



Standards and Waste: Valuing Food Waste in Consumer Markets

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RESEARCH

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ABSTRACT

Standards drive waste accumulation, which is particularly evident in the case of food. This article illuminates how food that is discarded due to failed standardized expectations is valued in consumer markets. Theoretically oriented by insights from the sociology of standards and valuation studies, it examines three Swiss organizational initiatives that successfully value food waste. Based on rich qualitative data, the article compares the three valuation processes and finds two central commonalities. On the one hand, the initiatives replace the valuation based on product standards with sensory experience. On the other, the initiatives employ additives that buttress the valuation process. These additives include additionally purchased food that enable the processing of the waste and various judgment devices that help consumers in judging the valued food waste. While improving our knowledge of how waste turns into food again, the article's main contribution lies in bringing the nexus between standards and waste to our attention.

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1. INTRODUCTION

Standards are formalized rules and measures that ensure the quality and safety of products (Brunsson & Jacobsson 2000; Busch 2011). In practice, however, the implementation of standards is often challenging because their following requires a lot of work (Higgins & Lerner 2010; Lampland & Star 2009; Timmermans & Epstein 2010), and more importantly, creates much waste (Arnold & Loconto 2021; Corvellec 2019). The nexus between waste and standards is particularly evident in the context of food. According to a recent study, as much as 40% of the food produced is never eaten (WWF-UK 2021), with standards contributing in significant ways to the gigantic amounts of food waste (Johnson, 2020; Milne, 2012; Stangherlin & de Barcellos 2018). This article interrogates how standards can be circumvented so that food waste can be reduced. In doing so, this article illuminates waste as an often-forgotten dimension of standardized food production and trade and identifies ways in which edible food waste is valued in consumer markets.

For the topic of food waste, it is important to distinguish those standards that pertain to processes and activities that must be performed (*process standards*) from those that relate to material properties and features (*product standards*). The rise of process standards, such as Fairtrade, Organic, or ISO 9000 standards, has stimulated vibrant social science interest in standards (Brunsson & Jacobsson 2000; Busch 2011; Timmermans & Epstein 2010), but the comparatively banal product standards are particularly relevant to food waste. Product standards include date labeling that distinguishes what is and is not considered edible and therefore, drives food waste (Milne 2012; Stangherlin & de Barcellos 2018; Toma, Costa Font & Thompson 2020). However, product standards do not only determine the maximum age of a food product, they also specify aesthetic expectations, such as size, color, or shape. And because food does not always meet these abstract rules and measures, product standards are held responsible for the waste volumes (Johnson 2020)—rightly so, as product standards account for 90% of the waste generated in agricultural production (Baier et al. 2017). Private buyers such as supermarkets set aesthetic product standards, but the international Organization for Economic Cooperation and Development (OECD) also specifies what internationally traded fruits and vegetables should look like (OECD 2021). In general, the poorer the rating, the greater the risk that food will be classified as a worthless waste.

The fact that product standards turn food into waste is particularly worrying because the food waste would often still be edible. For example, product standards evaluate edible food as worthless because it is too small, too big, or maybe just not has the right color (e.g., Arnold & Loconto, 2021; Johnson, 2020). In this situation, food

waste is abject capital, which means that the food is abandoned, although it would still be useful (Giles 2020). Similarly, date labeling creates abject capital because it often discards good, edible produce, for example, salt that holds and expiry date even though salt cannot naturally expire. In this article I deal with this ‘edible food waste’ that is considered worthless because it does not meet standardized expectations or buyer demand. Correctly, there is no such thing as ‘edible food waste’ because it is through the process of edibility that a thing becomes food (Roe 2006). In this sense, some scientists and policymakers prefer to write about food surplus or losses (rather than food waste) and use these terms to refer to edible food that is lost at any stage of the supply chain (e.g., Garrone, Melacini & Perego 2014). However, definitions of food waste are multiple (cf. Garrone, Melacini & Perego 2014; Närvänen et al., 2020) and in this article, I use the term to refer to the food that is, or used to be, discarded and valued as worthless, even though it might still be edible.

Given the extent of food waste, literature addressing how to infuse food waste with value has exploded. While some scholars describe the process of interest as a valorization and/or upcycling of food waste (e.g., Bolwig et al. 2019; Gedi et al. 2020), Abrahamsson (2019) suggests conceptualizing it as repair, a process, by which the value of food waste is re-negotiated. Regardless of the choice of term, the studies examine valuation processes that are based on a search for other, less demanding standards. For example, the transformation of food waste into animal feed and compost (Daniel & Martin 2021), or the recovery of energy from food waste via anaerobic digestion (Corvellec 2016; Holmberg & Ideland 2021; Van Bommel & Parizeau 2020) are well-studied cases of food waste valuation. In these cases, the value of waste is redefined, as lower standards are applied to produce animal feed, compost, or energy than in consumer markets. Similarly, lower standards apply when food, which has passed the best before date or does not meet aesthetic expectations, is resold cheaper or distributed for free by charitable food banks or social movements to people affected by food poverty.

Although such food waste distribution can improve the livelihoods of those affected (Clope, May & Williams 2017), the policy developed by the European Union does not rank this waste-management approach best (Papargyropoulou et al. 2014). Rather, and with a focus on environmental impact, the policy prioritizes food waste prevention, by which the food (waste) remains in the market to being consumed by humans. Interestingly, this prioritized way of dealing with food waste, has not yet attracted much empirical and theoretical attention (Abrahamsson 2019; Mourad 2016).

Against this background, this article closes a research gap on the valuation of food waste in consumer markets. In doing so, I aspire to account for the pivotal role played

by standards, why I ask: How is food that is discarded due to failed standardized expectations valued in a way that makes it desirable in consumer markets? Theoretically, I am guided by insights from the sociology of standards and valuation studies. Empirically, I compare three Swiss organizational initiatives that value food waste in the consumer market in such a way that it is assessed as valuable by individual consumers: manufacturing food waste jams and bouillon as well as conducting food waste catering. The results show that the valuation is based on the deployment of individuals' sensory experiences that replace the valuation based on product standards. Furthermore, the initiatives deploy additives that buttress the valuation process of waste. These additives include additionally purchased food that enables the processing of the waste as well as judgment devices that are oriented toward consumers and help them judge the valued food waste. Together, my empirical results improve our knowledge about the re-negotiations of the value of food waste, called for by social scientists and policy makers (e.g., Abrahamsson 2019; European Union 2021; Mourad 2016; Van Bemmel & Parizeau 2020). Alternatively, the findings will contribute to better understand the nexus between standards and waste, and why it deserves our close attention.

In the next section, I introduce the theoretical framework, then present the three cases and the methodological approach. Section three is dedicated to the empirical cases, which will be compared and discussed in section four. I conclude the article with a reflection on the implications of the results in terms of the relationship between standards and waste.

2. VALUING WASTE AND THE ROLE OF STANDARDS THEREIN

The key argument of the valuation studies is that the value of things is not given, but made and therefore contingent (e.g., Kjellberg & Mallard 2013; Muniesa 2011). This insight also applies to things that are offered and demanded in markets, where price is merely a valuation device and does not equate to value (Beckert & Aspers 2011). As Boltanski and Thévenot (2006) prominently point out, value is always plural and economic valuation is only one possible valuation among others. However, to facilitate the trade of things and enable scalability, multiple standards help evaluate the value of things before they are exchanged in markets (Arnold & Hasse 2016; Aspers 2011; Eymard-Duvernay 1989). The fact that standards take effect before the object of standardization is exchanged, explains why standards can boot large quantities of food out of the commodity chain before it is valued by individual consumers. If a thing does not meet the relevant standards, it is considered worthless—a valuation that is also contingent, as I discuss below.

While valuation scholars are intrigued by the examination of rather appealing goods with singular, contested qualities, such as wine, art, or foie gras (DeSoucey 2018; Karpik 2010), Greeson et al. (2020) point out that waste, which appears less attractive because its alleged worthlessness, is central for the study of the valuation process. Taking strong inspiration from the discard studies, Greeson et al. 'challenge the common understanding of waste as the zero point of value' (2020: 153) and emphasize that waste can be of value, why it is not the end of the valuation process, but also the starting point. In this context, Thompson made a major contribution in explaining that what is assessed as waste at one point in time may be re-valued and considered valuable at a later point in time, think of antique furniture (Thompson 1979). Due to the perishable nature of food, such long-term shifts in valuation are hardly possible in the case of food waste, but one can notice that contextual shifts are relevant for how and whether certain foods are valued as worthless waste or edible food. For example, pigs' feet are abject food in Switzerland, but can be exported profitably to China, where they are considered a precious delicacy (SRF 2020).

The fact that the value of food waste is contingent, and that food waste could be of value if it is valued differently has also been discovered by policymakers. Interestingly, they are resorting to process standards to actively work on the construction of new food waste valuations. For example, in the context of the EU Farm to Fork Strategy the European Union specifies voluntary, guiding rules about how to prevent and reduce food loss and waste for food manufacturers, food service operators and retailers (European Union 2021). Other examples are the Upcycled certification standard developed in 2020 (Upcycled Food Association 2020) or the Too Good to Go initiative, which awards those companies that take measures to reduce food waste by giving them the Waste Warrior Brands (Too Good to Go 2021). These efforts have in common that they set process standards to regulate production and trade and to reduce waste. These process standards are a form of waste management that concerns organizational processes, but they do not directly deal with the valuation of food waste that is of interest in this article.

A conceptual framework that theorizes valuation processes and thereby accounts for the material dimension of the object of valuation can be found in the work of Bessy and Chateauraynaud (1995). The two French scholars make the observation that formalized valuation devices, such as standards, measurements, or classification systems, receive excessive scholarly attention, while the role of materiality is insufficiently considered. They therefore propose a move away from the sole study of standards and other formalized valuation devices. This move is important for this research endeavor because standards, as flagged in the introduction, are

much more of a problem than a solution in the case of food waste (Arnold & Loconto 2021; Johnson 2020; Milne 2012). To understand the ways in which things are valued when standards and other formalized valuation devices are absent, Bessy and Chateauraynaud (1995) examine how counterfeits are tested for their authenticity. While at first glance, counterfeits seem to have little in common with food waste, in both cases the objects' values are unknown or at least difficult to assess because accepted valuation devices fail or are missing. In the case of counterfeits, valuation devices do not fulfill their function satisfactorily (they do not help determine whether something is authentic or counterfeit), while in the case of food waste, the standardized valuation devices at hand are of little help because it is often these standards that had discarded the food and valued it as worthless waste. Given this overlap, Bessy and Chateauraynaud's framework promises beneficial orientation for the study of food waste valuation without standards (Arnold 2019).

Specifically, Bessy and Chateauraynaud identify four, interconnected steps in a valuation process. As a first step, and unsurprisingly, they find that evaluators of counterfeits attempt to draw on familiar tools, shared beliefs and categories to test the authenticity and value of an object. As argued before, such accepted valuation devices that focus on form rather than presence are not only missing in the case of counterfeits but also in the case of food waste. Supporting this, Abrahamson (2019) observed that formally accepted valuation devices are lacking at food waste dinners, why participants discuss in detail whether the food waste is still good to eat or not. Interestingly, the focus of these discussions is on the origin of food, which is consistent with the conceptualization of Bessy and Chateauraynaud's (1995) who argue, that in a second step, the evaluators test the counterfeits' network, (which is composed of human and non-human actors). This investigation provides clues to determine the object's value. The study of networks is important for waste because their valuation relationships cannot be overestimated (Van Bommel & Parizeau 2020). For example, in the case of the abovementioned food waste dinners, participants explore the food waste's networks by questioning the persons who brought the food waste and determining the places where it was saved. In doing so, they build relationships of trust, which allow them to evaluate food waste as edible without checking the food waste itself. In other words, the network around the object (here food waste) and not the object itself, is used to assess what the object is worth.

In comparison to the first two steps, steps three and four receive less attention in the literature and therefore help capture the often-unnoticed dimensions of valuation. The third step highlighted by Bessy and Chateauraynaud (1995) refers to the examination of the objects' material affordances. That is, the evaluators examine the material properties of the objects, checking

what they can do. For this purpose, the evaluators often use technology. The testing of material affordances is generally relevant for waste valuation, as 'the valuation of waste is a thoroughly material process' (Greeson et al. 2020: 152), but due to possible health and safety risks, the testing of affordances is of elementary importance for the valuation of food waste. However, Bessy and Chateauraynaud (1995) identify a fourth step by drawing our attention to the role of sensory experiences in valuation processes. Although they consent, that sensory knowledge is subjective and not sufficient to make a generally accepted valuation, they emphasize that the sensory testing of the material object is often fundamental in an uncertain valuation process. Empirical studies on the valuation of food confirm this thesis, when for example, demonstrating that consumers use their senses to value tomatoes (Heuts & Mol, 2013) or let fish become sushi (Roe, 2006). In sum, the use of senses (step four), along with the use of formalized valuation devices (step one), and the testing of networks (step two) and material affordances (step three) make up a valuation process of things with high uncertainty, such as counterfeits or food waste, that is the topic of concern in the next sections.

3. RESEARCH CONTEXT AND METHODS

To study how food waste is valued in consumer markets, I conducted case studies on three initiatives that succeed in such valuation. I identified the organizational initiatives in the context of a research project on the Swiss food waste field, which has mainly taken form following a political postulate that claims collective efforts for realizing the sustainability development goal (SDG) 12.3 on food waste (Arnold 2021).¹ In this field, I identified 102 organizations that take responsibility for food waste. Among them, six organizations value food waste in such a way that they do not seek lower standards but transform it into edible food desired by consumers. Of the six organizational initiatives, I excluded one that produces chips from surplus bread because it ended its activities one year after its foundation. I also excluded two other initiatives because their activities focused on food waste only incidentally (a restaurant that does not want to produce leftovers and cooks them every Friday into new meals, and a fruit juice producer that occasionally buys surplus vegetables). The remaining initiatives that I studied for this article are an organization that values food waste by making food waste jams, another by arranging food waste catering, and another one by manufacturing food waste bouillon.

Information on the three selected organizational initiatives comes from different, complementary sources. In 2021, I conducted a survey with all organizations from the Swiss food waste field, which provided detailed

information on organizational characteristics. Further, and more importantly, I use information from 23 semi-structured interviews with key players from the Swiss food waste field, including the founders of the three food waste initiatives studied and experts familiar with Swiss food waste initiatives. The interviews provide information about the motivation and activities of the initiative as well as the different approaches to infuse food waste with new value. In addition, I also collected information about the selected initiatives on their websites and supplemented these self-descriptions with external descriptions. For the latter, I gathered media articles on the initiatives and conducted participant observation within the organizational initiatives in 2020 to understand how the valuation process occurs in everyday life.

I triangulated the rich data, disentangling the valuation process with a strong focus on the object of valuation (food waste). That is, I took inspiration from Appadurai (1986) and followed the food waste through the valuation process, assuming that its exchange is only one situation out of many others (e.g., production, manufacturing, marketing) in which its value is determined. After empirically detailing the three food waste valuation processes, I subjected them to a comparison, as valuation studies scholars request to obtain meaningful results (Lamont, 2012; Waibel et al., 2021). The comparison allowed for the identification of differences and similarities, the second of which was important in determining what it takes to value food waste in consumer markets. The differences, on the other hand, show that the market commitments of the three initiatives vary. Below, I will start the presentation with the initiative that is least engaged with the market and end with the initiative that shows the greatest commitment and effort in conventional consumer markets. All three initiatives read and commented on the draft analysis and gave written consent so that their correct organizational name may be used.

4. EMPIRICAL FINDINGS

While much research exists on the path from food to waste (e.g., Evans 2014), we know that 'waste may become food again under certain circumstances' (Van Bommel & Parizeau 2020: 210). In this section, I examine three of such circumstances, or more concretely, three organizational initiatives that succeed in such a valuation from waste to food. After briefly introducing each initiative, I describe, following the framework, their valuation processes, shedding light on the role of standards, senses as well as the material affordances and networks of the food waste. By examining the three initiatives comparatively, the empirical results provide evidence of the multiplicity in approaches to turning waste back into food.

4.1 FRÜTILE: VALUING UNDESIRE FRUITS

Frütile was founded in 2015 and operates in the urban area of the bilingual (French and German) city of Fribourg. According to their own information, they process between 500 kg and 1 ton of surplus fruit annually into jam, which they sell locally. The initiative receives no public or private financial support and all 18 members, almost exclusively women, work on a voluntary basis. Frütile and its brand is registered in the commercial register to be able to sell goods but does not generate financial profits, considering itself as a non-profit organization.

The founder of Frütile initially intended to manufacture unsold fruit from supermarkets, but food banks had earlier established a well-accepted redistribution system for supermarket's leftovers. Frütile therefore decided to not compete for supermarket leftovers since food banks' charitable actions are widely accepted in the region, where Frütile operates. The founder explains: 'We are in Fribourg, a Catholic city. [...] Leftovers are here for the poor' (interview, Feb 14, 19). Adapting to these circumstances, Frütile has started to source those fruits that could not be distributed by a local food bank (Schweizer Tafel). Frütile thus engages with fruits that were offered for free to those in need, but not desired by them. When asking if all fruits that they distribute stem from the food bank, the founder clarifies: 'Not all of them. We also get some [fruits] from the farmers. Last summer, there were so many fruits. Thus, we got them directly. But we don't go to the stores to pick up the unsold fruit' (interview, Feb 14, 19). This means Frütile has established long-term relationships that allow them to source, with only little effort or financial cost, discarded fruits that have no value to farmers and food banks.

Every Thursday, the food bank delivers the worthless fruits to Frütile. A group of volunteers receives the food waste in boxes and brings it to the kitchen of a church-run residential home, which provides its infrastructure (kitchen, freezer, storage) free of charge. Here, the volunteers extend the life of the delivered fruits by sugaring and cooking, that is, making jams (between 50–100 glasses per week). Although the production of jam is not associated with high regulations regarding hygiene and safety, the founder of Frütile is pleased about the fact that the chef of the residential home 'is now part of [...] [the] group and stands for the fact that everything is done properly there. She is the one who must answer for safety and hygiene' (interview, Feb 14, 19). Process standards are consequently followed during the jam production, while the delivered fruits do not meet any aesthetic product standards. That's why, in the kitchen, I can observe how the volunteers examine one fruit after another. 'After washing, the ladies examine each fruit visually and feel them individually to decide which fruit or which parts of it can still be processed' (field notes, Oct 3, 19). The founder of Frütile rightly emphasizes in this context:

They [the fruits] are not like compost, but they might have a stain here and a carve there. There is usually not very much work. What the Swiss food bank brings is still edible. So they [the fruits] are not in a terrible condition (interview, Feb 14, 19).

The volunteers mobilize their senses when washing and cutting the fruit to decide which fruits are still suitable for processing and which parts need to be cut away. They use their sensory perception again later when cooking the jams. Here, volunteers regularly check the consistency of the jam with a cooking spoon to see if the mass is thick enough.

Besides the use of the senses, I observe in the kitchen how the volunteers check the material affordances of the fruits. Not only do the fruits' appearances not meet standardized expectations, also the composition of the deliveries does not follow any standard. Every Thursday, it is uncertain which fruits will be delivered in what quantities. To ensure that jams with a convincing taste and consistency are produced, a volunteer specializes in determining the combination of fruits. She knows the fruits' affordances for jam-making and decides which cut fruits are processed and which are frozen and processed in a later week (see Figure 1). The result is a vivid variety of fruit combinations that are boiled up in large cooking pots, sugared, and then tested for their Brix grade (a

measure that indicates sugar content) before being filled into recycled jars (see Figure 1). Testing the Brix is important because according to legal regulations, Frütile must not only indicate its composition and best before date, but also the sugar content in the form of the Brix grade (EDI 2005: Art. 22).

The jam jars cool upside down in the kitchen and volunteers decorate them individually at a later stage. For this purpose, the women complete the prefabricated labels with the Frütile brand, by specifying the fruit composition, sugar content, and relevant dates in handwriting. Filled in nicely prepared jam glasses, food waste enters fourteen small alternative stores (e.g., zero waste stores, bakeries and world stores) and is sold by volunteers at the local weekly market. The unique jams are sold at moderate price. Although the financial income is not the declared objective of Frütile, the price and its resulting revenue are a prerequisite not only for producing the jams (e.g., buying sugar, spices) and for donating annually several thousand Swiss francs (CHF) to local, social institutions, but also for pushing further the valuation process. This is because the revenue is used to pay for the labels and information materials, such as flyer, posters, and banners, that explain to the consumers that the jams for sale are made manually from food waste. With explanatory customer conversations, these materials are important so that the consumers can judge



Figure 1 The valuing of food waste into jams at Frütile: Undesired fruits are washed, cut and frozen (left) and later processed into jams that cool upside down with standardized information (e.g., Brix grade, date, kilo) (right). (Source: Authors' own, fieldwork Mar 10, 2019).

the value of the jams placed on sale. And in the process, the price tag shows not least that Frütile's jams are worth something, even though, or precisely because they are made from waste. Without waste, Frütile jams would not exist, and it is the contingency of food waste that Frütile brings to consumers' attention and turns it to their advantage.

4.2 ZUM GUTEN HEINRICH (ZGH): VALUING DEFORMED AND OUTDATED FOOD

ZgH was created by three male students with the help of start-up funding in 2018. Originally, ZgH wanted to deliver lunch menus created from leftovers with a specially designed bicycle to popular city spots. This service was loss-making, but the founders experienced that food waste catering can be profitable, why ZgH concentrates its activities on catering services and recently opened a new Bistrot, which did not yet exist during field work. ZgH is a for-profit organization that classifies itself as a microenterprise (less than CHF 2 million in sales). It receives financial support from private donors and processes slightly less than 500 kg of deformed, undesired vegetables annually for their catering.

ZgH has established stable relationships with local farmers and alternative trade and sales organizations to buy from them the food they cannot sell. As the founder explains in the interview, they pay a price for it: 'It is about 50% [of the traditional price]. But it is important, we pay something. That is important for him [the supplier] and for us' (interview, Apr 25, 18). With other food waste initiatives, ZgH shares the conviction that food waste must have a financial price and should not be distributed for free, so that waste can be reduced (Arnold 2021). While ZgH buys food whose best before date has expired from the trade and sales organizations, it is mainly deformed fruits and vegetables that are bought from the farmers. Given that this deformed produce is often not harvested, ZgH encourages the farmers to understand gleaning as a new business solution (Kowalczyk, Taillon & Hearn 2020). Moreover, ZgH actively calls for private gleaning on their website:

Our suppliers also include amateur gardeners. Too much harvest in the garden? Our chef Daniel is happy about large deliveries of surplus vegetables or fruit. He makes fine dips, purées or puts them in a preserving jar to store them for the winter. Send us a message with the quantity of which vegetable or fruit you have too much (ZgH 2020).

In the choice of suppliers, ZgH prioritizes organic production from the region and lists its suppliers publicly on its website. Given the prioritization of organic, high-quality suppliers, ZgH rejected goods offered by an industrial bakery, manifesting its conviction to not leave the market niche to go big, as the founder outlines: 'We

really do not want to do that. [...] I think it is cooler to do something with the bakery next door' (interview, Apr 25, 18).

In a rented communal kitchen, ZgH chef and other staff deploy various preservation methods to expand the food's durability (e.g., drying, freezing, soaking in vinegar or oils, preserving with sugar or salt). This produces new creations, such as when nuts that have passed their best before date are enhanced with spice blends, resulting in tasty snacks (field notes, Jun 14, 2019). In this context, the following dialog came up:

Interviewer: How do you do that with the dates? Do you simply set them by yourselves?

Interviewee: Well, the thing is that as a chef, you are trained to judge whether something is spoiled. That is why the chefs can set the dates themselves.

Interviewer: Really? [...]

Interviewee: Well, as a production company, you set the best before date conservatively, so that it is certainly not spoiled. And you can extend it. What you cannot do is consume the product, after the expiry date. So, the best before is like a guarantee from the manufacturer until when it is good (interview, Apr 25, 18).

The chef of ZgH thus eludes the ostensibly objective product standards and interprets the best before date subjectively by deciding with the help of his sensory perception (How do the nuts look? How do they taste? How do they feel?) what products he will use and which not. Of course, in the case of deformed fruits and vegetables that do not meet aesthetic standards there is no date to consider, but again, the chef and its staff use their senses when manufacturing the food discarded for aesthetic reasons. This is a labor-intensive process because the produce must be processed by hand, as the uniqueness of food waste does not allow an industrialized standardized procedure. Figure 2 is an illustration of what it means when onions that do not meet the standards of size must be peeled so that they can be fermented. In this vein, the founder summed up with the phrase: 'A misshapen carrot simply needs more time to peel' (interview, Apr 25, 18). While the vegetables and fruits fail to meet any product standards, ZgH rigorously follows process standards when dealing with food waste. This illustrated a situation in the kitchen where a few leftovers from yesterday's catering remained and the chef explained that 'the warm food must not be warmed up again and must definitely be disposed of. Carrot sticks,



Figure 2 The valuing of food waste into catering snacks at ZgH: Onions that do not meet the size expected in conventional markets (left) are peeled and then fermented by ZgH (right). (Source: Authors' own, field work Jun 14, 2019).

on the other hand, can still be processed without any problems' (field notes, Jun 14, 2019).

ZgH is constantly striving to discover new affordances of food waste so that they can reduce it. To do so, they even break with the fifth principle of their philosophy 'Vegetarian and Vegan'. Given that in Switzerland, many laying hens end up in biogas plants and are not eaten—the Swiss Agricultural newspaper *Bauernzeitung* estimates that in 2017 30% of all laying hens, 0.5 millions lay hens are used for energy production (Jäger 2017) ZgH tries, to produce soup hens appetizers, which is a challenge because of the amount of work and not the taste. However, in most cases, the food waste purchased does not afford to create an entire catering. That is why ZgH purchases basic foodstuffs (e.g., butter, rice, eggs) additionally and food waste makes up only more than half of the catering. The founder explains in the interview:

Interviewee: So partly we must buy things in addition. Partly, it is really just basic food that we buy in addition. So, 60, 70 percent [...], we have from sources that would not have been used otherwise.

Interviewer: And what it is that you buy in addition?

Interviewee: Rice, for example, butter, [...] eggs and such things. Or oil and so on. Such basic food things (interview, Apr 25, 18).

The food waste catering is carried out regularly in coworking spaces (twice per week with 80 guests) as well as at one-time events, such as wedding parties or corporate events (four to five times per week with approximately 250 guests). The labor-intensive work

performed by paid personnel makes the catering rather expensive (approximately 25 CHF/person), which is why it is mainly ethically motivated customers that book the catering for thematic events (e.g., when a construction company organized a recycling event). At these events, the issue of food waste is directly addressed by the employees of ZgH when explaining that the appetizers and dishes are made of food waste. That food waste is in the center of the catering was observable during a catering event, when the guests were not only informed about the background of the food offered but were also invited to bring their Tupperware so that they can take leftovers home (field notes Apr 10, 19).

In addition to verbal explanations, the catering is peppered with flyers that explain the background of the catering, and ZgH invests a lot to present the food waste attractively. In this vein, a journalist summarized that 'at the Zurich gastro start-up "Zum guten Heinrich" [ZgH], it is not only the food itself that tastes good—the way it is prepared also leaves a good taste' (media article, *NZZ bellevue*, Apr 02, 20). Nevertheless, one staff member remembered that once someone judged the food waste catering as non-edible: 'There was only one person who did not want to eat the food because it was produced from food waste. In general, the criticism and reservations about the concept disappear as soon as people taste the food and then like it' (field notes, Jun 14, 19). For these positive evaluations, the many explanations provided about food waste, help convince the consumers of the value and price of food waste catering.

4.4 FOODOO: VALUING DEFORMED PRODUCE

Foodoo, formed in 2018, is led by a former star chef who also runs a food waste restaurant. Foodoo is based in the Swiss capital Bern and pursues its activities in the urban

area. Their activities focus on the production of bouillon, sauces, and mayonnaise, for which they process about 50 tons of food waste per year. The food waste bouillon is Foodoo's heart project, why I focus on it. Foodoo describes itself as a microenterprise (annual turnover less than 2 million CHF) that receives no public or private financial support and has 6 employees.

Foodoo buys organic vegetables (carrots, tomatoes, leeks, onions, herbs) which could not be sold by the farmers due to aesthetic shortcomings or lack of demand. In the field, this produce is called 'third-class-goods', as the founder explains. For this produce, Foodoo pays a price that is lower than the ordinary price for organic produce, but still higher than the price for non-organic produce. One of their most important suppliers is an organic producers' organization (Terra Viva) of more than 80 fruit and vegetable producers who follow organic standards. Foodoo thus processes vegetables that exceed ecological requirements but do not meet the aesthetic ones. As the founder outlines, Terra Viva does not just give these vegetables to anyone but seeks stable trade relationships. Somewhat dismissive of the alternative, leftist food savers, he says: 'When the funny volunteers in tights come [...], it [Terra Viva] is not interested. Terra Viva does not give into this' (interview, Mar 22, 18).

This food waste of quality is processed by people who are part of a labor market integration program or by volunteers at public events called 'Foodoo factories'. The field work is concerned with the second (Foodoo factories), where ad-hoc volunteers wash and cut the vegetables and then puree them in a mega-mixer with herbs and salt to a bouillon paste. Participant observations show that

these events resemble small folk festivals, as a DJ plays music and people from old to young snip vegetables, while being surrounded by colorful posters that provide information on the extent of food waste in Switzerland and what can be done about it (see Figure 3). This scene forms the new network into which Foodoo introduces the waste. As Foodoo explains on its website, the concept of the 'Schnippeldisko' (chopping discotheque) has inspired its factories:

The idea of the FOODOO Factories arose in the style of the chopping discos that have existed for years in northern Europe, in which food waste vegetables are usually processed into soup at a communal party. In contrast to such conventional parties, a FOODOO Factory produces one to two tons of vegetable bouillon and saves a corresponding volume of vegetables. The processing is done by many volunteers and under expert supervision and hygienic conditions (Foodoo 2021).

While Foodoo mainly emphasizes differences in the amounts of food waste saved, another main difference is that while snipping discos are initiated by social movements and produce dishes for self-consumption (Barnard & Mourad 2020), the outcome of Foodoo factories is a marketable product meant for the consumption by others.

The above website quote indicates with its last sentence that the production of the bouillon follows processual hygiene standards. The founder explains somewhat desperately: 'There are standards to which



Figure 3 The valuing of food waste into bouillon at a Foodoo factory: Informational posters explain the Swiss volumes of food waste and its causes to participants. (Source: Authors' own, fieldwork Sept 8, 2018).

we are subject. [...] Quality assurance, ISO standards, the devil knows what. For one and a half months, I have been doing nothing but forging concepts to make the thing [Foodoo bouillon] marketable on a large scale' (interview, Mar 22, 18). The Foodoo factories thus follow legal hygiene expectations, while creating veritable 'tactile spaces' (Carolan 2007), where everyone is invited to closely interact with food waste. All participants see, touch, and smell food waste, giving them a lived sense of what food waste can be.

The Foodoo factories run along a predefined, standardized script, which is why the material affordances of food waste are not examined and experimented with during the events. Rather, the testing of food waste affordances to produce bouillon has been done earlier, so that the events run successfully and produce large quantities of bouillon. While the Foodoo label declares that they contain '100% saved vegetables', it is important to acknowledge that food waste alone does not afford the production of bouillon. In fact, the saved vegetables make up only 75% of the bouillon because it is supplemented with 25% salt and 5% herbs, as explained to its participants on a Foodoo factory invitation (Bewegungsmelder 2019).

The bouillon is filled in glass jars (220g) that are decorated with an elaborately designed and informative Foodoo brand. With the famous Swiss white cross on a red background, the brand informs about its local origin and explains with the title 'save the veggies' the background and motivation of the bouillon. With a price of CHF 6 per jar, the bouillon is rather expensive. Nevertheless, Foodoo manages to sell it to a wider audience. While the suppliers are carefully selected, the bouillon is sold online and in various retail outlets, mainly located in the north-east of Switzerland. These points of sale are expected to multiply in the future, as Foodoo believes that in the future they will be able to process as much as 100 tons of food waste annually (wemakeit 2021). As a result of this expansion strategy, the bouillon is presented to as many consumers as possible for evaluation, and at best not only to Swiss consumers:

The goal is to be able to bring a label for food waste processing to high-quality products on the market. [...] And do it right. Now, we are all over the hipster stores and stuff. We want to enter the market. Because it is just much, much bigger. [...] Because if this [Foodoo factories and bouillon] goes abroad, it could become like a lighthouse project. Germany could do the same (interview, Mar 22, 18).

Foodoo's valuation consequently leaves the niche so that large amounts of food waste are bought and eaten by consumers. This means, food waste forms the basis for developing a new segment in the food market.

5. WHAT REQUIRES THE VALUATION OF FOOD WASTE IN CONSUMER MARKETS

A simplistic and superficial answer to explain how food waste is valued in consumer markets would be to interpret the three valuation processes as a form of a circular economy, as all three initiatives follow this idea by extending product life and exchanging of waste (cf. Gregson et al. 2015: 219–220). Yet, what we learn from the three initiatives is that the valuation requires much more than simply extending product life and exchanging waste. I detail this hereafter, specifying what it actually takes to successfully value food waste in consumer markets.

First, during food waste valuation in consumer markets, product standards are replaced with the mobilization of senses to test the quality and material affordances of food waste, while process standards are strictly followed. All the three initiatives use the sensory experiences of their employees and/or volunteers to test the quality of discarded food that does not meet product standards. Food experts (chefs) are involved in testing the affordances of the food waste and experiment with food waste products such as jams, bouillon, and catering snacks. By mobilizing the senses, the members of the three initiatives apply a caring approach to waste (Ureta 2016) and work against the devastating consequences of product standards expressed in waste accumulation (Johnson 2020; Milne 2012; Stangherlin & de Barcellos 2018). However, the sensory valuation process requires a lot of manual labor (e.g., peeling, preparing, cutting) that is done by volunteers for free (as shown by the cases Frütile and Foodoo) or paid manual labor, which leads to higher prices (as shown by the case of ZgH). Regardless of who performs the manual labor, all three valuation processes follow process standards that ensure the safety and hygiene of the process. This is the only way the initiatives are allowed to sell valued food waste in consumer markets. This adherence to process standards distinguishes the three initiatives from individual food waste recovery operations (e.g., dumpster divers and food waste dinners), for which process standards do not matter.

Second, food waste alone does not afford to become introduced into consumer markets, as the successful valuation requires the use of *additives* that buttress the process. The idea of additives, first raised to explain how different competing standards are nested, states that additives can be very different things (activities, materials, or humans) that help achieve priorities (Arnold & Locont 2021). In the case under study, the priority is the successful valuation of food waste in consumer markets, and I find two additives relevant to the valuation process in all three cases studied: on the one hand, additionally purchased food that buttresses the manufacturing of food waste products, and on the other, judgment devices

that consumers use to determine the value of the goods (Karpik 2010). Regarding additionally purchased food, the empirical findings show that Foodoo mainly adds salt, Früitle always sugar and ZgH needs staple food to transform and value food waste in a way that it assessed as desirable by individual consumers. Additionally, the three initiatives invest a lot in the creation of judgment devices that inform consumers about the motivation and background of their bouillon, the jams, and their catering so that they can adequately evaluate the offers. In doing so, the initiatives do not only develop creative, nicely designed brands and write information brochures and design posters, but also explain in personal conversations the background of their products. In this context, the price also acts as a form of judgment device because the products are not sold cheaply or even distributed free of charge, rather the pricing is used to provide information that food waste products are by no means of inferior quality.

Taken together, these findings make an empirical contribution to the literature on the transformation of waste into food (e.g., Abrahamsson 2019; Coles & Hallett 2012; Mourad, 2016; Van Bommel & Parizeau 2020) by detailing three specific valuation processes that succeed in making food waste desirable in consumer markets. By highlighting the relevance of replacing product standards with senses and enrolling additives, the findings explain that shifting places is not the only option for this process to be successful (Coles & Hallett 2012). The finding that judgment devices are a relevant additive for waste valuation contributes to valuation studies, which, following Karpik (2010), have understood judgment devices to be primarily important for singular, high-status goods such as wine and books. Complementary, this study highlights that waste is equally singular, why judgment devices are also important when waste is valued in consumer markets. However, while valuation studies have accepted waste as a relevant object of study (e.g., Daniel & Martin 2021; Greeson et al. 2020; Laser 2020), the literature on standards has only recently started to examine the waste that is generated by them (Arnold & Loconto 2021; Johnson 2020). My findings contribute to this strand of research by specifying alternatives to standardized valuation and explaining that senses and additives help circumvent standards.

6. CONCLUSION

This article started with the observation that proliferating standards generate drastic volumes of food waste and interrogated how these standards can be circumvented so that this food waste is successfully valued in consumer markets. Empirical findings from three organizational initiatives that value food waste successfully showed

that they mobilize the individual sensory perceptions to bypass the product standards that were the reason why the food turned into waste. Furthermore, the initiatives increase the affordances of food waste through additives (additionally purchased food and judgement devices) that buttress the valuation process. I end this article by placing these findings in the context of a multiplicity of wastes. Specifically, I want to account that my findings stem from an engagement with a specific type of waste—food waste—and reflect to what extent these food-waste specific insights are generalizable for a better understanding of the intersection between waste and standards. Two reflections stand out.

The first reflection is grounded in the insight that the use of sensory experiences plays an important role in the valuation of food waste, as the senses can replace formalized, pre-given product standards that value food as worthless. The mobilization of the senses to value waste is a common, but labor-intensive endeavor, as, for example, shown for the case of electric waste (Laser 2020). Given this high labor intensity, such close and individual engagement with waste is often done in regions at the margins where labor is cheap or working with waste is the only option (e.g., Minter 2014). In contrast, the waste valuation processes I studied have taken place in the privileged regions, where consumption escalates, and massive volumes of waste are generated. For the valuation process to succeed here, food waste has commanded a price that accounts for the costs of individual, sensory-based valuation. This means, the price of valued waste must be ‘high’ because no standardized procedures can be applied in its valuation—and not, as is often assumed, a ‘low’ price justified in the fact that supposedly worthless, undesired things are sold. While such valuations that deviate from standardization and aspire high prices are criticized for triggering social inequalities (Boltanski & Esquerre 2020), these processes are purposeful for reducing waste generated by standards.

The other reflection concerns the insight that product and process standards are differently linked with waste. This study has indicated that product standards are a central trigger for generating food waste and that these standards must be circumvented so that food waste can be successfully valued in consumer markets. At the same time, and interestingly, all three initiatives have rigidly followed those standards that pertain to processes, ensuring quality, safety or hygiene. Process standards are thus in a good light in this article, not least because I have also briefly pointed out that they are considered solutions to the food waste problem (e.g., Upcycled certification standard, EU code of conduct on responsible food business and marketing practices, Too Good to Go warrior brand). As a result, process standards had an unproblematic appearance in this article, which should be scrutinized more critically. To this end, we should not

limit our attention to the study of food waste. Rather, we should investigate whether the formula of understanding product standards as relevant and problematic for waste and process standards as a solution also applies to other wastes and what the implications are.

NOTE

- ¹ The sustainability development goal 12.3 reads as follows: 'By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses' (Food and Agriculture Organization of the United Nations 2022).

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