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1 **Some Issues in the Ethics of Food Waste**

2 Brian E. Roe*, Danyi Qi^a & Kathryn Bender^b

3 **Abstract**

4 It is estimated that nearly one-third of food produced on the planet never meets its intended
5 purpose of human nourishment. This represents a substantial stock of resources available for
6 reallocation. Any potential reallocation of resources raises ethical issues – who should sacrifice
7 (change current behaviors), who should benefit, and what methods are appropriate to induce
8 the behavioral change required to invoke the reallocation? In this brief article, we will discuss
9 several topics in the food waste literature that, in our opinion, raise ethical issues that warrant
10 further thought and consideration. These include the emphasis on food donation as a means to
11 reduce food waste, the emergence of markets for food with cosmetic imperfection (i.e., “ugly
12 food”), the appropriateness of guilt appeals to motivate reductions in wasted food, and the
13 ethical tensions in choosing dates on food labels.

14 **Keywords:** Food Waste, Ethics, Ugly Food, Food Donation, Date Labels, Guilt

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21

22 **Introduction**

23 It is estimated that nearly one-third of food produced on the planet never meets its intended
24 purpose of human nourishment (Gustavsson, et al., 2011). This represents a substantial stock
25 of resources that could potentially be redirected for other purposes. Any potential reallocation of
26 resources raises ethical issues – who should sacrifice (change current behaviors), who should
27 benefit, and what methods are appropriate to induce the behavioral change required to invoke
28 the reallocation? We discuss a number of topics in the food waste literature that, in our opinion,
29 raise ethical issues that warrant further thought and consideration. Our hope is that broader
30 discussion and engagement on the issues raised can contribute to a small but growing field of
31 food ethics (Kaiser and Algiers 2016) and add to a limited number of articles contemplating
32 ethical issues in the wasted food space (MacMillan 2009, Gjerris and Gainani 2013, Närvänen
33 et al. 2018, Blakeney 2019).

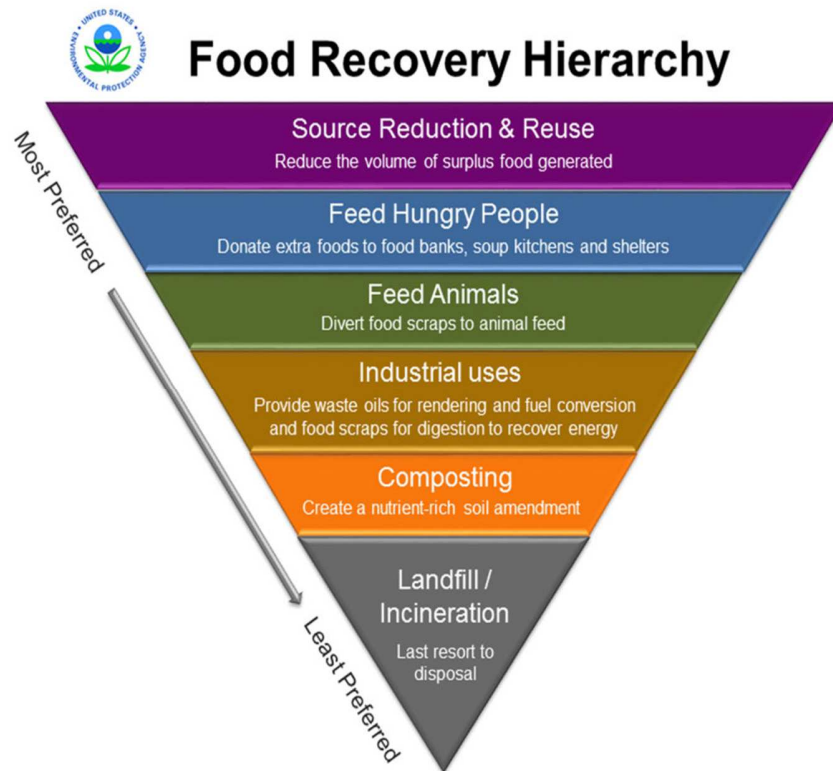
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35 **Dilemmas in Food Rescue, Recovery, and Donation**

36 The United States Environmental Protection Agency’s Food Recovery Hierarchy (Figure 1) is
37 the dominant normative guide for practitioners and research when it comes to wasted food
38 (Papargyropoulou et al. 2014). The hierarchy provides a visual prioritization of the actions to be
39 taken when the food system yields uneaten food. The hierarchy prioritizes using uneaten food
40 to nourish people (“feed hungry people”) as second only to not creating wasted food in the first
41 place (“source reduction”). This seems imminently logical because food is, by definition,
42 intended for human consumption. Therefore, if the amount of uneaten food cannot be reduced,
43 why not work to ensure that food is eaten by someone, particularly given that measures of food
44 insecurity are disturbingly high, even in a nation as wealthy as the United States? Hence firms,
45 organizations and even individuals are encouraged to donate uneaten food. The act of donation

46 is a moral imperative for certain population groups (e.g., social and religious organizations),
47 implying food donation should be as well.

48



49

50 **Figure 1. The U.S. Environmental Protection Agency's Food Recovery Hierarchy**

51

52 However, this begs the question: Why was the food uneaten and now being donated?
53 (Few ask why cash went unspent). Some of the first documented episodes of food donation
54 featured Peter IV directing his subjects to donate foods of diminished quality to the neediest
55 subjects populating 14th century Aragon (Schneider 2013). While much has changed over the
56 centuries, the power relationship between those donating and receiving food remains, as does
57 the potential that donated food may not be recipients' first choice if they were given full decision

58 autonomy (Carney 2012, Middleton et al. 2018). While many hunger relief organizations now
59 focus on raising donations of money that can be used to replicate the choices available in
60 mainstream food outlets, donations of food near expiry, with misprinted labels, or of unpopular
61 formulations remain prevalent (Middleton et al. 2018).

62 This generates a suite of ethical issues. First, does the hierarchy's prioritization of food
63 donation provide an 'easy out' for organizations and individuals who may not want to undertake
64 the more difficult steps involved in source reduction? Re-organizing and realigning system-wide
65 procedures can be costly and difficult, and may require overcoming long-standing consumer
66 expectations of retailers (e.g., produce displays that always have variety and are fully stocked).
67 Any social benefits of food waste source reduction may be buried in corporate sustainability
68 reports and difficult to explain to the public. Donation, on the other hand, involves only latter
69 portions of product pipeline and results in higher-profile actions that may be seen by the public
70 as socially responsible and caring for marginalized populations. Furthermore, given that some
71 of the donated food consists of near expiry items or unpopular formulations (Middleton et al.
72 2018), does this increase the odds that the donated food will go unclaimed at donation centers
73 or, if taken home, remain uneaten in recipients' homes, merely pushing the need to recycle or
74 discard further down the chain after additional resources are expended to move the donated
75 food?

76 Second, does the prioritization of food donation perpetuate a specialized supply chain
77 for the food insecure, relegating this segment of society to a system that may further
78 marginalize and stigmatize them? While the organizations and individuals involved in the
79 system serving the food insecure work tirelessly to ensure dignity and autonomy of those they
80 serve, the broader issue is whether a two-tiered food system is the appropriate societal
81 response to underlying drivers of food insecurity (Carney 2012). Society could choose to simply
82 transfer sufficient resources (e.g., income, transport) to the food insecure to allow participation

83 in the dominant food system frequented by the food secure. Furthermore, the presence of two
84 food distribution systems means two sets of ecological footprints rather than one. It also
85 requires public self-identification by those who struggle to meet nutritional needs, which may
86 further induce stigmatization (Poppendieck 1994, Middleton et al. 2018).

87 Suppose instead that organizations focused on source reduction, and this resulted in
88 less food donation. Would the resources saved as part of source reduction ever be dedicated to
89 help the food insecure? Would this be a net loss for the food insecure because donations would
90 diminish while any organizational resource savings would simply go to bolster shareholder
91 value? These are difficult questions to attack, though systems level models such as that
92 developed by Galli, Cavicchi and Brunori (2019) provide a foundation for approaching and
93 highlighting the ethical tensions that arise in this space, though we find more attention is
94 deserved to guide individual and collective action.

95

96 **Marketing Ugly Food**

97 Ugly food refers to products (usually fruits and vegetables) that fail to meet prevailing cosmetic
98 standards (size, shape and color) but retain desired nutritional and safety attributes.¹
99 Consumers may view such items as inferior, which diminishes immediate demand and may
100 undermine a brand's quality reputation. In many modern supply chains such items are sorted
101 out before retail presentation due to corporate standards (contractual specifications, e.g., Porter
102 et al. 2018) or government policy (e.g., marketing orders, e.g., Saitone and Sexton 2010). Ugly
103 food often goes unharvested (left in the field) or is removed from the supply chain and either

¹ Bruised and damaged produce may induce food safety concerns and is considered distinct from ugly food.

104 discarded (landfill or incineration), used to create lesser-valued processed items (where
105 cosmetic concerns are less important), or donated to the emergency food system.

106 Existing estimates of the national scope of the problem suggest that about 16% of food
107 waste occurs on farms (ReFED 2016), though more recent and detailed field studies may result
108 in an increase in this figure. For example, Baker et al. (2019) conduct 123 in-field
109 measurements in California for an array of items and find losses ranging from a low of 4.5% of
110 marketed sweet corn yield to 114% of marketed romaine hearts yield. In another field
111 measurement study of 68 fields of eight vegetable crops in North Carolina (Johnson et al. 2018),
112 the percentage of losses on the farm is about 57% of the marketed yield with an average of
113 42% of the remaining food in the field edible but not marketable, i.e., produce that doesn't meet
114 cosmetic or size standards. Baker et al. (2019) also find that the measured edible food loss
115 exceeded growers' self-estimates by a median value of 157%. Given that past national
116 estimates relied in part of self-estimates, this suggests that updated national farm level loss
117 estimates may increase.

118 Ugly food first attracted attention because its existence suggested that the reduction of
119 food waste could create a win-win, i.e., producers increase profits by having more marketable
120 product from a given area of land, while consumers obtain necessary nutrition at a lower cost
121 because there is now more produce in the supply chain. The potential to derive more market
122 value for ugly food and the potential for reducing food waste was the motivation for several
123 startup companies including Imperfect Produce, Full Harvest, Hungry Harvest, and Misfits
124 Market. The business proposition was compelling enough to attract financing from venture
125 capital funds and has resulted in a nascent ugly food market in which companies purchase ugly
126 and/or excess produce from farmers and sell it to consumers at discounted price via direct
127 delivery (Richards and Hamilton 2018). Similar efforts have emerged within traditional retailers

128 (Kroger, Walmart, Whole Foods), though several chains have recently discontinued these
129 efforts (Choi and McFetridge 2019).

130 While conceived and marketed as a win-win for both consumers and the environment,
131 the emergence of the ugly food retail segment results in a reallocation of resources, which
132 stimulates scrutiny of the distributional implications. For example, Taber (2019) questions
133 whether ugly food is a problem at all and whether selling ugly food can actually reduce food
134 waste along the supply chain. Taber (as quoted in Lieber 2019) claims imperfection is a natural
135 part of the growth process and was not viewed as a problem before we treated it as "...a
136 horrible tragedy that's preventable." One concern is that advertising and promoting food with
137 cosmetic imperfection as "ugly" food at discounted price may reinforce the fallacious link
138 between imperfect appearance and lower nutritional quality, undermining the initial policy goal
139 and potentially generating unexpected and unfavorable consequences. For example, retailers
140 without ugly food marketing schemes may be less likely to accept ugly food as ugly food
141 retailing companies now *de facto* certify ugly food as lower quality food via discounts on
142 prevailing market prices.

143 Critics also charge ugly food companies with over-stating the underlying problem and
144 over-selling the potential for ugly food sales to reduce system-wide food waste. Selling ugly
145 food reduces the amount available for processing and donation. In the short run (a given
146 planting season) sales of fruits and vegetables that would have been previously uneaten implies
147 that either (a) more total produce is consumed and/or (b) non-ugly produce goes uneaten. In
148 the case of (a), this could be beneficial if consumers reduce consumption of less healthy
149 alternatives. In the case of (b) more total food is shipped, incurring more environmental
150 damages prior to disposal, processing or donation, as previously much ugly food was simply
151 plowed back into the soil with minimal environmental damage.

152 In many ways, the ethical debate around ugly food centers on the general equilibrium
153 effects of selling ugly food, i.e., the responses that arise across the entire agricultural sector and
154 food supply chain from the introduction of this new marketing channel. Specifically, when the
155 food supply on the market increases due to the utilization of the ugly produce that would have
156 otherwise been wasted, the price of produce decreases and the lower price may reduce farmer
157 profitability, especially for small farmers who are more vulnerable to the changes in market
158 price. For example, Phat Beets Produce, a nonprofit food collective based on North Oakland,
159 CA, correlated a 30% drop in customers with the emergence of ugly food marketers (Food First
160 and Phat Beets Produce, 2018).

161 Also, some sustainable practitioners claim that ugly food marketers tend to collaborate
162 with larger agribusinesses instead of smaller, local farmers. Given the overlapping market
163 targets of ugly produce and local foods (e.g., CSAs and farmers markets), the introduction of
164 ugly food marketers is regarded as a threat to the local food market that has developed steadily
165 over decades in the United States. Some ugly food marketers support local communities
166 through collaboration with local farmers. However, this is far from a permanent solution to the
167 impacts arising from the potential general equilibrium effects it creates.

168 A final consideration is the consequences of long-term adjustment to a robust market for
169 ugly food. If the ugly food market continues, it will increase the amount of produce sold per unit
170 of land planted, and in the long run fewer acres may be planted. A reduction in the acreage
171 planted can relieve the environmental pressures associated with agricultural production.
172 However, this requires that the land no longer needed for food production be used in a less
173 environmentally deleterious manner. Environmental gains may be fleeting if, for example, the
174 newly available land is converted to low-density real estate development.

175

176 **Leveraging Consumer Guilt about Food Waste**

177 Guilt and ethics are linked. Guilt is a negative emotional state aroused when an individual's
178 behavior is inconsistent with his or her own conception of proper or ethical conduct (O'Keefe
179 2002). Guilt can motivate action. When individuals recall experiences of guilt, they commonly
180 wish they had acted differently and often express a willingness to make amends (Tangney et al
181 1996). Hence, feelings of guilt have long been regarded as a potential mechanism of
182 persuasion, e.g., to encourage pro-environmental behaviors (Bedford et al 2011).

183 Guilt and food waste are also linked, at least for many people. According to a national survey
184 conducted in 2015, more than three quarters of the U.S. respondents agreed that they feel guilty
185 when they throw away food (Qi and Roe 2016). Some U.S. food waste estimates suggest that
186 more than 80% of food is wasted in homes or in consumer-facing businesses (e.g., restaurants
187 and grocery stores, ReFED 2016), suggesting that changes in consumer behavior must play a
188 critical role if national wasted food reduction goals are to be achieved. If consumers play such a
189 large role and most consumers feel guilty about wasted food, could public campaigns leveraging
190 guilt be an effective way to promote sustainable consumer food behaviors? If guilt were an
191 effective motivator, it still begs the question: should guilt be leveraged to induce change?

192 To unpack this, we note that guilt is typically connected to an individual's own internal
193 standards. If an individual's behavior deviates from norms that are not accepted by that
194 individual, feelings of guilt will not be aroused. However, Qi and Roe's (2016) finding that more
195 than three quarters of their respondents felt guilty about wasting food suggests that many in the
196 United States have adopted an internal standard against wasting food. This high level of guilt
197 was measured in 2015, prior to many of recent formal campaigns to improve awareness about
198 food waste. Indeed, earlier in the Qi and Roe (2016) survey, only about half of the respondents
199 said they were aware of food waste as an ongoing issue of concern.

200 Evaluating the use of guilt in terms of consequentialism, we note that guilt might not
201 always work, i.e., induce the desired behavior, or guilt might work only in the short run without
202 sustained behavioral change. The extant literature finds that feelings of guilt can also evoke
203 other negative emotions, e.g., annoyance, resentment, anger, irritation, or similar negative
204 reactions (Baumeister et al. 1995, Coulter et al. 1997), which undermine behavioral change.
205 For example, to mitigate the feeling of guilt, consumers can choose to deny responsibility
206 (Bedford et al. 2011, Steg 2007), e.g., denying food waste is a serious problem. Alternatively,
207 even when admitting poor behavior, individuals may rationalize the behavior as normal and
208 suggest that, compared to others, their personal level of wasted food is smaller than average
209 (Qi and Roe 2016, Neff, Spiker and Truant 2015). Other defense mechanisms are also
210 available: denying that personal reduction effort is able to contribute to larger food waste goals
211 in a significant way and assigning blame to the food industry and other households for waste.
212 With that, consumers can find outlets to avoid the feeling of guilt from discarding food even
213 though they are aware of food waste.

214 A final ethical conundrum: Should practitioners and policy makers feel guilty about using
215 guilt to induce behavioral change? While more than 80% of food is estimated to be wasted in
216 homes and in consumer-facing settings, consumer choices are constrained by the choice
217 architecture in those settings. Package sizes, serving sizes, bulk discounts, and ambiguous
218 date labels are a few of the things largely outside the control of an individual consumer that
219 frustrate efforts to reduce waste. Such structural influences may be particularly pertinent for
220 certain population segments often identified as more prone to wasting food such as women and
221 small households (Hebrok and Boks 2017) who require fewer calories and for whom package
222 and serving sizes may simply be too large to facilitate effective waste reduction measures.

223 Others may simply ask: aren't we making consumers feel guilty about enough already?
224 Brennan and Binnie (2010) note a perception among their subjects that guilt appeals were

225 becoming pervasive. Will generating one more guilt-based appeal induce undue personal
226 stress among those who are perhaps already absorbing considerable stress, and would it even
227 be noticed among the deluge of such appeals already foisted upon consumers? For example,
228 is consumer guilt the only motivator available to encourage favorable behavior changes, or are
229 there better and guilt-free appeals that are able to achieve similar persuasion? Further, can the
230 feeling of guilt achieve behavioral changes that are sustainable in the long run, or will the effects
231 quickly fade? Poking consumers to feel guilty both about the waste that they can and about the
232 waste that they cannot control may quickly frustrate their reduction efforts and encourage guilt
233 mitigation.

234 **Choosing a Label Date**

235 As mentioned earlier, consumers and consumer-facing institutions account for about 80% of the
236 food wasted in the United States (ReFED 2016). Among consumer-oriented food waste
237 activities, it is estimated that consumer confusion about date labels accounts for more than 30%
238 of food waste (Quested and Murphy, 2014) and that efforts to better explain labels may reduce
239 the amount consumers waste (e.g., Stengard et al.'s 2018 assessment of labeling reforms in
240 Norway). In the United States, there exists a patchwork of state and local laws concerning the
241 format of date labels (Broad Lieb et al. 2013). Within this uneven regulatory framework, it is
242 almost always the firm who is responsible for choosing a product's date horizon, i.e., the length
243 of time between when the product is packaged and the date printed on the label.

244 Dates on labels are powerful mechanisms when it comes to consumer decisions to
245 discard food (Davenport et al. 2019). Roe et al. (2018) find that date labels affect consumer
246 discard intentions. Consumers were very likely to discard milk (which poses no safety risk due
247 to its pasteurization) that was post-date (i.e., expired), but the same consumers were
248 significantly less likely to discard the same milk if the date label was removed. Yu & Jaenicke

249 (2018) analyze retail milk sales and household milk waste following the lifting of a law in New
250 York City that required the sale of milk to occur within nine days of pasteurization (one of the
251 few regulations to impose specific date horizons). After the regulation was lifted, there was no
252 change in milk processing or longevity, but firms chose to extend the date horizon on milk to
253 around 15 days post-pasteurization. Retailers experienced a decrease in sales of about 10%,
254 and consumer milk waste decreased at least 10%.

255 These studies establish that extending the date label's time horizon could be a simple,
256 effective way to reduce consumer food waste. However, the fact that this decrease in waste
257 may decrease sales presents an ethical dilemma for firms who hold autonomy over such
258 decisions as it pits the interests of the public against the interest of firm shareholders. In
259 addition to this direct loss in sales, firms may be hesitant to extend date horizons at the risk of
260 harming their reputation. Firms choose a date horizon that accounts for the shelf-life of the
261 product as well as the potential for mishandling (i.e., temperature abuse) along the supply chain
262 both before the point of purchase and in the consumer's home. Extending the date increases
263 the probability of a consumer encountering a low-quality product within the labeled date horizon.
264 The risk of a firm's reputation being damaged from these negative consumer experiences could
265 incentivize firms to choose conservative date horizons. Even if firms agreed that extending date
266 horizons was the appropriate response, no individual firm may be willing to unilaterally
267 undertake the action for fear of being the only firm to suffer possible reputational loss with
268 extended date horizons. This would require coordination across the sector, which may be
269 difficult to sustain outside an industry umbrella group or a regulatory framework.

270 Another complicating factor is that there are two classes of foods when it comes to date
271 labels: those where the date indicates a quality threshold and those where the date indicates a
272 safety threshold. For most items the date on its label indicates quality (like the milk examples
273 above). However, some foods face pressure from virulent pathogens that consumers cannot

274 see or smell such as *Listeria*, *Salmonella*, *E. coli*, and *Campylobacter* and do not undergo a
275 cooking or other kill step prior to consumption (e.g., deli meats and soft cheeses). For these
276 items, extending the date horizon increases the risk of a consumer falling ill. Furthermore, this
277 risk could be disproportionately borne by vulnerable populations such as the sick,
278 immunocompromised, and elderly.

279 Hence, it is imperative that any pressure to extend data horizons focus only on products
280 where the date indicates quality and to ensure that consumers recognize and respond
281 differently to dates on safety-dated products. This may be a tall task, given there is already
282 significant confusion among consumers about food date labels (Gunders, 2012; Leib et al. 2016;
283 Wilson, Miao, and Weis, 2018). If consumers have more negative experiences where the
284 quality or safety of the food is not accurately represented by the date on the label, trust in date
285 labels may further erode, leading to increased confusion and possibly an increase in waste.
286 This issue needs to be studied further, and the costs, intended or unintended, of extending the
287 time horizon of date labels need to be compared with the benefits of the decrease in the amount
288 of food wasted. In addition, the groups that bear these costs should be considered.

289

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