of donation, but they are supposed to select donated foodstuff according to hygiene and safety EU rules.¹⁴³

Secondly, according to Article 4, food whose “best before” date has expired becomes officially part of the category of surplus food eligible for donation. According to PINPAS (2015), it was necessary to clarify to both FBOs and consumers through a legal reference that there are no safety risks in donating – and consuming – surplus food after the minimum durability date.¹⁴⁴ To avoid ambiguity, Article 2 clarifies the meaning of “*surplus food*” by distinguishing it from “*food waste*”. The former is defined as no longer marketable foodstuffs that have maintained hygiene and safety requirements that allow FBOs to find alternative uses for such products to avoid waste.¹⁴⁵ Hence, as

¹⁴¹ Azzurro P., PINPAS, *La donazione degli alimenti invenduti verso la semplificazione normativa*, 2015.

¹⁴² *Legge 19 Agosto 2016, n. 166*, Disposizioni concernenti la donazione e la distribuzione di prodotti alimentari e farmaceutici a fini di solidarietà sociale e per la limitazione degli sprechi explained in Busetti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019 and Franco S., Cicatiello C., *Levering waste taxes to increase surplus food redistribution at supermarkets: Gains and scenarios in Italian municipalities*, Waste Management, 2021.

¹⁴³ *Legge 19 Agosto 2016, n. 166*, Disposizioni concernenti la donazione e la distribuzione di prodotti alimentari e farmaceutici a fini di solidarietà sociale e per la limitazione degli sprechi, Article 5.

¹⁴⁴ PINPAS, 2015 in Busetti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019.

¹⁴⁵ *Legge 19 Agosto 2016, n. 166*, Disposizioni concernenti la donazione e la distribuzione di prodotti alimentari e farmaceutici a fini di solidarietà sociale e per la limitazione degli sprechi, Article 2.

emphasised by Trapè (2019), the “alternative use” of unsold food is what differentiates surplus from waste.

All these elements have been important innovations in the European legal scenario on food waste that transformed Italian Law into a good practice to be possibly followed by other Member States. Many scholars such as Lucchini (2016), Trapè (2017), Busetti (2019), and Franco and Cicatiello (2021) compared the Italian legislation with the French law (law no. 2016–138)¹⁴⁶ which is the other Member State with national legislation aimed to the reduction of food waste. However, even in this case, Legge Gadda is considered more efficient. Indeed, while Italian Law tries to incentivize donation practices, French law forces FBOs to enter into agreements with non-profit organizations to donate. Specifically, it requires that all retail businesses with a surface area exceeding 400 square meters must offer a donation agreement for unsold food products to one or more associations.¹⁴⁷ This obligation seems to disregard the donation costs explained above, which organisations or food banks cannot always bear. The Italian non-profit sector recognized this French weakness and “appreciated that the absence of a similar obligation in the Italian reform was not going to overload charities”.¹⁴⁸

The fact that Gadda Law has been well received by Italian donors and the scholarship does not mean that it has no shortcomings. First of all, Gadda Law is addressed to manufacturers and distributors of the food supply chain. Still, their activities are not the main drivers of Italian food waste. Additionally, the reasons for wastage produced by these sectors are only minimally related to the expiration of the “best before” date. According to Garrone (2014), only 6% of food waste caused by the manufacturer level is due to the return of unsold products that may be close to the end of the minimum durability date.¹⁴⁹ Hence, the majority of surplus food generated by manufacturers and all the unsold food of distributors could have been donated even before the legal reform of 2016. Differently, one of the main reasons for consumers’ wastage is related to the “best before” dates as largely explained. Furthermore, problems related to the donation of foodstuffs past the minimum durability date arose among donors as well. The principal fear of both charities and FBOs regards their reputation. They are afraid of losing their reputation if food with some aesthetic flaws is donated. The spread of uncertainty related to the safety of food after the “best before” date and the high

¹⁴⁶ LOI n° 2016-138 du 11 février 2016 relative à la lutte contre le gaspillage alimentaire.

¹⁴⁷ LOI n° 2016-138 du 11 février 2016 relative à la lutte contre le gaspillage alimentaire explained in Trapè I., *Lo spreco alimentare e la legge italiana n. 166/2016*, 2017.

¹⁴⁸ Lucchini M., Una bella lezione dell’Italia alla Francia, Legge anti-sprechi, 2016 in Busetti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019.

¹⁴⁹ Garrone P., Melacini M., Perego A., *Surplus food recovery and donation in Italy: the upstream process*. British Food J., 2016 in Busetti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019.

expectations of consumers when it comes to aesthetic standards of foodstuff lead to a certain reluctance to donate past the “best before” date.¹⁵⁰ Thus, the necessity of preventing food waste through education policies and by improving the knowledge about the meaning of date labels emerges again. The other deficiency identified by the literature is exactly related to how the legislator decided to manage the wastage produced in the sectors of manufacturing and distribution. Specifically, the option of donation has been selected. Nonetheless, in describing the EU hierarchy of waste management, it has been underlined that donation is not the most favourable alternative: it occupies the second place. Contrarily, prevention is considered the best option to be selected to avoid the wastage of food. Nevertheless, as emphasised by Trapè (2017) and Grant and Rossi (2022) acting on prevention requires more accurate instruments and not always the effectiveness of policies is granted. This is mainly because public involvement is limited when it comes to preventing food waste and engagement with stakeholders is often considered inadequate. Moreover, the financial costs associated with prevention measures and legal strategies are perceived to be higher than those needed to encourage donation practices.¹⁵¹ However, even though *Legge Gadda* does not cover prevention and the food waste generated at the consumption level, it established the *National Observatory on Food Surplus, Recovery, and Waste* [Osservatorio sulle Eccedenze, i Recuperi e gli Sprechi Alimentari (OERSA)]. This was precisely created to tackle the problem of misinterpretation and misinformation. In fact, being a technical and independent body, OERSA is committed to collecting data about food surpluses, recovery and waste and then elaborating recommendations for the implementation of possible measures. The most relevant guidelines concern the need to spread information and improve education on food safety and food information including date labelling among consumers.¹⁵²

Hence, considering the challenges associated with legal measures on prevention and the lack of unified legislation on food donation at the European level, the Italian case is widely regarded as a positive example to emulate. In fact, the government did not ignore the generation of waste from consumers or the prevention of food waste in general. It simply decided to activate different strategies that seemed to be more convenient from an economic and political point of view. This is reinforced by the fact that Italy is the only Member State with a food waste law that aims to incentivise waste reduction rather than forcing the food supply chain actors to intervene, as is the case in France.

¹⁵⁰ Buseti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019.

¹⁵¹ Council for Agricultural Research and Economics—Research Centre for Food and Nutrition (CREA Food and Nutrition), Grant F., Rossi L., *The Italian Observatory on Food Surplus, Recovery, and Waste: The Development Process and Future Achievements*, Frontiers in Nutrition, 2022.

¹⁵² Ibidem.

Additionally, it shows that even if an EU reform on FIC Regulation has not been elaborated yet, it is possible to act at the national level with the EU legislation in force and by respecting consumers' health. Intervening at the local level to fight food waste is (again) the best solution.

Conclusions

The objective of this work was to assess whether a reform to the current EU legislation on date labelling could be implemented to reduce food waste. The question arose from the recognition of a significant gap in the EU law: the absence of a legal act regulating the negative relationship between food waste and date labelling. Hence, the revision of the existing Regulation (EU) 1169/2011 has been identified as a possible solution to fill this gap in light of the reduction of wastage. Considering how broad the areas of food waste and date labelling are, the work intended to clarify why a correlation exists between them.

The exploration of the emergency of food loss and waste including its negative impacts on the environmental, economic, and social spheres, and the description of its drivers in Chapter I helped to emphasize why it is crucial to act. Moreover, two distinctions emerged clarifying the necessity of acting at the local level. First, food loss occurs from the harvesting stage of the food supply chain up to but not including retail. Contrarily, the retail and consumption sectors generate food waste. Second, developing countries generally face food losses differently from the Western world where food waste is more spread. This requires different types of action according to the geographic area. Therefore, the European Union is committed to reducing food losses. Still, its priority is to halve food waste by improving the management of foodstuffs in the distribution and consumption phases of the food supply chain. Among the causes generating food waste in the Union, date labelling legislation has been identified as one of the main responsible. Indeed, the CEAP (2015), as well as the Farm to Fork Strategy (2020), include in their objectives the need to improve date marking legislation to reduce food waste. Therefore, the fact that these recent packages of measures still present this objective raised two questions. On the one hand, it was necessary to understand why date labelling generates food waste. On the other, it was worth considering whether EU legislation on date labelling has ever addressed this problem.

Chapter II has been useful in clarifying these issues. In particular, the analysis of the evolution of date labelling legislation over time showed that the main problem with the current regulation lies in the increasing perception of safety levels by both FBOs and consumers, which often differ from the real risks associated with food safety. This attitude generates food waste as, on the one hand, consumers interpret the “best before” date as the “use by” date by discarding perfectly edible food only because the date of minimum durability has expired. On the other hand, FBOs are more inclined to choose a “use by” date even for those products whose microbiological composition would require a simple “best before” date. Furthermore, they tend to discard unsold food with an expired “best

before” date that instead could be still marketed or donated. In this way, any safety and reputational risk is avoided. Thus, it is evident that clarification is needed on the distinction between the two types of dates and on the possibility of selling or donating food after the expiration of the “best before” date. This clarification should make it explicit that such distinction as well as donation practices are crucial to reducing the amount of food waste. The historical excursus of EU law on date labelling also demonstrated that this concept has never been addressed by the legal acts on date marking. The amendments applied to the first Directive 79/112/EEC on the provision of food information to consumers did not include the necessity of reducing wastage. This was because, until the beginning of the 21st century, food waste was not yet considered a problem to be tackled. However, even the following legal changes that led to the implementation of the current FIC Regulation did not address the issue. On the contrary, they have always aimed to increase the protection of consumers. The latter is also identified as the main obstacle to the elaboration of reform of date labelling legislation targeted at reducing food waste. The principles of food safety and public health protection cannot be overridden by the fight against food waste. Therefore, this trade-off must be taken into account when legal reform is to be proposed.

The third chapter of the thesis highlighted that during the last decade, the European Union's awareness of the negative relationship between date labelling and food waste increased. This led to the elaboration of the mentioned packages of policy measures and project groups such as FUSIONS. According to them, the Commission was called to present a legislative proposal to amend FIC Regulation to avoid the misinterpretation of dates and to spread donation practices. Considering the necessity of taking into account the protection of public health, the EC needed to be supported by technical experts. Hence, expert groups such as the EU Platform on Food Loss and Waste and the sub-group on date marking have been created. The consultation with them, guidance published by EFSA, and best practices coming from other Member States should have been tools for the formulation of a legislative proposal from the Commission by the end of 2022. As regards donations, on the one hand, the EFSA's guidelines on date marking published in 2020 helped to clarify the impossibility of making the practice of food donation mandatory after the expiration of the “best before” date due to safety reasons. On the other hand, the case of the Italian *Legge Gadda* demonstrated that it is possible to increase this practice without obliging donors. The removal of legal burdens and the introduction of economic incentives make Italian law a good practice to be followed in this context. As far as the “use by” and “best before” terms are concerned, EFSA held that it cannot be decided a priori whether a product simply needs the date of minimum durability. It is crucial to act considering individual cases. Hence, the EC and the expert groups discussed the possibility of finding

alternatives to indicate the dates in order to make them clearer. However, no agreements have been reached yet. This is mainly due to the fear of reducing consumer protection if “best before” is removed or even if the list of products not requiring an expiration date is expanded. Furthermore, the Commission stated that, according to the survey conducted in 2015, consumers would discard even more food if the “best before” date disappeared from labels. The removal of familiar labelling could increase confusion and ambiguity. Not having found solutions to concretely reform Regulation (EU) 1169/2011, the Commission is still struggling to adopt a proposal.

To conclude, these findings highlight that the past legislation on date labelling did not face the problem of food waste as the latter was not considered an emergency yet. Nevertheless, even when food waste started to be identified as a global problem and date marking one of its causes at the EU level, no legal acts have been formulated to address this negative relationship. This is due to the difficulty in balancing the protection of public health and the reduction of food waste. EFSA’s guidelines specifying the heterogeneity of food due to the intrinsic and extrinsic factors that may affect its safety declared the necessity of acting on a case-by-case basis. This implies that it is not possible to adopt a reform of Regulation (EU) 1169/2011 that would make compulsory both the choice of best-before date for products other than those listed in Annex X and the donation of foodstuffs beyond the minimum durability date. Nonetheless, EFSA’s guidance also emphasized the lack of accurate definitions in FIC Regulation related to the products requiring a “use by” or a “best before” date. This is a shortage of legislation that inevitably creates confusion among FBOs and consequently among consumers. Hence, considering that misinterpretation of terms is the key problem, it could be argued that an amendment to the current regulation is possible. Following EFSA's suggestion, the reform should include a more detailed and clear explanation of definitions of every wording regarding dates. Additionally, the aspect of donation could be improved as well without making it mandatory. The Italian law could serve as an inspiration to better clarify in FIC Regulation the possibility of donating products after the “best before” date. Specific tools, such as economic incentives, could be included to encourage FBOs to donate instead of discarding food. Therefore, to contribute to the fight against food waste, it would be sufficient to improve the above-mentioned aspects, without the need to make drastic changes to the regulation.

Bibliography

Legal documents:

- and European Commission (2018), Nikolakopoulou A., *Update on Circular Economy Action Plan and Work of EU Platform on Food Losses and Food Waste*, Vilnius, 2018.
- C-229/01, *Unabhängiger Verwaltungssenat im Land Niederösterreich (Austria) v Susanne Müller*, ECLI:EU:C:2003:153.
- Codex Alimentarius International Food Standards, *General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985). Adopted 1985. Amended 1991, 1999, 2001, 2003, 2005, 2008 and 2010 in FAO, 2016. *Handbook on food labelling to protect consumers*, Rome, 2016.
- Consolidated version of the Treaty on the Functioning of the European Union - PART THREE: UNION POLICIES AND INTERNAL ACTIONS - TITLE X: SOCIAL POLICY - Article 153 (ex-Article 137 TEC), in force.
- *Council Directive 79/112/EEC* of 18 December 1978 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs for sale to the ultimate consumer. No longer in force, Date of end of validity: 25/05/2000; Repealed by 300L0013.
- *Council Directive 89/395/EEC* of 14 June 1989 amending Directive 79/112/EEC on the approximation of the laws of the Member States relating to labelling, presentation and advertising of foodstuffs for sale to the ultimate consumer. No longer in force, Date of end of validity: 25/05/2000.
- Council for Agricultural Research and Economics—Research Centre for Food and Nutrition (CREA Food and Nutrition), Grant F., Rossi L., *The Italian Observatory on Food Surplus, Recovery, and Waste: The Development Process and Future Achievements*, Frontiers in Nutrition, 2022.
- *Directive (EU) 2018/851* of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste
- *Directive 2000/13/EC* of the European Parliament and of the Council of 20 March 2000 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs. No longer in force, Date of end of validity: 12/12/2014; Implicitly

repealed by 32011R1169 and Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers.

- European Commission (DG ENV), Watkins E., Hogg D., Mitsios A., Mudgal S., Neubauer A., Reisinger H., Troeltzsch J., Van Acoleyen M., *Use of Economic Instruments and Waste Management Performances*, Final Report, 2012.
- European Commission Request to the European Food Safety Authority for Scientific Opinions on *Date marking and related food information in view of the application by food business operators of Regulation (EU) No 1169/2011 on food information to consumers as an integrated part of their food safety management system (FSMS)*, 2019.
- European Commission, 2014. *Commission staff working document impact assessment on measures addressing food waste to complete swd (2014) 207 regarding the review of EU waste management targets*, Brussels and Parfitt J., Barthel M., and Macnaughton S., (Review) *Food waste within food supply chains: quantification and potential for change to 2050*, Phil. Trans. R. Soc. B, 2010.
- European Commission, 2020. *Farm to Fork Strategy. For a fair, healthy and environmentally-friendly food system*. 2020.
- European Commission, 2023. *Commission staff working document impact assessment report Accompanying the document Directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste*. 5.7.2023, Brussels.
- European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Closing the loop - An EU action plan for the Circular Economy*, Brussels, 2015.
- European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A new Circular Economy Action Plan for a cleaner and more competitive Europe*, 2020.
- European Commission, Directorate-General for Health and Food Safety, “*Market study on date marking and other information provided on food labels and food waste prevention. Final Report*”, 2018.
- European Commission, Directorate-General for Health and Food Safety, Directorate-General for Communication. Survey carried out by TNS political & social network, Flash Eurobarometer 425, *Food Waste and Date Marking*, 2015.

- European Commission, Directorate-General for Health and Food Safety, *Food and feed safety, innovation. Food information and composition, food waste*, 2018.
- European Commission, Directorate-General for Health and Food Safety, *Food Sustainability, International Relations. Farm to Fork Strategy*, 2022.
- European Commission, Directorate-General for Health and Food Safety, *Food redistribution in the EU: Mapping and analysis of existing regulatory and policy measures impacting food redistribution from EU Member States*, Food and feed safety, innovation, 2020
- European Commission, *Inception Impact Assessment*, 2020.
- European Commission, Information from European Union Institutions, Bodies, Offices and Agencies, EU Guidelines on Food Donation, Official Journal of the European Union, 2017.
- European Commission, *Proposal for a Regulation of the European Parliament and of the Council on the provision of food information to consumers*, {SEC (2008) 92} {SEC (2008) 93} {SEC (2008) 94} {SEC (2008)95}, Brussels, 2008.
- European Parliament, *Proposal for a Regulation Revising the Rules on Date Marking ('Use By' and 'Best Before' Dates) on Food Products - Q4 2022*, Legislative Train. A European Green Deal, 2023.
- *Legge 19 Agosto 2016, n. 166*, Disposizioni concernenti la donazione e la distribuzione di prodotti alimentari e farmaceutici a fini di solidarietà sociale e per la limitazione degli sprechi.
- *Legge 25 giugno 2003, n. 155*. Disciplina della distribuzione dei prodotti alimentari a fini di solidarietà sociale.
- *Legge 27 dicembre 2013, n. 147*. Disposizioni per la formazione del bilancio annuale e pluriennale dello Stato (Legge di stabilità 2014).
- LOI n° 2016-138 du 11 février 2016 relative à la lutte contre le gaspillage alimentaire.
- Opinion of Advocate General Tizzano, *Case C-229/01 Susanne Müller*, delivered on 10 October 2002
- Piano Nazionale di Prevenzione degli Sprechi Alimentari del Ministero dell'Ambiente, della Tutela del Territorio e del Mare adopted by Ministero dell'ambiente, 2014.
- *Regulation (EC) No 178/2002* of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.
- *Regulation (EU) No 1169/2011* of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and

repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004.

Scholarship:

- Adinolfi F., Fargione R., Vivani D., Sotgiu M., Coppola E., Riccio C., DIVULGA, Spreco e fame. *I costi economici, sociali ed ambientali dello spreco alimentare*, Aletheia, 2023.
- Arcuri S., *Food poverty, food waste and the consensus frame on charitable food redistribution in Italy*, Agriculture and Human Values, 2019.
- Aschemann-Witzel J., Bech-Larsen T., de Hooge I., and Oostindjer M., *Consumer-Related Food Waste: Causes and Potential for Action*, Sustainability, 2015.
- Azzurro P., PINPAS, *La donazione degli alimenti invenduti verso la semplificazione normativa*, 2015.
- Brennan L., Langley S., Verghese K., Lockrey S., Ryder M., Francis C., Phan-Le N.T., Hill A., *The role of packaging in fighting food waste: A systematised review of consumer perceptions of packaging*, Journal of Cleaner Production, 2020.
- Buseti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019.
- CHAFEA Consumers Unit, *Consumer research study to identify new ways of expressing date marking that meet consumers' information needs whilst minimising food waste*. Consultation on date marking policy options of the EU Platform on Food Losses and Food Waste and of the Working Group on Food Information to Consumers Regulation, 2021.
- Cristóbal J., Castellani V., Manfredi S., Sala S., *Prioritizing and optimizing sustainable measures for food waste prevention and management*, Elsevier, 2017.
- EFSA Panel on Biological Hazard (BIOHAZ), *Guidance on date marking and related food information: part 2 (food information)*, EFSA Journal, 2021.
- EFSA Panel on Biological Hazard (BIOHAZ), *Guidance on date marking and related food information: part 1 (date marking)*, EFSA Journal, 2020.
- Elsen M., van Giesen R., Leenheer J., European Commission, Directorate-General for Justice and Consumers EU Consumer Programme, *Milan BExpo 2015: A behavioural study on food choices and eating habits*. Final report, 2015.

- Eriksson M., Giovannini S., Kumar Ghosh R., Is there a need for greater integration and shift in policy to tackle food waste? Insights from a review of European Union legislations. SN Applied Sciences, 2020.
- European Court of Auditors, Combating Food Waste: An Opportunity for the EU to Improve the Resource-Efficiency of the Food Supply Chain, 2016 in Bianchi M., Fattibene D., Fighting against Food Losses and Waste: An EU Agenda, IAI, 2017.
- European Court of Auditors, Special Report, *Combating Food Waste: an opportunity for the EU to improve the resource-efficiency of the food supply chain*, 2016.
- European Environment Agency, *Managing municipal solid waste — a review of achievements in 32 European countries*, 2013.
- Eurostat estimates (2023) in Adinolfi F., Fargione R., Vivani D., Sotgiu M., Coppola E., Riccio C., DIVULGA, Spreco e fame. *I costi economici, sociali ed ambientali dello spreco alimentare*, Aletheia, 2023.
- FAO, 2010. *Innovations in food labelling*. Published by The Food and Agriculture Organization of the United Nations and Woodhead Publishing Limited, 2010.
- FAO, 2013. *Food Wastage Footprint. Impacts on Natural Resources. Summary Report*. Food Wastage Footprint, 2013.
- FAO, 2016. *Handbook on food labelling to protect consumers*, Rome, 2016.
- FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome, 2019.
- FAO, *Global Food Losses and Food Waste*, Study conducted for the International Congress *SAVE FOOD!*, 2011.
- FAO, IFAD, UNICEF, WFP and WHO. 2022. *The State of Food Security and Nutrition in the World 2022*.
- Franco S., Cicatiello C., *Levering waste taxes to increase surplus food redistribution at supermarkets: Gains and scenarios in Italian municipalities*, Waste Management, 2021.
- FUSION, Canali M., Östergren K., Amani P., Aramyan L., Sijtsema S., Korhonen O., Silvennoinen K., Moates G., Waldron K., O'Connor C., *Drivers of current food waste generation, threats of future increase and opportunities for reduction*, Bologna, 2014 and Eriksson M., Giovannini S., and Ghosh R. K., *Is there a need for greater integration and shift in policy to tackle food waste? Insights from a review of European Union legislations*. SN Applied Science, 2020.

- FUSION, Canali M., Östergren K., Amani P., Aramyan L., Sijtsema S., Korhonen O., Silvennoinen K., Moates G., Waldron K., O'Connor C., *Drivers of current food waste generation, threats of future increase and opportunities for reduction*, Bologna, 2014.
- FUSIONS (2016), *Recommendations and guidelines for a common European food waste policy framework*, 2016.
- Garrone P., Melacini M., Perego A., *Surplus food recovery and donation in Italy: the upstream process*. British Food J., 2016 in Busetti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019.
- Garske B., Heyl K., Ekardt F., Weber L.M., Gradzka V., *Challenges of Food Waste Governance: An Assessment of European Legislation on Food Waste and Recommendations for Improvement by Economic Instruments*, MDPI Land, 2020.
- Giordano C., Falasconi L., Cicatiello C., Pancino B., *The role of food waste hierarchy in addressing policy and research: A comparative analysis*, Journal of Cleaner Production, 2019.
- González Vaqué L., *French and Italian Food Waste Legislation: An Example for other EU Member States to Follow?*, European Food and Feed Law Review, Lexxion Verlagsgesellschaft mbH, 2017.
- Goulaki O., DG SANTE, EU Actions on Date Marking, EU Platform on Food Losses and Food Waste, 2021.
- Grant F., Rossi L., *The Italian Observatory on Food Surplus, Recovery, and Waste: The Development Process and Future Achievements*, Frontiers in Nutrition, 2022.
- Holthuysen N., Kremer S., Bos-Brouwers H., *The effect of date marking terminology of products with a long shelf life on food discarding behaviour of consumers*, Wageningen Food & Biobased Research, 2017.
- Holthuysen N., Kremer S., Bos-Brouwers H., *The effect of date marking terminology of products with a long shelf life on food discarding behaviour of consumers*, Wageningen Food & Biobased Research, 2017.
- Hudson U. and Messa M., Slow Food, 2016. Documento di posizione sulle perdite e gli sprechi alimentari. SIMeVeP, 2016.
- Lucchini M., Una bella lezione dell'Italia alla Francia, Legge anti-sprechi, 2016 in Busetti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019.
- M. M. Mekonnen and A. Y. Hoekstra. *The green, blue, and grey water footprint of crops and derived crop products*. 2011, Twente Water Centre, University of Twente, Enschede, The Netherlands.

- Malinauskaite J., Jouhara H., Czajczynska D., Stanchev P., Katsou E., Rostkowski P., Thorne R.J., Colon J., Ponsa S., Al-Mansour F., Anguilano L., Krzyzynska R., Lopez I.C., Vlasopoulos A., N. Spencer, *Municipal solid waste management and waste-to-energy in the context of a circular economy and energy recycling in Europe*, Energy, 2017.
- Matvett, “*Food waste reduction in Norway*”, 2020.
- Milne R., *Arbiters of waste: Date Labels, the Consumer and Knowing Good, Safe Food*, Sociological Review, 2012.
- Närvänen E., Mesiranta N., Mattila M., and Heikkinen A., *Introduction: A Framework for Managing Food Waste*, Food Waste Management, 2020.
- Ocicka B., and Raźniewska M. *Food Waste Reduction as a Challenge in Supply Chains Management*. Log Forum [online]. 2018 and FAO, 2019. *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*, Rome.
- Ocicka B., Raźniewska M., *Food Waste Reduction as a Challenge in Supply Chains Management*, LogForum, 2018.
- Paganizza V., A European overview on Regulation (EU) No 1169/2011 after the entry into force, *Rivista di Diritto Alimentare*, 2020.
- Parfitt J., Barthel M., and Macnaughton S., (Review) *Food waste within food supply chains: quantification and potential for change to 2050*, Phil. Trans. R. Soc. B, 2010.
- PINPAS, 2015 in Busetti S., *A theory-based evaluation of food waste policy: Evidence from Italy*, Food Policy, 2019.
- Plasil T., “*Best Before, Often Good After*”. *Re-scripting the date label of food in Norway*, Nordic Journal of Science and Technology Studies, 2020.
- Priefer C., Jörissen J., and Bräutigam K., *Food waste prevention in Europe – A cause-driven approach to identify the most relevant leverage points for action*, Resources, Conservation and Recycling, 2016.
- Przyrembel H., *Food labelling legislation in the EU and consumers information*, Trends in Food Science & Technology, 2004.
- Samotyja U., *The System of Date Labelling in the Food Supply Chain – The Weak Links from the Perspective of Final Consumers*, LogForum Scientific Journal of Logistics, 2021.
- Seberini A., *Economic, social and environmental world impacts of food waste on society and Zero waste as a global approach to their elimination*, SHS Web of Conferences, Globalization and its Socio-Economic Consequences, EDP Sciences, 2020.
- Trapè I., *Lo spreco alimentare e la legge italiana n. 166/2016*, 2017.

- United Nations Environment Programme (2021), *Food Waste Index Report 2021*, Nairobi.
- Valant J., European Parliamentary Research Service, *'Best before' date labels. Protecting consumers and limiting food waste*. Briefing, 2015.
- Vittuari M., Politano A., Gaiani S., Canali M., Elander M., Review of EU Member States legislation and policies with implications on food waste. Final Report. FUSIONS, Bologna, 15 June 2015.

Websites:

- DIVULGA website <https://www.divulgastudi.it/>
- European Commission Delegated Decision, 2019. See: https://food.ec.europa.eu/safety/food-waste/eu-actions-against-food-waste/food-waste-measurement_en
- European Commission website on *EU Platform on Food Losses and Food Waste*, available at: https://food.ec.europa.eu/safety/food-waste/eu-actions-against-food-waste/eu-platform-food-losses-and-food-waste_en
- European Commission Website on Food Safety available at: https://food.ec.europa.eu/safety/biological-safety/food-hygiene_en
- European Commission website, *Food Waste. About Food Waste*: https://food.ec.europa.eu/safety/food-waste_en
- European Commission website, *The European Green Deal Striving to be the first climate-neutral continent*. Available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
- European Commission, *Proposal for a revision of the Regulation on Food Information to Consumers (FIC)*, Food, farming, fisheries. Food Safety. Available at: https://food.ec.europa.eu/safety/labelling-and-nutrition/food-information-consumers-legislation/proposal-revision-regulation-fic_en.
- European Food Information Council, 2021. See <https://www.eufic.org/en/food-safety/article/best-before-use-by-and-sell-by-dates-explained>
- Eurostat, *Food waste and food waste prevention – estimates*, Data extracted in September 2023. Planned article update: 29 September 2024. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Food_waste_and_food_waste_prevention_-_estimates

- FAO website:
[https://www.fao.org/faoterm/viewentry/en/?entryId=173194#:~:text=Food%20business%20operators%20\(FBOs\)%20have,of%20food%20under%20their%20control](https://www.fao.org/faoterm/viewentry/en/?entryId=173194#:~:text=Food%20business%20operators%20(FBOs)%20have,of%20food%20under%20their%20control)
- FAO, *Tackling food loss and waste: A triple win opportunity*, 2022. Available at:
<https://www.fao.org/newsroom/detail/FAO-UNEP-agriculture-environment-food-loss-waste-day-2022/en>
- Food and Agricultural Organization of the United Nations website:
<https://www.fao.org/home/en/>
- The second EU-wide monitoring of food waste levels (2023). See:
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Food_waste_and_food_waste_prevention_-_estimates&stable=0&redirect=no
- UNESCO website, *Imminent risk of a global water crisis, warns the UN World Water Development Report 2023*: [https://www.unesco.org/en/articles/imminent-risk-global-water-crisis-warns-un-world-water-development-report-2023#:~:text=Globally%2C%202%20billion%20people%20\(26,Water%20Conference%20in%20New%20York](https://www.unesco.org/en/articles/imminent-risk-global-water-crisis-warns-un-world-water-development-report-2023#:~:text=Globally%2C%202%20billion%20people%20(26,Water%20Conference%20in%20New%20York).
- United Nations, Sustainable Development. The 17 Goals. Department of Economic and Social Affairs. Available at: <https://sdgs.un.org/goals>