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## **Exploring consumers' perceptions of suboptimal food products: a strategy for food waste reduction**

### **Explorando as percepções dos consumidores sobre alimentos fora do padrão: uma estratégia para a redução do desperdício de alimentos**

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**Abstract.** Food waste has received increasing attention during the last decade, especially due to its environmental and social impacts. An important contributor to food waste levels is consumers lower preference for purchase fruits and vegetables with unusual appearance, products with damaged package and close to the expiration date, technically called suboptimal food products. Research shows that consumers tend to reject these products when buying food, increasing avoidable food waste. However, consumer considerations when deciding to buy or not suboptimal food are still unknown. The current research explored consumers acceptance of suboptimal food with a focus group. Results reveal that considerations about suboptimal food are divergent, with some of the participants rejecting them due to a search for perfection when buying food products. However, some individuals are inclined to accept the product, mainly if they have concern with the environment and cook ability. In the end, this study contributes to food waste reduction strategies and has implications for marketing actions.

**Keywords:** Suboptimal food products, food waste, consumer food waste, consumer choice.

## **Introduction**

Many areas of food systems can be improved to mitigate the impacts and an important one is related to waste reduction. When food waste occurs, energy from agriculture, transportation, processing, food sales, storage, and preparation also are wasted. Therefore, food waste represents a waste of resources (KUMMU et al., 2012). One significant way of meeting such calls involves our food behaviour as consumers. An important contributor to food waste levels is consumers' preference for cosmetic standards (BERETTA et al., 2013; PARFITT; BARTHEL; MACNAUGHTON, 2010). Individuals have a pattern of shopping behaviour in which only products with a certain visual characteristic are selected. However, this demand for "cosmetically perfect" food results in high levels of food waste and impacts the entire food supply chain.

Fruits and vegetables are selected by its appearance (MARX-PIENAAR; ERASMUS, 2014). Deviations in the usual shape, size, or weight cause rejection, even if they have the same intrinsic quality attributes and safety assurance (GÖBEL et al., 2015). With the same importance, packages imperfections also have limited acceptance. When a package has a superficial damage, contamination cues are produced and the preference to purchase the products is reduced (WHITE et al., 2016). A similar pattern of behaviour that contributes to food waste levels is related to date labels (MILNE, 2012). When expiration date is approaching or has passed, consumers reject the product mainly due to food safety and risk concern (QI; ROE, 2016). Therefore, edible food is thrown away by farmers, producers, retailers and consumers due to a high demand for perfection. Fruits and vegetables with different visual



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appearance, food product with damaged package and close to its expiration date are called suboptimal food products (DE HOOGE et al., 2017) and previous studies discuss the low preference they have among consumers (ASCHEMANN-WITZEL et al., 2015; LOEBNITZ; GRUNERT, 2015; LOEBNITZ; SCHUITEMA; GRUNERT, 2015; TSIROS; HEILMAN, 2005).

However, it is yet unknown which considerations consumers undertake when they have the opportunity to purchase suboptimal food. Why do individuals tend to reject these products? Do they always have negative thoughts when faced with suboptimal food products? Or do they also have positive thoughts? How these considerations influence their buying behaviour? In trying to answer these questions the main goal of this study is to explore consumers' considerations about suboptimal food products and how these impressions can influence in their final decision. This explorative study consisted of a focus group with women to capture their main impressions about the same products. This study helps in the understanding of the relation between consumer behaviour and suboptimal food perceptions. Doing so, the study contributes to the evaluation of food waste reduction initiatives of selling suboptimal food products, which has increased in the last years.

## **2 Literature review**

Food supply chain rejects food that deviate the usual visual standards, even if its nutritional value remains the same (GÖBEL et al., 2015). This practice is considered an important contributor for food losses and waste (GUSTAVSSON; CEDERBERG; SONESSON, 2011; STUART, 2009). First, it is important to distinguish between products that do not meet hygiene and quality requirements and food products with different visual appearance, but with the same nutritional quality (SALHOFER et al., 2008). The first group is associated with safety issues, while the latter is only created due to market requirements, acting as barriers to food consumption (HYDE et al., 2001). Concerns regard food safety are considered important aspects to waste food (CANALI et al., 2016; NEFF; SPIKER; TRUANT, 2015). Nevertheless, consumers demand for food and packaging aesthetic appearance, selection of the freshest product, and misinterpretation of date labels (CANALI et al., 2016) equally represent a great impact on food waste and could be reduced with acceptance of suboptimal food products among consumers.

Suboptimal food products can be a result of natural variability, poor processing, physical or chemical reactions accelerated through incorrect handling (RAAK et al., 2017). De Hooge et al. (2017) define suboptimal food into three main deviations of food's characteristics. The first includes variation on food appearance standards, food weight, shape or size, being cosmetically appealing or not. The second variation is related to food close to or beyond its best-before date. And the third variation is related to food packages with visual damages, such as a dented can or a torn wrapper (DE HOOGE et al., 2017). These deviations, however, do not represent safety risks and the food is still proper for human consumption.

The choice of suboptimal foods may occur in the purchasing environment (buy or do not buy) or in household context (consume or do not consume) (ASCHEMANN-WITZEL et al., 2015). When decisions are taken in supermarkets, consumers have the option to select or not the product, whereas decisions at household level food is already possessed (DE HOOGE et al., 2017). It is necessary, therefore, to define the context where the consumption of suboptimal food occurs.



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In the purchasing environment, create accessibility, visibility and availability is essential (HOEK et al., 2017), opening markets to these products (PRIEFER; JÖRISSEN; BRÄUTIGAM, 2016). A major problem is that the judgment of foods' edibility varies significantly from person to person (BLICHFELDT; MIKKELSEN; GRAM, 2015) and, with the same attributes, consumers tend to choose the ones with perfect appearance (CANALI et al., 2016). However, this pattern of perfection creates a cycle of behavior (BLOCK et al., 2016) and, therefore, a cycle of waste.

It is possible to find a movement toward changing this patten of behavior and to increase the acceptance of suboptimal food products. The French retailer Intermaché created a campaign, called “inglorious” fruits and vegetables. Albert Heijn from Netherlands used baskets of suboptimal fruits and vegetables to sell on their store. Imperfect redistribution from US sells boxes with suboptimal food (ASCHEMANN-WITZEL et al., 2017). In Brazil, companies started to focus on food waste solutions for fruits and vegetables with unusual appearance (DO CANTO et al., 2017).

However, to these initiatives succeed, consumers must have positive attitudes and behaviours toward the products. Attitudes toward suboptimal food might be linked to emotions (ROHM et al., 2017). However, it is important to explore deeply how these emotions occur. It is not clear yet which considerations of suboptimal food products consumers' have when they have the opportunity to buy these products. Moreover, it is not clear how these considerations can influence in their final decision.

### **3 Methodology**

Given the goal to specifically research consumers' considerations about suboptimal food products, this study is part of an extensive study<sup>1</sup> about consumer food waste and suboptimal food products. For this particular phase, during June 2018, a focus group discussion was conducted in the south of Brazil. The focus group was performed with 6 participants, whereas the recommended number is between six and eight participants (MORGAN, 1998) . The age range was 21 to 75 years old. To increase sample variability, participants came from different types of employment status and household composition (single, married or cohabiting; with or without children under 18 years in the household). Table 3 presents the socio-demographic profiling of the focus groups participants. Participants were recruited by personal invitations using a standardized recruitment procedure: have already made purchases in supermarkets and being female. It was decided to select only women mainly because literature shows that they are usually the ones responsible for grocery shops and tend to have a more wasteful behaviour (STANGHERLIN; BARCELLOS, 2018).

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<sup>1</sup> The results of the quantitative data are explored in a different study.



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**Table 1 - Focus group participants**

Participant	Age	Occupation	Education	Household composition
1	31	Accounting technician	Incomplete higher education	Single-household
2	54	Vet	Complete higher education	Six-person household
3	21	Student	Incomplete higher education	Three-person household
4	62	Retired	High School complete	Two-person household
5	75	Retired	Complete higher education	Two-person household
6	61	Retired	Complete higher education	Single-household

Focus group was conducted according to standard procedures (MORGAN, 1993). There was a classroom with acoustic recording facilities. The focus group lasted 1 hour and 5 minutes and was guided by a moderator. A topic guide was developed prior to the field work. The topic guide consisted of three main parts, following the overall objectives. The first one investigated respondents' opinion about the image of a carrot with an unusual appearance, the second part aimed at exploring respondents' perceptions about the image of a yogurt with two days remaining to expire, and the third part explored participants' opinions toward an image with a broken biscuit. Each image was presented separately and participants reported their opinions about each of them. Participants were asked to state free associations and thoughts about the products. In the end, the moderator discussed with the participants main opinions emerged during the discussion.

Focus group discussions were carefully transcribed. Analysis was performed with Microsoft Excel package. The first task was to use the same code list from phase one, with a common understanding across researchers. Researchers iteratively compared coding decisions and discussed about the content of the codes, resulting in a list of codes which was consistently interpreted across researches. After agreeing on the code list, the transcript of the focus groups was coded: the text was broken down into manageable categories of phrases and sentences and labelled with the code(s) that reflected the content of these phrases and sentences. In that way, after coding all transcripts, a code contains all available information and statements about one concept. These can then be examined in detail to detect, for instance, trends, relationships with other concepts or conflicting aspects. Findings are reported including verbatim statements to illustrate the opinions and beliefs as reflected by the participants.

## **4 Results**

In this section, the main findings of the focus group discussions are reported. First, participants' comments about the carrot with unusual appearance are presented, followed by their impressions toward the yogurt with a reduced expiration date and participants' opinions toward the broken biscuit. In the end, a combined analysis investigating the correspondence between both phases is presented.



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When analyzing impressions about the product with **unusual appearance**, the great majority of the participants mentioned that they would buy it. They mentioned the different appearance, however they believe that the carrot is similar with others. Some respondents mentioned the fact that the product came from the nature: *“I think it's normal because I think in nature, for example, we have a potato, one stuck in the other, from the soil in places where no fertilizer is used... so I think it's...the essence of nature, which is not normal, but is a carrot.”* (R6). Additionally, an association with the production method was mentioned: *“I would buy... but I would question what kind of fertilizer was used to grow that way, which was, of course, different.”* (R4).

According to the participants, even accepting the product, they recognize that humans tend to search for perfection when buying products: *“It is that the human being tends to go in the standard. It's kind of natural, so you look “ah, no, this is not ...” is not that you will look ... no, you will look the standard.”* (R1). Furthermore, some of the respondents mentioned the importance of distinguishing where the purchase occurs. When buying in supermarkets, it is more common to have only food with standard appearance: *“You can also observe, in the supermarket, they have more or less the same ... the same size, more or less the same texture.”* (R6). However, this fact may change if the purchase occurs in local fairs: *“You go to the fair and what you have there is what is there, is rustic, is what it is, comes with dirt, comes without dirt...”* (R4).

Some of the respondents would not buy the carrot, mainly because of its size or different appearance: *“I would buy if I had no other option ... but if there were other normal ones together I would buy the others, I would not accept that...”* (R2).

About the product with **reduced expiration date**, the great majority of the participants stated that they would buy the yogurt, mainly because they could consume the product in the same day or use it with different recipes: *“... I'd probably buy it and eat it at the same time.”* (R1) / *“If I were to make a recipe or something and I'm sure I would do on that day or the other ... then I would buy, no problem at all.”* (R3). Some of the respondents mentioned that they already used products expired in their households: *“Mainly because sometimes you eat expired at home and it's good anyway.”* (R3). However, they stated that they would not buy the product if it was already expired: *“If I see that it's expired, I will not buy it...”* (R1).

Some of the respondents mentioned that they would not buy the yogurt with two days to expire: *“I look for maximum durability until expire.”* (R6). Additionally, when buying food products, some respondents mentioned that they select the ones with the longest expiration date: *“I get the newest one ...”* (R2). Respondent 6 mentioned important aspects to reject the product: she will not consume the yogurt in the same day; and if the family was bigger she could buy the product, but as she lives alone she would not buy it. Moreover, respondent 6 mentioned a concern with her health, even when she has an expired product in her household: *“I through it out, no matter the price, because my health is priceless, right, I will not risk my health, not at all.”* Participants also expressed different perceptions about different types of products when close to expiration date, demonstrating more acceptance for ones then for other: *“It seems there is some products, cookies for example, I already bought expired, but I consider normal.”* (R5)

When asked about the product with a **damaged package**, participants had divergent impressions. One participant had a negative emotion toward the product and others with a damaged package: *“I do not buy because I think conservation changes. A dented can, I think it changes. A crumpled cardboard box, I think it changes. I do not buy.”* (R6). However, the great majority sad that they would buy the product, but with a certain limit: *“It depends on the*





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*kneading. I think if it's a bit ... if it's a bit, you do not have to stop buying.*" (R3). It is important to note that some of the participants mentioned that they were willing to buy the products depending on what they plan to do with it: *"If you're going to make a pie it is fine. If it's to consume like a biscuit, I would buy the whole thing."* (R2).

## **5 Discussion**

This study presents original findings on consumers' perceptions toward suboptimal food products. Results from the focus group discussion showed that participants are more connected with food and food preparation and, therefore, do not reject them. Previous studies show that developed cooking skills (GJERRIS; GAIANI, 2013; GRAHAM-ROWE; JESSOP; SPARKS, 2014; MYLAN; HOLMES; PADDOCK, 2016; PONIS et al., 2017) and better understanding of foods edibility reduce the amount of waste (FARR-WHARTON; FOTH; CHOI, 2014). Additionally, connection with food is a key driver to reduce food waste (BLICHFELDT; MIKKELSEN; GRAM, 2015). Individuals that are more aware of the importance of food and know different ways to prepare it seem to be more proactive to reduce and accept suboptimal products.

An important factor that emerged was the production method of the carrot with an unusual appearance. There is a tendency to accept this product if the product has an organic production credential. Consumers tend to accept cosmetically imperfect food after provisioning information about the reduced use of pesticides (BUNN et al., 1990). Moreover, branding the product as organic have benefits to the company, promoting positive brand associations (WHITE et al., 2016). When individuals have higher environmental concern, they are more open to cosmetic imperfections (YUE; ALFNES; JENSEN, 2009). This is represented by the results, where individuals that showed a connection with nature were more open to accept the product (BLICHFELDT; MIKKELSEN; GRAM, 2015).

However, when there is a lack of necessary knowledge to draw inferences about the product, individuals tend to rely on food appearance, smell, or taste to judge its edibility (GRAHAM-ROWE; JESSOP; SPARKS, 2014; LAZELL, 2016). In this case, the lack of familiarity with the carrot with unusual appearance produced negative perceptions toward the product.

For the yogurt close to its expiration date, the participant who anticipated that would not be able to consume the product within two days mentioned that would avoid to buy it in order not to waste food in their households, what was already found in previous studies (GRAHAM-ROWE; JESSOP; SPARKS, 2014; STEFAN et al., 2013). Individuals elaborated about their ability to eat the product within two days. If they could eat the yogurt before it expires, they were inclined to accept it. However, they tended to reject it if they could not include it in their eating habits. Additionally, an important factor that emerged was the household size (JÖRISSSEN; PRIEFER; BRÄUTIGAM, 2015; KOIVUPURO et al., 2012; SILVENNOINEN et al., 2014; TUCKER; FARRELLY, 2016). For bigger households, eating the product with a reduced expiration date seemed to be easier than for smaller ones. Moreover, safety concerns were also an important factor described. Some individuals justify their rejection of the product with a reduced expiration date with safety and risk concerns (ABDELRAADI, 2018; EVANS, 2011; GRAHAM-ROWE; JESSOP; SPARKS, 2014; LAZELL, 2016). Therefore, a better understanding of the food edibility can help in the acceptance of the product



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and, therefore, help in food waste reduction (BLICHFELDT; MIKKELSEN; GRAM, 2015; FARR-WHARTON; FOTH; CHOI, 2014).

The product with a damaged package was the most rejected. This was mainly justified by their necessity of buying products in perfect conditions. De Hooge et al. (2017) found that individuals hardly accept to buy broken biscuits when they are in the supermarket. When visualizing this product, contamination cues may be activated (WHITE et al., 2016), which impacted in their final perceptions. Moreover, quality dimension (GRUNERT, 2006) is an important factor that contributed to its rejection. The broken biscuit was associated with poor quality and also poor handling, which impacts its quality perception. However, for the individuals that knew what to do with the product, using it in recipes, the acceptance was higher.

Results reinforce the importance of appropriate communication toward the products. When selling suboptimal food products, they must be accompanied with communication of their safety, as products still suitable for consumption, and how rejecting them can be an aggravator of food waste levels. Additional effort can be directed to convince consumers that the products have the same attributes of taste, flavour and smell (SYMMANK; ZAHN; ROHM, 2018). This practice can be explored with practical interventions, such as sensory skills (PRINCIPATO; SECONDI; PRATESI, 2015), increasing freshness and expiration date awareness. Moreover, it is important to create awareness about the importance of connection with food and nature, in trying to increase individuals' environmental concern. Finally, results showed the importance of providing different recipes and help individuals to use food products. Participants that knew how to use the products tended to accept more suboptimal food than the ones that didn't know. These strategies together can help in food waste reduction strategies.

## **6 Conclusion and Implication**

It is increasing in the literature discussions about the importance of consumers changing their usual behaviours to cope with more sustainable practices. A way to achieve that is through the purchase of suboptimal food, whereas preferences for these products affect both retailer and consumer-food waste issues (ASCHEMANN-WITZEL et al., 2015). Findings show the extend to which suboptimal food choice is impacted by various factors. The results particularly highlight significant differences in opinions and perceptions toward these products. Moreover, there was not a pattern of behaviour: some of the respondents would accept one of the products and reject the others, while some of the respondents would accept/reject all of them. This shows the importance of analysing the results for each product individually, whereas the acceptance of suboptimal food depends on the type of sub-optimality (DE HOOGE et al., 2017).

This research holds important implications for advertisers and marketing strategies. Campaign designers should use normative influences in trying to communicate the importance of consuming suboptimal food. Again, it is important to create awareness that rejection of these products significantly increases avoidable food waste.

Additionally, retailers need to create a good brand image and trust in food safety (ASCHEMANN-WITZEL et al., 2017). Since some individuals believe that the two days to expire and that the few broken biscuits do not invalidate their consumption, retailers can create the right context where more consumers perceive value in these products. Consumers' decision-making regard suboptimal food can be positively influenced if they are provided with the appropriate message for that.

It is important to note that the qualitative findings have to be interpreted with the



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limitations of the data. The method might to some degree trigger thoughts that under normal circumstances would not have come to mind to that extent. Interpretation of such data should focus on the relation of factors. Thus, results have to be interpreted with care and regarded as explorative of these relations. Future research could provide greater insight into the issue by using different methods of data collection and trying to analyse suboptimal food perceptions under different circumstances.

## References

- ABDELRAADI, Fadi. Food waste behaviour at the household level: A conceptual framework. **Waste Management**, [s. l.], v. 71, p. 485–493, 2018.
- ASCHEMANN-WITZEL, Jessica et al. Consumer-related food waste: causes and potential for action. **Sustainability**, [s. l.], v. 7, n. 6, p. 6457–6477, 2015.
- ASCHEMANN-WITZEL, Jessica et al. Key characteristics and success factors of supply chain initiatives tackling consumer-related food waste—A multiple case study. **Journal of cleaner production**, [s. l.], v. 155, p. 33–45, 2017.
- BERETTA, Claudio et al. Quantifying food losses and the potential for reduction in Switzerland. **Waste management**, [s. l.], v. 33, n. 3, p. 764–773, 2013.
- BLICHFELDT, Bodil Stilling; MIKKELSEN, Marie; GRAM, Malene. When it Stops Being Food: The Edibility, Ideology, Procrastination, Objectification and Internalization of Household Food Waste. **Food, Culture & Society**, [s. l.], v. 18, n. 1, p. 89–105, 2015.
- BLOCK, Lauren G. et al. The squander sequence: understanding food waste at each stage of the consumer decision-making process. **Journal of Public Policy & Marketing**, [s. l.], v. 35, n. 2, p. 292–304, 2016.
- BUNN, David et al. Consumer acceptance of cosmetically imperfect produce. **Journal of Consumer Affairs**, [s. l.], v. 24, n. 2, p. 268–279, 1990.
- CANALI, Massimo et al. Food waste drivers in Europe, from identification to possible interventions. **Sustainability**, [s. l.], v. 9, n. 1, p. 37, 2016.
- DE HOOGE, Ilona E. et al. This apple is too ugly for me!: Consumer preferences for suboptimal food products in the supermarket and at home. **Food quality and preference**, [s. l.], v. 56, p. 80–92, 2017.
- DO CANTO, Natália Rohenkohl, STANGHERLIN, Isadora do Carmo, ECKERT, Daniele, ALVES, Ana Paula Ferreira, BARCELLOS, Márcia Dutra. Food Waste Solutions in Sustainability Strategy: a multiple case study with Brazilian companies. **Anais do XLI Encontro da ANPAD**, São Paulo, SP, Brasil, 2017.
- EVANS, David. Blaming the consumer—once again: the social and material contexts of everyday food waste practices in some English households. **Critical Public Health**, [s. l.], v. 21, n. 4, p. 429–440, 2011.
- FARR-WHARTON, Jeremy; FOTH, Marcus; CHOI, Jaz Hee-Jeong. Identifying factors that promote consumer behaviours causing expired domestic food waste. **Journal of Consumer Behaviour**, [s. l.], v. 13, n. 6, p. 393–402, 2014.
- GJERRIS, Mickey; GAIANI, Silvia. Household food waste in Nordic countries: Estimations and ethical implications. **Etikk i praksis-Nordic Journal of Applied Ethics**, [s. l.], n. 1, p. 6–23, 2013.
- GÖBEL, Christine et al. Cutting food waste through cooperation along the food supply chain. **Sustainability**, [s. l.], v. 7, n. 2, p. 1429–1445, 2015.
- GRAHAM-ROWE, Ella; JESSOP, Donna C.; SPARKS, Paul. Identifying motivations and barriers to minimising household food waste. **Resources, conservation and recycling**, [s. l.], v. 84, p. 15–23, 2014.
- GRUNERT, Klaus G. How consumers perceive food quality. **Understanding consumers of food products**, [s. l.], p. 181–199, 2006.





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IN AN URBANIZING SOCIETY**

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GUSTAVSSON, Jenny; CEDERBERG, Christel; SONESSON, Ulf. **Global food losses and food waste: extent, causes and prevention ; study conducted for the International Congress Save Food! at Interpack 2011, [16 - 17 May], Düsseldorf, Germany.** Rome: Food and Agriculture Organization of the United Nations, 2011.

HOEK, AC et al. Shrinking the food-print: A qualitative study into consumer perceptions, experiences and attitudes towards healthy and environmentally friendly food behaviours. **Appetite**, [s. l.], v. 108, p. 117–131, 2017.

HYDE, Katherine et al. The challenge of waste minimisation in the food and drink industry: a demonstration project in East Anglia, UK. **Journal of Cleaner Production**, [s. l.], v. 9, n. 1, p. 57–64, 2001.

STANGHERLIN, Isadora do Carmo; BARCELLOS, Marcia Dutra. Drivers and barriers to food waste reduction. **British Food Journal**, 2018, accepted for publication.

JÖRISSEN, Juliane; PRIEFER, Carmen; BRÄUTIGAM, Klaus-Rainer. Food waste generation at household level: results of a survey among employees of two European research centers in Italy and Germany. **Sustainability**, [s. l.], v. 7, n. 3, p. 2695–2715, 2015.

KOIVUPURO, Heta-Kaisa et al. Influence of socio-demographical, behavioural and attitudinal factors on the amount of avoidable food waste generated in Finnish households. **International Journal of Consumer Studies**, [s. l.], v. 36, n. 2, p. 183–191, 2012.

KUMMU, Matti et al. Lost food, wasted resources: Global food supply chain losses and their impacts on freshwater, cropland, and fertiliser use. **Science of the total environment**, [s. l.], v. 438, p. 477–489, 2012.

LAZELL, Jordon. Consumer food waste behaviour in universities: Sharing as a means of prevention: Consumer food waste behaviour. **Journal of Consumer Behaviour**, [s. l.], v. 15, n. 5, p. 430–439, 2016.

LOEBNITZ, Natascha; GRUNERT, Klaus G. The effect of food shape abnormality on purchase intentions in China. **Food quality and preference**, [s. l.], v. 40, p. 24–30, 2015.

LOEBNITZ, Natascha; SCHUITEMA, Geertje; GRUNERT, Klaus G. Who buys oddly shaped food and why? Impacts of food shape abnormality and organic labeling on purchase intentions. **Psychology & Marketing**, [s. l.], v. 32, n. 4, p. 408–421, 2015.

MARX-PIENAAR, Nadene JMM; ERASMUS, Alet C. Status consciousness and knowledge as potential impediments of households' sustainable consumption practices of fresh produce amidst times of climate change. **International Journal of Consumer Studies**, [s. l.], v. 38, n. 4, p. 419–426, 2014.

MILNE, Richard. Arbiters of waste: date labels, the consumer and knowing good, safe food. **The Sociological Review**, [s. l.], v. 60, n. 2\_suppl, p. 84–101, 2012.

MORGAN, David. **Successful focus groups: Advancing the state of the art.** [s.l.] : Sage Publications, 1993. v. 156

MORGAN, DL. The focus group guide. [s. l.], 1998.

MYLAN, Josephine; HOLMES, Helen; PADDOCK, Jessica. Re-Introducing consumption to the 'circular economy': A sociotechnical analysis of domestic food provisioning. **Sustainability**, [s. l.], v. 8, n. 8, p. 794, 2016.

NEFF, Roni A.; SPIKER, Marie L.; TRUANT, Patricia L. Wasted food: US consumers' reported awareness, attitudes, and behaviors. **PloS one**, [s. l.], v. 10, n. 6, p. e0127881, 2015.

PARFITT, Julian; BARTHEL, Mark; MACNAUGHTON, Sarah. Food waste within food supply chains: quantification and potential for change to 2050. **Philosophical Transactions of the Royal Society of London B: Biological Sciences**, [s. l.], v. 365, n. 1554, p. 3065–3081, 2010.

PONIS, Stavros T. et al. Household food waste in Greece: A questionnaire survey. **Journal of cleaner production**, [s. l.], v. 149, p. 1268–1277, 2017.



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IN AN URBANIZING SOCIETY**

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PRIEFER, Carmen; JÖRISSEN, Juliane; BRÄUTIGAM, Klaus-Rainer. Food waste prevention in Europe—A cause-driven approach to identify the most relevant leverage points for action. **Resources, Conservation and Recycling**, [s. l.], v. 109, p. 155–165, 2016.

PRINCIPATO, Ludovica; SECONDI, Luca; PRATESI, Carlo Alberto. Reducing food waste: an investigation on the behaviour of Italian youths. **British Food Journal**, [s. l.], v. 117, n. 2, p. 731–748, 2015.

QI, Danyi; ROE, Brian E. Household food waste: multivariate regression and principal components analyses of awareness and attitudes among US consumers. **PloS one**, [s. l.], v. 11, n. 7, p. e0159250, 2016.

RAAK, Norbert et al. Processing-and product-related causes for food waste and implications for the food supply chain. **Waste management**, [s. l.], v. 61, p. 461–472, 2017.

SALHOFER, Stefan et al. Potentials for the prevention of municipal solid waste. **Waste management**, [s. l.], v. 28, n. 2, p. 245–259, 2008.

SILVENNOINEN, Kirsi et al. Food waste volume and composition in Finnish households. **British Food Journal**, [s. l.], v. 116, n. 6, p. 1058–1068, 2014.

STEFAN, Violeta et al. Avoiding food waste by Romanian consumers: The importance of planning and shopping routines. **Food Quality and Preference**, [s. l.], v. 28, n. 1, p. 375–381, 2013.

STUART, Tristram. **Waste: uncovering the global food scandal**. [s.l.] : WW Norton & Company, 2009.

SYMMANK, Claudia; ZAHN, Susann; ROHM, Harald. Visually suboptimal bananas: How ripeness affects consumer expectation and perception. **Appetite**, [s. l.], v. 120, p. 472–481, 2018.

TSIROS, Michael; HEILMAN, Carrie M. The effect of expiration dates and perceived risk on purchasing behavior in grocery store perishable categories. **Journal of marketing**, [s. l.], v. 69, n. 2, p. 114–129, 2005.

TUCKER, Corrina A.; FARRELLY, Trisia. Household food waste: the implications of consumer choice in food from purchase to disposal. **Local Environment**, [s. l.], v. 21, n. 6, p. 682–706, 2016.

WHITE, Katherine et al. When do consumers avoid imperfections? Superficial packaging damage as a contamination cue. **Journal of Marketing Research**, [s. l.], v. 53, n. 1, p. 110–123, 2016.

YUE, Chengyan; ALFNES, Frode; JENSEN, Helen H. Discounting spotted apples: investigating consumers' willingness to accept cosmetic damage in an organic product. **Journal of Agricultural and Applied Economics**, [s. l.], v. 41, n. 1, p. 29–46, 2009.

### Attachments and Appendices - Used pictures of Suboptimal food options

