Too ugly, but I love its shape: Reducing food waste of suboptimal products with authenticity (and sustainability) positioning

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ABSTRACT

In the societal change towards a more sustainable future, reducing food waste is one of the mostly discussed topics. One significant source of food waste is the reluctance of supply chains and consumers to sell, purchase, or consume products that deviate from optimal products on the basis of only cosmetic specifications. Yet, it is currently unclear how consumers can be motivated to purchase such suboptimal products. The present research suggests that presenting suboptimal products with a sustainability positioning or with an authenticity positioning can positively affect consumers’ purchase intentions and quality perceptions of suboptimal products. Two studies (total N = 1804) presenting suboptimal products with a sustainability positioning, an authenticity positioning, or no positioning under varying price levels reveal that especially authenticity positioning can increase purchase intentions for and quality perceptions of suboptimal products independent of the prices of suboptimal products. A sustainability positioning appears to work best when combined with a moderate price discount. Moreover, the findings show that respondents have lower intentions to waste suboptimal foods when a clear positioning is provided compared to when this is not provided. Together, these findings provide a constructive first step towards a more sustainable solution for the suboptimal product waste problem.

1. Introduction

Over the last decade, the high amount of food waste has received increasing attention. Food waste can be defined as “any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed (including composted, crops ploughed in/not harvested, anaerobic digestion, bio-energy production, co-generation, incineration, disposal to sewer, landfill or discarded to sea)” (FUSIONS, 2014, p. 6). About one-third to half of all food produced for human consumption is wasted along the food supply chain and in households (FAO, 2013; Parfitt, Marthel, & MacNaughton, 2010), amounting to a staggering millions of tons of food being wasted yearly (Brautigam, Jorissen, & Priefer, 2014; Buzby & Hyman, 2012; Buzby, Hyman, Stewart, & Wells, 2011). As the production of food requires extensive use of natural resources such as water, energy, and land (FAO, 2013; Godfray et al., 2010), and produces greenhouse gas emissions (Garnett, 2011), food waste is highly inefficient.

One significant source of food waste is the reluctance of consumers to purchase or consume suboptimal products (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen, & Oostindijer, 2015; Buzby & Hyman, 2012; de Hooge et al., 2017; Loebnitz, Schuitema, & Grunert, 2015). Suboptimal foods, also called oddly-shaped foods (Loebnitz et al., 2015) or foods with aesthetic or cosmetic imperfections (Beretta, Stoessel, Baier, & Hellweg, 2013; North, Hargreaves, & McKendrick, 1997), are products that deviate from optimal products on the basis of (a) cosmetic specifications (e.g. weight, shape, or size), (b) their date labelling (close to or beyond the best-before date), or (c) their packaging (e.g., a torn wrapper, a dented can), without deviating on the intrinsic quality or safety (Aschemann-Witzel et al., 2015; de Hooge et al., 2017; White, Lin, Dahl, & Ritchie, 2016). The focus of the present research is on cosmetic sub-optimality of fruits and vegetables. > 50 million tons of fruit and vegetables are discarded each year in the European Economic Area, largely because these products do not meet retailers’ and consumers’ standards of how they should look (Porter, Reay, Bomberg, & Higgins, 2018). Retailers use high aesthetic standards for the fruits and vegetables they offer (de Hooge, van Dulm, & van Trijp, 2018; Loebnitz et al., 2015). One reason for this is that the storage and distribution of fruits and vegetables with similar shapes and sizes is more efficient (Porter et al., 2018). Retailers also argue that consumers are not willing to purchase fruits and vegetables with cosmetic flaws (de Hooge et al., 2017; Loebnitz, Schuitema, & Grunert, 2015).
Therefore, retailers typically sell suboptimal fruits and vegetables with price discounts (e.g. Intermarché’s Inglorious foods initiative and Loblaws “Naturally imperfect” initiative2, see also Aschemann-Witzel et al. (2017)). Finally, consumers are generally unwilling to purchase cosmetically suboptimal fruits and vegetables (Bratanova et al., 2015; de Hooge et al., 2017; Loebnitz & Grunert, 2015; North et al., 1997).

Multiple studies indeed support the idea that consumers tend to avoid purchasing suboptimal products. For example, consumers perceive superficial packaging damages as a source of potential contamination, and therefore have lower intentions to purchase such products (White et al., 2016). In supermarkets, non-perishable products such as pasta or cereals are often discarded because of “crushed, dented, or otherwise damaged packaging, and expired shelf dates” (Kantor, Lipton, Manchester, & Oliveira, 1997, p. 5). Together, such consumer responses to suboptimal products can maintain high retailer standards.

It is currently unclear how consumers can be motivated to purchase suboptimal products. There is some evidence that consumers purchase suboptimal products when they receive extreme price discounts (de Hooge et al., 2017; Vergheese, Lewis, Lockrey, & Williams, 2013), when suboptimal products are advertised as being grown with low pesticide use (Bunn, Feenstra, Lynch, & Sommer, 1990), or when the deviation from the cosmetic specifications is only moderate (compared to extreme) (Bratanova et al., 2015; Loebnitz & Grunert, 2015; Loebnitz et al., 2015). Yet, none of these options reflects a sustainable or financially viable solution for the supply chain (de Hooge et al., 2018).

Our research aims to provide initial insight into how consumers could be encouraged to purchase suboptimal products in a sustainable and financially viable way. Contrary to using price discounts to sell suboptimal products, a more sustainable and financially viable strategy might be to position suboptimal products differently. We examine whether a different positioning of suboptimal products is as effective as price discounts or whether a combination of these strategies is more effective. Two studies, conducted in two different European countries, reveal that sustainability and authenticity positioning can increase purchase intentions of suboptimal products. Moreover, by including pricing strategies, the studies demonstrate that sustainability and especially authenticity positioning can generate higher purchase intentions for suboptimal products compared to price discounts. Together, these findings provide a valuable step towards a more sustainable solution for the suboptimal product waste problem.

1.1. Pricing strategies

Pricing strategies are used to boost sales and to change consumers’ purchase decisions (Chen, Monroe, & Lou, 1998) for, among others, suboptimal products (Aschemann-Witzel et al., 2017). Consumers usually determine the value of products based on product characteristics and price (Ahmetoglu, Furnham, & Fagan, 2014). When seeing similarly priced optimal and suboptimal products together, consumers tend to purchase the most aesthetically appealing (optimal) product (Kiyotoku, Hasegawa, Dan, & Kitazawa, 2018). A price discount for suboptimal products can act as a motivator for consumers to purchase suboptimal products (de Hooge et al., 2017). However, price discounts can simultaneously signal and confirm consumers’ perceptions that the product is of lesser quality, increasing the likelihood of the product being wasted at home (Taïros & Heilman, 2005).

Instead, Study 1 examines whether providing a product character- istic cue in the form of a positioning message may positively affect consumer quality perceptions of suboptimal products, and thereby reduce the need for price discounts. If positioning messages indeed increase quality perceptions, it might be possible to combine these with other signals of a high quality, such as higher prices (Zeithaml, 1988). Therefore, Study 2 further investigates the effect of positioning together with a price increase.

1.2. Sustainability positioning

Nowadays, multiple information channels such as governmental campaigns (e.g. the European Waste Framework Directive), NGO activities (e.g. the Waste Resource Action Program (WRAP) in the UK), or public activities on social media (e.g. Food sharing apps) provide consumers with information about sustainability issues. The general idea is that increasing consumers’ awareness about sustainability motivates consumers to adjust their behavior accordingly (Abrahamse, Steg, Vlek, & Rothengatter, 2005; FAO, 2013). For instance, WRAP’s “Love Food, Hate Waste” awareness campaign effectively reduced food waste by emphasizing environmental impacts (Principato, 2018). In addition, previous research showed that providing information on the carbon footprint of bread production increased consumers’ willingness to pay for lower-carbon-footprint bread (Del Giudice, La Barbera, Vecchio, & Verneau, 2016). Also, raising consumer awareness of food waste (e.g. with diary studies) increased consumers’ intentions to reduce their household food waste (Quested, Parry, Eastal, & Swannell, 2011).

These findings imply that providing information on sustainability aspects related to food waste of suboptimal products (e.g., “purchase this product to avoid food waste”) may motivate consumers to act sustainably and to purchase suboptimal products. Sustainability positioning is in the present research defined as the positioning of suboptimal products in a way that highlights their environmental sustainability.

At the same time, there are some arguments against the potential positive effect of sustainability positioning, as such positioning provides an external reason to purchase a suboptimal product. In the case of suboptimal products, consumers experience uncertainty about the intrinsic quality aspects of the product (de Hooge et al., 2017; Loebnitz et al., 2015). Intrinsic quality aspects refer to the physical part of a product, such as taste, shape, or size; aspects that cannot be changed without altering the physical composition of the product (Olson, 1977; Zeithaml, 1988). Extrinsic quality aspects are product-related aspects not part of the physical composition of the product itself, such as advertising, brand names, or price. Whenever there is information asymmetry within a transaction, consumers tend to focus on one or two extrinsic quality aspects to make their purchase decision (Connelly, Certo, Ireland, & Reutzel, 2011; Darby & Karni, 1973; Spence, 1973). A sustainability positioning may then function as an extrinsic quality cue, signaling that there are additional external reasons to purchase the product. Yet, the positioning will not address consumers’ low expectations concerning the quality and taste of suboptimal products.

Therefore, we expect that a sustainability positioning can increase purchases for suboptimal products compared to not using positioning because it provides an additional reason for purchasing, however this positioning would not increase consumers’ quality perceptions of suboptimal products. As both sustainability positioning and price discounts are extrinsic quality cues, we expect that they are equally effective in increasing sales. At the same time, when sustainability positioning and price discounts are combined, it is expected that purchase intentions will increase more than when only a price discount or a sustainability positioning is provided.

1.3. Authenticity positioning

A positioning strategy that focuses on increasing quality perceptions of suboptimal products might also be used. For example, suboptimal products may be perceived as more realistic or natural compared to optimal products. This can be done by using a positioning that focuses on what makes a product unique. For example, a product that has a unique flavor or texture may be positioned as more authentic than a product that is mass-produced. This can be done by highlighting the uniqueness of the product and emphasizing the authenticity of the production process. For instance, a product that is grown using organic methods may be positioned as more authentic than a product that is grown using conventional methods. This can be done by highlighting the organic farming practices and emphasizing the quality of the product. This can be done by using a positioning that focuses on the sustainability and ethics of the production process. For instance, a product that is grown using sustainable farming practices may be positioned as more authentic than a product that is grown using conventional farming practices. This can be done by highlighting the sustainability and ethics of the production process and emphasizing the quality of the product. This can be done by using a positioning that focuses on the quality of the product and the sustainability and ethics of the production process. For instance, a product that is grown using sustainable farming practices may be positioned as more authentic than a product that is grown using conventional farming practices. This can be done by highlighting the sustainability and ethics of the production process and emphasizing the quality of the product. This can be done by using a positioning that focuses on the quality of the product and the sustainability and ethics of the production process.
on the authenticity of a product. Authenticity positioning of suboptimal products highlights the product’s genuineness, origin, or naturalness. Authenticity is a broad construct encompassing various dimensions. For instance, brand authenticity encompasses continuity, originality, reliability, and naturalness (Bruhn, Schoenmüller, Schäfer, & Heinrich, 2012). Authentic products are perceived as products with a more natural, home-made, or handmade appearance, are often described as nostalgic, local, and/or traditional, and are perceived as products for which more effort was needed to produce it (Hersleth, Næs, Radbotten, Lind, & Monteleeone, 2012; Kadirov, 2015). Following the product authenticity literature, we focus on the degree to which products are perceived as real, sincere and genuine (Bendix, 1992; Beverland & Farrelly, 2010; Morhart, Malär, Guèvremont, Girardin, & Grohmann, 2015).

Specifically relevant for the current type of foods studied (fruits and vegetables) is the naturalness dimension of authenticity. This dimension covers the perceived healthiness and freshness of a product, and respect for the environment (Binninger, 2017; Margetts et al., 1997). Natural products are products based on grown plants, animals, or materials collected from the environment, and with an absence of additives, pesticides, preservatives, chemicals, or processing in the final product (Rozin, Fischler, & Shields-Arégés, 2012). Natural products are perceived as better, more genuine, more green and organic (Rozin et al., 2012). Therefore, emphasizing the abnormal shapes of suboptimal foods could underline the product’s naturalness, and thus also its genuineness.

Authenticity cues in regular (i.e., in manufactured, optimal) products have been shown to increase brand choice (Fritz, Schoenmueller, & Bruhn, 2017; Morhart et al., 2015), purchase intentions and willingness to pay (O’Connor, Carroll, & Kovács, 2017). Moreover, authenticity cues can increase perceptions of product quality and freshness (Groves, 2001; Lu, Gursoy, & Lu, 2015; Moulard, Raggio, & Folse, 2016). Authenticity positioning may thus function as an intrinsic quality cue in the same way as a ‘Cues of organic’ label has been found to act as a heuristic cue from which consumers infer higher product quality and additional health aspects (Vega-Zamora, Torres-Ruiz, Murgado-Armenteros, & Parras-Rosa, 2014). Therefore, we expect that an authenticity positioning of suboptimal products (e.g., “naturally imperfect”) will increase both purchase intentions and quality perceptions compared to suboptimal products without positioning. Moreover, we expect that authenticity positioning will be equally effective in increasing sales as price discounts. At the same time, when authenticity positioning and price discounts are combined, purchase intentions will increase more than when only a price discount is provided.

The present two studies examine the effects of sustainability and authenticity positioning on purchase intentions, choice and quality perceptions. In both studies, consumers were presented with optimal and suboptimal products (apples or carrots) of varying prices with an accompanying sustainability or authenticity positioning (or no positioning). Consumers then made a choice between the optimal and suboptimal product, and indicated their quality perceptions and purchase intentions for the suboptimal product only. In both studies, we expected sustainability positioning to only influence purchase intentions for suboptimal products, and authenticity positioning to influence both purchase intentions and quality perceptions. We tested the following hypotheses:

H1: Sustainability and authenticity positioning of suboptimal products increase purchase choice and intentions compared to no positioning.

H2: Authenticity positioning increases quality perceptions compared to sustainability or no positioning.

H3: The larger the price discount, the higher the purchase choice and intentions for suboptimal products.

H4: Positioning of suboptimal products combined with price discounts increases purchase choice and intentions more than only a price discount.

Additionally, Study 2 tests whether the purchases for suboptimal products depend on consumers characteristics such as their commitment to environmental issues (Alcock, 2012), or organic buying behavior (Porter et al., 2018). Consumers who are environmentally committed or who are used to buy organic products might view suboptimal products as more natural than consumers low on these characteristics (Loebnitz et al., 2015), and may therefore be more susceptible to sustainability or authenticity positioning.

2. Study 1: A first test of sustainability and authenticity positioning

Study 1 tested whether a sustainability or authenticity positioning increases purchase intentions for and quality perceptions of suboptimal products, and whether these effects would be comparable to the effects of price discounts (H1-H4). The study included apples and carrots to test whether any effects would hold for two different types of products.

2.1. Method

2.1.1 Respondents and design

Four hundred ninety-six visitors of the Milan Expo3 (250 males, Moptimal = 31.41, SDoptimal = 13.40) participated during the summer of 2015 in exchange for a gift voucher of €5 that they could spend at the Expo site. Respondents came from fifteen different European countries, northern Africa (2), the USA (6), or from Asia (11). They were randomly assigned to one of the conditions of a 3 (Positioning: sustainability vs. authenticity vs. control) × 3 (Price: discount vs. moderate discount vs. same price) × 2 (Product: apple vs. carrot) between-subjects design. Purchase choice, purchase intentions, and quality perceptions of suboptimal products functioned as the dependent variables.

2.1.2 Procedure and variables

Data collection took place in a quiet room located near the main street of the Milan Expo. Respondents imagined doing their weekly grocery shopping at their local supermarket and needed to buy, among others, apples or carrots. They imagined that they wandered through the aisles, and then encountered two shelves filled with apples (Apple condition) or carrots (Carrot condition), one filled with optimal (perfect-looking) products and one with suboptimal products. The suboptimal products only deviated in terms of appearance (oddly shaped), and prices were added to both suboptimal and optimal products. In all cases, the optimal apples cost €2 per kilogram and the optimal carrots €1.50 per kilogram, approximately in line with the regular prices for apples and carrots in Italy and the Netherlands at that time. In the same price condition, the suboptimal products were priced exactly the same as the optimal products. In the discount condition, the price for the suboptimal products was 30% lower compared to the optimal products (€1.40 for apples and €1.05 for carrots). In the moderate discount condition, these prices were 15% lower (€1.70 for apples and €1.25 for carrots).

To manipulate positioning, the suboptimal products in the sustainability condition were accompanied by the slogan “Embrace imperfection: join the fight against food waste!” (Bruhn). The focus of Study 1 was on the naturalness dimension of authenticity, so the authenticity condition, the slogan “Naturally imperfect: apples the way they actually look!” was added (see Appendix A). In the control condition respondents saw the products without any text. A pre-test (N = 53) showed that the sustainability slogan was perceived as more sustainable than the authenticity slogan (M_sustainability slogan = 6.0, M_authenticity slogan = 5.12, F (1, 52) = 1.76, p = .002). The authenticity slogan was
perceived as more natural than the sustainability slogan ($M_{\text{sustainability slogan}} = 5.87, M_{\text{authenticity slogan}} = 5.08, F (1, 52) = 5.18, p = .027$), and there were no differences in how traditional the slogans were perceived ($M_{\text{authenticity slogan}} = 3.74, M_{\text{sustainability slogan}} = 3.85, F (1, 52) = 0.55, p = .816$).

To measure Purchase choice respondents clicked on the product (optimal or suboptimal) that they would buy. Next, respondents indicated how likely they were to buy the suboptimal product (Purchase intention, 1, not at all likely, to 9, very likely) and they provided quality perceptions for the suboptimal products (poor vs. good taste, flavorless vs. flavorful, not at all delicious vs. very delicious, very poor vs. very good quality, 9-point scales). A Factor analysis showed a clear one-factor solution (Quality perceptions, Eigenvalue = 3.37, $R^2 = 84\%$, $\alpha = 0.94$, See Appendix B). Finally, respondents answered background and demographic questions (gender, age, income, nationality, living region, educational level, profession).

### 2.2. Results and Discussion

#### 2.2.1 Purchase choices

Analyses of the data for the apples and carrots separately revealed no differences between products (all $F$s < 1.21, all $p$s > 0.27), hence we analyzed the data for both products as one dataset. A chi-square analysis with positioning as the independent variable and purchase choice of suboptimal products as the dependent variable showed a significant association between positioning and purchase choice, supporting H1 ($\chi^2 (2, N = 496) = 29.25, p < .001$). Overall, for the sustainability positioning (54%) and the authenticity positioning (46%) suboptimal products were selected more often than for the control condition (26%), $\chi^2 (1, N = 327) = 13.61, p < .001$, and $\chi^2 (1, N = 338) = 28.35, p < .001$, respectively, see Table 1). The sustainability and authenticity positioning conditions did not differ in purchase choice ($\chi^2 (1, N = 327) = 2.57, p = .11$).

Under all price conditions, (marginally) significant associations were found between positioning and purchase choices (all $\chi^2$s (2) > 5.43, $p$s < .06), see Fig. 1. In line with H4, under all price conditions more respondents preferred the suboptimal products when they were exposed to a sustainability positioning (discount: 53%; moderate discount: 64%; same price: 47%) vs. no positioning (discount: 33%; moderate discount: 29%; same price: 16%; all $\chi^2$s (1) > 4.53, $p$s < .03). Further, more respondents who were exposed to authenticity positioning (vs. control) preferred the suboptimal products when receiving a high (30%) discount (51% of the respondents vs. 33% of the respondents in the control condition) or when receiving no discount (47% of the respondents vs. 16% in the control condition), ($\chi^2 (1, N = 110) = 3.74, p = .05$, and $\chi^2 (1, N = 107) = 12.02, p = .001$, respectively). Unexpectedly, however, authenticity positioning did not affect purchase choice when respondents received a moderate discount (39% of the respondents, vs. 29% in the control condition, $\chi^2 (1, N = 110) = 1.03, p = .31$).

Most importantly, without any discount, more respondents preferred the suboptimal products when they were exposed to sustainability positioning (47%) or authenticity positioning (47%) compared to when no positioning was provided without any discount (16%), with a moderate (29%), or with a high discount (33%) (all $\chi^2$s (1) > 4.56, $p$s < .04). This shows that a sustainability or authenticity positioning (without any price discount) can increase purchase choices of suboptimal products more than price discounts (without any positioning).

#### 2.2.2 Purchase intentions

A two-way ANOVA with positioning and price as independent variables and purchase intention for suboptimal products as the dependent variable showed a main effect of positioning, supporting H1 ($F (2, 487) = 11.96, p < .001, \eta_p^2 = 0.05$). Not in line with hypotheses H3 and H4, there was no main effect of price, ($F (2, 487) = 0.70, p = .50$) and no interaction between positioning and price, ($F (4, 487) = 1.84, p = .12$). Follow-up contrast analyses showed that a sustainability positioning ($M = 5.64, SD = 2.50$) or an authenticity positioning ($M = 5.58, SD = 2.44$) increased purchase intentions compared to the Control condition ($t(493) = 4.33, p < .001; t(493) = 4.03, p < .001$, respectively). There were no differences between the sustainability and authenticity positioning ($t(493) = 0.23, p = .82$). When controlling for socio-demographics, by adding these as covariates, the outcomes of these analyses remained similar. There were also no effects of demographics on purchase intentions for suboptimal foods, except for age ($F_{\text{Age}} = 22.17, p < .001$; all other $F$s < 0.061, all $p$s > 0.92). Older people generally showed lower purchase intentions for suboptimal products (b = -0.32). Thus, the findings suggest that sustainability and authenticity positioning can increase purchase intentions for suboptimal products compared to when no positioning is provided, independent of the price of the suboptimal product and of the respondents’ demographics.

#### 2.2.3 Quality perceptions

A two-way ANOVA with positioning and price as independent variables and quality perceptions as the dependent variable revealed a main effect of positioning ($F (2, 487) = 8.78, p < .001, \eta_p^2 = 0.04$), but no main effect of price ($F (2, 487) = 0.23, p = .80$). Partially in line with H2, follow-up contrast analyses revealed that sustainability positioning ($M = 5.85, SD = 2.02$) and authenticity positioning ($M = 5.67, SD = 1.93$) both increased quality perceptions of the suboptimal products compared to the Control condition ($M = 4.98, SD = 2.13$, $t (493) = 3.94, p < .001; t(493) = 3.09, p < .01$). There was no difference between the two positioning strategies ($t(493) = 0.78, p = .43$).

Moreover, an interaction between positioning and price was found ($F (2, 487) = 3.15, p = .01, \eta_p^2 = 0.03$): both sustainability and authenticity positioning increased quality perceptions of suboptimal products, but this effect depended on the price of the suboptimal products. Contrast analyses showed that in the discount condition, only authenticity positioning marginally significantly increased quality

### Table 1

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Positioning condition</th>
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<tr>
<td></td>
<td>Control</td>
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<tr>
<td>Purchase choice %</td>
<td>%</td>
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<tr>
<td>Price discount (30%)</td>
<td>33%</td>
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<tr>
<td>Moderate price discount (15%)</td>
<td>29%</td>
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<tr>
<td>Same price (%)</td>
<td>16%</td>
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<tr>
<td>Total</td>
<td>26%</td>
</tr>
<tr>
<td>Purchase intention M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Price discount (30%)</td>
<td>4.38 (2.61)</td>
</tr>
<tr>
<td>Moderate price discount (15%)</td>
<td>4.64 (2.53)</td>
</tr>
<tr>
<td>Same price (%)</td>
<td>4.39 (2.52)</td>
</tr>
<tr>
<td>Total</td>
<td>4.46 (2.55)</td>
</tr>
<tr>
<td>Quality perceptions M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Price discount (30%)</td>
<td>5.09 (2.09)</td>
</tr>
<tr>
<td>Moderate price discount (15%)</td>
<td>4.82 (2.12)</td>
</tr>
<tr>
<td>Same price (%)</td>
<td>5.04 (2.22)</td>
</tr>
<tr>
<td>Total</td>
<td>4.98 (2.13)</td>
</tr>
</tbody>
</table>

Note. Purchase choice reflects the percentage of respondents who chose the suboptimal product above the optimal product. Purchase intentions means (and standard deviations) reflected respondents’ preference for the suboptimal product (not at all likely (1) -- very likely (9)). There are no significant differences between means with the same superscript, with $\chi^2$s and $t$s < 1.29, $p$s > .20. Means with different superscripts differ significantly with $\chi^2$s > 5.19, $p$s < 0.02 and $t$s > 2.14, $p$s < 0.04.
perceptions compared to the control condition (t(487) = 1.92, \( p = .06 \)). Unexpectedly, when prices were moderately lower, only sustainability positioning increased quality perceptions compared to the authenticity condition (t(487) = 3.28, \( p = .001 \)) and compared to the control condition (t(487) = 4.11, \( p < .001 \)). Finally, when prices were similar, only authenticity positioning increased quality perceptions compared to the control condition (t(487) = 2.70, \( p < .01 \)). This suggests that authenticity positioning indeed yields higher quality perceptions, and that a discount is not necessary (and may even diminish the effects of positioning on quality perceptions).

### 2.2.4 Discussion

Study 1 provides first evidence for positive effects of presenting suboptimal products with a positioning message. Overall, it appears that both sustainability and authenticity positioning can motivate consumers to purchase suboptimal products, and that these effects may occur independent of the prices of suboptimal products. Moreover, respondents exposed to authenticity positioning reported higher quality perceptions than respondents exposed to sustainability positioning. In addition, three unexpected findings were obtained from Study 1: First, there was no main effect of price discounts. This could be due to the specific sample of Study 1. Milan Expo visitors are relatively caring about the environment, as indicated by their high pro-environmental self-identity (M = 5.60, 7-point scale), and they might therefore be less sensitive to price discounts. Second, authenticity positioning did not increase purchases of suboptimal products when consumers received a moderate price discount, and third, not authenticity but sustainability positioning increased quality perceptions of suboptimal products when consumers received a moderate price discount. To test whether these findings can be generalized beyond the specific messages and respondent sample used in Study 1, Study 2 was conducted.

### 3. Study 2: Further evidence for sustainability and authenticity positioning strategies

Study 2 had multiple aims. First, Study 2 tested whether the findings of Study 1 could be generalized beyond the specific sustainability and authenticity messages used in Study 1. Specifically, Study 2 used new messages, of which the authenticity message focused on the genuine dimension of authenticity. Second, Study 2 aimed to replicate the findings with a representative Dutch sample. Third, Study 2 aimed to further investigate the combination of positioning and pricing, by adding a condition where suboptimal products were priced moderately higher than optimal products. Furthermore, we tested for the potential moderating effect of commitment to environmental sustainability (Alcock, 2012), and organic buying behavior as a measure for prior exposure to suboptimal products. Finally, thus far we studied the influences of positioning on purchase intentions of suboptimal products to reduce waste of suboptimal products. Yet, consumers’ purchase decisions in supermarkets are influenced by different factors than consumers’ consumption decisions at home (Aschemann-Witzel et al., 2015; de Hooge et al., 2017). Therefore, the effect of positioning strategies on purchase decisions does not necessarily translate to food consumption (and thereby food waste) at home. To examine whether products are more or less likely to be wasted at home and the influence of positioning thereof, Study 2 also measured likelihood to waste suboptimal products.

### 3.1. Method

#### 3.1.1 Respondents and design

1308 Dutch inhabitants (50.2% female, M_{age} = 53.46, SD_{age} = 16.94) participated in a study on food choices in exchange for a monetary reward. Data collection took place via an online survey in a nationally representative consumer panel, managed by CentERdata (CentERpanel). Respondents were randomly assigned to one of the conditions of a 3 (Positioning: Sustainability vs. authenticity vs. control) × 4 (Price: Discount vs. moderate discount vs. same price vs. price increase) × 2 (Product: Apple vs. carrot) between-subjects design with

#### 3.1.2 Procedure and variables

The procedure was similar to Study 1. To manipulate positioning, the sustainability slogan read “Apples (carrots) with special shapes: Don’t let them be wasted!”, and the authenticity slogan – focusing on the genuine dimension, as induced by the first part of the slogan – read “Directly from the tree: apples with natural shapes! (Directly from the field: carrots with natural shapes)!”. A pre-test (N = 1059) showed that the sustainability positioning was perceived as more sustainable than the authenticity positioning and the control condition without positioning (M_{sustainability slogan} = 5.67, M_{authenticity slogan} = 5.40, M_{no slogan} = 5.24, F (2, 1057) = 8.75, \( p < .001 \)). The authenticity positioning was perceived as more authentic than the sustainability positioning and the control condition without positioning (M_{authenticity slogan} = 5.06, M_{sustainability slogan} = 4.77, M_{no slogan} = 4.63, F (2, 1057) = 4.11, \( p < .001 \)).

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1058) = 6.39, \( p = .002 \). There were no differences in naturalness between the sustainability and authenticity positioning, but the products in both conditions were perceived as more natural than the products in the control condition \( \text{M}_{\text{sustainability slogan}} = 5.44, \text{M}_{\text{authenticity slogan}} = 5.49, \text{M}_{\text{no slogan}} = 5.13 \), \( F (2, 1058) = 4.52, \( p = .011 \)\). Price conditions were the same as in Study 1, except that a price increase condition was added in which prices for suboptimal products were 15% higher compared to the optimal products (€2.30 for apples and €1.95 for carrots).

**Purchase choice and purchase intention** were measured in the same way as in Study 1, except that purchase intention was now measured on a 7-point scale. Quality perceptions were measured with the items taste, healthiness, safety, quality, and receiving value for money (all ranging from 1 to 7) (Quality perceptions, Eigenvalue = 3.62, \( R^2 = 73\% \), \( \alpha = 0.90 \), see Appendix B). To measure waste likelihood, the respondents indicated the likelihood that they would waste at least part of the suboptimal products after having purchased the product (ranging from 1, not at all likely, to 7, very likely).

The respondents then answered a shortened three-item version of the Commitment to Environmental Sustainability Scale (Alcock, 2012), which measures personal commitment to environmental sustainability by putting sustainability in the context of personal costs and forgiving other things in life (1 = completely disagree, 7 = completely agree) (de Hooge et al., 2017) (Eigenvalue = 2.01, \( R^2 = 67\% \), \( \alpha = 0.75 \)). To measure organic buying behavior, respondents indicated how often they bought fruits or vegetables from the local farmer and how often they bought biologically grown fruits or vegetables (1 = never, 5 = always, Pearson’s \( R = 0.38, p < .001 \)). These items largely overlap with the items “How often do you eat locally grown foods?” and “When in season, how often do you shop at farmer’s markets?” from the Green Eating Behavior scale (see Weller et al., 2014). Finally, the respondents indicated how often they engaged in grocery shopping and cooking for their households (both items 1 = never, 5 = always, averaged into one shopping/cooking variable, Pearson’s \( R = 0.70, p < .001 \)) (de Hooge et al., 2017), and completed several questions regarding their demographics.

### 3.2. Results and Discussion

#### 3.2.1 Purchase choices

Analyses of the data for the apples and carrots separately revealed no differences between products (all Fs < 1.06, all ps > .30), hence we analyzed the data for both products as one dataset. A chi-square analysis with positioning as the independent variable and purchase choice of suboptimal products as the dependent variable showed a significant association between positioning and purchase choice, supporting H1 (\( \chi^2 (2, N = 1308) = 33.57, p < .001 \); see Table 2 and Fig. 2). Overall, suboptimal products were selected more frequently when presented with the sustainability positioning (36%) than with no positioning (29%), \( \chi^2 (1, N = 846) = 4.73, p = .03 \). Also, suboptimal products were selected more frequently when presented with the authenticity positioning (47%) than with the sustainability positioning (\( \chi^2 (1, N = 881) = 12.15, p < .001 \)), or with no positioning (\( \chi^2 (1, N = 889) = 32.42, p < .001 \)).

Separate chi-square analyses showed significant associations between positioning and purchase choices under all price conditions, partially in line with H4 (all \( \chi^2 s (2) > 7.92, ps < 0.02 \)). Contrary to Study 1, only when respondents received a moderate discount, suboptimal products were more frequently selected when presented with a sustainability positioning (58%) than with no positioning (38%, \( \chi^2 (1, N = 218) = 8.01, p < .01 \)). Under the price discount or similar price conditions, suboptimal products were selected more frequently when presented with the authenticity positioning (discount: 64%; moderate discount: 51%; same price: 51%) than with no positioning (discount: 45%; moderate discount: 38%; same price: 19%; all \( \chi^2 s (1) > 6.88, ps < 0.01 \); \( \chi^2 (1, N = 213) = 3.16, p = .07 \) for moderate discount condition). When prices were similar or higher, suboptimal products were selected more frequently when presented with the authenticity positioning than with the sustainability positioning (both \( \chi^2 s (1) > 9.93, ps < 0.01 \)).

Finally, suboptimal products were selected more frequently when presented with the authenticity positioning without any discount (47%) than with a moderate discount in the control condition (38%; \( \chi^2 (1) = 8.28, p < .01 \)), and these choices did not differ from a 30% discount in the control condition (45%; \( \chi^2 (1) = 1.79, p = .22 \)). This shows that authenticity positioning (without any price discount) can increase purchase choices of suboptimal products at least as much as price discounts.

#### 3.2.2 Purchase intentions

A two-way ANOVA with positioning and price as independent variables and with purchase intentions for suboptimal products as the dependent variable showed a main effect of positioning, supporting H1 (\( F (2, 1296) = 16.70, p < .001 \), \( \eta^2 = 0.03 \)). Follow-up contrast analyses showed that there was a marginally significant effect of sustainability positioning on purchase intentions (\( M = 3.50, SD = 1.73 \)) compared to the control condition (\( M = 3.27, SD = 1.77 \), \( t (1305) = 1.89, p = .06 \)). Authenticity positioning increased purchase intentions (\( M = 3.91, SD = 1.79 \)) compared to both the control condition (\( t(1305) = 5.40, p < .001 \)) and to sustainability positioning (\( t (1305) = 3.45, p = .001 \)).

Supporting H3, there was also a main effect of price (\( F (3,
1296) = 30.86, p < .001, η² = 0.09). Higher prices for suboptimal products decreased purchase intentions: contrast analyses showed that every time the prices went up with 15%, purchase intentions decreased (M = 4.10, SD = 1.79 for discount condition, M = 3.85, SD = 1.82 for moderate discount, M = 3.44, SD = 1.67 for similar prices, and M = 2.92, SD = 1.62 for price increase; all ts (1304) > 2.96, all ps < 0.01, except for a marginal difference between a 30% and a 15% discount, t (1304) = 1.87, p = .06).

Moreover, there was an interaction between positioning and price, partially in line with H4 (discount, p = .02, η² = 0.01). Contrast analyses showed that when prices were moderately lower, only sustainability positioning increased purchase intentions compared to the control condition (t(1296) = 2.67, p < .01; t (1296) = 1.32, p = .19 for authenticity compared to control). When prices of the suboptimal products were 30% lower, similar to, or 15% higher, only authenticity positioning increased purchase intentions compared to the control condition (ts(1296) > 2.56, ps < 0.02) and compared to the sustainability condition (ts(1296) > 2.58, ps < 0.02; ts < 1 for sustainability compared to control).

To test whether commitment to environmental sustainability or organic buying behavior would predict respondents’ purchase intentions for suboptimal products, we conducted a linear regression analysis on purchase intentions of suboptimal products with positioning, price, commitment to environmental sustainability, organic buying behavior, and demographics as independent variables. This analysis showed no effect of any of the demographics (all βs < 0.21, all ps > 0.13; see Table 3). There were positive effects of commitment to environmental sustainability and of organic buying behavior on purchase intentions in addition to the positioning and pricing strategies: a higher commitment and higher organic buying behavior increased purchase intentions. Adding interaction terms between the positioning strategies and organic buying behavior or between the strategies and commitment as independent variables in the regression did not result in significant interaction effects (all βs < 0.06, all ps > 0.60), showing that the effects of positioning did not depend on these consumer characteristics.

### 3.2.3 Quality perceptions

We expected that especially authenticity positioning would affect quality perceptions of suboptimal products. Replicating Study 1, a two-way ANOVA with positioning and price as independent variables and with quality perceptions as the dependent variable showed a main effect of positioning (F (2, 1296) = 24.94, p < .001, η² = 0.04), but no main effect of price (F (2, 1296) = 0.71, p = .54). Contrast analysis showed that an authenticity positioning increased the quality perceptions (M = 5.11, SD = 0.99) compared to the control condition (M = 4.66, SD = 1.05, t(1299) = 6.56, p < .001), and compared to the sustainability positioning, supporting H2 (M = 4.73, SD = 1.05, t (1299) = 5.45, p < .001). There was no difference between the sustainability positioning and the control condition (t(1299) = 1.05, p = .29).

There was an interaction between positioning and price (F (2, 1296) = 3.01, p < .01, η² = 0.01). Contrast analysis revealed that authenticity positioning increased quality perceptions compared to both the control and sustainability conditions under almost all price conditions (authenticity vs. control: ts(1296) > 2.56, ps < 0.02) (authenticity vs. sustainability: ts(1296) > 2.58, ps < 0.02; t < 1 in the moderate discount condition). Replicating the unexpected finding of Study 1, sustainability positioning only increased quality perceptions compared to the control condition when prices were 15% lower (t (1296) = 3.05, p < .01; ts < 1 for the other price conditions).

### 3.2.4 Waste likelihood

To test whether the positioning strategies would influence the sustainability positioning, supporting H2 (M = 4.73, SD = 1.05, t (1299) = 5.45, p < .001). There was no difference between the sustainability positioning and the control condition (t(1299) = 1.05, p = .29).

There was an interaction between positioning and price (F (2, 1296) = 3.01, p < .01, η² = 0.01). Contrast analysis revealed that authenticity positioning increased quality perceptions compared to both the control and sustainability conditions under almost all price conditions (authenticity vs. control: ts(1296) > 2.56, ps < 0.02) (authenticity vs. sustainability: ts(1296) > 2.58, ps < 0.02; t < 1 in the moderate discount condition). Replicating the unexpected finding of Study 1, sustainability positioning only increased quality perceptions compared to the control condition when prices were 15% lower (t (1296) = 3.05, p < .01; ts < 1 for the other price conditions).

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**Table 3**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability Positioning (1)</td>
<td>0.23</td>
<td>0.12</td>
<td>0.06*</td>
</tr>
<tr>
<td>Sustainability condition, 0 other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authenticity Positioning (1)</td>
<td>0.62</td>
<td>0.11</td>
<td>0.17**</td>
</tr>
<tr>
<td>Authenticity condition, 0 other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price Discount (1 30% discount, 0 other)</td>
<td>0.63</td>
<td>0.13</td>
<td>0.15**</td>
</tr>
<tr>
<td>Price Discount (1 15% discount, 0 other)</td>
<td>0.47</td>
<td>0.13</td>
<td>0.11**</td>
</tr>
<tr>
<td>Price Increase (1 15% increase, 0 other)</td>
<td>−0.52</td>
<td>0.13</td>
<td>−0.13**</td>
</tr>
<tr>
<td>Gender (0 male, 1 female)</td>
<td>0.10</td>
<td>0.11</td>
<td>0.03</td>
</tr>
<tr>
<td>Age (16–93 y.o.)</td>
<td>&lt; 0.01</td>
<td>&lt; 0.01</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Number of household members (1–7)</td>
<td>−0.04</td>
<td>0.05</td>
<td>−0.03</td>
</tr>
<tr>
<td>Urbanity living region</td>
<td>&lt; 0.01</td>
<td>0.04</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Education</td>
<td>0.02</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Urbanity living region</td>
<td>0.02</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Household income</td>
<td>0.02</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Do shopping/cooking</td>
<td>0.03</td>
<td>0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Commitment to environmental sustainability</td>
<td>0.20</td>
<td>0.05</td>
<td>0.12**</td>
</tr>
<tr>
<td>Organic buying behavior</td>
<td>0.25</td>
<td>0.05</td>
<td>0.14**</td>
</tr>
</tbody>
</table>

**Note.** Significant relationships are indicated in bold. *p < .05. **p < .01.
household wastage of suboptimal products, we ran a two-way ANOVA with positioning and price as the independent variables and waste likelihood as the dependent variable. The results showed a main effect of positioning \( F(2, 1296) = 3.45, p = .03, \eta^2 = 0.01 \), no effect of price \( F(2, 1296) = 1.35, p = .26 \), nor an interaction \( F(6, 1296) = 0.87, p = .52 \). Contrast analysis showed that a sustainability positioning \( (M = 2.23, SD = 1.43) \) or an authenticity positioning \( (M = 1.98, SD = 1.30) \) did not increase wastage of suboptimal products compared to the control condition \( (M = 2.09, SD = 1.38); t(1299) = 1.51, p = .13 \) and \( t(1299) = 1.13, p = .26 \), respectively). The authenticity positioning did decrease intentions to waste suboptimal products compared to the sustainability positioning, \( t(1299) = 2.66, p < .01 \).

3.2.5 Discussion

Study 2 provides further support for the idea of presenting suboptimal products with a marketing positioning. Replicating Study 1 with different slogans and with a representative Dutch sample, Study 2 shows that a sustainability positioning can increase preferences for suboptimal products. Yet, these effects appear to depend on the prices of suboptimal products. On the contrary, an authenticity positioning seems to have a positive effect on purchase intentions for suboptimal products, and can increase purchase choices at least as much as price discounts. Moreover, authenticity positioning has a positive effect on quality perceptions of suboptimal products compared to sustainability positioning or no positioning, and does not seem to increase wastage of suboptimal products in consumer households.

4. General Discussion

The belief that consumers do not purchase suboptimal products makes supply chain actors sell suboptimal products with a price discount or avoid selling suboptimal products altogether (de Hooge et al., 2018; Stuart, 2009). The consequences are unsustainable: lowering the value of food paves the way for more household food waste (Tsiros & Heilman, 2005), and not selling suboptimal products increases food waste across the supply chain (Beretta et al., 2013; Buzzby et al., 2011). In a search for more sustainable solutions, the current research explored whether consumer acceptance of suboptimal products could be increased with marketing strategies. Two studies in two European countries revealed that sustainability and especially authenticity positioning can increase purchase intentions for suboptimal products. Moreover, an authenticity positioning can increase quality perceptions of suboptimal products, and can increase purchase intentions at least as much as price discounts. Together, these findings show that marketing strategies can provide a sustainable solution that stimulates the acceptance of suboptimal products.

4.1. Theoretical implications

The present findings demonstrate that a sustainability positioning can increase consumer choices for suboptimal products. Some prior evidence suggested that providing consumers with information on the food waste issue can influence their behavior (Del Giudice et al., 2016; Quested et al., 2011). Our findings extend this line of reasoning and demonstrate that sustainability cues can influence consumer choices also for suboptimal products.

Similarly, we expand the authenticity literature by revealing that an authenticity positioning can also be effective for suboptimal products. Previous studies have shown that authenticity positioning can affect consumer responses to brands and to optimal products (e.g., Beverland & Farrelly, 2010; Fritz et al., 2017). Our findings demonstrate that positioning suboptimal products as genuine or natural can motivate consumers to purchase these products. Moreover, it appears that authenticity positioning can counteract the doubts that consumers have about the intrinsic quality of suboptimal products. This is especially surprising when considering that an authenticity positioning emphasizes the “error” of suboptimal products: focusing attention on visible weaknesses of products in a positive way can apparently generate positive consumer responses.

Our studies are among the first to compare the effects of multiple marketing strategies on consumer responses to suboptimal products. Existing research has separately demonstrated effects of sustainability positioning (e.g., Del Giudice et al., 2016; Quested et al., 2011) and authenticity positioning (e.g., Beverland & Farrelly, 2010; Morhart et al., 2015) for regular products. Studies investigating marketing strategies for suboptimal products have demonstrated effects of claims used in practice, such as messages focusing on health aspects, good taste, and lower prices (Louis & Lombart, 2018). Yet, theoretical and empirical comparisons between strategies are essential to advance knowledge about the differences and similarities between these strategies and to advance supply chain decision-making. Indeed, the current studies indicate that an authenticity positioning of suboptimal products can be more beneficial than a sustainability positioning, because it effectively increases quality perceptions.

By combining positioning strategies with pricing strategies, our research demonstrates that the effects of positioning strategies depend on the pricing situation. In both studies, authenticity positioning positively affected purchase intentions and quality perceptions when consumers received a price discount or when prices were similar to those of optimal products. Conversely, authenticity positioning did not affect purchase intentions when consumers received a moderate price discount. The effects of price discounts have been shown to vary depending on the size of the discount and on whether consumers expect a discount (Kalwani & Yim, 1992). It is possible that the positioning strategies influence consumers’ expectations concerning discounts, such that consumers would either expect a large discount (e.g. with sustainability positioning) or no discount (e.g. with authenticity positioning), but not a moderate discount. In general, discounts are costly to supply chains and can negatively affect consumers’ reference prices and quality perceptions (Palazon & Delgado-Ballester, 2009). Therefore, it seems promising that sustainability and especially authenticity positioning can increase purchase intentions at least as much as price discounts.

4.2. Limitations and future research

There are several remarks that could be made with respect to our findings. Although we think that none of these is critical to our findings, it is valuable to shortly discuss each. First, some of the results were not consistent across the studies. Study 1 showed no differences in purchase choice and intention between authenticity and sustainability positioning, except for the moderate price discount situation (where the sustainability positioning was more effective). In contrast, in Study 2, authenticity positioning lead to higher purchase choice and intention compared to sustainability positioning, except for the moderate price discount situation. It seems likely that these differences depend on the operationalization of the multi-dimensional construct authenticity. Whereas Study 1 focused on the naturalness dimension of authenticity, Study 2 focused on the genuineness dimension. This suggests that focusing on more than ‘just’ the naturalness dimension of authenticity (e.g., genuineness) is more effective, as is also supported by earlier research on the authenticity of regular products (Bryla, 2015; Morhart et al., 2015). Future research could directly compare the relative effectiveness of the different authenticity dimensions to market suboptimal products.

Second, the pricing effects are somewhat inconsistent across the studies. Specifically, the studies demonstrated some interactions between positioning and pricing, but these interactions were mixed across studies and dependent variables. Both studies did, however, show that a moderate price discount combined with sustainability positioning instead of an authenticity positioning increased quality perceptions of
it is possible that combining a positioning that signals high product quality (authenticity) with a price that signals doubtful product quality (a moderate price discount) can confuse consumers, or lead them to misattribute their motivation to purchase (e.g., "I chose it because it was on sale") (Darke & Chung, 2005). Such an effect would not occur for larger discounts, as such discounts can be perceived as sacrifices that companies valuing authenticity are prepared to make for consumer welfare (Kadirov, 2015). Future research is needed to further examine the (underlying process of) potential interactions between the positioning and pricing strategies for suboptimal products.

Third, the present research focused on purchase and waste intentions and not on consumer behavior. Purchase and waste intentions are strong predictors for behavior, also in the domain of environmentally responsible behavior (e.g., Follows & Jobber, 2000). Similarly, the current research focused on oddly shaped fruits and vegetables, but other types of sub-optimality exist (e.g., in packaging such as a torn wrapper). It is therefore valuable to extend the current findings to purchase and waste behavior for varying types of suboptimal products.

Finally, it is possible that promoting suboptimal fruits and vegetables as being natural can have other, undesired effects that were not investigated in the current studies. For example, consumers may incorrectly equate authentic with organic and generate the idea that the products are without pesticides or chemicals (Vega-Zamora et al., 2014). Therefore, it is important for future research to explore whether consumers confuse authentic with organic and how such confusion can be avoided.

4.3. Conclusion

Thus far, supply chain actors have been unwilling to market suboptimal products, and consumers have been unwilling to purchase them. It appears that suboptimal products require a more unique approach than “simple” price discounts to address consumers’ unwillingness to purchase these products. The present studies suggest that retailers can sell suboptimal products without price discounts by approaching the weaknesses of ugly products as authentic and sustainable elements. Emphasizing the genuineness or naturalness of suboptimal products appears to be a unique selling point for these products, and might provide a cost-effective solution for food waste issues. Thus, there is beauty in ugliness after all.

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### Appendix B

Items and factor loadings of the Quality perceptions measures in Study 1 and Study 2

<table>
<thead>
<tr>
<th>Item</th>
<th>Study 1</th>
<th>Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Taste?</td>
<td>0.90</td>
<td>0.84</td>
</tr>
<tr>
<td>2. Flavor?</td>
<td>0.90</td>
<td>–</td>
</tr>
<tr>
<td>3. Delicious?</td>
<td>0.90</td>
<td>–</td>
</tr>
<tr>
<td>4. Quality?</td>
<td>0.86</td>
<td>0.85</td>
</tr>
<tr>
<td>5. Healthiness?</td>
<td>–</td>
<td>0.81</td>
</tr>
<tr>
<td>6. Safety?</td>
<td>–</td>
<td>0.77</td>
</tr>
<tr>
<td>7. Value for money?</td>
<td>–</td>
<td>0.78</td>
</tr>
<tr>
<td>Reliability (α)</td>
<td>0.94</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Note. Items in study 1 were answered using 9-point scales and in study 2 on 7-point scales with end points labelled (very bad taste/very unhealthy/very unsafe/of very bad quality/hardly any value for money) to (very good taste/very healthy/very safe/of very good quality/much value for money).

### Appendix C. Supplementary data

Supplementary data to this article can be found online at [https://doi.org/10.1016/j.foodqual.2019.02.020](https://doi.org/10.1016/j.foodqual.2019.02.020).