

# **Food waste 4.0: An Introduction to Contemporary Food Waste Studies**

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**Accepted manuscript PDF deposited in Coventry University's Repository**

**Original citation:**

'Food waste 4.0: An Introduction to Contemporary Food Waste Studies', in Routledge Handbook of Food Waste, ed. by C Reynolds, T Soma, C Spring & J Lazell, pub 2020 (ISBN 9781138615861)

Publisher: Routledge

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Please refer to and cite the published copy available at  
<https://www.taylorfrancis.com/books/9780429462795/chapters/10.4324/9780429462795-1>

eBook ISBN9780429462795  
<https://doi.org/10.4324/9780429462795-1>

**Food Waste 4.0: An Introduction to Contemporary Food Waste Studies**  
**Christian Reynolds, Tammara Soma, Charlotte Spring, Jordon Lazell**

**Food Waste: Our Anthropocene legacy?**

It is said that when looking back, our ancestors will recognise the legacy of the ‘Anthropocene’ age through the archeological marker of rubbish. Such archaeology speaks of food waste as a particular continuity of humans’ habitation on planet Earth. We have consistently left traces of food, from the earliest sites of human settlement to the trash heaps of today. This rubbish consists not only of ubiquitous plastics (Liboiron, 2016) or electronic waste (Lepawsky, 2015). It also consists of food, and lots of it, evidenced by the pristine-looking 40 year-old hot dog and 25 year-old lettuce found by ‘garbologist’ William Rathje during his *Garbage Project* excavation (Rathje, 1974). Our legacy will be marked by trails of uneaten food.

**Global narratives of scale**

The amount of food the world currently wastes is overwhelming. As Trentmann (2016:622) posits, “we appear to be drowning in waste”, with perfectly edible food contributing a significant portion of what we discard. Studies continue to highlight the global scale of food waste, differentiating between ‘avoidable’ and ‘unavoidable’- or edible and in-edible (Nicholes et al., 2019). The preventability of vast quantities of thrown-away food has spurred ever-more concerted efforts in food waste practice and research. Well-rehearsed statistics mark out this trend, such as the

Institute of Mechanical Engineers' estimate that "30–50% (or 1.2–2 billion tonnes) of all food produced never reaches a human stomach" (IMechE, 2013), and the common refrain that, if imagined as a country, food waste's climate-contributing emissions, at 4.4 GT CO<sub>2</sub>E, would place it as the third greatest contributor to greenhouse gas emissions globally, behind China and the United States (FAO 2015). This editorial aims to shed light on some explanations for the meteoric rise of food waste as a topic of public concern, as well as tracing some of the linguistic, philosophical and representational means, beyond statistics, through which that concern has been expressed and understood.

Some commentators suspect that public alarm over food waste does not simply mirror the growing scale of the problem. Archaeologists have suggested that our ancestors tossed even more detritus on a daily basis than we do<sup>1</sup>- traces of foodscapes have long been central to understanding human-environment interactions. But some suggest that the tendency to moralise and panic over waste as a 'crisis' prevents proper historiography and level-headedness in dealing with the problem (Rathje & Murphy, 2001, O'Brien, 2008). It also masks differences of understandings of where the roots of 'crisis' might lie: in profligate behaviour? Profit-prioritising business models? The policy environments that prevent or enable these? Registers of thought, language and relationality?

This introductory chapter attempts to synthesise some of these differences. Food waste is 'ontologically multiple' (Blake, 2019): it is political and bureaucratic, as shown in images of three frozen geese ceremonially pulverised by Russian officials in response to imports of 'banned' food from Ukraine (Lang, 2016). It is cultural, perhaps even evolutionary, as suggested in Stuart (2009)'s account of potlatch ceremonies. It is microbial and mutable, as Loughheed (2017) shows in his study of food allergens, recalls and biosecurity. It is visual, categorical, statistical, visceral, multi-scalar, spiritual, relational, biological, technological, historical, and re-thinkable, as the rest of this chapter aims to show.

### **A multi-dimensional concern**

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<sup>1</sup> Graphically depicted in Derf Backderf's (2015) lurid graphic novel of the societal ills of gluttony, *Trashed*. Abrams Comic Arts. Also Havlíček, F., & Kuča, M. (2017). Waste Management at the End of the Stone Age. *Journal of Landscape Ecology(Czech Republic)*, 10(1), 45–57.

Chapters in this Handbook of Food Waste will help to demonstrate that the food waste problem affects all parts of the inhabited world. In the United States, as much as 40% of all food produced is wasted (NRDC, 2012), while 88 million tonnes are thrown away in Europe each year (Fusions, 2016). Per-capita food waste in America has been calculated at more than 1400 kcal per day (Hall et al., 2009) and the economic cost of food waste is estimated at more than \$940 billion (FAO, 2015), a figure that continues to rise. These are, of course, estimations rather than approximations, with the true scale and costs of the impact of uneaten, discarded food difficult to quantify. The extent and problematisation of contemporary food waste is a marked consequence of the way that the current food system generates waste from food production through to retailing and consumption (Blake, 2015; 2019). Left unchecked, environmental impacts of the food system could increase by 50 to 90% by 2050 (Springmann et al., 2018; Willett et al., 2019), with food waste playing a substantial role in contributing to human-induced climate change. The wastage of food generates considerable environmental impacts not only through the use of energy, water, soil health and labour of transforming uneaten or excessive food from farm to fork, but also in the deterioration of food itself, which generates methane gas once discarded. In Europe, estimates place food waste as responsible for 15% of the environmental impact of the entire food chain (Scherhauer et al., 2018).

The 'global north' of Europe, North America and industrialised Asia display trends whereby the consumption end of the supply chain is considered most responsible for food waste. UK households, for example, generate 10.2 million tonnes of food waste annually (WRAP, 2018), whereas in many parts of the global south, the issue tends to be framed as food 'loss', as it is argued that wastage principally occurs during growing, harvesting and processing stages (Parfitt, Barthel and Macnaughton, 2010). While this particular and dominant framing is woven throughout the literature (Parfitt et al., 2010, Gustavsson et al., 2011, IMechE, 2013, Schneider, 2013, Papargyropoulou et al., 2014), recent work from countries such as Indonesia challenges the reductionism of the 'food loss in the global South' and 'food waste in the global North' dichotomy. These analyses call upon food waste scholars to consider the changing demographic and rapidly-urbanising landscapes of many countries in the global South (Soma, 2018), as well as the impact of 'supermarketisation' on people's consumption (Battersby, 2017).

Rising research interest in food and food systems more generally (Murcott, Belaso and Jackson, 2013), particularly since the financial crisis of 2008, is mirrored in attention to food waste. Such attention has exposed food systems' instabilities, paradoxes, and injustices (Hossain et al., 2014,

Trentmann, 2016), and extensive speculation and commodification (Clapp and Isakson, 2018). Amidst turbulent struggles over the future direction of human cohabitation on a finite planet, food waste has emerged as an indictment of past patterns and decision, posing the theoretical and practical challenges of new juxtapositions of scarcity and excess.

### **Growing public and policy attention**

Public awareness of food waste has been bolstered by shocking footage of mountains of food waste in popular documentaries<sup>2</sup>, such as a viral scene from Craig Reucassel’s “War on Waste” showing millions of bananas dumped not for their edibility, but for being too big, or too short. Such images have come to hint at a dynamics of neglect in how contemporary societies overconsume and exploit natural resources. The wastage of food symbolises for many the excesses of wealthy countries compared to the extent of food insecurity in others. For example, it is estimated that the 40 million tonnes of food that is wasted annually in the US could feed the worlds 1 billion people who are food insecure (Stuart, 2009). Increasingly, this ‘waste versus want’ trope has highlighted not only inequities between countries in the global North and South. Research highlighting intersections of food waste and food insecurity demonstrates that such inequities exist *within* wealthy nations, cities and neighbourhoods (e.g. Giles, 2016). The seeming paradox of food waste amidst hunger was publicised in popular books such as Tristram Stuart’s investigative book *Waste: Uncovering the Global Scandal* in 2009, and Jonathan Bloom’s (2010) *American Wasteland*, both of which sparked global conversation and initiatives. While more detailed accounts of the environmental, social, political and economic impacts of food waste can be found throughout this Handbook, suffice to suggest that the causes and impacts of food waste will help to determine whether life on earth can continue within planetary boundaries.

As several chapters in this Handbook will demonstrate, the food waste crisis reflects multiple policy journeys, and arguably some failures, in how to mitigate and prevent the wastage of food. Turn-of-the-century changes in European waste policy represented an important redirection towards diverting food waste away from landfill and stimulating innovative solutions in action today (Evans, Campbell and Murcott, 2013). Food waste has increasingly influenced mainstream political agendas at international and national levels, prompting legislation to actively reduce

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<sup>2</sup> For example, *Wasted: The Story of Food Waste* produced by late celebrity chef Anthony Bourdain and *Just Eat It* by Grant Baldwin and Jenny Rustemeyer and public outcry following broadcasts such as Craig Reucassel’s American Broadcasting Corporation’s (ABC) “War on Waste.” -May 19th 2017

waste levels, as explored in Part Three. Impacts of these regulatory efforts and interventions are hard to properly account and remain ambiguous. Mourad (2016, 2019), for example, analyses how, despite France's food waste 'ban', efforts to prevent retailers from discarding food have shown little overall reduction. Strategies of surplus redistribution, date-marking and waste valorisation amongst others form multifaceted solution pathways, but the complexity and systemacity of food waste makes it clear that no single solution will address the root causes of its many manifestations (Gascon, 2018).

Governance bodies working across governments, industry and civil society<sup>3</sup> have collaborated across sectors and multi-scalar levels of jurisdiction, responding to the clear need to tackle food waste holistically, often through public behaviour-change campaigns (e.g. 'Love Food Hate Waste' and voluntary business agreements such as the UK's Courtauld Commitment. Food waste reduction was included in the revised Sustainable Development Goals (SGDs), which set a clear global agenda for mitigation. SDG 12.3 aims to "halve per capita food waste at retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses" by 2030 (UN, 2015). Certain Handbook chapters interrogate the assumptions, framings and mechanisms of these mainstream approaches to food waste, asking what might they mask, exclude and, in the process of collaborating, who/which sectors might be ignored.

However, the purpose of this editorial is not to just detail the mind-boggling facts and statistics surrounding the food waste problem. Nor do we ascribe to the need to give a thorough history on the topic. Andrew Smith's chapter in this Handbook covers this in detail, as do Evans et al. in the opening chapter of their 2013 book *Waste Matters: New Perspectives on Food and Society* (see also Campbell, Murcott and Evans, 2017). Rather, as the opening of this book indicates, it is important to explain the terrain over which food waste is situated after a relative intellectual invisibility in sustainability literatures up until the last 10 years (see Reynolds et al. (2019), and Chen et al. (2017) for bibliometric reviews). This editorial therefore hopes to go some way in opening up some intellectual doors to this Handbook as a resource that informs, facilitates, debates and ponders food waste in the past, present and future.

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<sup>3</sup> For example, the Waste & Resources Action Programme (WRAP) in the UK, World Resources Institute (WRI) and Natural Resource Defense Council (NRDC) in the USA, and World Wide Fund for Nature (WWF)

## **Bringing food waste studies up to speed**

Previewing possible futures and directions of debate in food waste studies, Part Six of this book considers the role of technologies and their potentially disruptions of consumption patterns (Farr-Wharton, Osadchiy and Lyle, this volume). As technology such as smartphone ‘apps’ become more accessible, there may be new opportunities to share food and prevent waste through technology mediated interactions (Davies and Legg, 2018). Online spaces have facilitated new relationships around food, such ‘Disco Soup’ spaces and events that propose convivial solutions to minimise food waste through cooking and eating together (see Barnard and Mourad, this volume). New ideas and material innovations in packaging, labelling and portion-sizing, it is hoped, might address some of the contextual, discursive and environmental structurings of food wastage as the processual ‘fallout’ of everyday provisioning practices (Evans, 2014, see LaBarge et al., this volume). While the waste-mitigating potential of new technologies- and the political-economic contexts that mediate them- are up for debate, it is likely that they will play a key role.

Another issue we have aimed to tackle in the editing of this Handbook is that of over- or under-representation in food waste studies, discussed in further detail in following sections. Despite its 89 contributors and over 30 chapters, we make no claims that this Handbook is all-encompassing or all-inclusive, particularly because of how food waste is not attached to any single discipline but cuts across academic fields. We recognise, for example, the relative over-representation of global north perspectives. This regrettable marker of academia’s uneven structures also reflects major inequalities embedded in food systems (Patel, 2007). It is not only global South scholars whose voices have been less apparent in dominant food waste discourses, but non-Eurocentric perspectives and ontologies more broadly. As Shilling (2013, p.1) asks, “who gets to define what is and what is not food and waste?”.

In recognising these gaps, we sought to include more diverse perspectives, scholars and case studies that may challenge certain well-received framings and interpretations of food and our relationship to it. The varied perspectives given in different chapters present just some of the possible approaches to food waste scholarship. This variability is partly rooted in the ways that food waste is woven into so many different aspects of everyday life, whether as a consumer, businessperson and/or policymaker. In this Handbook, scholars, practitioners and policymakers engage with food waste through the lens of religion and spirituality; supply chains; political economy; policy integration; behaviour change; waste measurement; social innovation; surplus

food redistribution; infrastructure; inequality; activism, and a breadth of methodological approaches and innovations; amongst other broad themes. Today, those investigating the wastage of food continue to add to a rapidly-expanding area of academic interest. The following section introduces a number of chapters analysing food waste activism and the visceral encounters with wasted foods that such activism frequently entails.

### **The moral pull of food waste: and acting upon it**

This volume includes authors whose current activism is rooted in scholarship, and others whose scholarship is rooted in activism, or at least visceral encounters with the ubiquitous stuff of food waste. Many food waste scholar-activists recall an experience of encountering food waste first hand, and often at scale, prompting questioning and an urge to somehow do something about it. Some years ago, beside a small supermarket in the UK, one editor noticed a bin overflowing with unopened, partly in-date packets of food: ice creams, whole chickens, bottles of beer, tomatoes, organic eggs, chocolate, and a preponderance of bread products and bananas- as would later come to be recognised as ‘normal’ for supermarket bins. Another recalls his part-time employment at a supermarket whilst in college and the shocking of the amount of unsold food that was generated at the end of each day, while another editor was taught from a young age through a traditional folktale, that to waste even one single grain of rice is unethical.

Our reactions and subsequent investigations led us, in different ways, to study causes and trajectories of wasted food. Discoveries of inexplicably-wasted food might prompt horror or denial: close the bin, drive away. A combination of curiosity, greed and consternation might prompt one to think how this very food could be put to good use: could I eat this? Share it? The materiality and symbolism of food, perhaps more so than other manifestations of waste, exerts a particularly strong call. The store bin’s food was hastily bundled into the car (guiltily: the moral and structural line between gleaning and stealing has always been blurry and riddled with taboo<sup>4</sup> and, once home, displayed and photographed: the visceral overwhelm of confronting excessive amounts of uneaten food turned to spectacle. There is something about hoards of food, turned matter-out-of-place by their mediation within a furtively-opened bin, that prompts urgings to tell others, seek explanations, and solutions, expressed in Barnard and Mourad’s recounting (this volume) of the

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<sup>4</sup> Exemplified with the case of Steven de Geynst has also been popularly dubbed the “Muffin Man” case. On March 22nd 2010, De Geynst was charged for robbery and sent for trial for taking two bags of muffins discarded at the back of a store in Rupelmonde, Belgium (O’Brien, 2012)



'Wave the banana at capitalism' speech. Emerging writing on 'dumpster-diving' (e.g. Edwards & Mercer, 2007) assured us that we were not alone.

The ontological perturbations induced by encountering food waste, and starting to learn how it is caused, can translate into political perturbations. Some Handbook authors have participated in social movements mobilising around food waste, convinced that individual efforts to 'waste less' will be futile in the absence of broader critical analysis and action to counter structurally-entrenched causes (See Bowman in this volume). The past decade has seen an upswell of writings aiming to spur such critical attention. Curiosity and concern around food waste may have derived from reading Stuart's (2009) or Bloom's (2011) popularly-written but thoroughly-researched books, or the increasing number of academic papers and courses on food waste awaiting students of multiple disciplines. Equally, it may come from encounters with food waste while working in catering, or deep-rooted mores about the inadmissibility of wasting food from aphorisms around the childhood dinner table. Others' politicisations of food waste occur through involvement in broader social justice movements. Consider the origin story of Food Not Bombs (Barnard and Mourad, this volume): founder Keith McHenry, upon discovering an enormous wheel of cheese in a dumpster, announced; "To heck with being vegan, let's be 'freegan'!". Noting that the politics of veganism rests in-part on one's capacity to 'vote with the wallet' through market purchasing (Alkon and Guthman, 2017), Food Not Bombs aimed to highlight the destitution of many amidst dominant logics of economic growth and military expansion. Yet despite burgeoning academic and popular writings, public awareness campaigns, and organisations making food waste visible, many of us relate to it in a personal way, often bringing a raft of moral conceptions to the table (O'Brien, 2008).

### **Embodying waste/guilt: a gendered perspective**

The contradictions of a vastogenic economy premised on the manufacturing of scarcity (Cloke, this volume, Abbott, 2014) are swallowed and metabolised in political ecologies of bodies that once again complexify easy categorisations of how-and where- food waste is caused and manifested (Hayes-Conroy & Hayes-Conroy, 2013). The gendered and familial dynamics of domestic food waste have been documented (Evans, 2014, Cappelini and Parsons, 2013, Fraser and Parizeau, 2018). On the topic of food literacy and food waste reduction, Soma's Indonesian case study (2016) identified the critical role that women predominantly play (through food provisioning) in passing down traditional and intergenerational knowledge around food waste

prevention, reduction and attitudes. This knowledge is transferred through folktale storytelling, spiritual teachings, as well as gender-based domestic food work, which in a political economy perspective is categorized as “unpaid” labour and often devalued (Soma, 2016). Further, a feminist perspective sheds light on how our bodies themselves become sites for the temporary resolution of capitalism’s ‘bulimic’ contradiction of growth and bodily limitations (Guthman and Dupuis, 2006). Beyond metaphorical critiques, others have written highly personal and embodied accounts of experiences with bulimia, articulating experiential realities of dominant cultural dichotomies of gluttony and self-denial (Bullitt-Jonas, 1999), food’s (over)use as tool to manage self and social expectations (Squires, 2002) and racialised, classed guilt at ‘wasting’ food through culturally-disordered eating (Stovall, 2017). Feminist accounts of obesity and fatness provide critical routes into understanding the relationships between minded bodies, foodscapes and food economies whose excesses are both profitable and potentially life-threatening. Historical changes in cooking practices, gender roles, package/portion sizes and food/choice availability all nuance the enrolment of the ‘rational individual’ in the reckoning of what is, simply, enough.

### **Seeking root causes, recasting received wisdom**

Social movements have coalesced around the problem of food waste, but differ in their framings, political diagnoses, and proposed actions to address it (Arcuri, 2019). Many such movements, for example, have attempted to situate food’s wastage within a critique of the logics of neoliberal capitalism, where food’s profitability exerts a greater influence on its journey than its capacity to nourish (Gascón, 2018). Ever-increasing excess becomes a business rationale rather than an effort to feed a growing number of humans equitably, as Cloke’s chapter theorises through the concept of ‘vastogenesis’. Far from being devoid of, or separate from, regimes of value, “food/waste is both supportive of and necessary to the functionality of the system and therefore of direct value to it” (Cloke, this volume).

The values accorded to food and the ways in which it is perceived, narrated and treated, is a theme running through a number of chapters (Jane Midgley, for example, considers multiple values informing “ideas and understandings of surplus food”). Several Handbook authors engage a Marxist analysis of food wastage, centred on the dominant logic of ‘use values’ over ‘exchange values’ and an unquestioned faith in the necessity (and assumption of the possibility) of economic growth in food markets. Such analyses trouble received ideas about who, or what, is responsible for food wastage. As Giles argues (this volume), “the lion’s share of public responses centre fickle

consumers or technical inefficiencies. These narratives are a convenient exculpation for agribusiness and food retailers, ostensibly beholden to their customers' demands. In other words, they let capitalism off the hook" (see also Parizeau's chapter on household food waste, this volume). Such re-tellings unsettle explanations of food waste as 'accidents'- climatic, technical, or managerial, that interrupt the normal and desirable way of producing and distributing food. Rather, they shed light on normalised- but historically abnormal- conditions whereby food's commodification, rather than its provisioning as a commons (Morrow, 2019) appears natural. In this light, the bread tossed at the end of the supermarket day is seen in terms not only of depleted freshness that might deter fussy customers, but as a commodity whose cheap price, and industrialised sped-up mode of production allows for its overproduction.

Making space for newer items that can earn a greater premium for retailers than the old (Giles, 2016) daily remakes the visage of mass consumption, whose aesthetic standardisation stands "diametrically opposed to the contingency of a natural world" (ibid, p.84). Tackling the biopolitical structures that produce waste, Giles' chapter (this volume) analyses the wastage of edible food commodities as the necessary counterpart to the reckoning of exchange value through the constant flow (and uneven accumulation) of capital. Giles notes: "where goods are produced in excess, and demand is produced through scarcity or rarefaction, the two strategies are in diametric opposition to one another". These considerations of political economy perhaps help us understand why large food businesses can happily donate edible surpluses to charity, but will not simply allow passers-by or retail workers to take the food for free at the end of the day: why would people pay for food when they know "it can be had for less, albeit not quite as fresh, in the alley?" (Giles, 2013, p.46).

### **The variegated and visceral politics of food waste activism**

Several Handbook chapters compare the variegated and shifting politics and practices of food waste activists (see especially chapters by Barnard & Mourad, and Bowman). Many involve encounters with the copious amounts of edible food that ends up in the waste stream; the lives of discarded foodstuffs do not always end in the dumpster. Food's use value- its capacity to nourish (and delight) bodies and commensal experiences, persists (Giles, 2016). Discarded foodstuffs trace an "abject map of the conspicuous consumption of high-income earners" (ibid., p.83), but can fuel practices of food sharing (Davies and Legg, 2018) and landscapes of 'social' eating where commodity values are no longer the dominant force (Blake, 2019). Giles' (2013) ethnographic

delvings into Food Not Bombs' anarchist kitchens, open-air shared meals- and an array of dumpsters- take us into the topsy-turvy, shadowy worlds of value. Here, the "abject labour" of those unwilling- or unable- to participate in the high-price urbanism of commodity capitalism, turns wasted foods into commensality and social solidarity through shared public meals.

Food Not Bombs thus transform wasted food materially but also discursively, naming contemporary waste as symptomatic of uneven structures and dynamics of resource distribution. Giles has studied how the globalised logics of waste production beget globalising, networked movements that not only critique those logics, but use the material stuff of waste to share food with people less able to participate in market economies in what he calls "a kind of after-market shadow economy" (2016, p.85). Yet there are conflicting visions of how the food waste problem should be understood and approached, with Lougheed and Spring's chapter (this volume) exploring conflicts around how different kinds of food waste can, and should, be divested and disposed of in the name of at-times contradictory rationales of food safety and food insecurity.

UK campaign group This Is Rubbish have sought to counter what they see as neoliberal tendencies in dominant policy and industry responses to food waste. These tendencies include emphasising consumer-level, rather than pre-consumer, causes of wastage (Evans, 2011), and preferences for managing unsold excesses, rather than preventing their generation in the first place (Warshawsky, 2010), and for "voluntary responsibility deals over mandatory regulation", which they attribute to a broader tendency for a politics of encouraging business efficiency with minimal government intervention (Stewart et al., 2013, 2). Over recent years, the group has lobbied for mandatory audits of industry waste generation and binding EU targets to halve farm-to-fork food waste by 2030, while supporting a parliamentary food waste bill (see Porter, this volume).

As well as creating discursive space for structural demands, sometimes through public stunts (a skipful of wasted food delivered to supermarket entrances, for example), groups such as This is Rubbish have attempted to 'reconnect' consumers with food systems through public awareness-raising and educational efforts in schools but also outdoor events. Community-based surplus redistribution efforts may combine food waste reduction efforts premised on individuals' knowledge and skills (e.g. of expiry labels and food handling) with broader awareness-raising about food systems, to transmit understanding of causative factors and solutions. Spring, Adams and Hardman (2019) explore the tensions between educational food waste activism that can shift

the responsibility to young people rather than target systemic causes, yet whose attention to bodily, sensory dimensions of food access and handling can engender embodied and collective understandings of food and food systems that extend beyond a focus on waste alone (Hayes-Conroy and Hayes-Conroy, 2013). Many food waste movement actors themselves reflect on these tensions, and are aware of the potential contradictions of activism that seeks to contest, yet may inadvertently contain, food wastage and its causes (Heynen, 2010).

A concentration of this literature hails from North America, which has seen the growth of professionalised food charity as a response to the politically-embarrassing contradictions of excess and poverty in wealthy nations. Riches (1997) critiqued charitable responses to ‘first world hunger’ as evidence of failing liberal welfare states, with Poppendieck (1998) noting the ‘moral safety valve’ food charity affords as a means to appease the discomfort of living in affluent-but-unequal societies. Fisher (2017) describes the globalising logics of industrial-scale surplus food charity in terms of ‘Big Hunger’, and research increasingly attends the growth of food banking in the global South (Warshawsky, 2018). Yet food charity has been framed as a “win-win” solution in debates around interventions that often conflate food waste and food insecurity issues. Challenging such oversimplifications, this Handbook calls for a more inclusive approach to food waste studies and the need to explore alternative paradigms and solutions (see Yoreh and Scharper in this volume for a spiritual approach).

### **A More Inclusive Approach to Food Waste Studies: Alternative Paradigms, Alternative Food Waste Conceptualisations and Alternative Solutions**

From the “Tale of the Crying Rice” common in Java, Indonesia (Soma, 2016) to the Mohawk (Kanien’keh.:ka) telling of the Creation Story of the “Sky Woman” (Horn-Miller, 2016) and the “All My Relations” Indigenous teaching- in Turtle Island (North America), a new wave of intersectional food waste scholars are recognising the need to include and (re)learn from paradigms, scholarships, cultures and worldviews that might counter and challenge the industrial food system, while serving to reconnect identity, well-being, and relationships to food and land. This is especially relevant in a dominant global food system that numerous studies have defined as unjust and exploitative of labour (Weiler, Otero, and Wittman, 2016), destructive to biodiversity and natural resources (Willett et al., 2019), wasteful (Stuart, 2009), and a food system that has been commonly referred to as “broken” (Holt-Giménez and Peabody, 2008).

Alternative worldviews on food systems (see Soma et al. in this volume) and alternative conceptualisations of relationships that are non-anthropocentric, non-human or “beyond human,” are well-established in post-humanist literature (Wolfe, 2010). Bennett (2010) notes the ecological importance of shifting the gaze from an anthropocentric focus on human experience to things-in-themselves. Food in this view becomes *actant*, with agency and vitality whose recognition may escape and challenge human mastery. In discussing waste matters, Bennett explores such vibrancy of matter, noting that “our trash is not ‘away’ in landfills, but generating lively streams of chemicals and volatile winds of methane” (2010, vii). This point is voiced in other registers within food waste literature e.g. scholars and reports oft-repeat the point that food waste decomposing in landfills generates methane, a greenhouse gas with a warming impact 25 times more potent than carbon dioxide (CEC, 2017; FAO, 2015).

In large part, however, the dominant response to food waste has assumed the treatment of food waste as a resource, as a commodity, or as a problem for humans to master (Papargyropoulou et al., 2014). Bennett alerts us to a different approach to solving public problems that takes more seriously the agency of these matters (in the double sense), including edible matters such as food. She explains her advocacy for nondualistic distributed agency thus: “my hunch is that the image of dead or thoroughly instrumentalized matter feeds human hubris and our earth-destroying fantasies of conquest and consumption” (ibid, p.ix). Underlying our conceptions of power, Bennett implies, are ontologies of domination premised on anthropocentric dualisms whose decentring might allow us to seek new possibilities for understanding action, community, and politics. Seen in this way, from the point of production, food deserves- and demands- to be elevated to a point where it is not merely a thing to be “managed” but emphatically deserving of more respect and not to be wasted. Lou’s (2017) unveiling of everyday practices of re-use in Hong Kong is one example of ontological and ethnographic work that challenges the objectification and commodification of food matters.

### **The affective pull of wasted food materialities: a wellspring for politics...and art?**

Other authors, especially those writing about waste from an indigenous perspective (e.g. Liboiron, 2016) highlight the partialities of political economy for a comprehensive understanding of waste. While it has long been unfashionable in academic discourse to reinforce individual action as the locus of our analyses, ‘assemblage’ ontology troubles the very notion of the individual, arguing

that our problems cannot simply be laid at the discursive door of 'government' or even 'capitalism'. How might recent efforts in social theorising to attend to sensoriality, affect and emergence, help us make sense of the embodied, emotive and multi-species experiences of many of those directly working in the generation, recapture and transformation of wasted food (Korsmeyer and Sutton, 2011, Waitt and Phillips, 2016)? Lougheed and Spring's chapter (this volume), for example, draws on resources of assemblage thinking to consider the ethical, regulatory and material infrastructures- or conduits- through which food is variously divested (Gregson, Metcalfe and Crewe, 2007). How might food- and multiple conduits through which wasted food is rescued, repurposed, or landfilled, 'bite back' (Tenner 1996) in unexpected, unintended, ways?

What does it mean to give food agency, to be "struck by its phenomenology" (Hawkins 2006, p.83)? Hawkins describes the heart-shaped potato picked out by 'The Gleaners' documentary maker Agnes Varda not merely as effect of cinematic representation but as a "sensuous, wondrous thing" (ibid, p.84). The camera not so much renders the object as lively but allows us to witness "objects becoming things and the ethical implications of this". Hawkins notes of the close-up panning of potatoes on a table that we don't just 'see' them but 'touch' them and that "through this imbrication of touch and vision...we experience Varda's sensuous enchantment with the thing" (ibid). "When we encounter waste as things", she suggests, "the affective energy that can accompany this...can be the impulse for new relations: a motivation for a different ethics, a sudden inspiration for a new use" (p.85). What might be the ethical implications of engaging with various kinds of wasted food and the things we do with them? What happens if we let food itself speak as an actant? Perhaps Varda's art conveys an attunement to 'thing-power' that gives artists capacity to change hearts and minds (what is politics if not this?) that seems defunct in tired behaviour-change campaigns. Reno (2015, p.568) notes the sleight-of-hand afforded by such weightings of blame: "while economic incentives and moral shaming campaigns focus on consumer and retail practices, the possibility of compelling manufacturers to produce less waste is foreclosed".

Austrian photographer Klaus Pichler is another such 'attuner'. His 'One Third' photo series<sup>5</sup>, inspired by UN reports on global food wastage (Gustavsson et al., 2011), re-presents decaying food- the stuff of waste- in ways that fascinate and affect differently from images of landfills of

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<sup>5</sup> <https://klauspichler.net/project/one-third/>

fruit. Their *affect* operates through their animation of *other beings* who lay claim to food when we don't eat it<sup>6</sup>. The photo collection as a whole manages to depict the global dimensions of food waste while invoking the most intimate, perhaps abject close encounters with food that Pichler allowed to rot in his apartment before photographing them. A beheaded, plucked chicken carcass sits bolt upright in its roasting dish, forearms splayed and chest skin splayed to reveal the green tinge of the putrifying flesh beneath. A mound of moulding beetroots 'bleed' down the side of their fluted white vase. A slab of beef teems with maggots and grubs. A pile of 'white' asparagus lay bare their yellowed, stringy innards like burned viscera. A bow-headed octopus gleams ghoulish and alien from its green bin-bag shroud. The smiles of potato 'smilies' are obscured by furring mould or squished into grimaces. Animated thus, the processual and dynamic nature of wastage is frozen in the photographic form, eerily inverting the fetishising aesthetics of food advertising (Keefe, 2014).

### **Animal Relations and Beyond-Humans**

There remains a lack of food waste literature that foregrounds the vitality of non-human matters, even in this Handbook. Another major paucity in food waste literature` is deeper consideration of animal welfare and categorisations of animals as "waste", despite Alexander et al.'s (2013, p.482) call for research to "explore how food— particularly meat production—troubles posthumanist politics, in which the equivalence of life forms is often assumed" (for critical discussion on animal parts as waste see Coles and Hallett IV, 2012 and Roe, 2013). This is particularly poignant in a food system where certain animals -the case of male dairy calves is a good example- are seen as of no use to the dairy industry and therefore considered 'waste product' (Gillespie, 2014). While not technically "wasted" in the sense that the industrial system still sees some sort of use for those categorised as "waste commodities", some of the male dairy calves live very short confined lives separated from the mother and are sold as veal, while others are killed at birth with their bodies composted or rendered (Gillespie, 2014). According to Ellendorff and Klein (2003), in the United States, 226 million-day-old male chicks are culled every year almost immediately after hatching from layer breeders. Industry sees no reason to rear them due to slower growth rate and seemingly inferior meat in comparison to broiler chickens, significant ethical concerns (Krautwald-Junghanns et al. 2018) . Culled chicks are generally processed industrially for animal feed so are not technically "wasted" from the industrial food system perspective. However, instead of

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<sup>6</sup> Close attention to non-human forms of Serres' notion of parasitism offers new vantage points onto who-or what- decides what is waste (Burton & Tam, 2015)



acknowledging wider ethical and environmental implications of industrial egg manufacturing and retailers/consumers' unrealistic expectations of chicken size, Ellendorff and Klein (2003, p.7) suggest that killings "could easily be avoided if only female chicks were born" or the unwanted gender could be identified at the stage of an embryo and then killed, assuaging public concerns around chick culling. While culled animals' categorisation as waste does not exclude them from being seen as a "waste commodity" or "resource" in other sectors - such as for rendering or animal feed - their vitality was never considered and they were not, as Bennett (2010) called for, treated with respect.

Relationships between animal agribusiness and waste trouble our very conceptualisations of what can be defined as food waste (Alexander et al. 2013). At a food waste symposium on a rural English farm, Henry Buller (2015) described the "systemic waste of growing potentially human food to feed animals". The idea of animal feed as waste challenges commonly-held notions of 'efficiency' (Garnett & Little, 2015), while troubling narratives of the need to double food production by 2050 (Weis, 2015). Tomlinson (2013) indeed argues that recognising food waste more broadly as part of this discourse offers alternative ways to feed the world than normative productivism.

Critical animal studies consider animal relations and how discourses around dirt, pests, vermin and waste are reflected in stigmatic framings of both the unwanted non-human (in the case of Cormon, 2011, raccoons) and the unwanted human other (freegans/ dumpster divers) within an urban context. Cormon describes the cultural vilification of both freegans and raccoons, noting that urban "civility" somehow becomes threatened by both the physical and symbolic disruption of trash when both freegans and raccoons reclaim what was once categorised as "trash". In re-valuing what others have deemed invaluable, freegans reclaim the discards of consumer culture and make the political choice to challenge excess consumption (Barnard, 2016). Despite stigma around garbage and dumpster diving, and the fact that many freegans eat from waste voluntarily and not due to lack of income (Edwards and Mercer, 2007), much food reclaimed from bins is not rotten, spoiled, or dirty but in many cases high-quality, though Clark's (2004) symbolic analysis of 'punk cuisine' highlights how the very categories of 'civility' may be rejected and inverted through activist food praxis.

## **Re-connecting the Distance: Alternative Food Systems**

We argue that an alternative framing of value in edible matters can be found in various non-Eurocentric alternative paradigms, especially those focused on different forms of relationality and ethical responsibility. Alternative paradigms that delve deeper into intersections between human/non-human relations and non-Eurocentric forms of knowledge are evident in fields such as food studies and also economics (see example of Buddhist Economics in Payutto and Evans, 1994). For example, studies exploring Indigenous food sovereignty demonstrate the need to tackle the exploitation of land and resources due to colonisation (Kepkiewicz and Rotz, 2018; Grey and Patel, 2015; Rudolph and McLachlan, 2013) and the important role of traditional ecological knowledge (Coté, 2016) in the development of a more sustainable and just food system.

Addressing supposedly 'developed' nation-states, critical studies of equity and food justice (Alkon and Agyeman, 2011; Guthman, 2014) consider the importance of attending to class, race and socioeconomic status in understanding determinants and measures of food security, hunger and food accessibility. Food justice and non-Eurocentric approaches such as traditional ecological knowledge have not adequately informed debates and conversations in food waste literature (for some examinations of food waste through an equity lens see Spring, 2016; Spring, Adams and Hardman, 2019; and Soma, 2017 on the influence of class on food waste). One exception to this trend is the significant body of work, already mentioned, that critiques the assumption that industry's food surpluses constitute an adequate solution to food insecurity (Henderson 2004). Thus far, paradigms with potential to challenge food system injustices by countering food's commodification while offering a decolonial approach to eaters and the food that they eat (see Todd, 2014 on human-fish relationships), have not been made mainstream in current food waste studies literature. It is for this reason that we seek a more inclusive and intersectional approach to food waste studies that showcase more scholarly work from the global South and from Indigenous scholars. In a nutshell, a "food waste 4.0".

"All My Relations", an indigenous worldview found in Canada (also referred to as Turtle Island) offers an interconnected framework of rights and responsibilities that is premised on the values of being in balanced relations with all creations (McGregor, 2009). When applied to food systems, it challenges the status quo and neoliberal paradox of the commodification that perpetuates wastage alongside hunger. It also seeks to counter the exploitative potentials of the distancing process, defined by Princen as, "...the separation of primary resource-extraction decisions from final consumption decisions" (2002, p.157). The "All My Relations" framework acknowledges that

survival is possible through recognising our mutual relatedness, and responsibilities towards our kin (both human and beyond human). Histories of ever-greater distancing between food system elements and relations has disconnected these roles, responsibilities and relations.

Despite widespread media and academic coverage showcasing the diversity of issues (health, environment, economic, animal welfare etc.) around food production, consumption, choices, and wastage, simply being aware of an issue is not sufficient to mobilise action. As Carolan (2016) notes, “we need to feel”. Elsewhere he writes that “the experiential horizon of food consumers comes from the level of epistemic distance from the global nature of today’s food systems” (2011, p.32). This epistemic distance is reflected in a framework of severed relationships, which from an Indigenous ontological perspective (Manson, 2015), may also refer to our separation from our kin (note: plants, animals, the land, and food in general are considered “kin”). Princen (2002) and Clapp (2002; 2012) have sought to explain how such spatial and mental distancing, leads to overconsumption, exploitation and waste. Thus we pose the following question to the reader. In the context of wasting food, *“what does it truly mean to waste one’s kin?”*

### **Building New Foundations of Relationality**

Carolan (2017) documents examples of intentional efforts to distance eaters and producers, allowing issues such as farm labour exploitation or environmental injustices such as pollution for people living downstream of food processing plants to go unnoticed or unpunished. These distancing processes are rooted in imperialist-turned-corporate regimes (Friedmann and McMichael, 1987), colonialism, and slavery (Mintz, 1986). Neoliberalism, through the liberalisation of global agricultural economies under structural adjustment policies, corporatisation, and regulations that promote unjust international trade (Bello and Baviera, 2009), have restructured landscapes, foodways, labour, and relationships, threatening the food sovereignty of various nations. Transnational Corporations (TNCs) dominate global food supplies, from food production to food processing, distribution and retail (Clapp and Fuchs, 2009). This process of intensified financialisation as Clapp argues has in turn “abstracted food from its physical form into highly complex agricultural commodity derivatives” (2014, 797).

Viewed in this light, food waste solutions that do not challenge, disrupt or address these systemic injustices could perpetuate further inequalities. It is rooted in the obfuscation and disregard of the interconnectedness of not only ecosystems, but also of land, and human relations. Gille (2009)

notes how cultural and social values have shifted to meet the demands of profits in waste regimes of disposability. Cheap food implies “the decontextualisation of food in its broadest sense” (Carolan 2012, p.2) and the externalisation of environmental, social and political costs of food production, consumption, distribution and waste management. In building a new foundation of relationality that honours vitality, challenges injustice, and considers the need to address the structural roots of globalised food waste, a number of chapters showcase diverse perspectives, theories, methodologies and case studies from different regions. For example, Indigenous scholar Adrienne Lickers (Onondaga from the Six Nations of the Grand River First Nations Territory)’s chapter in this volume, co-authored by Soma, Li, Geobey and Gutierrez, asks “how do we see food?”. This question will be useful to keep in mind when reading this book, considering whose lenses (individuals, academics, institutions, activists, corporations) have been privileged in approaches to food waste.

In addressing the ‘wicked’ problem of wasted food (see Soma et al in this volume), it is thus important to recognise how problem framings and definitions influence interventions. In *Waste Matters* (Evans, Campbell and Murcott, 2013), food and waste are firmly positioned as good for theorising. In thinking and acting, we hope that this book promotes interdisciplinary collaboration, cross-cultural learning, equitable policymaking, systems thinking and alternative paradigms in approaching food waste. In doing so, it will become more possible to build a foundation of respect for the agency, vitality, and vibrancy of food and all of the relations embedded in its matter.

### **Joining the Movement: A New Wave of Food Waste Studies and The International Food Loss and Food Waste Studies Group**

We conclude this editorial with the genesis of how this book came to be, as to do so is our approach to challenge a linear framework by reconnecting the *present* to the *past*, in efforts to engage *future* food waste scholars. In early 2014 a whirlwind email thread discussing the expanding insights of the burgeoning field of food waste studies and deeply concerning statistics led to the beginnings of a global network of emerging food waste scholars. We responded to the alarming figures by helping to organise and aid the mobilisation of a new wave of global attention to the food waste problem, attention whose ambiguous implications and variegated politics are revealed by some chapter authors. First profiled and hosted as an online network and group by the Garbage Matters Project at Leiden University (Netherlands), The International Food Loss and

Food Waste Studies Group (foodwastestudies.com) sought to create a space to nourish a new phase of food waste research. The group was born by autumn 2014, with a website and Google group platform enabling the exchange of research, knowledge and debate within a growing community of academics and practitioners. As the Food Waste Studies network grew, the interdisciplinary nature of the field became increasingly apparent. The opening chapter of the seminal monograph *Waste Matters*<sup>7</sup>, noted that “food waste is a hugely under-researched area of interest for social scientists” (Evans, Campbell and Murcott, 2013, p.5). Six years on, this *Handbook* includes 89 authors, among them scholars, practitioners and policymakers. Clearly, food waste studies has come a long way, although much work remains to be done.

The Food Waste Studies group has encouraged discussion and debate both in-person and virtually, given the global nature of food waste studies. A significant milestone was the organisation of a special session at the 2015 Association of American Geographers conference in Chicago. The session, a ‘Food Waste Tour of the Global North and Global South’, was the first face-to-face meeting of many of the group members. Multiple paper presentations revealed food waste as an economic, ecological and moral issue through a range of case studies from across the world. This was an attempt to unveil, compare and conceptualise ‘food waste’ in its many aspects, interpretations and politicisations. An Economic and Social Research Council Festival of Social Science event was held in 2015 on ‘Innovation in Tackling Food Waste’ as well as various seminars in Europe and North America. Further events followed, such as the organising of multiple food waste panels and a roundtable led by Food Waste Studies group members at the 2016 joint conference of the Association for the Study of Food and Society; the Agriculture, Food, and Human Values Society; and the Canadian Association for Food Studies in the City of Toronto, Canada.

Thus far, the group has provided a platform for advertising events wide and far, from ‘Disco Soup’ events to conferences, seminars, policy discussions, and film screenings. The group has provided a network of collaboration for research grants, book projects and more. With the co-editors having been founding and/or active members since the group’s inception, we see this book as a significant milestone in the group’s journey and hope that as well as providing a valuable manual and point of reference for a variety of perspectives on food waste, it is also a call to arms to

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<sup>7</sup> This was originally published as a special issue in *The Sociological Review*

students, academics and practitioners to further develop and act upon their interests in this critical field for addressing more sustainable and just food futures.

The community that has grown out of [foodwastestudies.com](http://foodwastestudies.com), totaling more than 200 in number and spanning multiple countries, has shown us that an interdisciplinary response is needed to address the issue(s) of food waste in light of the urgency of climate change and the global inequities around food insecurity. For this community to operate effectively together we need a common starting point and language. For this reason we have edited this book with two aims. First, we have edited this Handbook to appeal to a broad audience of food waste students, academics, policy makers and practitioners. Second, we have edited the book to illustrate the breadth and scope of food waste literature, view points, and research, and to provide an intellectual starting point from where others can launch themselves.

We recognise that food waste studies is rapidly evolving as a field of research. When the editors began their studies in the area, the number of academic papers related to food waste was under 100 - we (the editors) all had read sociological and cultural theorisations of waste by Douglas (2003), Evans (2011), Hawkins (2006), Thompson (1979), and Rathje and Murphy (2001). Now every month we are alerted of new articles that expand the literature ever further, yet large gaps in knowledge -and voices- remain. This hand book recognises the speed at which this field is growing, and provides a voice to emerging and established scholars to provide a snapshot of the swift proliferation of interest in this field. We encourage readers to join this community by visiting [foodwastestudies.com](http://foodwastestudies.com).

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