

Article

The Social Production of Food Waste at the Retail-Consumption Interface

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Abstract: A major problem throughout the world, food waste is an issue that must be addressed not only by all actors in the agri-food chain but also without a silo mentality. To examine this problem, this article considers the interfaces between the stages of the agri-food chain, by emphasizing the interconnectivity of the different links in the chain, and focusing on the interface between retail distribution and consumption. We show that food waste is socially produced through the interactions and practices of the different actors within food systems. The study presented in this article results from a collaboration research project with two organizations involved in the food waste debate. The data analyzed are derived from an online survey of 1026 Quebec consumers and from 14 semi-directed interviews with retail distribution merchants in the Montreal area, Canada. By identifying, describing and analyzing the consumption and commercial and logistical management practices that contribute to food waste, our analysis demonstrates the existence of four symbolic processes that generate food waste at the retail–consumption interface: the economization of waste, the construction of edibility, the construction of freshness, and the moralization of waste. We argue that these processes should be considered when designing solutions to food waste.

Keywords: food waste; food chain; food system; retail; consumption; social practices; constructivism

1. Introduction

One-third of the food produced in the world is wasted [1]. Food waste figures prominently among the trends and challenges that will shape the future trajectories of global food and agriculture [2]. Combating food waste is therefore a central strategy in the quest for a more sustainable food future [3]. It is also a strategy for combating climate change, according to the Drawdown project, which ranks it third among the 80 best solutions for reducing greenhouse gas emissions by 2050 [4]. In addition, the 2019 report of the EAT-Lancet Commission identified the halving of global food waste by 2050 as one of the scientific targets and strategies to be implemented to ensure that humankind is properly nourished, that food production respects global limits, and that it meets the sustainable development goals of the United Nations and the Paris Climate Agreement [5]. As the Commission’s researchers note, such a transformation of the global food system must necessarily involve a multitude of stakeholders and their joint efforts, “from individual consumers to policy makers and all actors in the food supply chain” [5] (p. 448). From this perspective, those involved in the fight against food waste should avoid the silo mentality when analyzing the steps and stages of the food chain and instead consider the interconnectivity of the factors that contribute to its generation [6].

This call to consider the interconnectivity of the causes of food waste is particularly important in the field of consumption. Indeed, the major international study on food waste conducted for the Food and Agriculture Organization of the United Nations (FAO) points out that in industrialized countries, 40% of food waste occurs during retail distribution and consumption, but that discarded food is often still fit for consumption [1]. A literature review by Schmidt reports that several studies conducted in Western countries (Germany, United Kingdom, Italy, France, Austria, Switzerland, United States) conclude that households are the chief contributor of food waste and food wastage in general [7]. Such observations tend to place the blame on the consumer, and to build an image of a consumer without conscience or remorse, a participant in the so-called throwaway society [8,9]. Even in research on the causes of waste, approaches that focus on the intrapersonal factors of individual behavior can implicitly reinforce the image of a careless or irrational consumer [10].

This article considers the problem of consumption-related waste in light of the concept of the interfaces among the stages of the agri-food chain. By emphasizing the interconnectivity of the different links of the agri-food chain, this concept makes it possible to show that food waste is socially produced through the interactions among and practices of the different actors within food systems. More specifically, the empirical study presented in this article focuses on the interface between retail distribution and consumption. This interface in particular was chosen following the discussions among the researchers and two organizations that took part in this collaborative research project (see Section 3). The data analyzed are derived from an online survey of 1026 Quebec consumers and from 14 semi-directed interviews with retail distribution merchants in the Montreal area, Canada. By identifying, describing and analyzing the consumption and commercial and logistical management practices that contribute to food waste, our analysis demonstrates the existence of four symbolic processes that generate food waste at the retail–consumption interface: the economization of waste, the construction of edibility, the construction of freshness and the moralization of waste. The next section of the article elaborates on the concept of the interface and lays out the constructivist theoretical perspective, which allows us better to understand the connectivity of the stages of the food chain. The section after that presents our mixed research methodology and describes the empirical materials analyzed. The final section presents the results of the analysis for each of the four symbolic processes listed above. The conclusion, lastly, allows us to put forward some ideas concerning the fight against food waste.

2. The Retail-Consumption Interface and the Social Production of Food Waste

Understanding the phenomenon of food waste generally proceeds from two contradictory analytical angles: either by considering the different stages of the food chain separately or by adopting a holistic approach that highlights the systemic effects that generate waste. By insisting, in this section, on connectivity and interface in consumer and retail distribution practices, we propose a third way to understand food waste: as a socially constructed phenomenon.

The idea of the agri-food chain involves a series of steps linked in a linear fashion: food moves from one link to the next, transforming and accumulating value at each step [11]. The image of a chain allows these steps to be functionally distinguished and facilitates their division into relatively distinct units of analysis, such as production, processing, distribution and consumption. The danger of this linear model is that its overly compartmentalized view implies that the causes of food waste are inherent to the stages in which they appear [6]. As Diaz-Ruiz et al. point out in their whole-supply-chain analysis realized in the metropolitan region of Barcelona (Spain), “food waste is a structural problem, which is mainly linked to the current structure of the food supply chain and not to particular and isolated inefficiencies”, which can be solved with focused measures [12] (p. 15). In this perspective, many studies do concentrate on managerial approaches or management practices aimed at mitigating food waste in specific sectors as, for example, retail [13,14] and food services [15,16]. However, although logistical and technical flaws may obviously occur during the transportation, storage and handling of food by staff, the emphasis on effective management processes tends to obliterate marketing, planning

and consumption practices that generate a share of the surplus and unsold items that then end up in waste containers [13]. In addition, very often, isolating the links in the food chain in order to understand waste ends up highlighting the consumer, who is then considered responsible for a large proportion of food waste [10].

At the other end of the spectrum, a holistic and critical perspective can be adopted to understand how waste is a consequence of an organizing system dominated by a neoliberal and capitalist institutional order. Some have pointed out, for example, that consumers are “integrated into a system that, at the expense of many farmers and with great advertising costs, encourages them to buy too many products, which will end up in their garbage cans or will eventually be reflected in rising obesity figures” [17]. According to this perspective, actors in the food system participate in the “waste regime,” which is produced and maintained by a set of social institutions and conventions that regulate food production and distribution, such as agricultural policies that promote monoculture, overproduction and dumping; international trade agreements that legitimize structural inequalities between producers and consumers in the North and the South; the consumer culture largely organized by marketing; and state-regulated management of collective anxiety about health and biological risks [6,17,18]. Although the holistic perspective is useful for highlighting the structural problems throughout the agri-food chain, it is difficult to implement empirically to develop a detailed and local understanding of waste production.

This is why we suggest a third option: to define an intermediate unit of analysis, that is an empirically realistic fieldwork that emphasizes interconnectivity while being anchored in the day-to-day reality of actors, their practices and their immediate material contexts. To understand how waste actually occurs, we deem it necessary to look at the “interfaces” between the stages of the food chain, where concrete interactions between actors happen. We are not the first to propose such a strategy. Other researchers who have studied food waste have used the concept of interface, explicitly or implicitly. Mena et al. [19] find three categories of “root causes” of food waste (mega-trends in the marketplace, natural causes and management) at the supplier-retailer interface. Eriksson et al. [20] have shown how the wastage of fruits and vegetables in retail is related to agreements between retail and distribution actors. Ghosh and Eriksson [21] point to the same kind of agreements between suppliers and retailers to show how waste is produced in the bread industry. Lee [22] describes how the “retail landscape” influences food waste in households. All these examples demonstrate that the concept of interface is a productive and relevant unit of analysis to understand how food waste is generated through interconnectivity. In its simplest sense, an “interface” is “a point where two systems, subjects, organizations, etc., meet and interact” [23] or “a situation, way, or place where two things come together and affect each other” [24]. This notion therefore has the potential to refocus the analysis on the interconnectivity and reciprocity of the impacts of actors’ practices among the different links in the food chain.

In this research, we have studied the interface between retail distribution and consumption. We define the retail–consumption interface as a set of concrete physical places—such as the retail store, displays or the refrigerator—where the interconnectedness of the chain [13] is very concretely manifested through symbolic constructions, objective devices and practices that are shared by several actors such as managers, consumers and institutional entities. The originality of our approach is to analyze this interface through a constructivist lens: we argue that the actors interacting together in these spaces produce practices related to activities such as logistics, labelling, sales and purchasing, or cooking, which ultimately generate what we call the social production of food waste. This theoretical posture has methodological implications: it moves away from analyzing actors and stages of the food chain individually, and from analyzing the meta processes of the food chain. The main assumption is that focusing on the interface between specific actors and stages of the food chain will provide an original understanding of the production of food waste. The empirical and theoretical analysis of this interface is based on three main questions.

First, what are the symbolic constructions shared between retailers and consumers? Symbolic construction involves the intersubjective process of developing ideas, categories and definitions that allow social actors to refer to a more or less shared understanding of their social and material environment [25]. Symbolic construction therefore consists of giving meaning to the various manifestations of reality, in this case related to food. For example, if a given society considers parts of plants or animals edible, it is because of a process of symbolic construction involving many factors, such as social and cultural norms and practices, personal preferences, beliefs and food taboos [26–28]. In other words, the mental categories of edible and non-edible are generated through interactions between individuals and social structures, and are then transmitted through socialization. It is important to identify and describe symbolic constructions because they often reflect power issues and judgments about who is responsible for problems and solutions. The notion of food waste is thus an illuminating example of symbolic construction. In a systematic literature review that lists the different terms and definitions used in 19 scientific sources, Roodhuyzen et al. demonstrate that there are nuanced distinctions among different approaches to waste [29]. For example, we may assign the term “waste” to the last stages of the agri-food chain and speak instead of “loss” in reference to the first stages (harvesting and post-harvest). This suggests that waste results from a “disorderly, or incomplete or unnecessary use of resources,” which is indicative of overproduction in the food system [6,30]. And yet, while social actors do not always agree on the exact definition of food waste, they nevertheless recognize what it is and are able to tell us about it. At the retail–consumption interface, symbolic construction processes are numerous and involve concepts such as waste, loss, edibility, freshness as well as questions of accountability.

Secondly, what are the objective measures that embody these symbolic constructions? Eventually, the symbolic constructions are called upon to be objectified within mechanisms that structure the practices of social actors [25]. Objectification consists of embodying symbolic constructions in rules, norms, and technical or managerial measures capable of regulating the practices of the actors. For example, expiry date systems are an objective mechanism since, as tools for managing inventories and providing consumer information, they represent freshness and edibility and have a great impact on all actors at the retail–consumption interface. In this sense, objective devices have the effect of channeling and routinizing social activity [31].

Thirdly, what practices are developing at the retail–consumption interface? The concept of social practice refers to routinized behaviors embedded in given symbolic constructions and forms of objectification [31–34]. There is ample literature on social practices, particularly in studies of consumption and food systems [8,9,35–39], and these studies support in many ways what we seek to demonstrate in this article: that food waste is socially produced in the complex relationships among actors. To understand these practices, it is necessary to look at the concrete activities of individuals, the symbolic representations of these activities, and the objectified devices that they manipulate, consciously or not. This allows us to recognize the mutual influence between human actors and objects, technologies and infrastructure in shaping social activities such as food retailing, consumption and waste [40].

In summary, the idea of “social production” suggests that it is through the interactions of the various actors in agri-food chains that symbolic representations, objective mechanisms and practices that lead to food waste are organized. In order to study the social production of food waste at the retail–consumption interface, we must speak with the actors involved.

3. Methodology

From the start, this research was a collaborative project. It was initiated after informal and formal discussions (all parties were eventually tied to an agreement drafted by the university legal services) with a non-profit organization called La Transformerie, that works with retailers to process their unsold fruits and vegetables and sell these new products in their stores. Eventually another partner joined the project: a specialized media on consumption issues called Protégez-Vous. Both partners participated in designing the project and the methodological tools. This had an impact on the overall structure of the project and on methodological choices because the concrete needs of both partners were very much influential to the research design. As Table 1 shows, each member of the partnership

expressed specific needs in terms of knowledge production, favored a type of data and method, and had expected outputs.

Table 1. The research design of the collaborative project on food waste.

Partners	Needs in Knowledge Production	Type of Data and Method	Expected Outputs
La Transformerie	To learn more on how food waste is produced in retail stores, and on the consumers perceptions of food waste issues.	Qualitative method (semi-directed interviews with retailers) and quantitative method (consumer survey).	Research report [41] and media exposure.
Protégez-Vous	To learn more on consumption profiles and the food waste habits of consumers at home.	Quantitative method: consumer survey.	Media article on consumers habits and perception regarding food waste, and research report.
Researchers	To understand how food waste is socially produced through symbolic construction, objectives devices and practices, at the retail–consumption interface.	Mix methods: interviews and survey.	Research report and scientific paper.

In the following sub-sections, we outline the two methodological approaches that were chosen to analyze the symbolic constructions, the objective devices and the practices related to food waste at the retail–consumption interface: a qualitative survey for retailers and a quantitative survey for consumers. We also report on the relationship between the data and our interpretations, and on the challenges and limits of the methodological framework.

3.1. Semi-Directed Interviews with Retailers

The first data collection was based on a series of 14 semi-directed interviews with retail distribution merchants in the Montreal area. The sample is composed of nine representatives from six different chains (affiliated or franchised) of the three major food retail chains in Quebec (Loblaws, Sobeys, Metro) and five representatives from independent grocery stores (chains and single stores) in Montreal or the metropolitan area. According to the Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec (MAPAQ), the three largest chains account for 65% of sales of the grocery products sector in Quebec [42]. Although of modest size, the corpus of interviews reflects approximately this proportion. In accordance with the ethical approbation obtained for this project, the respondents to the interviews were initially contacted by La Transformerie who probed their interest to participate in the research. Some of these respondents were already working with La Transformerie, while others were new to the project. Following the first contact, the research team took over and led the interviews. The interview grid was designed to understand how retailers operate (with respect to inventory and display management), how they represent waste (e.g., definition of waste, role of consumers in producing waste) and what practices they use in an attempt to reduce waste. With three exceptions, all interviews were conducted at the respondents’ workplaces and all were conducted between January 31 and April 30, 2018. The average duration of the interviews was 37.5 min. The interviews were recorded on audiotape, transcribed and analyzed using the NVivo software. The content analysis of the interviews consisted in operations such as the generation of matrices with codes, word frequency searches and cooccurrence analysis in order to interpret the retailers’ statements and synthesize the shared symbolic representations and practices.

3.2. Consumer Survey

The second data collection was a survey conducted with a web panel of Quebec consumers. The online questionnaire (available to respondents in both French and English) was designed to highlight perceptions of food waste issues and consumption patterns, including those that either lead to or prevent food waste. To avoid influencing the results, the term “food waste” was used only once in the questionnaire, in the specific question: “For you, what is food waste?” (see Q12 in Table 2). The questionnaire was divided into three parts, dealing with (1) food purchasing, preparation and management practices; (2) food disposal: frequency, quantity, types of food, reasons, the ways to

minimize waste at home, etc.; and (3) consumer opinions on certain commercial practices related to food waste. Other questions in the survey aimed to ascertain the socio-demographic profile of respondents. SolutionStat, a polling firm, was commissioned to conduct the survey on the web, and data collection took place between December 21 and 28, 2017. The invitation to participate in the survey was sent to 7357 potential respondents participating in the online survey panel Legerweb, which is recognized by the Marketing Research and Intelligence Association (MRIA). Out of a total of 7357 invitations to participate in the study, 2106 people began filling out the questionnaire, constituting an opening rate of 28.6%. In the end, 1040 questionnaires were completed (constituting a completion rate of 49.4%), of which 1026 were validated and retained for analysis. The sample is non-probabilistic. To assess its validity, we compared the sociodemographic composition of the sample to the sociodemographic profile of the Quebec population. We found that the sample is slightly more masculine, older and more educated than the average Quebec population [41]. On average, respondents took about 22 min to answer the questions. The survey analysis was done using the SPSS software and was published in its entirety in a research report in September 2018 [41]. In this article, we present only the results of questions Q1, Q2, Q10 and Q12, these being the questions that pertain more directly to the issues addressed in this article. Q1, Q2 and Q10 use Likert-type scales, which allows for a ponderation of the importance given to statements by respondents. Table 2 presents the results of these selected questions.

Table 2. Results of the selected questions of the survey.

Questions	Not Important										Very Important		Total (9+10)
	0	1	2	3	4	5	6	7	8	9	10		
Q1. How important are the elements below when you select products while shopping for groceries?													
Taste	0.00%	0.0%	0.2%	0.2%	0.4%	1.9%	2.4%	7.0%	21.2%	26.0%	40.7%	66.7%	
Expiry date	0.30%	0.6%	1.5%	1.8%	1.4%	5.9%	5.4%	9.8%	17.1%	18.5%	37.8%	56.3%	
Price	0.2%	0.0%	0.1%	1.1%	0.7%	4.0%	4.4%	12.5%	22.1%	22.0%	32.9%	54.9%	
Nutritional value	0.3%	0.5%	0.6%	1.3%	1.0%	5.3%	8.4%	15.8%	25.3%	18.5%	23.1%	41.6%	
Your diet (vegan, vegetarian, omnivore, etc.)	11.7%	3.9%	4.1%	4.9%	3.4%	12.4%	10.5%	14.3%	14.3%	8.2%	12.3%	20.5%	
Aesthetic aspect of the food (e.g., food without blemishes, good presentation)	3.4%	2.3%	4.2%	5.5%	6.5%	12.2%	13.8%	17.6%	15.2%	9.6%	9.6%	19.2%	
Quality labels (organic, fair trade, GMO free, sustainable fishing, etc.)	7.5%	3.3%	5.3%	6.3%	5.4%	15.6%	11.6%	13.9%	14.9%	7.8%	8.4%	16.2%	
Aesthetic aspect of the packaging (appearance and good condition)	4.3%	3.0%	4.4%	4.0%	7.0%	16.3%	12.3%	16.8%	15.9%	7.5%	8.6%	16.1%	
Waste generated by the product	4.2%	2.7%	3.3%	6.5%	7.2%	16.3%	13.3%	15.1%	15.6%	8.0%	7.8%	15.8%	
Distance between the production site and the purchasing site	7.3%	4.8%	6.9%	7.4%	4.9%	18.0%	11.8%	15.2%	12.9%	5.4%	5.5%	10.9%	
Brand	3.4%	2.6%	4.5%	6.5%	7.1%	18.1%	14.5%	19.5%	14.2%	5.0%	4.5%	9.5%	
Support for a social cause (e.g., a % of the price goes to an organization)	8.8%	4.7%	6.3%	9.3%	5.8%	20.0%	12.8%	14.1%	10.2%	4.8%	3.3%	8.1%	
Novelty of a product	8.6%	4.7%	7.4%	8.7%	8.1%	21.9%	12.9%	13.5%	9.2%	2.6%	2.5%	5.1%	
Q2. How important do you consider the following criteria when evaluating the quality of a food product?													
Freshness	0.0%	0.0%	0.2%	0.1%	0.6%	0.9%	1.9%	7.3%	20.4%	25.1%	43.5%	68.6%	
Taste	0.0%	0.1%	0.2%	0.0%	0.4%	1.2%	2.2%	6.1%	22.3%	25.0%	42.4%	67.4%	
Price	0.8%	0.0%	0.6%	0.5%	1.5%	5.4%	5.2%	11.7%	23.5%	20.8%	30.2%	51.0%	
Ripeness	0.0%	0.1%	0.4%	0.6%	1.8%	5.7%	10.2%	19.7%	27.9%	17.1%	16.7%	33.8%	
Whether the food is produced locally	2.3%	1.2%	2.7%	2.4%	3.7%	10.1%	10.4%	15.3%	21.2%	15.0%	15.5%	30.5%	
Appearance	1.2%	0.8%	1.7%	2.6%	3.1%	9.6%	12.0%	17.8%	23.9%	13.9%	13.4%	27.3%	
Whether the food is in season	1.3%	0.4%	1.20%	1.90%	2.40%	12.8%	10.8%	18.1%	25.5%	12.5%	13.2%	25.7%	
Whether the food has a label (organic, fair trade, GMO free, etc.)	8.8%	3.7%	5.5%	5.4%	5.9%	17.5%	12.1%	13.2%	15.7%	6.3%	5.9%	12.2%	
Brand (if applicable)	3.0%	2.3%	5.5%	5.6%	6.0%	17.0%	15.2%	19.2%	14.5%	6.5%	5.1%	11.6%	

Table 2. Cont.

Questions	Not Important										Very Important		Total (9+10)
	0	1	2	3	4	5	6	7	8	9	10		
Q10. Why is food thrown away (or composted) in your household?													
I always follow the expiration dates and “best before,” “use by” and similar comments	22.1%	6.2%	5.8%	5.8%	5.4%	11.1%	7.0%	8.8%	9.7%	6.6%	11.3%	17.9%	
The organization of food in my refrigerator and pantry	31.7%	9.6%	8.2%	5.4%	4.6%	8.6%	8.3%	8.5%	6.9%	4.1%	4.3%	8.4%	
I don’t know whether a particular food is still healthy to consume	29.9%	9.9%	8.2%	5.9%	5.1%	9.6%	7.3%	9.1%	8.1%	2.6%	4.3%	6.9%	
I often buy a greater quantity than expected to take advantage of 2-for-1 type specials	34.0%	10.2%	8.6%	7.3%	5.5%	8.8%	7.1%	6.3%	6.2%	2.3%	3.6%	5.9%	
I don’t have enough time to cook and prepare meals	37.8%	11.1%	7.6%	5.5%	4.4%	10.7%	6.4%	6.3%	4.5%	2.6%	3.0%	5.6%	
The quantity of food contained in the packages is more than I need	28.6%	9.6%	7.6%	6.6%	6.0%	11.9%	8.5%	8.3%	7.5%	2.4%	3.0%	5.4%	
I plan my meals and purchases poorly or not at all	34.2%	12.6%	7.9%	7.5%	5.3%	9.8%	7.0%	5.1%	5.5%	2.6%	2.5%	5.1%	
I don’t know very much about how to optimally store food	38.7%	11.1%	9.1%	6.7%	4.6%	9.6%	5.8%	5.0%	5.1%	2.2%	2.2%	4.4%	
Whether planned or otherwise, I eat several meals outside the home	39.0%	13.1%	8.6%	4.9%	5.3%	8.9%	6.1%	5.8%	4.1%	1.9%	2.3%	4.2%	
I find it hard to evaluate the quantity that I need	33.0%	12.3%	8.6%	6.4%	4.6%	11.3%	7.3%	7.4%	5.5%	1.5%	2.1%	3.6%	
I have little knowledge of or expertise in cooking, food processing or meal preparation	43.3%	12.6%	9.3%	6.3%	5.4%	9.7%	3.6%	3.2%	4.2%	1.0%	1.5%	2.5%	
	<i>Does not contribute</i>						<i>Strongly contributes</i>						
Q12. What does food waste mean to you? <i>Open question. Answer in your own words in the box below.</i>													

3.3. Collaborative Research, Mix Methods, and the Interpretation of Data

As explained above, this research was a collaborative project that combined the needs and expectations of three partners. This reflects a current trend in sustainability science that advocates the co-design of “solutions-oriented” research [43]. Such a type of research projects, however, implies specific methodological challenges that, as a consequence, tend to limit the potential generalization of our findings. One is that the research partners may pursue various goals in the research and expect different outputs (as shown in Table 1). Consequently, from the researchers’ point of view, data collection and analysis may be organized in a way that favors the goals of the partners over their own. At later stages of the research process, researchers may find that the data is difficult to systematize in a way that is directly coherent with their own research goals. In our case, the consumer survey was not entirely drafted to inform the retail–consumption interface. This is the reason why we focus only on Q1, Q2, Q10 and Q12 of the survey in this paper (see Table 2).

The integration and interpretation of quantitative and qualitative data is another challenge of our research design. Quantitative methods, especially, are often considered as “positivist” in the sense that they are supposed to reflect the reality of the social world by outlining causality and correlations between variables, for example. Our constructivist theoretical posture and the focus on symbolic processes, however, imply a more “interpretive” perspective, which means that the data reflect only the actors’ interpretations of their own actions and reality, and that these interpretations and symbolic constructions allow for a better understanding of how things work (how food waste is socially produced, for example). Hence, we have treated the data from the consumer survey in a similar way as the data from the interviews with the retailers: they both contribute to understanding how retailers and consumers interact and on the basis of what opinions, ideas, values, etc. The two data collections remain asymmetrical, but the analyses below show that their combined interpretation

allows for the identification and description of four processes through which retailers and consumers take part in the social production of food waste.

4. The Four Processes of the Social Production of Food Waste

The ways in which people conceive of and define food waste provide a window into the symbolic and objectification processes and on the practices that take place at the retail–consumption interface. Our analyses show that four processes are involved in the social production of food waste: the economization of waste, the construction of edibility, the construction of freshness, and the moralization of waste.

4.1. Loss, Surplus Food and the Economization of Waste

It is revealing that, for the managers interviewed in this study, “waste” occurs primarily in households—and not, therefore, in food stores. To refer to food disposed of in stores, managers use the word “loss” or “surplus food” instead. In food management practices, however, there does not seem to be consistent definitions of these three terms; indeed, some managers affirmed that their company does not have a precise definition for them (Respondent 11). The challenge of clarifying these terms can possibly be attributed to the fact that they encompass a wide range of processes, from edibility, handling and management practices, to the donation of food to food banks:

For example, I might have surplus food that’s still good and surplus food that’s no longer good. Is the surplus food that’s no longer good “waste”? Not necessarily; it depends on how we have treated it. Because we monitor our fruit and vegetable sections, we rotate them, but sometimes things ripen much faster, without us noticing, for all kinds of reasons. So there’s really a difference for me. Loss includes the surplus food that I can return or send to Moisson Montreal (Moisson Montreal is a food bank on the island of Montreal. It is the food bank that distributes the most food in Canada). Waste, for me, means that we didn’t really pay attention (Respondent 12).

Indeed, even scientists and institutions fail to clarify the definitions of these terms. For example, “surplus food” is defined as “edible food that is produced, manufactured, retailed or served but for various reasons is not sold to or consumed by the intended customer” [44]. Surplus food can thus become food loss, though this can be avoided if it is repurposed—donated to food banks, for example. The notion of “food loss” refers to foods that spoil and undergo a significant deterioration in quality before reaching the consumer [3,45]. In this context, the fact that food can be transferred to food banks does not prevent it from being considered a loss in terms of commercial value. In France, as part of a study carried out with food retailers, the French Environment and Energy Management Agency (ADEME) defined food waste as “all products that do not yield a retail value but that are still edible for humans” [46]. Hence, according to this definition, even foods that are donated (and consumed) are considered food waste, since they remain “financial losses.” The same is true in a study conducted by Value Chain Management International in 2014, whose calculation of the “cost” of food waste in Canada (\$31 billion) considers food waste to comprise all foods that go to landfills and biodigesters, or are composted, processed for animal feed, or even redistributed to food banks [47].

Overall, these attempts to define food waste, surplus and loss result in conceptions of food value that vary only slightly. These definitions suggest that even food no longer holding any commercial value retains nonetheless an intrinsic use value: to feed people. More generally, however, it is noteworthy that an approach to the problem of food waste that resorts primarily to the categories “loss” and “surplus food” constitutes a perspective that is above all economic. This comes across very clearly in the statements of food store managers:

Here, we try to make sure that we don’t have too much surplus food, because in the end it’s a waste of money. It results in an overall loss (Respondent 3).

I mean, we don’t want to waste. It amounts to the same thing: minimizing waste and loss as much as possible. For me, that’s it. It’s the same, it’s less turnover, less loss (Respondent 9).

This economic perspective, which translates the loss of food into an economic loss, is also shared by some consumers. A percentage of 7.7% of the sample (79 respondents out of 1026) associate food waste with monetary loss, with some expressing this bluntly in response to the open-ended question on the definition of waste: “It’s like throwing money directly into the garbage,” “throwing away my hard-earned dollars,” “waste of money and time,” “It’s a waste of money and is harmful to the environment.”

At the retail–consumption interface, then, the symbolic association of food with money is widespread. According to many retailers, losses are even “part of doing business” (Respondent 11). This is a way of saying that in the food trade, losses are conceived of in monetary terms and are seen as “natural side effect” in the retail sector [13]. This process of objectification can be observed in management activities that concern the calculation of losses and surplus food. These activities, however, are not the same across all stores; we found evidence, for example, suggesting a link between the level of information that managers have about their losses and the type of approach they adopt. We distinguish between two main ways of objectifying loss: indirect measures and technological management.

For some types of food, particularly fresh produce such as fruit, vegetables and meat, the collection of information on losses is not always rigorously collected. Some retailers told us that they do not keep track of the variety, volume or cost of the food they remove from the shelves, because they do not see “the added value of doing so” (Respondent 1) or because “it’s a lot of management” (Respondent 9). The tracking of losses is therefore done “visually,” as Respondent 1 explains: “I don’t know to the nearest dollar, but I know about how much [I’m losing]. And I’m aware of that more or less day to day, because we always have our eyes on what’s going on in the store.” Another manager (Respondent 2) acknowledged making estimates “by sight” and doing financial calculations “much more so when losses are in the order of full boxes,” while for the rest, “I’m not able to quantify it by the week.” The information available to some merchants on losses is therefore often indirect in nature. For example, it may be based on the calculation of the weight of the waste container and an approximate conversion into dollars, which is an accounting operation consisting of comparing purchases and sales over a given period. Such indirect measurement practices appear to be more prevalent among independent brand merchants and franchises. What is important to remember is that in a context where information on discarded foods is lacking, managers have no way of assessing losses other than in dollars. Thus, although very imprecise, this approach is nevertheless a way of objectifying losses.

A second method of objectification is through the technical management of inventories. This is practiced primarily in chain grocery stores, where sophisticated management systems ensure integrated tracking of orders, sales, inventories and losses. Such systems are imposed by the parent company and are standardized across all store locations. In a sense, they are designed to better limit losses and facilitate planning: “You weren’t able to order more than a given quantity of a product if that product had been sold for such and such an amount for a similar period of time, basically. So the system takes this into consideration in order to avoid mistakes or over-ordering” (Respondent 11). Unlike the indirect measures listed above, these systems are based on a fairly detailed accounting of commodity flows: “Price, weight, quantity. Everything is taken into consideration” (Respondent 13). Another function of these management systems is to compare store performance. As one respondent explained, “it allows us to benchmark stores against one another. Why are you throwing away twice as much as the other one? It allows us to analyze practices and see how we can improve” (Respondent 4). These systems therefore help chain stores establish acceptable loss scales to ensure sufficient sales—in other words, they normalize a certain level of losses within the business model of food retail businesses:

If you want to sell a product, you’ll invariably have a loss, especially with fresh products. For example, if I want to sell 10 pieces of meat, I probably have to arrange for 12, because if I only display 8 at the counter, I’ll lose money. I’ll lose out on a sale (Respondent 12).

We’ll always get about 4% [of food loss], that’s normal. You have to be able to offer variety, that’s the way it is (Respondent 4).

Loss is therefore considered normal, and is accordingly internalized in business models and at the same time objectified in a sophisticated calculation system that works thanks to a wide range of technical objects ranging from barcode scanners, to loss accounting software, to indices used to compare businesses with one another.

Ultimately, whether it is indirect and approximate measures or highly technical inventory systems, losses always reappear in the form of dollars, because “of course, at the end of the day, there’s only one measure that matters, and that’s how much it costs” (Respondent 13). This is how the representation of losses in monetary terms, as well as measurement and management systems, objectify food waste—at least in some form. It is this symbolic construction, with the corresponding forms of objectification, that we call “the economization of waste.”

4.2. From Edibility to Expiry Date

We have explained above how the edibility of food is an issue that is by and large social and cultural, albeit also related to its materiality. In fact, to understand how the transition from food that is edible to food that is *no longer* edible takes place, we must first consider the degree to which subjectivity and interpretation are central, as much on the part of retailers as on the part of consumers. When asked about the criteria for what should be thrown away, one manager justified his practices as follows: “What gets thrown away isn’t good anymore at all; it’s rotten or non-recoverable. It’s not just because it’s damaged” (Respondent 2). This statement suggests several possible characteristics of “inedible” food: not good, rotten, non-recoverable and damaged. This type of observation, which we heard repeatedly (and to which we’ll return in Section 4.3, where we discuss freshness), shows that the evaluation of the physical characteristics of foods is based on a series of individual judgments about their condition. Consumers also rely on this type of evaluation; in the open-ended survey question about the definition of food waste, they—256 to be exact—mobilized a series of binarities when discussing the notion of edibility, such as food that is good vs. not good, consumable vs. rotten, and safe vs. not safe.

Thus, each individual, whether working in the supermarket or examining their own refrigerator, must make decisions that are often subjective about the edibility of food [48]. These decisions involve multiple considerations, some economic (see Section 4.1) and some moral (see Section 4.4), and therefore a certain amount of effort is required to arrive at the most objective judgment possible. Some objective edible parameters, such as expiry dates, are of great help. Indeed, consumers in our survey identified the expiry date as the most important factor prompting them to throw out food at home (see Q10 in Table 2). More specifically, nearly 18% of the sample indicated that this factor contributes significantly (scores of 9 or 10 out of 10) to their discarding of food, which represents a substantial difference from the other factors mentioned. On the retailer side, and for similar reasons, the expiry date is likewise a very important factor in inventory management.

The expiry date is a good example of a parameter for objectification; it draws a clear line between the “before” and the “after,” which guides both consumers’ choices and retailers’ management methods. The date, which is visible on the packaging of a wide range of foods on display, provides information that, although not always well understood, is explicit and legible. Tsiros and Heilman have shown that products approaching their expiry date are perceived as being of a lower quality by consumers, who are then less inclined to buy them [49]. In fact, the date labelling has an impact on the perception of a product’s freshness and healthfulness [50]. The consumer survey indicates that 56% of respondents consider a product’s expiry date to be a very important (ratings of 9 or 10 out of 10) factor that can influence their purchasing choices (see Q1 in Table 2).

However, in both the consumer survey and the interviews with retailers there is considerable confusion about how the expiry date system works and what the dates themselves actually mean. This is not surprising, since expiry dates, as a way of categorizing information for consumers, significantly oversimplifies complex issues of freshness and preservation. Yet in Canada, “a durable life date is not an indicator of food safety, neither before nor after the date. It applies to unopened products only;

once opened, the shelf life of a food may change. Products may be found for sale after the ‘best before’ date has passed as the date is based on freshness and quality rather than safety” [41].

In Canada, expiry dates are governed by the Food and Drug Regulations of the Canadian Food Inspection Agency (CFIA). These regulations require that the labels of prepackaged products with a shelf life of 90 days or less must indicate the date and storage instructions (if applicable). For foods with a shelf life of more than 90 days, manufacturers or retailers are not required to provide a “best before” date, storage instructions (e.g., “store in refrigerator”), packaging date or shelf life information, but may do so by following the statutory reporting format [51]. The CFIA specifies that “the durable life of products or categories is not prescribed in regulation.” This means that it is the responsibility of manufacturers or retailers to determine the shelf life of products and to decide on expiry dates based on the type of food. It is therefore necessary, once again, to look at management practices to understand how this objective mechanism contributes to generating food waste.

Our discussions with retailers showed that expiry dates are indeed a fundamental issue within the food retail sector. The issue is even considered to be at the heart of the grocery store business, since “the expiry date is the base, it’s the first thing you learn when you come to work in a grocery store” (Respondent 12). Retailers also recognize that the expiry date is an important factor in the generation of losses and waste, and yet paradoxically, although numerous managers consider it questionable or too severe as an indicator of edibility, they tend to apply it with an overzealousness that results in the hasty or premature disqualification of certain products.

Several respondents stated openly that the expiry date system is too strict and acknowledged that most foods removed from the shelves because of the expiry date would be safe to eat. For example, one retailer said “I think we live in a somewhat over-regulated society. There are products, like yogurt and eggs, that have very close expiry dates. Yogurt, if you eat it the next day, you won’t get sick” (Respondent 1). Many also note that expiry dates have recently appeared on products that did not have them before, such as chips and canned food. Others suggest that expiry could be better expressed in terms of the function of products; for example, instead of a specific date, a color code could indicate a level of freshness. Others still argue that MAPAQ, which oversees inspections in food establishments in Quebec [52], is more stringent than other jurisdictions with regard to expiry dates.

The expiry date system is therefore subject to some dispute, yet it is nonetheless at the heart of food retail inventory management. For large chains (the situation is different for small independent grocers), inventory management revolves around the expiry date to the point where some managers conceive of their work as “date management”, not food management:

We work with a date system where we know that a product, because it’s labelled, has been packaged on a given day, and when it’s reaching its expiry date. So with certain products those dates come sooner, and we work with that to control our stock. So that’s a main part of working in a fresh produce section [. . .] you calculate your dates (Respondent 12).

In chain stores, this management is computerized and standardized. Database systems support managers and clerks in tracking product dates, and internal audit systems assist with their rigorous application. While these measures aim in particular to ensure compliance with expiry dates for health reasons, they are implemented with a degree of zealotry that clearly exceeds the initial intention of the rules. For example, retailers of some large chain stores readily admit that products are removed from shelves even before the expiry dates are reached, especially processed products, baby products, dairy products, and meat and sausages. For example:

At [chain store], we protect ourselves even more. We want to be the best in food safety. So let’s say with fresh produce, ready-to-eat, cheese or ham, normally you’ll never see a product with an expiry date of the current day. That counts as surplus food and food loss. [. . .] So, while the MAPAQ is strict, we set ourselves even stricter food safety criteria (Respondent 4).

Thus, the internal standards of the major chain stores exacerbate the tendency of the expiry date system to generate food losses, even though this system is also considered too strict by retailers. As some of the quotes above show, this situation is the result of business strategies that aim, on the one

hand, to avoid controversies that may be related to food safety and expiry and, on the other hand, to satisfy consumers' perceived requirements with regard to freshness. These strategies have significant consequences, since, as we have seen, consumers tend to rely significantly on the expiry date system when managing their own refrigerators at home. Our study is in line with the conclusions of Milne, who described this type of system as a social production resulting from compromises between the interests, real or perceived, of the agri-food industry, governments and consumers, and offering a response to social anxieties about the food system [53].

4.3. *The Construction and Implementation of Freshness*

The notion of freshness plays an important role in consumption practices and in the organization of food waste. The consumer survey revealed that 69% of respondents prioritize freshness highly (ratings of 9 or 10 out of 10) when determining the quality of a food product (see Q2 in Table 2). As for retailers, most of them stated that they consider it their duty to ensure and promote the freshness of their products: "It's really the mentality of fresh, fresh, fresh only," said one of them (Respondent 5). Like edibility, freshness is directly related to the materiality and temporality of food: through fermentation, oxidation or other chemical or biological phenomena that take place over time, food transforms until it eventually becomes harmful to health. Determining the freshness of a food is therefore to impose a limit—often arbitrary—based on its materiality and temporality. This limit is difficult to determine, because it is crossed as a result of "the convergence of diverse concerns and pressures, including of routine, anxieties, care, time and space" [36] (p. 110). As a symbolic construction, freshness has particular qualities and management features that can be found in both domestic and commercial spaces.

Our empirical analyses show that certain measures such as the expiry date are often used by consumers to judge the freshness of a product. For certain products such as fruits and vegetables, however, there is no designated expiry date, forcing consumers to rely on more or less objective evaluation criteria, such as the appearance of the packaging, food price or firmness. However, in the absence of any objective criteria, retailers must develop and implement a series of mechanisms to objectify freshness, such as ensuring that routine evaluations based on sight, taste and feel are performed automatically and systematically (see Q2 in Table 2). At both the point of purchase and the point of consumption, the actors set up personalized control systems that are more or less systematic and more or less objective. It would appear, then, that the flaws in these customized control systems result in potentially healthy foods being thrown away.

In smaller grocery stores, too, freshness assessment practices are based on subjective judgments and can be flawed. In fact, "freshness controls," "quality checks" or "freshness check" are part of a routine practice in all our respondents' businesses: every morning or twice a day, employees examine fresh products likely to be rejected on the basis of certain physical characteristics. This practice is undeniably systematic: it is periodic; it includes rules such as product rotation on the shelves; and it is based on a series of criteria for assessing the freshness of products. These criteria once again fall largely within the scope of the sensory assessment of food by staff trained to identify soft tissue, bruises, stains and wilting on fruit and vegetables and, on meat, cut quality and color. Equipped with this general notion of freshness, the staff doing the rounds judge whether the products are "pretty," "still good," or, to put it another way, whether they meet a store's advertised standards (Respondent 1). At the end of these control procedures, part of the inventory is removed from the shelves and becomes surplus food or food loss. However, since all these criteria are assessed "by sight" (Respondent 6), "require the use of common sense" (Respondent 1) and "hinge at all times on everyone's level of sensitivity" (Respondent 4), the implementation of freshness control is essentially an exercise in judgment.

In the fresh produce sections of grocery stores, then, freshness control necessitates the systematization of subjective criteria. This is not surprising, since this type of "ritual," which contributes to objectifying the notion of freshness, also occurs at various stages of food consumption practices [28]. At the distributor-consumer interface, the ritual of freshness control makes it possible to

restore the appearance of objectivity to a category of food between “fresh” and “loss,” and thus to manage a “reputation risk” with regard to their perception of consumer expectations.

Retailers are very concerned about the risk of selling food that may be considered “not fresh.” Sometimes this is a public health issue (especially in the case of meat), but it can also be a brand issue. Hence, freshness control is largely about managing consumers’ expectations:

We do the freshness check, and after that the customers use this as a criterion too. They want the store to be nice, they want it to be clean, prettier than the competition. Because it’s about freshness. So when we do the checks, we’ll remove products that don’t meet the freshness criterion (R11).

Here, grocery shelves are clearly seen as a material aspect of the interface between retail distribution and consumption. They are the very place where food is visually and tangibly appreciated not only by staff but also by consumers. In this sense, they are the place where the differences in peoples’ representations of freshness become clear, through selection practices that are distinct for any given group. These practices are incomprehensible without taking into account intersubjective representations of freshness—in other words, what retailers believe freshness means to the consumer in contrast to what consumers actually expect from their food store in terms of freshness.

For example, some retail managers stated in interviews that the consumer is looking for the “perfect product” and that this contributes to waste by generating surplus food that does not meet consumers’ criteria. These managers observe that this quest for perfection affects the food that is put on the shelves each day. According to the retailers, for products without an expiry date, mainly fruit and vegetables, customers’ selection criteria are so demanding, and the customers themselves so exacting in their control processes, that this generates losses. Consumers are so attentive to the quality of fruit and vegetables that they “will touch them” (Respondent 12); they “touch the products a lot [. . .] and will not take products that are in any way bruised” (Respondent 11). This, too, recalls the materiality of food, since the handling of fresh food contributes to its degradation, in turn resulting in more sieving out by consumers and by staff in charge of the freshness checks. A similar phenomenon can also be observed for products with an expiry date (especially meat, fish and dairy products), where consumers tend not to be content with mere compliance and instead look for the farthest possible expiry date at the back of a shelf, even if this means fiddling around with the packaging and handling the products. Although this practice necessarily generates surplus food, retailers are sympathetic, since “people will always want what’s freshest [. . .] that’s human nature. We’ll always opt for the freshest” (Respondent 1).

The intersubjectivity that dictates the symbolic construction of freshness thus contributes concretely to the social organization of waste not only in refrigerators and warehouses but also on the shelves of supermarkets, which represent the veritable materialization of the retail–consumption interface. This symbolic construction develops through a set of judgments on food quality, freshness objectification measures such as retailers’ “freshness controls” and consumers’ personalized controls, and through the perceived expectations of the various actors in the interface.

4.4. *Moralizing Food Waste*

A fourth symbolic construction process at work at the retail–consumption interface is the moralization of the problem of food waste. In the public sphere, debates on food waste are often framed in emotionally laden terms, such as the “global shame” referred to in a FAO’s document [54]. These judgments, as well as analyses that attribute responsibility for waste to particular actors, tend to present this phenomenon as a moral issue. The conception of food waste that develops at the retail–consumption interface is not exempt from these moral judgments. Our analyses show that, among the actors of this interface, postures of denial, projection and internalization account for the moralization of food waste, which can be either a divisive or a unifying force between retailers and consumers.

Denial is an attitude that characterizes retailers more than consumers. Store managers do not readily admit responsibility for their activities in generating waste. Hiding behind standards, routine management processes, and even the quest for efficiency associated with their private enterprise status, store managers claim to take all possible measures to avoid losses and waste. For example, they claim that waste “doesn’t really occur in store” (R4) and that “grocery stores have been setting up freshness checks, inventory rotations, over-processed products, etc., for a long time now” (Respondent 7) to combat losses. On the consumer side, the survey reveals that 83% of consumers believe they “don’t waste” or “waste only small quantities occasionally.” This figure is inconsistent with recent research statistics that identify consumers as the main generators of waste in industrialized countries [1]. In the open-ended question of the survey, respondents sometimes denied the role of the consumer in food waste, for example, with judgments such as “individuals don’t make much food waste.

As a posture, projection can complement denial. Without denying their individual responsibility, some survey respondents, in the open-ended question, “project” responsibility for the problem onto another actor, such as retailers and companies in general, even going so far as to state that “corporations throwing out food they don’t sell and won’t give for free. Sometimes even pouring bleach on it to make it inedible.” The idea that “restaurants or grocery stores throw away instead of giving to the poor” likewise obviously moralizes the problem through projection. Other consumer responses that project responsibility for waste refer, for example, to oversized portions in restaurants, poor inventory planning by retailers, and overproduction in the agricultural system.

As if responding to these accusations, many managers attribute responsibility for waste to consumers, namely for two reasons. First, they target the domestic space, saying, for example, that “for me, waste is really more at home. People who buy, who don’t know what to do with things and it ends up in the garbage. That, I think, accounts for more waste” (Respondent 8). This projection posture does not, therefore, involve retail stores. Second, however, managers do adopt a projection posture that locates the responsibility for waste within the food store itself. In these cases, the behaviors described in the previous sections, such as the handling of food in stores and consumer’s search for the “perfect product,” are believed to generate waste. In the same vein, consumer’s supposed expectations regarding fruit and vegetable sizes are seen to “force” retailers to waste.

Finally, many survey respondents expressed in writing that they assume responsibility for food waste, at least in part. This is what we call internalization. The sober recognition that domestic space generates waste is often thrown into relief by the idea that it is just one of many places where the problem exists. Thus, waste “represents all avoidable losses throughout the food production chain. From the point of departure (harvesting, slaughter, . . .) to the consumer’s table.” In addition, several comments testify to a certain resignation in this attitude of internalization, such as: “but I can’t help it if sometimes food doesn’t get eaten and it turns bad. So it’s 50% of me that cares about it and 50% of me who just thinks that it’s unavoidable.” In short, just as losses are considered to be part of the business model of food stores, so we can assume that the domestic space also inevitably generates a certain amount of waste. However, other respondents seem to associate a sense of guilt about this waste in the domestic space. They then make comments referring to remorse, repulsion and other negative emotions in their relationship with domestic waste, using terms such as “unconscious,” “shame,” “drama,” “sin” and “unacceptable.” Throwing out food “disturbs,” “makes you somewhat guilty.” Several respondents pointed out that the food injustice and food crisis besieging some parts of the world make this problem even more serious: “Considering the amount of food wasted in our country and the large number of hungry or starving people in the world, I find it terrible—even immoral”.

The moralizing aspect of internalization is therefore very clear. However, internalizing guilt is not only the prerogative of consumers. Based on both the scientific literature and our interviews, some retailers acknowledge their role in the problem of waste, expressing regret and affirming their intention to combat the problem. Swaffield et al., for example, examined the motivations of UK retailers to act against food waste and found that while financial and reputation justifications are significant, a sense of civic responsibility is also among their main motivations [55]. The fight against waste is thus conceived

as a moral issue that must be addressed in a world where poverty and environmental problems persist. In this sense, one of our respondents stated that “I, [in all the various positions I have held in the company], saw waste and all that. It’s a practice that we try to avoid as much as possible and we try to find solutions to solve it” (Respondent 8). This moral sense may explain why the donation of surplus food was practiced by 13 out of 14 respondents, who had formal or informal agreements with community organizations or food banks, and who donated on a regular or sporadic basis.

In summary, the three ways of moralizing food waste effectively present reductive visions of the problem. Even while constituting the symbolic dimension of the social production of food waste at the retail–consumption interface, these moralizing attitudes actually make the problem less intelligible.

5. Conclusions

A better understanding of the social production of food waste should lead to a discussion about the solutions, which was also a goal of this “solution-oriented” collaborative research. In fact, a growing literature focuses on the various strategies to prevent and mitigate food waste within the agri-food chain. While many of the solutions tagged as “valorization” imply more technical and managerial innovation [56,57], others rest on rather social innovation such as food sharing [58,59]. These solutions can be prioritized according to their environmental, social and economic impacts at the different steps of the food chain [60]. The prioritization of solutions should then focus on a fair evaluation of the sustainability benefits. The case is also made for a multifold strategy that would address many “entry points” of the food consumption model [61]. While our findings are limited to the retail–consumption interface, they point to taking into account the sociological processes that underlie the development and implementation of the solutions.

In this article, we have shown how food waste can be analyzed as the result of interactions among various actors and stages of the food chain. It is socially produced in the sense that it results from the organization of social practices, objective measures and symbolic constructions concerning the economic aspects, edibility and freshness of food, as well as the moralization of discarding potentially edible food. Food store managers and staff, consumers, as well as public policies and devices such as expiry date systems are all involved in these intersubjective processes that highlight the connectivity of the different stages of the food chain.

To conclude, we propose that the same processes do apply in the development of potential solutions to food waste. Hence, strategically, these solutions could be thought of as social productions and promote reflexive symbolic constructions and forms of objectivation. In fact, the issue of the solutions involving both retail and consumption was an important aspect of this collaborative research project since La Transformerie was planning to launch a brand and a range of products issued from the processing of unsold fruits and vegetables (the brand and the products are now available in Montreal retail stores). This initiative rests on three strategies that reflect the process of social production: it proposes a positive symbolic framing of food waste mitigation that challenges the dominant views on food edibility and freshness; it objectifies this construction in a series of devices such as a brand and the products themselves; it relies upon consumption and commercial practices already shared by a large community of actors, including the retailers and the consumers.

Although the concrete impacts of this initiative are hard to evaluate at this point, it can be argued that the search for solutions to the problem of food waste at the retail–consumption interface should go beyond moralizing postures and promote a greater awareness of the intricate practices of each of the actors, and of the symbolic constructions and objective devices that support them. To facilitate the development of such types of social innovations, public policies on expiry date systems could foster the communication of better information to prevent food waste for both the retailers and the consumers.

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